KATANNING GOLD PROJECT
Integrated Water Production and Management Report

Version 0

May 2026

Executive Summary

Ausgold Exploration Proprietary Limited (Ausgold) proposes to develop its Katanning Gold Project (KGP; the Project) located approximately 275 km southeast of Perth and 37 km northeast of Katanning, in the Great Southern Region of Western Australia (Figure 1-1). The Project consists of a series of open pit mines namely Jinkas, Jackson, Olympia and Dingo and associated infrastructure. The Project is designed to treat gold ore at an average rate of 3.6 Mtpa from the abovementioned Katanning Gold Mineral Reserves through a conventional Carbon in Leach (CIL) circuit to produce over a million ounces of gold doré over a 10-year mine life.

As part of the range of environmental impact assessments for the Project, Ausgold commissioned a series of hydrogeological investigations.

This report consolidates an extensive series of investigations conducted to date and offers a singular source of collated information on the investigations undertaken to date, as well as outlining applied methodologies, data, key findings and proposed additional investigations to fully characterise potential hydrogeological effects and management thereof.

It is anticipated that this Report will support a referral under Section 38 of the *Environmental Protection Act 1986* (EP Act) as well as an application for a groundwater licence or amendment to the existing licence in accordance with the *Rights in Water and Irrigation Act 1914* (RiWI Act).

Whilst further work will continue to expand the knowledge base, sufficient information is presently in hand to demonstrate that the project can be designed and managed to control adverse hydrological and hydrogeological risks. Ausgold is confident that assessment of applications under the RiWI Act and Part V of the EP Act enables all necessary mitigation measures and controls to be adequately and comprehensively regulated by respective agencies and that potential impacts will be adequately mitigated to achieve desired environmental outcomes and objectives.

1. Completed Investigations and Assessments

Between 2022 and 2024, Ausgold initially commissioned SRK Consulting (Australasia) Pty Ltd (SRK) to undertake hydrogeological field investigations, aquifer testing, and associated hydrogeological assessment for the Project to meet the aim of *Operational Policy No. 5.12 Hydrogeological reporting* associated with holding a groundwater licence (DWER, 2009). Ausgold used its site-based groundwater bore monitoring data to inform the establishment of bores and make estimations of local groundwater depth and quality. However, other than a preliminary guide to modelling, the SRK work does not now inform current forecasts of pit dewatering and has only been used to provide field observations and empirical data adopted by subsequent analysis by Rockwater (Appendix 2) and EMM Consulting (Appendix 4), as described below. However, even though substantive work was completed by SRK, the forecast dewatering rates estimated by early SRK modelling were found not to be fit-for-purpose. Furthermore, a H3 hydrogeological assessment was prepared and delivered to DWER, ahead of referral of the Project to the EPA.

Rockwater was subsequently engaged in 2025 to conduct an independent technical review of SRK's previous hydrogeological report; Rockwater went on to produce a numerical groundwater model for the Project and predict pit dewatering rates (Rockwater, 2025a). These findings and outcomes of the calibrated groundwater model are provided in Appendix 2 and 4. The peer reviews and revised groundwater modelling (Rockwater, 2025a; EMM, 2025) concluded that SRK's predicted dewatering rates were likely over-estimated by at least one order of magnitude, mainly due to use of an unrealistic specific yield values and setup assumptions to represent the fractured bedrock hydraulic connectivity. In 2025, Rockwater produced updated groundwater modelling to reflect KGP's current base-case water management strategy, incorporating dewatering of pit inflows, water supply borefield operation and the use of a fully lined tailings storage facility (TSF) during the mine pit dewatering phase.

In order to more fully characterise ground conditions including the natural salinity gradients of the hydrogeological profile within and surrounding the proposed mine pits for the Project, Ausgold commissioned Hydrobiology to assess the groundwater salinity with depth, elevation and aquifer type (Hydrobiology, 2025b). Baseline salinity conditions in nearby groundwater and surface water systems, potential receptors for any unplanned future release, were also evaluated. The findings are intended to inform opportunities for management of natural groundwaters typically generated through dewatering activities (Appendix 3). Hydrobiology (2025b) (Appendix 1) also provides a risk assessment and ground truthing of potential groundwater dependent ecosystems in the district.

Ausgold also commissioned WSP Australia Pty Ltd (WSP) to undertake the *Site-wide Water Balance* (WSP, 2026a) with the report provided in Appendix 5. WSP also developed a *Surface Water Management Plan* (SWMP) and design of a surface water management structures for the Project (WSP, 2026a). The SWMP report is provided in Appendix 6. The work of WSP (2026a; 2026b) indicates the following; in general, contact water comes from three main sources, and has two sinks:

Sources (described by WSP reports)

- Pits: Dewatering of surplus groundwater inflow in the pits (~427 ML/year).
- Sediment Ponds: Runoff and seepage from the Waste Rock Dumps (WRDs) (~472 ML/year).
- Tailings Storage Facility (TSF): Return water from the TSF (~2,990 ML/year), which constitutes about ~70% of the total water the TSF receives resulting from slurry water release, incident rainfall and surface runoff.

Water Demand and Projected Surplus

- Processing Plant water demand averages around 3.7 GL/year.
- This results in an annual water surplus in Year 4 through to Year 9 of approximately 400 ML/year, necessitating a site-based loss system (e.g. mechanical evaporator and/or water evaporation pond). This surplus occurs in later years of the operations providing time for the adopted solutions to match the on-site balance of consumption/swing inventory.

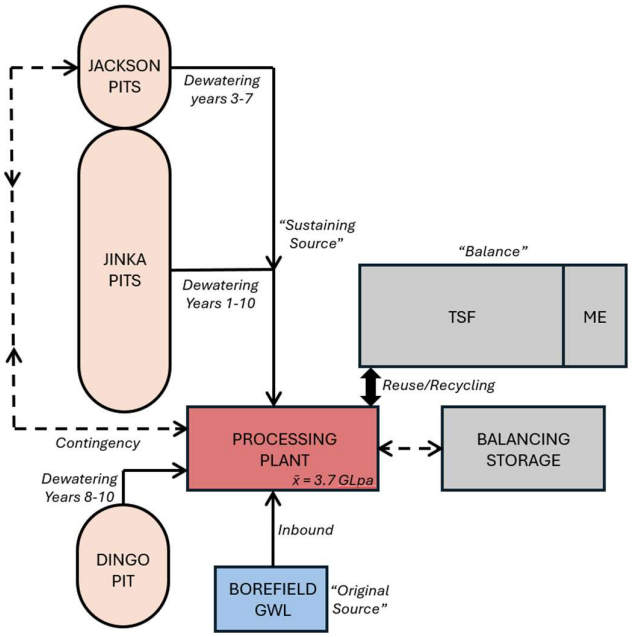


Diagram 1: Processing Plant demand at centre of water balance

The potential impact to regional surface water and groundwater depends on the site's annual water demand which would be largely at the processing plant; it is estimated at approximately 3.7 GL/year. Initially, this will include water sourced from a water supply borefield (under GWL at CAW-permitted WERC06A), noting that for the majority of the years the demand is forecast to be primarily met through return water from the Tailings Storage Facility (TSF), contact water caught as rainfall at site and inflows from pit dewatering below the water table.

Water usage and control at the KGP means that low risk of adverse impacts from its water usage relies on two key elements:

- Relatively low and short-term supply of water from the southern borefield, led largely by abstraction at licensed Production bore WERC06A; and

- Capture and retention of rainfall contact and pit dewatering volumes on-site and entrainment into the site-wide water balance to avoid off site release.

Model inflows and outflows and water transfers for each storage were identified for each storage type. These are 'balanced' by identifying the Surplus/Deficit water over the course on each operating year. In the case of KGP, a managed surplus occurs by virtue of the policy of **nil release**; this then requires additional management mitigations to provide water volume controls including by:

- Use of mechanical evaporators to enhance the loss of accumulated water to the atmosphere; and/or

- Temporary in-pit storage in mined voids after Year 5 when surpluses are forecast to occur, such as the Jackson pits (J1-J3) to the north of the mining domain; and/or

- Future potential use of a dedicated (>32 hectare; 2+GL) Water Balancing Storage to be constructed as an evaporation basin (eg summer time) / balancing storage for seasonally surplus (eg. winter time) waters.

2. Summary of Hydrogeology findings

The site's annual water demand is estimated at an average of approximately 3.7 GLpa (WSP, 2026a). This demand is expected to be primarily met in the majority of operating years through return water from the Tailings Storage Facility (TSF) and inflows from pit dewatering below the water table.

Regional groundwater flow generally follows surface topography, trending from elevated zones near Jinka Main Pit (~356 m RL) toward highly seasonal drainage lines. Dingo Pit appears to act as a local groundwater sink, likely due to evaporative losses. The lowest observed groundwater level is 265 m RL to the north of the site.

Regional groundwater flow generally follows surface topography, trending from elevated zones near Jinka Main Pit (~356 m RL) toward creeks and drainage lines. Dingo Pit (southern mining zone) appears to act as a local groundwater sink, likely due to evaporative losses. The lowest observed groundwater level is 265 m RL to the north of the site. Regional bores intersecting major structures (e.g., WERC007, WERC006A) exhibit shallow water levels and likely confined to artesian conditions. Groundwater levels show subdued seasonal variability, with typical fluctuations of 1–2 m and isolated changes up to 4 m. A lag of 1–2 months between peak rainfall and water level response suggests the presence of low-permeability cover enabling recharge.

Bores intersecting major geologic structures in palaeovalleys (e.g. WERC007, WERC006A) exhibit relatively shallow water levels and generally confined to artesian conditions, with WERC007 (north of KGP) recording a water level above ground level. Groundwater levels show subdued seasonal variability, with typical fluctuations of 1–2 m and isolated changes up to 4 m. A lag of months between peak rainfall and water level response suggests the presence of low-permeability overburden beneath the alluvium.

Groundwater quality is highly variable. Electrical conductivity (EC) values ranged from ~900 (fresh) to over 100,000 µS/cm (hypersaline), with increasing salinity observed at lower elevations. Most samples are classified as saline, and total dissolved solids (TDS) often exceed livestock water guidelines. pH ranges from 4.0 to 9.6. Major ions are dominated by sodium-chloride facies. Several samples exceed guideline values for chloride, sodium, sulphate, iron, manganese, selenium, vanadium, and nitrate. These exceedances highlight the importance of continued groundwater monitoring and further characterisation of aquifer geochemistry to inform future water management and environmental approvals.

Groundwater inflow estimates over the life of mine; Rockwater (2025a) highlighted the year-on-year predicted pit inflows, as part of a peer review process of previous work by SRK. Rockwater (2025a) developed a simplistic alternative numerical model to assess the reliability of these predictions. Using a quarterly bench progression over a 10-year mine life, Rockwater's model estimated average inflows of approximately 0.4 GL/year on average, with ranges of between **0.20 to 0.88GLpa**. All dewatering taken from pits (pumped recovery from operating pit floor sumps) would be consumed at the processing plant and otherwise retained in site and lost to evaporation.

The earlier divergence in modelled outcomes was primarily due to differing inputs regarding the extent and hydraulic connectivity of fault zones. SRK's initial model assumed regionally extensive, vertically continuous, and hydraulically connected faults that act as preferential flow paths; whereas Rockwater, based on its review of core logs and in consultation with Ausgold geologists and its detailed site mapping, assumed that fault transmissivity significantly diminishes below 150 m AHD in the vicinity of the proposed below water table pits, and is considered a more realistic reflection of known field conditions. This work by Rockwater (2025a) supported the development of a refined, fit for purpose numerical model in line with Australian Groundwater Modelling Guidelines.

2.1. Existing Groundwater Conditions

Naturally, groundwater is highest in elevation beneath the topographic high points in the catchment, being under the tenements of the KGP (Figure 1). However, generally, the depth below natural surface to the groundwater table is also greater on the highest elevations >350 metres and the groundwater is generally shallower in the lower palaeovalleys.

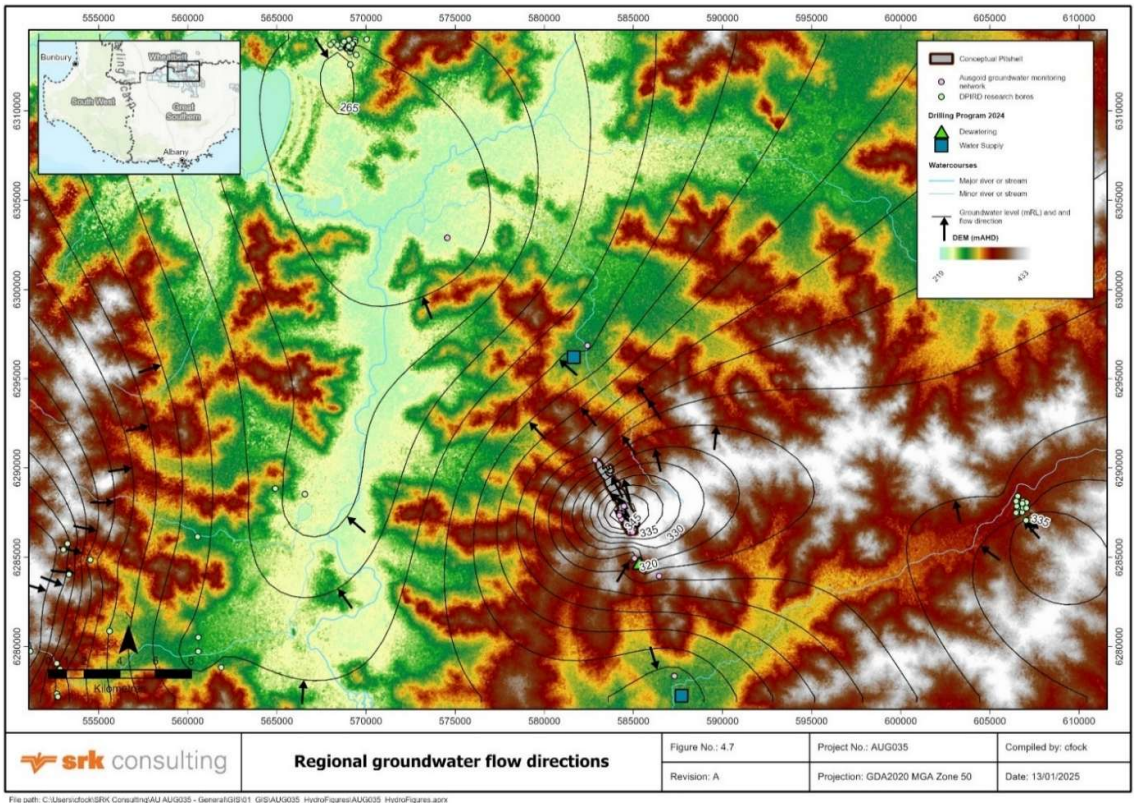


Figure 1. Groundwater contours around the KGP on the topographic high

The relationship of increasing salinity as TDS (mg/L) shows it being lowest at topographic highs and highest at 15,000-20,000 mg/L in the palaeochannels and valleys with lower elevation (Figure 2).

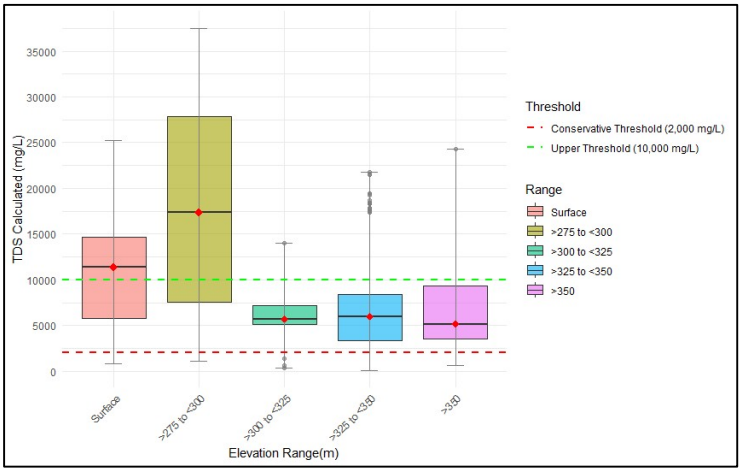


Figure 2. Groundwater quality in Total Dissolved Solids (mg/L) around the KGP

2.2. Forecast Groundwater Drawdown Effects

2.2.1. Groundwater Users and the Beaufort Palaeochannel

The work of Rockwater (2025a) shows the nature of the localised drawdown on the standing groundwater table. During the first year of production from the southern borefield, comprised currently of licensed bore WERC06A (and modelled for two other supplementary, yet undeveloped sites). The southern borefield would be in the Beaufort Palaeovalley. The bore WERC006A is screened in the underlying fractured bedrock (confined beneath the palaeovalley sediments, which consist of a blanket of thick clays).

The maximal drawdown is short term as water in planned to be supplied into the KGP only for its first year of operation (after which pit dewatering will supply the bulk of the top-up water). Figure 3 shows the first two years of southern borefield drawdown with rebound in the Beaufort Palaeovalley evident by Year 2 and close to a return to baseline conditions by Year 10 (Figure 4). At that time, the modelled drawdown of groundwater reflects the lower confined layer 2 of the model, and not in the palaeochannel sediments above the drawdown zone.

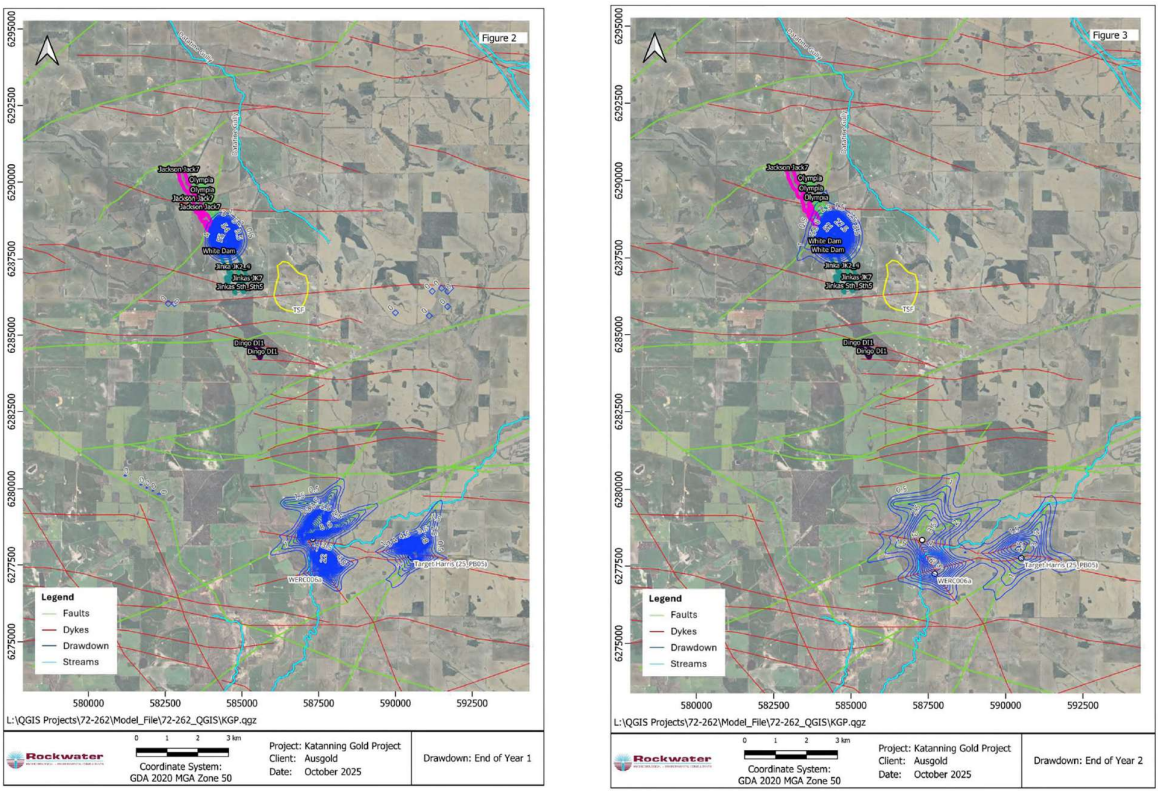


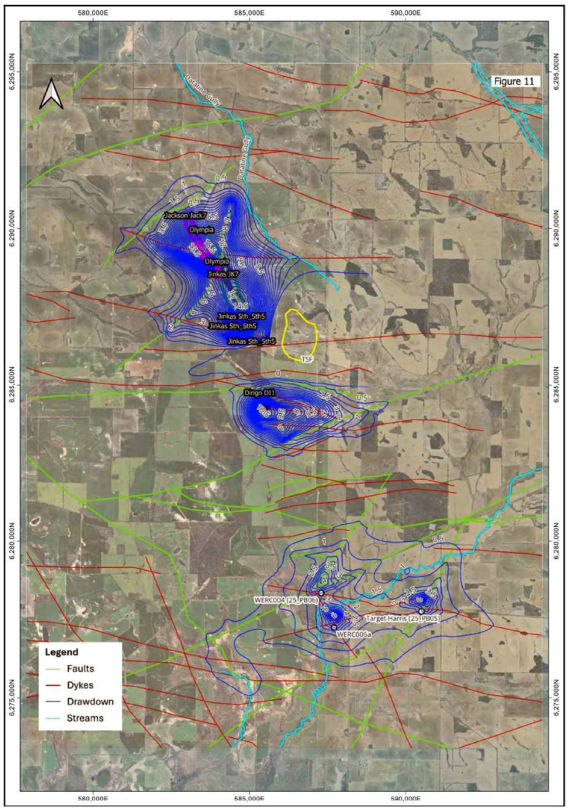
Figure 3: Initial groundwater drawdown in Years 1 & 2.

The forecast maximal groundwater drawdown in Year 1 is shown to be small in area, localised to the district, and not known to interfere with any other licensed bore in that district. Notably, the water drawn down is known to saltine in quality (15,000-20,000 mg/L TDS) and would be abstracted from bores slotted at depth (>50m) in a confined pressurised aquifer. The view is the risk is very low of there being an impact on surficial, seasonally fresher unconfined aquifers near the surface. In the district, the native vegetation on clay pans and the bed of palaeovalleys is generally poor in quality and the shrubs identified in 2025 to be associated with the seasonal surface drainage (16,000 mg/L) are salt tolerant halophytes. Ausgold's Waterway Monitoring Plan (2025) contains water quality data at many catchment sites.

Groundwater drawdown due to abstraction and dewatering could have a positive influence on ecosystems or farmland already impacted by clearing and associated dryland salinity by removing the salt burden from waters beneath those lands.

The short-term physical drawdown effects can be seen in Figure 4 which shows the rebound of the deep groundwater aquifer by Year 10 beneath the Beaufort Palaeochannel and Year 20, approximately ten years after completion of the 2025 mine plan. At the KGP site post-closure, the recovery of the groundwater forming as pit lakes is shown by Rockwater (2026) in Appendix 8.

Year 10 at end of LOM



Year 20, ten years after end of LOM

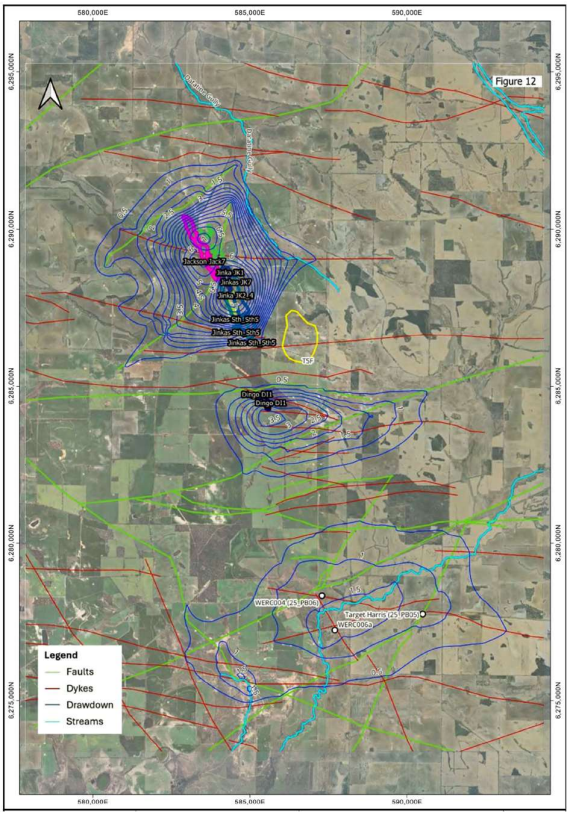


Figure 4: Groundwater contours in Years 10 at end of Life of Mine and Year 20 (ten years post mining).

2.2.2. Drawdown on GDEs including beneath Wurgubup Reserve

Ausgold commissioned Hydrobiology (2025a) to initially conduct a risk assessment and site inspection of potential GDEs near the proposed groundwater production zones which used national GDE mapping, modelled groundwater drawdown, and satellite-derived vegetation and climate data. Normalised Difference Vegetation Index (NDVI) and Aridity Index (AI) were analysed to assess vegetation responses during drought periods. Vegetation that remained relatively healthy during drought was considered more likely to access groundwater, while vegetation with low or seasonal NDVI was excluded as groundwater dependent. NDVI declined significantly between 2020–2021 and 2022–2024, consistent with increased aridity. Modelled drawdown extents from groundwater abstraction indicate that adverse impacts on High Potential GDEs are unlikely. A total of 21 terrestrial (114.91 ha) and 10 aquatic GDEs (137.67 ha) were identified and assessed. Of these, all terrestrial GDE were classified as Low Potential. Four aquatic GDEs were classified as High Potential, four Moderate Potential and one Low Potential. Hydrobiology (2025a) determined that of the four High Potential aquatic GDEs, only one was assessed to be an obligate GDE; however, its location on the boundary of the survey area meeting the assessment criteria (where predicted drawdown is >1.0 m after 10 years abstraction, and where depth to groundwater <10 m)) reduces the risk. Most terrestrial and aquatic GDEs across the study area were in close proximity to intensive agricultural operations or other established infrastructure.

The distribution of potential aquatic and terrestrial GDEs proximal to the Project, relative to test production bores (potential supply sites), is shown in Figure 5-7.

An intersection between modelled groundwater drawdown occurs at the nearest mapped 'low potential' Terrestrial Groundwater Dependent Ecosystem (GDE) (BOM (2025) rated as 'low potential') being the Wurgubup State Reserve (R12423). This is forecast to occur only after recommencement of mining (and dewatering) in the Dingo existing 'care and maintenance' pit in Year 7 and actively continue until Year 10 (Figure 5); there would only be up to three years of active groundwater draw down while Dingo pits are being mined. Groundwater rebound would occur as modelled in Figure 4 above. Adverse impact to the intact native bushland in the Reserves is very unlikely when considering the following factors:

- It is anticipated that there is little vertical connection between the lower zone of the bedrock aquifer (the zone of pit dewatering and drawdown) and any potential shallow surficial aquifers, where GDEs may be drawing seasonally recharged groundwaters. Review of RC drill logs suggests an aquitard created from lithologic layering including tight clays between the deeper fractured rock aquifer and shallow surficial layers above. There is not expected to be any localised drawdown in the surficial seasonal aquifers as a response to mine dewatering. Therefore, drawdown response within the bedrock aquifer should not transmit significantly through to the upper surficial aquifers to induce any localised drawdown.
- Terrestrial GDEs mapped in the upper-catchment settings, are less susceptible to widespread drawdown impacts. The higher rates of natural recharge in upper catchments can also help mitigate the potential impacts of groundwater fluctuations.
- The local watercourses are completely ephemeral, meaning they are naturally resilient to intermittent water availability.
- The duration of mining at Dingo Pit where a drawdown is modelled in the deep confined aquifer is short at only three years. Drawdown due to mining and dewatering in the Jinkas main pit to the north is not modelled to impact the State Reserves due to a geologic dyke that strikes west to east at depth, retarding north-south groundwater movement (refer to Figure 3-13).
- The is no evidence that earlier mining up until 1997 or the longer term presence of salty pit lake had caused any permanent impact to vegetation within the Wurgubup Reserve by subterranean ingress.
- Monitoring before and during operations can guide management to control any unexpected impacts.

- Groundwater drawdown due to dewatering could also have a positive influence on ecosystems or farmland already impacted by clearing and associated dryland salinity.

Further discussion on geological controls is given in "Section 3. Geology" and "Section 5.5. Identified Groundwater Risks".

Notwithstanding a low risk to GDEs from groundwater abstraction, because of clay-rich subsoil and/or saprolitic subsurface layers, the potential for terrestrial ecosystems drawing from seasonal and/or perched aquifer systems is also being considered. As a result, a field assessment and monitoring plan advancement will occur in H2 2026 to include:

- Vegetation type and condition assessment at high-value target locations in 2026 to assess 'current' baseline conditions to enable comparisons (during mining in future field assessments) including at:
  - North of Woorgabup Nature Reserve on Smith Road, south of the Jinka South pit;
  - Bounding the eastern part of the Wurgubup Rifle Range Reserve, on the north and south sides, adjacent to Dingo Pit.
- Assessment of mature trees at leaf water potential (LWP) to measure water status and ability to access soil moisture sources; along with tissue stable isotope analysis.
- Undertaking groundwater and GDE pathway monitoring components in the project's *Flora & Vegetation Monitoring & Management Plan* (FVMMP) which includes routine monitoring to extend the above baseline and to determine trigger action response levels.

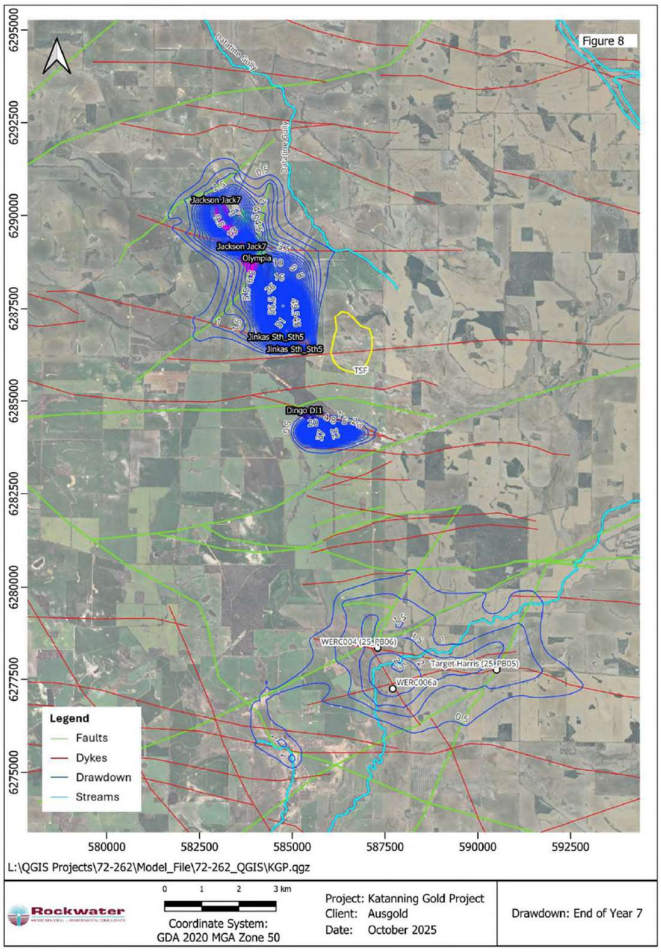


Figure 5: Year 7 mining showing the extra effect of Dingo Pit dewatering

Subject to further evaluation of potential drawdown and the low likelihood of vegetation being GDEs, the study also concluded that risks from groundwater abstraction were rated between moderate to low.

Rockwater (2025a) mapped intersections provide a useful screening tool for identifying and prioritising the need for and focus of additional ground truthing to refine the GDE occurrence. Project design and implementation will therefore adopt a precautionary approach to managing potential ecological impact as far as practicable and commensurate with identified risks to these systems.

3. Key Conclusions

Ausgold has committed to defining, investigating, assessing and quantifying the range of potential hydrological and hydrogeological conditions associated with its proposed operations at the KGP. The body of work completed to date, as summarised in this document, has drawn from an iterative approach to the range of studies to enable progressive refinement of assumptions, conclusions and quantification of the nature and scale of potential environmental risks.

Rockwater (2025a) pit dewatering informed WSP's (2026a) detailed site wide water balance based on updated pit inflow modelling and pit void storage volumes. The revised water balance forecasts that additional water supply from the borefield will be required in Year 1 and then by top up supplements based on site demands. Surplus water from Year 2 onwards of the mine operations will be managed such as to avoid releases to downstream surface waters or groundwater levels.

In summary:

- Groundwater drawdown will largely be caused by water abstraction and dewatering of pits at KGP. Modelled drawdown is spatially-limited in extent as the confined aquifers at lower depths being dewatered (between 20-200m) are spatially constrained by tight country bedrock geology. In the fractured rock layer, only major faults are thought to be highly transmissive through the region and the relatively small size of the KGP mine means the drawdown is not expansive. Where geologic faults are known to occur in fractured rock, they are small in size (often less than a metre in width and not vertically or laterally extensive);
- It is not evident that other users rely on the district's groundwater, given its typical brackish quality condition (at or above 4,000-6,000 mg/L at highest elevations) and greater than 10,000mg/L below 300m AHD. Annual crops are farmed by dryland-style agriculture and farm dams capture incident rainfall-runoff for livestock. KGP would only use and retain brackish-saline bulk water for its processing and water balance. No water release would occur from KGP, hence there is no risk or compromise to the ephemeral quality of seasonal drains and creeks. For the most part, based on 2025 monitoring, these too are known to have a baseline condition of brackish-saline over winter and spring.
- The deeper confined aquifer would be either pumped at bore/s or drawn out of pit floor sumps for the KGP. Overburden lithologies beneath the surface alluvium and above the deep aquifer are typically shown to create an layer of low permeability, called an 'aquitard'. These layers can be seen it excavated pit walls and in exploration and bore drill cores. This has the effect of causing zero (impermeable) to low (semi-permeable) vertical transmission rates of soil moisture and groundwater between near surface and at depth. Where they apply, they control vertical water interaction.
- The water balance at KGP shows an initial reliance on inbound bore water largely in Year 1 (and smaller top ups potentially afterwards), but the balance predominantly maintained during operations by retention of captured contact water and dewatering of pits in the layers below the water table. The balance is maintained over time as a water surplus is decreased by use of mechanical evaporators and, if needed, other measures including in-pit and evaporation basin storage.

- Notably, established monitoring bores are known to typically contain brackish to saline quality water at various water table depths. Such bores, with recent data contained in this report, are also known to be in close proximity to remnant living bushland including within the Wurgubup Reserve (R12423). The vegetation there and in the State Reserve complex shows no signs of poor plant or foliage condition, as it likely relies on rain-fed fresh water in the vadose zone and/or potentially seasonal perched fresh aquifers. It is unlikely that it (and other regional prospective GDEs) does not interact with the brackish-salty water sitting vertically beneath it, because of an aquitard which has been measured as saprolitic clays, immediately below surface soils and above the country granitic rock. Where they have in the past, because of broadscale capillary rise and drainage of ancient salt loads - such as on the floor of the Beaufort palaeovalley (at and near WERC06A) - the plant communities have clearly been modified to now be comprised of halophytic shrubs, and no longer typically dominated by deeper-rooted eucalypts nor hydrophilic melaleucas.

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List of Abbreviations

Term	Definition
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
AI	Aridity Index
AMD	Acidic and/or Metalliferous Drainage
ANC	Acid Neutralising Capacity
ANZECC	Australian and New Zealand Environment and Conservation Council
ARMCANZ	Agriculture and Resource Management Council of Australia and New Zealand
ASC	Australian Soil Classification
Ausgold	Ausgold Limited
BC Act	*Biodiversity Conservation Act 2016* (WA)
BESS	Battery Energy Storage System
BoM	Bureau of Meteorology
CCiA	Climate Change in Australia
CIL	Carbon in Leach processing method
DBCA	Department of Biodiversity, Conservation and Attractions
DEM	Digital Elevation Model
DEMIRS	Department of Mines, Energy, Industry Regulation and Safety (former)
DFS	Definitive Feasibility Study
DIWA	Directory of Important Wetlands in Australia
DMIRS	Department of Mines, Industry Regulation and Safety (former)
DMP	Department of Mines and Petroleum (former)
DMPE	Department of Mines, Petroleum and Exploration
DPIRD	Department of Primary Industries and Regional Development
DWER	Department of Water and Environmental Regulation
EC	Electrical Conductivity
EF	Evaporation Factor
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EP Act	*Environmental Protection Act 1986* (WA)
EPA	Environmental Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cth)
EWTEC	Eucalypt Woodlands of the Western Australian Wheatbelt Threatened Ecological Community
g/t	grams per tonne
GDE	Groundwater Dependent Ecosystem
GDE Atlas	Groundwater Dependent Ecosystems Atlas
GWL	Groundwater Well Licence
Hydrobiology	Hydrobiology WA Pty Ltd
HDPE	High-density Polyethylene
IRR	Internal Rate of Return
KGP	Katanning Gold Project
km	kilometre
koz	thousand ounces

Term	Definition
LLDPE	Linear Low-density Polyethylene
LOM	Life of Mine
m	metres
MAR	Managed Aquifer Recharge
MODIS	Moderate Resolution Imaging Spectroradiometer
MPA	Maximum Potential Acidity
mRL	Metres Relative Level / Metres above Sea Level
Mt	Million tonnes
Mtpa	Million tonnes per annum
NAPP	Net Acid Production Potential
NDVI	Normalised Difference Vegetation Index
NORM	Naturally Occurring Radioactive Material
NPV	Net Present Value
oz	Troy ounce
PAF	Potential Acid Forming
PAR	Population at Risk
PEC	Priority Ecological Community
ppm	parts per millions
Project, the	Katanning Gold Project
PV	Photovoltaic
RC	Reverse Circulation
RiWI Act	*Rights in Water and Irrigation Act 1914* (WA)
RO	Reverse Osmosis
ROM	Run-of-Mine
SF	Salinity Factor
SG	Specific Gravity
SI	International System of Units
SILO	Department of Science, Information Technology and Innovation
SMU	Soil Management Unit
SRK	SRK Consulting (Australasia) Pty Ltd
t	tonne (metric)
TDS	Total Dissolved Solids
TEC	Threatened Ecological Community
TSF	Tailings Storage Facility
WA	Western Australia
WIR	Water Information Reporting
WRD	Waste Rock Dump
WRL	Waste Rock Landform
WSP	WSP Australia Pty Ltd

1. Introduction

Ausgold Limited (Ausgold) proposes to develop its Katanning Gold Project (KGP; the Project) located approximately 275 km southeast of Perth and 40 km northeast of Katanning, in the Great Southern Region of Western Australia (Figure 1-1). The Project consists of a series of open pit mines namely Jinkas, Jackson, Olympia and Dingo and associated mining infrastructure. The Project is designed to treat gold ore at an average rate of 3.6 Mtpa from the abovementioned Katanning Gold Mineral Reserves through a conventional Carbon in Leach (CIL) processing circuit to produce over one million ounces of gold doré over a 10-year mine life. The holder of current and the applicant for all future permits and licences is Ausgold Exploration Pty Ltd.

1.1 Purpose of Report

In order to support the environmental impact assessments for the Project, Ausgold commissioned a series of hydrogeological investigations through H3 level of hydrogeological assessment to meet the requirements of Operational Policy No. 5.12 – *Hydrogeological reporting associated with a groundwater licence* (DWER, 2009).

An H3-level assessment requires a field hydrogeological assessment, including drilling and test pumping to characterise the groundwater regime, and numerical groundwater modelling to evaluate the potential for impacts on surrounding groundwater and surface water systems, users and ecosystems.

This report consolidates the series of hydrogeological investigations conducted to date and offers a singular source of summaries of investigations undertaken to date, methodologies, data, key findings and proposed additional investigations to fully characterise potential hydrogeological impacts and management thereof.

1.2 Applicant Details

1.2.1 Contact Details

Table 1.1: Applicant Details

Name:	Ausgold Exploration Pty Ltd
ACN:	140 164 496
ABN:	67 140 164 496
Head Office Address:	Level 1/307 Murray St, Perth WA 6000

Table 1.2: Authorised Representatives

Contact Person:	**Troy Collie** Title: General Manager – Planning, Environment & Approvals E-mail: tcollie@ausgoldlimited.com
Alternate Contact Person:	**Mark Mitchell** Title: Chief Operating Officer E-Mail: mmitchell@ausgold.com

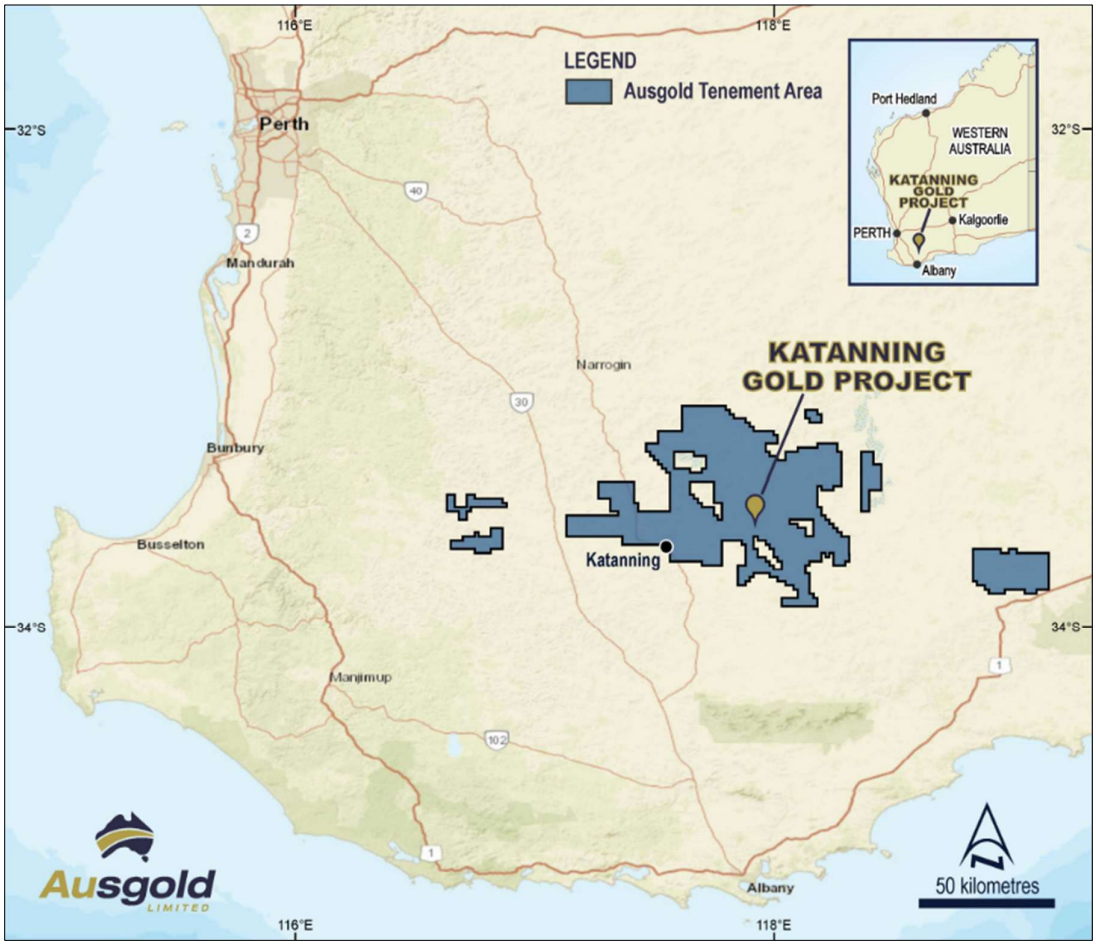


Figure 1-1: Regional Location

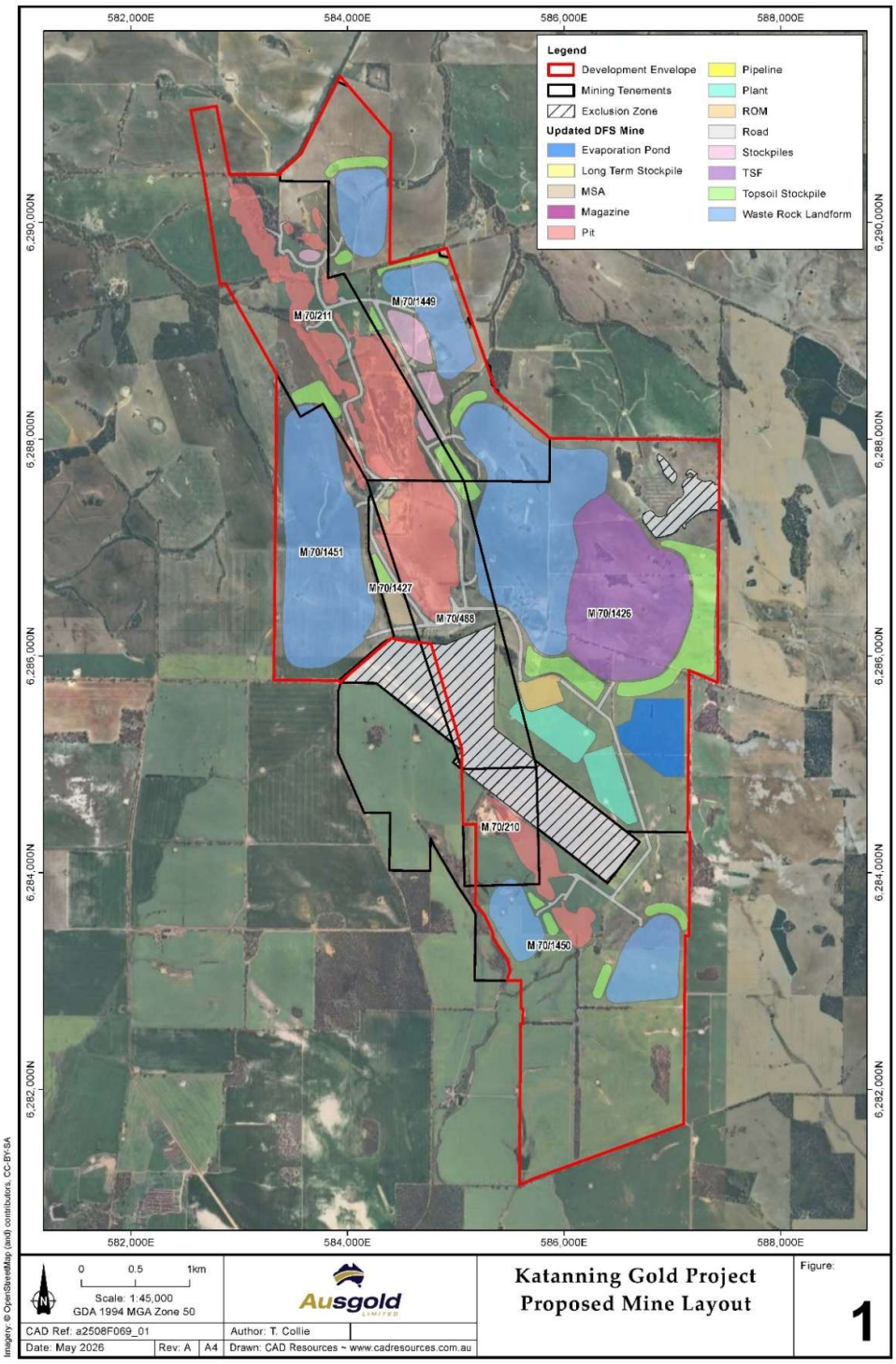
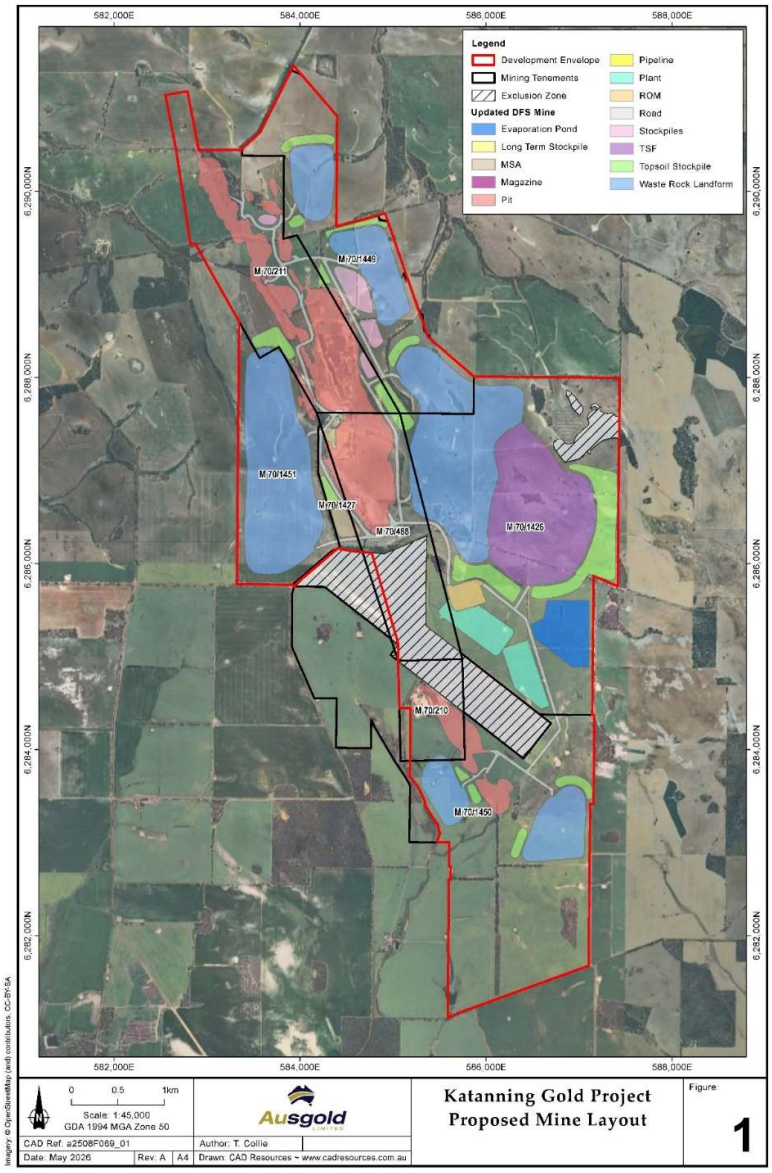


Figure 1-2: Proposed Premises Layout within Development Envelope on Mining Tenements

2. Katanning Gold Project Background and Overview

The Katanning Gold Project is located approximately 275 km southeast of Perth and 40 km northeast of Katanning, in the Great Southern Region of Western Australia (Figure 1-1). The Project is within the 'Wheat Belt', a region of Western Australia primarily focused on agriculture and sheep/cattle grazing.



2.1 Project History

The KGP leases encompass the Central (Jackson, Jinkas and Olympia) and Dingo (southern) areas. The Project is brownfield, with previous mining undertaken by Glengarry Mining NL in 1995 at the Jinka Hill (or Jinkas) and Dingo open cut operations which were mined between 1995 and 1997. Having produced approximately 20,000 oz Au, both pits were placed in care and maintenance. Across the entirety of the KGP, high-grade zones are focussed within fold hinge zones of tightly folded and metamorphosed rocks. These high-grade zones plunge broadly NNW in the Central Zone, SSE in the Southern Zone; these mineralised zones form the basis of the KGP proposal. Note, while there is mineralisation to the ENE at Datatine in the Northern Zone (Ausgold Limited, 2025) if does not form part of the KGP proposal.

In 2009, Ausgold acquired a large holding of tenements in the area, including the Project, with a view to redeveloping the Project. In 2017, Ausgold reinterpreted the geological model and is currently drilling to expand the defined Mineral Resource and Ore Reserve to form a key component of a definitive feasibility study.

The Definitive Feasibility Study (DFS) released 20 June 2025 incorporated an updated Ore Reserve of 35.2 Mt grading at 1.11 g/t Au and describes a 10-year Life of Mine (LOM) plan to produce a total of 1.14 Moz of gold from the open pit at the central and southern zones. The project demonstrates excellent key financial metrics including a LOM revenue of A$4.9 billion and a net present value ($NPV_{5\%}$) after tax of A$953.6 million at the adopted gold price. Higher gold grades in the initial four years of production deliver, on average per year, 140 koz of gold and generating A$946 million of undiscounted cashflow after tax, which contributes to an early payback of 1.1 years and a post-tax internal rate of return (IRR) of 53.2%.

2.2 Katanning Gold Project Overview

The Katanning Gold Project will consist of a series of open pits at Jinkas, Jackson, Olympia and Dingo and its associated infrastructure. The Project is designed to treat gold ore at an average rate of 3.6 Mtpa from the abovementioned Katanning Gold Mineral Reserves through a conventional Carbon in Leach (CIL) circuit to produce 1.14 Moz of gold doré over a 10-year mine life.

The project scope is summarised as:

- Mine: Jinkas Pit, which is by far the largest, augmented by the smaller Jackson, Olympia and Dingo open pit mines with waste dumps, pit dewatering and mine infrastructure including offices and workshops. Mining will be undertaken by mining contractors using conventional mining equipment such as haul trucks, excavators, drill rigs, graders, bulldozers and water trucks.
- Process plant: 3.6 Mtpa average ore tonnage capacity which includes:
  - Crushing: jaw crusher, conveyors and a crushed ore stockpile.
  - Milling: SAG mill, pebble crusher, ball mill, cyclone cluster and trash screen.
  - Gravity recovery: centrifugal concentrator, intensive cyanidation and electrowinning.
  - Leaching: cyanide leaching and carbon adsorption tanks.
  - Gold recovery: Split between AARL elution, electrowinning and smelting to produce gold doré
  - Tailings handling: carbon safety screen, cyanide recovery thickener, cyanide detoxification, tailings pumps and pipe.
- Tailings storage facility: engineered embankment to store up to approximately 40.6 Mt of tailings, linear low-density polyethylene (LLDPE) lined basin to reduce seepage, emergency spillway, downstream construction which includes underdrainage recovery, seepage interception as well as decant recovery and pumping of tailings return solution back to the process plant for re-use.
- Raw water supply from three bores at the southern borefield bores and onsite water storage.

- Power supply: a hybrid power station consisting of a split of gas generators, solar PV capacity, 20 MW of Battery Energy Storage System (BESS) and 3.0 MW of diesel (backup) generators.
- General infrastructure: such as offices, workshops, water storage ponds, warehouse with day storage areas at the process plant and mining services areas, control rooms, and laboratory.

3. Receiving Environment

3.1 Regional Setting

The Project area occurs in part of the southern section of the Western Australian Wheatbelt which has been almost entirely cleared for agricultural activities. The proposed Project lies within the Avon Botanical District in the South-West Province (Beard 1990). The natural vegetation of Western Australia has been assigned to bioregions and subregions under the Interim Biogeographical Regionalisation for Australia (IBRA), with the Project footprint being designated as within the Avon Wheatbelt 2 (AW2 – Re-juvenated Drainage) subregion of the Avon Wheatbelt region.

The Project area is well-established farming country, with reliable albeit low-moderate rainfall and numerous cropping and grazing options for dryland farming operations. The farming community is generally quite cohesive and is well-connected because of the historical dominance of farming as a land use since European habitation. The region has long been affected by dryland salinity and especially in lower lying topographic areas has limited to productivity of significant areas of the valley floors.

3.2 Climate

The Project area has a Mediterranean climate characterised by mild, wet winters and hot, dry summers.

The Badgebup weather recording station is the closest active Bureau of Meteorology (BoM) weather station to the Project area (approximately 6 km away) that records rainfall; it does not record temperature. The Katanning weather station is the closest (approximately 25 km away) BoM weather station to the Project that records temperature. Since 2023, a weather station has also been installed to operate at KGP and it monitors weather conditions which can be interrogated in real-time.

The Project area experiences moderate wind speeds throughout the year, with occasional gusts during storm events, predominantly coming from the east and south. The area enjoys ample sunshine, especially in summer, contributing to warm temperatures and dry conditions.

Average climate conditions for the Project (Figure 3-1) have been projected from the Badgebup weather station (station number 10508) (SILO, 2024) located approximately 10 km to the south of the Project's mining. The weather station has rainfall data available from 1915.

The annual average rainfall is 390 mm, with highest rainfall typically occurring between May and September.

The average annual pan evaporation measured exceeds 2,000 mm and is highest between October and March, peaking in January.

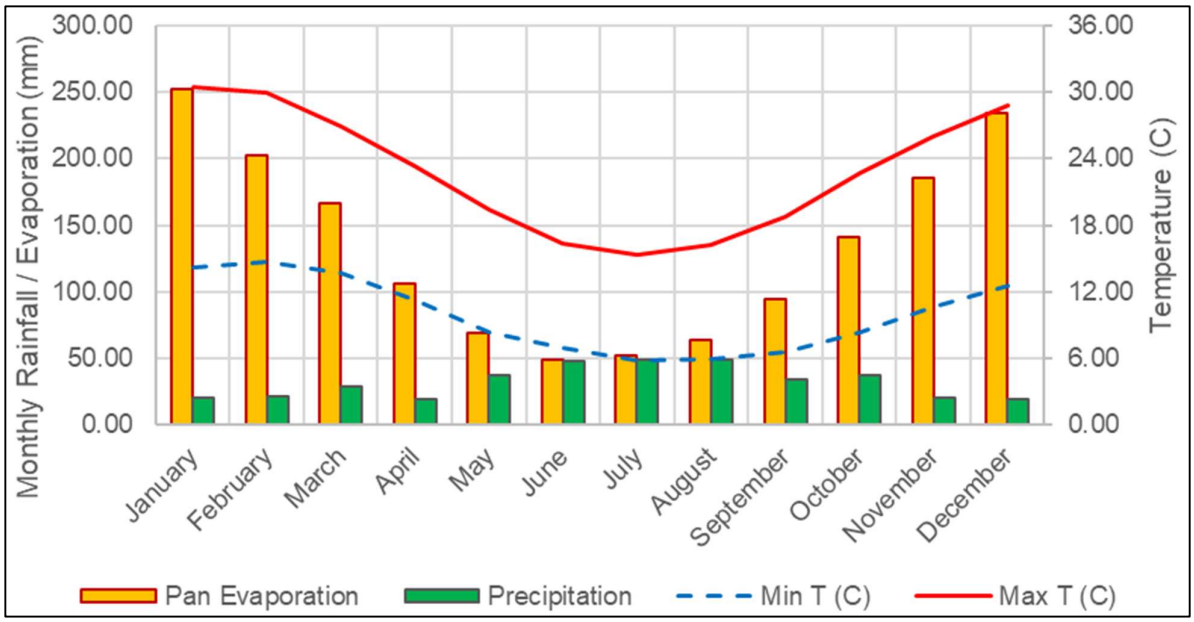


Figure 3-1: Average annual climate data for Badgebup weather station (2010–2024)

3.3 Flora and Vegetation

3.3.1 Flora

A total of 292 vascular plant taxa which are representative of 149 genera and 57 families were recorded within the Katanning Gold survey area and these observational data were collected from foot traverses and detailed plots counted by botanists (Mattiske, 2025). The majority of taxa recorded were representative of Myrtaceae (65 taxa), Asteraceae (27 taxa), Fabaceae (26 taxa), Poaceae (25 taxa) and Proteaceae (21 taxa) families and were widespread both locally and more broadly within the associated biogeographical subregion; although some occurred as representative of the Southern Wheatbelt and nearby southern coastal and mallee communities.

The records indicate the botanical richness of the region which has been heavily cleared for agriculture.

On the basis of a desktop assessment (within a 20 km radius of the project area) of State and Federal databases there is the potential for 10 threatened and 17 priority flora taxa pursuant to Schedule 1 of the *Biodiversity Conservation Act 2016* (WA) (BC Act) and 10 threatened flora taxa pursuant to Section 179 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). Despite active searching, no threatened or priority flora taxa were recorded in the Katanning Gold survey area.

3.3.2 Vegetation Associations

The Project lies within the Avon Botanical District in the South-West Province (Beard, 1990). Typical vegetation of the Avon Botanical District includes Eucalyptus woodlands comprising *E. loxophleba*, *E. salmonophloia* and *E. wandoo* on loams, scrub-health on sandplains, *Acacia-Casuarina* thickets on ironstone and halophytes on saline soils (Beard, 1990). Beard (1980) described the general vegetation type occurring in the area as Eucalyptus Woodlands of various species, specifically York gum (*E. loxophleba*), Salmon gum (*E. salmonophloia*), and Wandoo (*E. wandoo*), with small patches of Mallee (common species of Eucalyptus). These species are large iconic trees that can successfully grow individually often along farm's fencelines and within road verges.

A total of 13 Eucalypt woodland communities and 4 mixed Proteaceous – *Myrtaceae* heath communities were recorded within the Katanning Gold survey area. The vegetation communities were separated by Mattiske (2025) on the range of overstorey and understorey species utilizing the Primer 7 software and clustering techniques, field observations and aerial photograph interpretations.

3.3.3 Priority and Threatened Ecological Communities

The listing of the "Eucalypt woodlands of the Western Australian Wheatbelt" in December 2015 at the national level under the EPBC Act raises the conservation significance of certain stands of woodlands within the Katanning Gold Project's Survey Area. It should be noted that the majority of the land within the survey area have been used for historical agricultural activities and most remnants of bushland are narrow and linear (less than 5 m wide) and also lacking understorey floral species. This has likely arisen through vastly altered natural processes of changed fire, weed invasion, light and dust effects and animal grazing which has degraded the quality and condition of the understorey floristic composition.

The principal issues – at this juncture – with respect to the flora and vegetation surveyed is in relation to the presence of the heath communities that also support a variety of flora and the Eucalypt woodland communities that fall within the definition of the "Eucalypt woodlands of the Western Australian Wheatbelt (EWTEC) (critically endangered; DotEE, 2015). It should be noted that the maps of the listed Eucalypt woodlands supplied by government are very broad in scale, generalised and do not account for the nature of the agriculture nor of condition remnant areas as defined by the Department of Primary Industries and Regional Development (2025a). In the local context there also remains other stands of some of the woodlands and heaths in nearby reserves (e.g., Badegbup; Kwobrup) and on some private lands.

There are no State of WA Threatened Ecological Communities (TECs) that occur within a 20 km buffer of the KGP. There are four State Priority Ecological Communities (PECs) listed by the Department of Biodiversity, Conservation and Attractions (DBCA) that occur in the Avon Wheatbelt IBRA region and could potentially occur in/within the 20 km buffer of the project (DBCA, 2018). In effect, these equate to the mapped extent prospective as EWTEC. That is, the diversity of Eucalypts associated with the EWTEC highlights the range of Eucalypt species in this community. As the State PECs listed above are a subset of the nationally listed TEC it is apparent the State PECs cover the EWTEC in the Project area.

The proposed mine footprint will, as afar as practicable, avoid the largest stands of native vegetation of highest natural value.

The listed woodland types are then to be considered on the basis of their habitat condition (DotEE, 2015) which delineates the extent of exotic species (as opposed to native species) which may be in the understorey. An assessment of vegetation condition completed by Mattiske (2025) found a large portion of the Survey Area (both within the proposed development envelope and the other survey areas) was either Degraded or Completely degraded and the values in these areas are less than for the mapped Eucalypt woodlands. There were however substantial areas rated as Good or Very Good and little in the survey area rated as Excellent condition. Note that the five condition ratings categories are standardised for use in Western Australia known as the Keighery (1994) Condition Scale.

Over 90% of the land had condition ratings of Degraded or less condition.

Despite the proximity of agricultural operations, many of the areas of heath, shrublands and Eucalypt woodlands on the slopes and ridges within the survey area and mine development envelope remain relatively undisturbed, intact as habitat and as a result the largest and best condition of these eucalypt-dominated remnants could be identified for avoidance when it came to clearing by any proposed mine infrastructure design. These parcels were, in the most part, within two large uncleared vegetation parcels carried in polygons within the KGP Development Envelope known as:

- State Reserves (the Reserves) comprised of Wurgubup Rifle Range (Reserve 12423) and Woorgabup Nature Reserve (Reserve 24072).

- Ausgold's North-east bushland on M70/1426.

Approximately 63 ha of vegetation occurs coincidently with the mine disturbance footprint. This vegetation would not necessarily be cleared immediately, but sequentially over the mine's ten years of development and operations. There is 234 ha of native vegetation within the development envelope with the majority sitting within the State Reserves and the NE bushland (on M70/1426), and 122.76 ha within the MDE is representative of the Eucalypt Woodlands TEC (EWTEC). None of the bushland in the State Reserves nor the NE bushland (on M70/1426) will be cleared; they were identified as essential exclusion areas during Ausgold's design leading to the assigned general arrangement (Figure 1-1).

Of the native vegetation to be cleared, approximately 9 ha of EWTEC would be cleared given the current site layout. Furthermore, after detailed botanical and environmental assessment, all of this area is contained in one parcel being in the north of the KGP atop Jackson Deposit. Not all of the vegetation proposed to be cleared at Jackson Deposit maps as EWTEC. The project development strategy is of avoidance by design, with the vast majority of the mapped EWTEC (114.1 ha) within the MDE to be avoided; the 9 ha atop Jackson deposit is unavoidable because it is situated above the mineralised ore which expresses just below terrain surface.

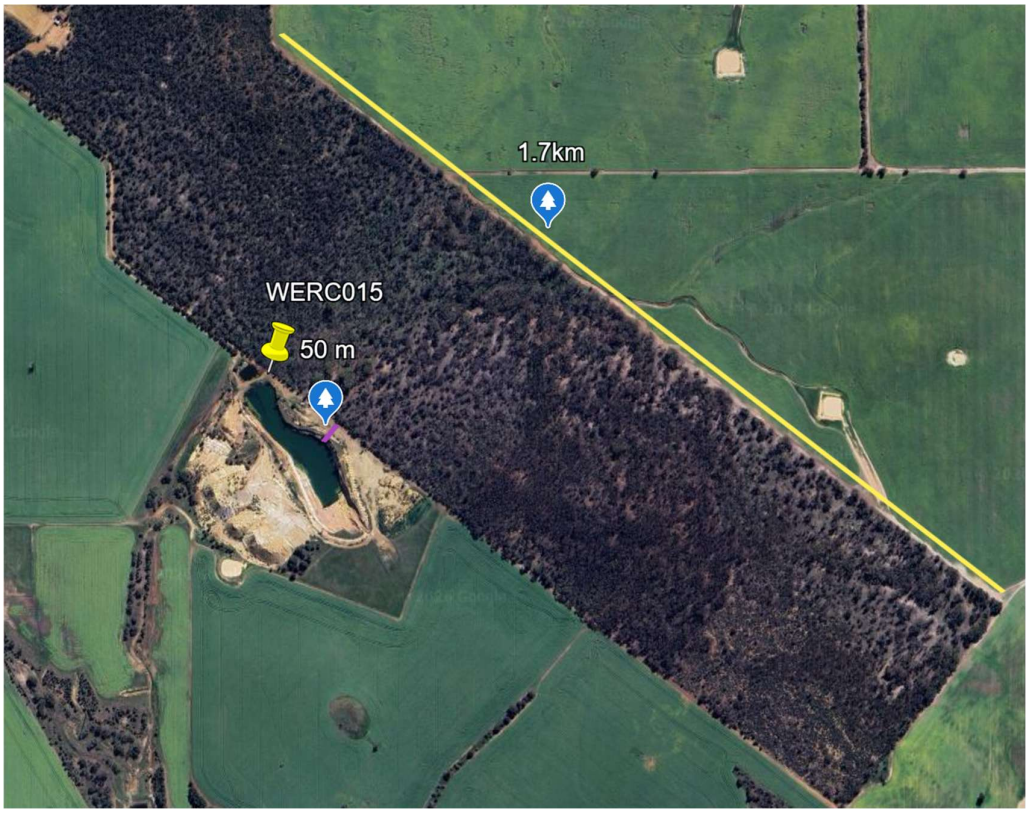


Figure 3-2: Legacy Dingo Pit directly south of the Wurgubup Rifle Range Reserve bushland

There has been relatively close spatial proximity between the Dingo Pit and the bushland in the Wurgubup Rifle Range Reserve (R12423) for almost 30 years (see Figure 3-2). Over that time, since 1997 at the end of the original Badgebup Mine, the Dingo Pit lake began to form from recharging groundwater and incident rainfall. The surface linear distance varies between twenty to fifty metres from the pit lake surface to the bushland just inside the south side of the State Reserve. Because of the ingress from the confined aquifer at depth, and evapo-concentration over time, the salinity of the Dingo pit lake has been an average of 25,350 mg/L TDS and pH 8.62 in the period 2025-2026. There is no evident effect from the salty, slightly alkaline water within the legacy Dingo pit on causing effects or impacts in the adjacent vegetation by a pathway of subsurface ingress of salty water. This supports evidence of a separating aquitard that provides low very permeability between at-surface systems and the likely vadophytic vegetation within the Reserve. This is examined in greater detail in Sections 3.6 and 5.

3.3.4 Groundwater Dependent Ecosystems

Groundwater Dependent Ecosystems (GDEs) are defined as 'complex dynamic natural ecosystems that require access to groundwater to meet all or some of their water requirements on a permanent or intermittent basis, so as to maintain their communities of plants and animals, ecosystem processes and ecosystem services' (Doody et al., 2018; Richardson et al., 2011). They are mapped by BOM (2025) to occur in the survey area and assigned a level of potential.

An understanding of the distribution of GDEs proximal to the Project was initially obtained through *the Groundwater Dependent Ecosystems Atlas* (GDE Atlas) a national dataset of Australian GDEs.

The Atlas separates GDEs into the following three categories:

- Aquatic ecosystems that may rely on the surface expression of groundwater, e.g., springs, wetlands and rivers;
- Terrestrial ecosystems that may rely on the subsurface presence of groundwater, e.g., vegetation; and
- Subterranean ecosystems in caves and aquifer ecosystems.

The GDE Atlas categorises data by the 'potential of an ecosystem to be a GDE. It classifies as potential as high, moderate or low. It should be noted that the GDE dataset originates from a combination of remote sensing using Moderate Resolution Imaging Spectroradiometer (MODIS) satellite timeseries data between 2000 and 2021, and calculations of water balance dynamic and greenness of vegetated land using Landsat Imagery (Van Dijk et al., 2015). Therefore, data reflected within the GDE Atlas may be outdated or at a coarse scale.

As stated previously, Ausgold commissioned Hydrobiology (2025a) (refer Appendix 1) to conduct a desktop risk assessment and site inspection of potential GDEs near the proposed groundwater production zones which used national GDE mapping, groundwater drawdown zones, and satellite-derived vegetation and climate data. Normalised Difference Vegetation Index (NDVI) and Aridity Index (AI) were analysed to assess vegetation responses during drought periods. Vegetation that remained relatively healthy during drought was considered more likely to access groundwater, while vegetation with low or seasonal NDVI was excluded as groundwater dependent.

The distribution of aquatic and terrestrial GDEs proximal to the Project and drawdown zones are shown in Figure 5-8 and Figure 5-9. Modelled drawdown extents from groundwater abstraction indicate that extensive adverse impacts on high potential GDEs are unlikely. Refer to Section 5.5.1 for further discussion on risks to GDE.

3.4 Fauna

Ausgold's consultant Terrestrial Ecosystems conducted a detailed series of basic and targeted field surveys to assemble evidence of conservation significant fauna species, in order to describe terrestrial fauna present within the Survey Area. The collated fauna survey report was issued as Terrestrial Ecosystems (2025) which included searches of available literature and databases (a 'desktop' study), and field surveys over the many parts of the Survey Area.

The remnants of native vegetation typically represent refuges of habitat for a number of fauna species that used to occur more commonly throughout the region before its broadscale clearing. Many abundant fauna species were found to be ferals including foxes, cats and rabbits. Other animals recorded and captured by camera traps were kangaroos, black cockatoos, phascogales and goannas. In terms of relative abundance, in November-December 2024, animals were recorded as follows:

- Western Grey Kangaroos (*Macropus fuliginosus*) at 23 camera traps;
- Foxes (*Vulpes vulpes*) at 13 camera traps;
- Rabbits (*Oryctolagus cuniculus*) at eight camera traps;
- Cats (*Felis catus*) at four camera traps; and
- Red-tailed Phascogale (*Phascogale calura*) at two camera traps.

3.4.1 Conservation Significant Fauna

Terrestrial Ecosystem (2025) identified that many marsupial and bird species, and two reptile species listed with conservation significance have the potential to occur within 25 km of the Project.

The Survey Area contains some foraging habitat for Carnaby's Black-Cockatoo, with patches of Banksia heath providing favoured food plants, evidence of foraging was noted in locations nearby the layout of the KGP and generally within the Wurgubup Reserves (Western Wildlife, 2017). After a series of more recent field surveys by Terrestrial Ecosystem (2025), it was evident that, of the conservation significant fauna, Carnaby's Black-Cockatoo and Red-tailed Phascogale were present in the survey area within the district.

The amounts of good and poor quality nesting habitat within a 12 km radius shows approximately 6,706.9 ha of habitat that provides mature Eucalypt trees, some of which would be suitable nesting hollows (and another 5,673.3 ha that provides poorer quality nesting habitat). In addition, in excess of 350 ha of vegetation that would provide suitable foraging habitat.

A desktop study and field screening survey by Bennelongia Environmental Consultants (2025) indicated that the likelihood of suitable subterranean fauna habitat was unlikely for either troglofauna or stygofauna (typically crustaceans which inhabit aquifer systems). Neither the host geology nor the salinity of deep groundwaters are suitable and no samples of animals were collected upon field sampling.

3.5 Hydrogeology

The topography of the Project area consists of low hills and plateaus with broad and shallow valleys (Figure 3-1). Elevations range between 219 m AHD and 433 m AHD (DataWA, 2024). The Project is located within the upper reaches of the Upper Blackwood River drainage basin. Locally, the Project area is straddling a catchment divide between to sub-catchments. The southern end of the Project drains to the Coblinine River located approximately 20 km west and south of the site. The northern end of the Project drains to the Datatine Gully, which runs approximately 1.5 km to the northeast of the Jinkas and Dingo pits. Both catchments drain into the Dumbleyung Lake that discharges into the Blackwood River with its estuary at Augusta. Large-scale agriculture is the dominant industry within the region. The use of artificial contour drains and earthen dams (turkey nests) are commonplace across the region (DWER, 2024).

In the vicinity of the Project (Figure 3-3), there are three identified wetlands serving as sinks for surface water drainage, all located a substantial distance from the proposed area for mining activities:

- **Coyrecup Lake** – located approximately 15 km southwest of the Project area within the Coblinine River drainage system. The lake receives only a minor portion of total surface water drainage from the Project area. It is a near-permanent saline lake located in a riverine floodplain with smaller lakes and areas of saline marshes to its northwest and east that covers an area of 572 ha. It is a listed wetland under the Directory of Important Wetlands in Australia (DIWA). At times, the lake is a major drought refuge area for waterfowl, and it provides habitat for migrating water birds and the threatened Freckled Duck (DEC, 2009).
- **Dumbleyung Lake** – located approximately 25 km northwest of the Project area and covers an area of 5,630 ha. This forms the main discharge point for the majority of surface water drainage from the Project area. Like Coyrecup Lake, this salt lake is a DIWA-listed wetland and provides habitat for migrating water birds.
- **Lake Grace System** – located approximately 40 km east of the Project area and covers an area of 53,121 ha. The Lake Grace System is a DIWA-listed wetland and consists of four lakes: Lake Grace North, Lake Grace South, Lake Altham and Lake Cemetery. No surface water discharge from the Blackwood River drainage basin is known to enter this system.

Although subject of other studies, it is worth noting that no discharge of contact waters occur from the KGP proposal area into any of the (minor) tributaries of these surface systems.

3.5.1 Regional Groundwater Conditions

The Project area located in the distant upper reaches within the Karri groundwater resources catchment that is defined as a combined fractured rock and alluvium aquifer.

Correlation between recent (2022–2024) precipitation data (Badgebup weather station #10508) and groundwater level data (collected manually) demonstrated subdued groundwater responses following seasonal rainfall patterns. Groundwater levels tend to have a range of 1–2 m but outliers (BSMB006 in September 2023, for example) suggest the range may, on occasion, be as much as 4 m. Peak groundwater elevations tend to lag peak rainfall periods by approximately 1–2 months, indicating the presence of a low permeability zone that overlays the screened aquifers in the monitored boreholes. Recent data from 2023 and 2024 groundwater programs show bores intersecting regional east–west trending structures (including BSMB008, WERC004, WERC006A, and WERC007) have shallow groundwater depths. These bores have a thick semi-confining layer above them suggesting the fractured/faulted rock aquifer is pressurised. WERC007 has a water level of 2.1 m above ground level highlighting the artesian nature of the system locally.

Figure 3- displays modelled regional groundwater level contours, using manual measurements taken in January 2023. The elevation of the current pit lake, as obtained from topography digital elevation model (DEM) files, was incorporated during the creation of the water level isolines.

Additionally, data from the Department of Primary Industries and Regional Development (DPIRD) database were used to complete the conceptual model. The database includes groundwater level measurements from 101 bores located approximately 20 km to the north, west and east of the Project area (Figure 3-4). Surface water levels have only been collected once from each location between 2021 and 2023. These data have been used to improve the spatial distribution of data points used to create groundwater contours. An additional 23 DPRID bores with data from the late 1990s are clustered within a 2 km radius of the location of WERC007 (northern water supply bore). The average water levels from this period are 0.68 mbgl. This provides an interesting insight into the groundwater dynamics over time and the general increasing recharge to regional groundwater levels being experienced over the last 25 years.

Groundwater flow direction largely aligns with the topographic gradient and generally corresponds with the direction of surface water flow, moving from higher to lower elevations. Near the Central pit (Jinka), at an elevation of 356 m above sea level (mRL) atop the catchment, surfacewater flows from outside the pit lake drain towards the creek lines to the south, north and west of the Project site. The southern pit lake at Dingo shows lower groundwater levels, suggesting its role as a groundwater sink, possibly due to its more exposed location and higher susceptibility to evaporation. The lowest recorded water level of 265 mRL was observed at a distant bore to the north of the project area.

An assessment was undertaken (Hydrobiology, 2025b) to characterise salinity gradients of the hydrogeological profile within and surrounding the proposed mine pits for the Project. The assessment focused on describing the distribution of groundwater salinity with depth, elevation and aquifer type.

The site is underlain by a sequence of geological units that influence groundwater occurrence and behaviour. These units correspond to the layers used in the groundwater model developed for the site and provide a framework for a simple aquifer classification relevant to our analysis. The units, listed in order of increasing depth, include:

- Alluvial and colluvial sediments near the surface (~0–13 m), representing an unconfined aquifer.
- Interbedded clay and sand deposits (~13–30 m), which may behave as partially confined or unconfined aquifers depending on local conditions.
- Bedrock and fractured bedrock (dykes and faults) at approximately 50 m depth or more, considered confined aquifers with relatively high conductivity through the geologic fractures.
- Basement bedrock devoid of faults or dykes at ~110 m depth, representing a confined aquifer with very low permeability.

Saline groundwater occurs in fractured rock aquifers in the project area due to dissolution of salts from marine-derived sediments or mineralised bedrock, a natural source of primary salinity (George et al. 2006; DWER 2019). The Wheatbelt region has also experienced significant land clearing for agriculture, leading to rising water tables and secondary salinisation, especially in shallow, unconfined aquifers in low-lying areas where saline discharge and waterlogging occur (DPIRD 2002; South Coast NRM 2020; UWA 2024).

Surface water drainage in the local Badgebup area and Katanning-Dumbleyung region is highly modified by agriculture, with artificial contour drains and earthen dams altering natural flows. Salinity now affects many wetlands and streams regionally, driven largely by secondary salinisation. However, the area also contains natural salt lakes formed by regional processes of evaporation causing salt accumulation in low-lying discharge zones. The project area drains primarily into Dumbleyung Lake, a natural salt lake typical of the Wheatbelt's semi-arid landscape, where evaporation and limited outflow concentrate salts. Coyrecup Lake, a near-permanent saline lake on the floodplain of the upper Coblinine River, receives minor drainage from the site. Dumbleyung Lake discharges into the Blackwood River, which flows to its estuary at Augusta.

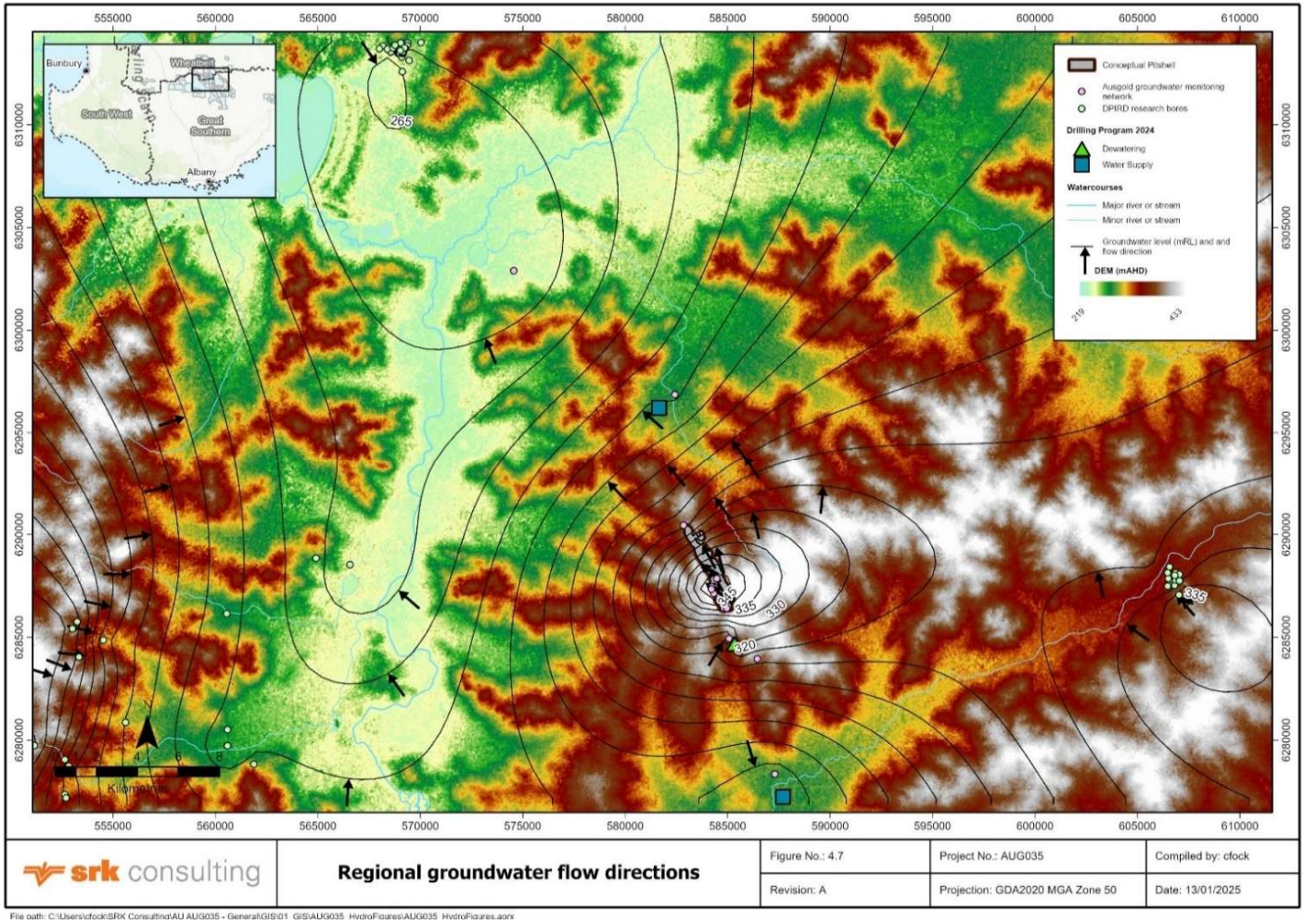


Figure 3-3: Regional Baseline Conditions Groundwater Contours

3.5.2 Water Quality Assessment Methodology

Groundwater and surface water salinity data, including electrical conductivity (EC) and total dissolved solids (TDS), were compiled and reported by Hydrobiology (2025b) from datasets and reports provided by Ausgold for the KGP, and from the Department of Water and Environmental Regulation's (DWER) Water Information Reporting (WIR) database. Only data within an approximately 10 km buffer around the mining tenement were included, as shown on Figure 3-4. Where TDS measurements were not available, EC values were converted to TDS. Where both field and laboratory measurements were available, field readings were prioritised.

For groundwater records the bore depth, elevation, and aquifer type were attributed where possible. Bore depth was derived from field notes or bore logs. Elevation was derived from DEMs available through Geoscience Australia (2020).

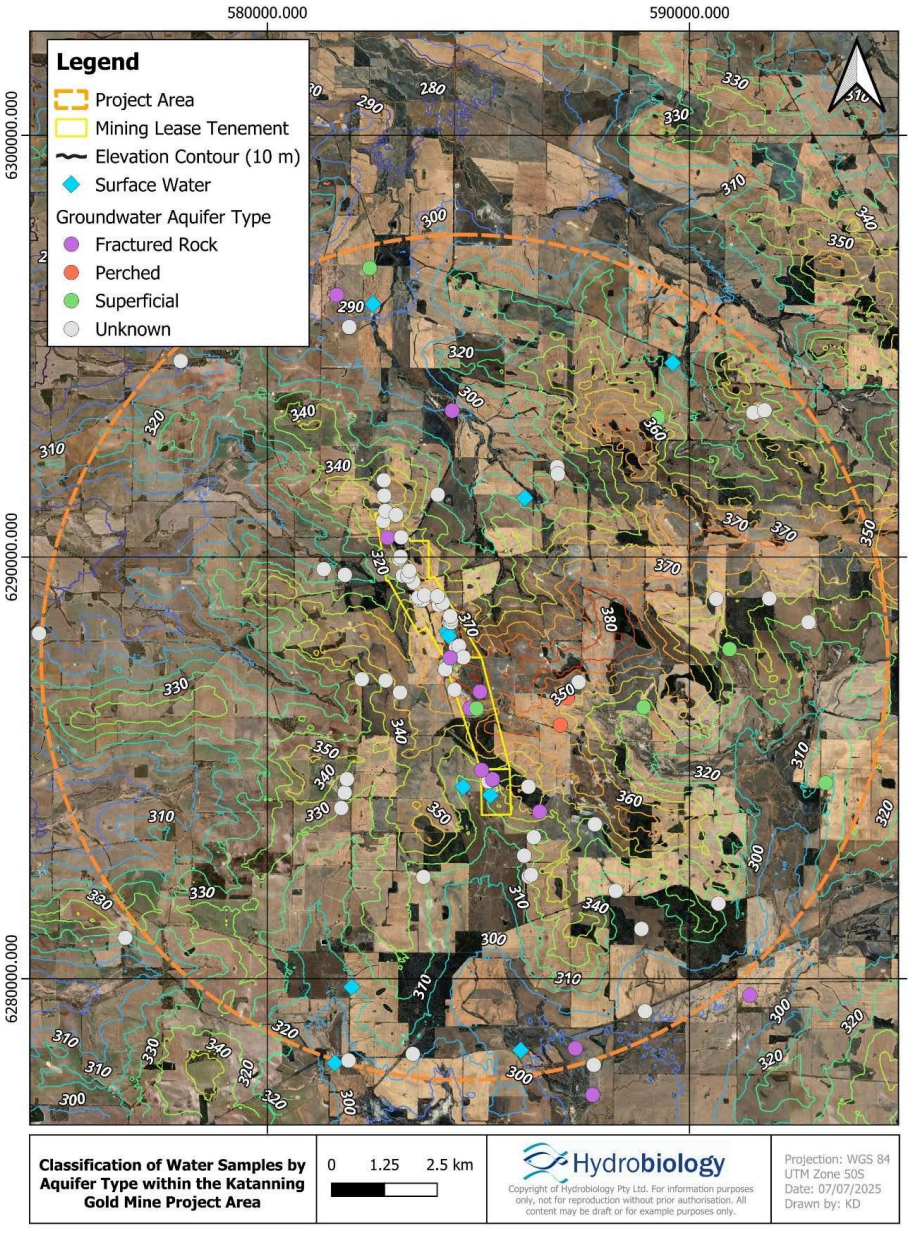


Figure 3-4: Regional Groundwater and Surface Water Records within and around the Project area

For the purposes of analysis, bores were grouped into the following categories based on depth and geology:

- **Perched** — Shallow bores intersecting isolated groundwater above clay-rich layers.
- **Superficial** — Bores screened within the near-surface alluvial and colluvial sediments, representing unconfined aquifers.
- **Fractured rock** — Bores intercepting groundwater within deeper fractured or basement bedrock, under confined conditions.
- **Unknown setting** — Bores with insufficient geological logging or bore construction data, mostly drilled using reverse circulation methods for mineral exploration, preventing confident aquifer classification as above.

After applying the spatial buffer and excluding records lacking sufficient attribute information, there were a total of 554 groundwater samples and 39 surface water samples.

Groundwater and surface water salinities were compared to livestock water quality guidelines. Ecosystem protection trigger values from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ 2000) were not applied as salinity in the Katanning region, driven by both natural processes and secondary salinisation, commonly exceeds even the upper end of default values for slightly disturbed systems, as demonstrated by the data presented in this study. Instead, livestock water quality guidelines from ANZECC & ARMCANZ (2000) were considered a more appropriate benchmark, given the already saline nature of local surface water bodies and their relevance as potential receptors in an agricultural landscape. A conservative threshold of 2000 mg/L TDS was used to highlight potential areas of elevated salinity, while 10,000 mg/L TDS represents a higher level of salinity commonly associated with reduced livestock water quality. These values provide context for understanding salinity variation and potential implications, without constituting a formal risk assessment.

3.5.3 Water Quality Results for the Badgebup Region

Figure 3-5 and Figure 3-2 illustrate the relationship between groundwater salinity (TDS) and depth, elevation and aquifer type. The scatter plots show TDS plotted against elevation and bore depth, with data points colour-coded by aquifer category.

Groundwater in perched aquifers is fresh, while salinity in the superficial and fractured rock aquifers varies widely from fresh to saline. Regarding depth trends, groundwater salinity in the superficial aquifer generally increases with bore depth, while in the fractured rock aquifer, it tends to decrease with depth Figure 3-5.

The most pronounced pattern is that groundwater salinity in both the superficial and fractured rock aquifer decreases with increasing elevation in the catchment (Figure 3-2) (Hydrobiology, 2025b), reflecting fresher conditions at higher ground and higher salinity in lower drainage valleys.

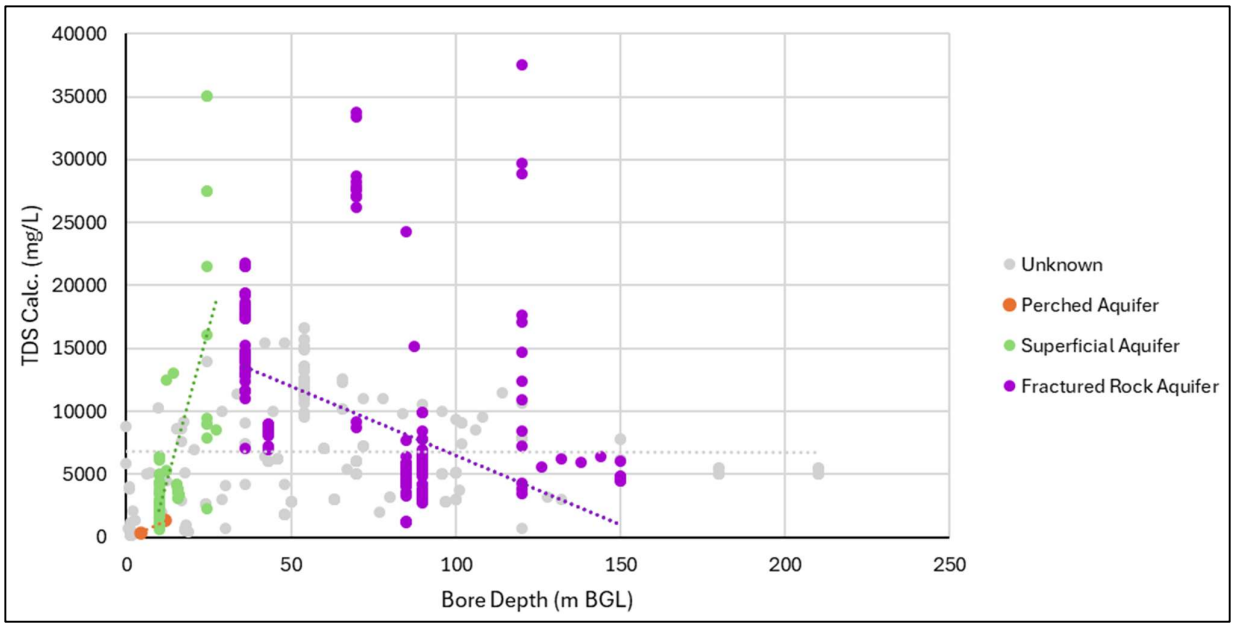


Figure 3-5: Groundwater Salinity vs. Depth across various aquifer types

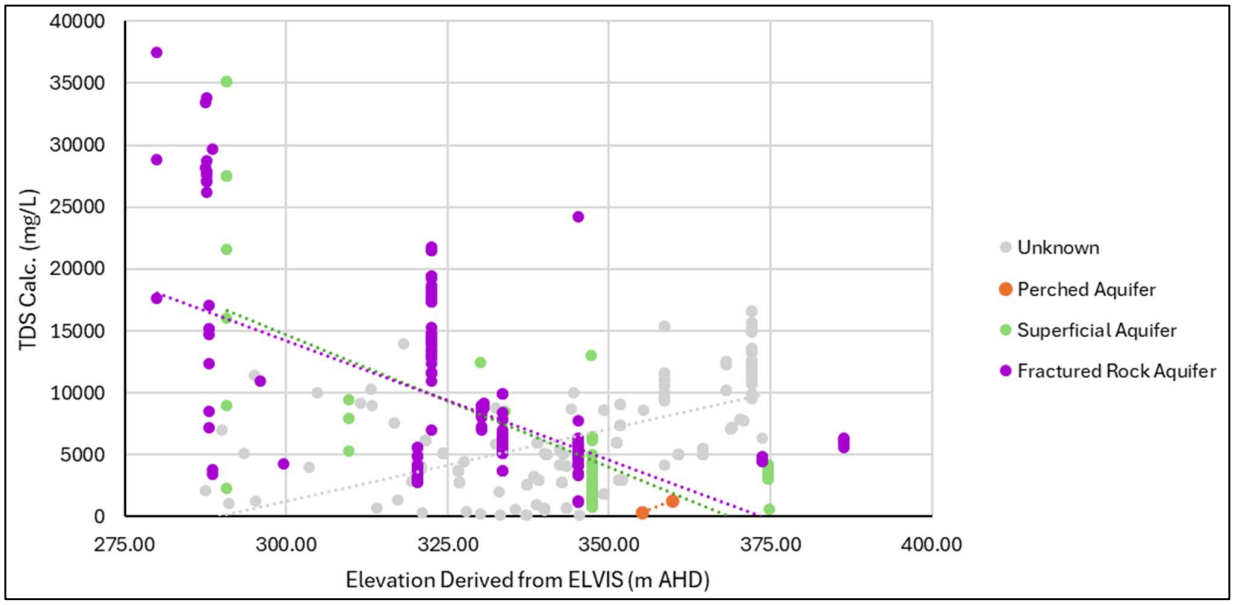


Figure 3-2: Groundwater Salinity vs. Elevation across various aquifer types

As shown on Table 3.1, groundwater salinity in bores located at elevations greater than 300 m AHD is generally lower than surface water, with both the medians and 80th percentiles below those of surface water and below the upper livestock guideline of 10,000 mg/L TDS. This indicates that groundwater is fresher than surface water at these elevations.

Table 3.1: Surface Water and Groundwater Salinity in TDS (mg/L)

Parameter	**TDS (mg/L)**			
Elevation Range	Median	80th percentile	Minimum	Maximum
Surface	**11,400**	**15,629**	838	**25,208**
>275 to <300 m	**17,378**	**28,512**	1,117	**37,500**
>300 to <325 m	5,715	8,120	305	**14,000**
>325 to <350 m	5,995	9,955	105	**21,800**
>350 m	5,140	**10,802**	618	**24,255**

Note: Results higher than the ANZECC & ARMCANZ (2000) livestock water quality guideline (10,000 mg/L) are bolded.

The median salinity for both surface water and groundwater from bores located at elevations below 300 m AHD exceeds the livestock guideline. While part of the central range of groundwater salinity overlaps with that of surface water, a substantial portion extends above it, and the groundwater has a higher median salinity. The salinity of groundwater is much higher at lower elevations (between 275m and 300m AHD) than at higher elevations; and of seasonal surface waters (Figure 3-7).

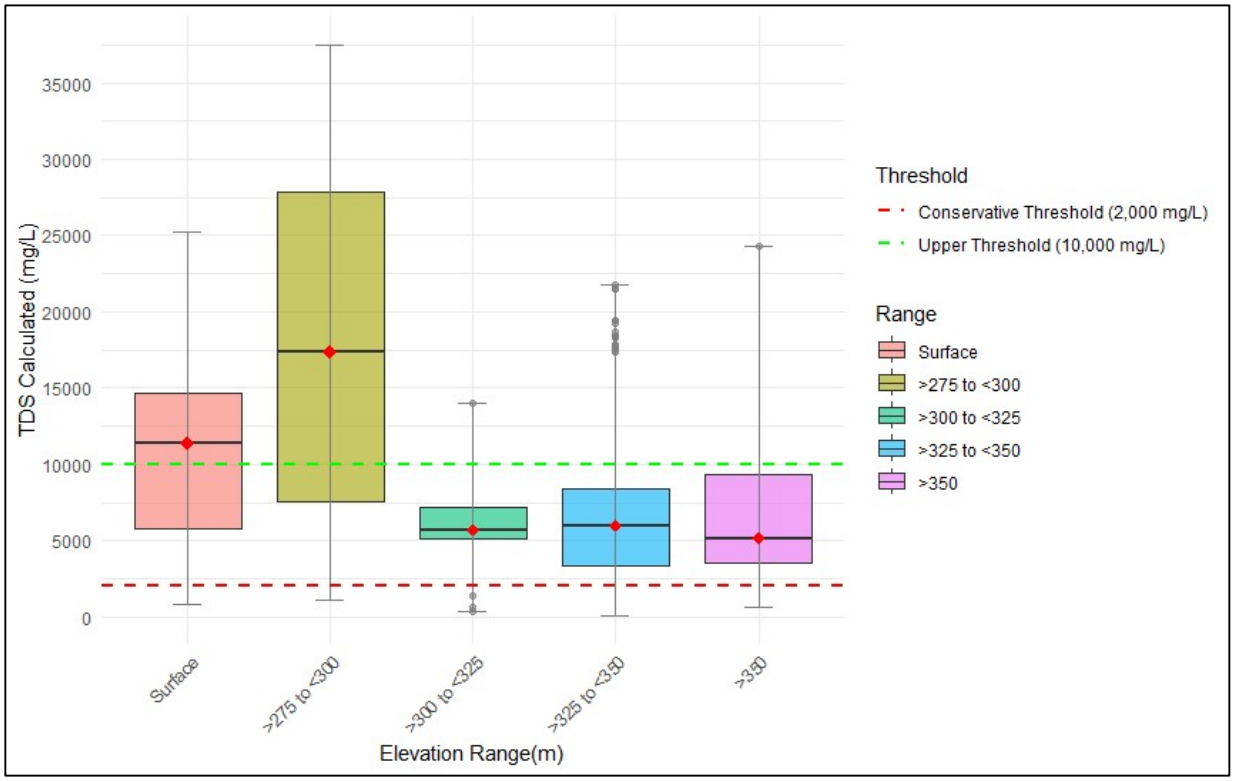


Figure 3-7: Medians and 20th to 80th percentile ranges for Surface Water and Groundwater Salinity (as TDS mg/L)

3.5.4 Water Quality Assessment – Groundwater monitoring on the KGP footprint

Monitoring is also conducted for compliance of activity at KGP because of its care and maintenance condition at the Badgebup Gold Mine; recent results from 2025 and 2026 are shown below in Figure 3-8. These are a subset of the regional data analysis provided by Hydrobiology 2025a in a preceding section. Also, additional water exploration holes to place additional bores were sunk in March 2026.

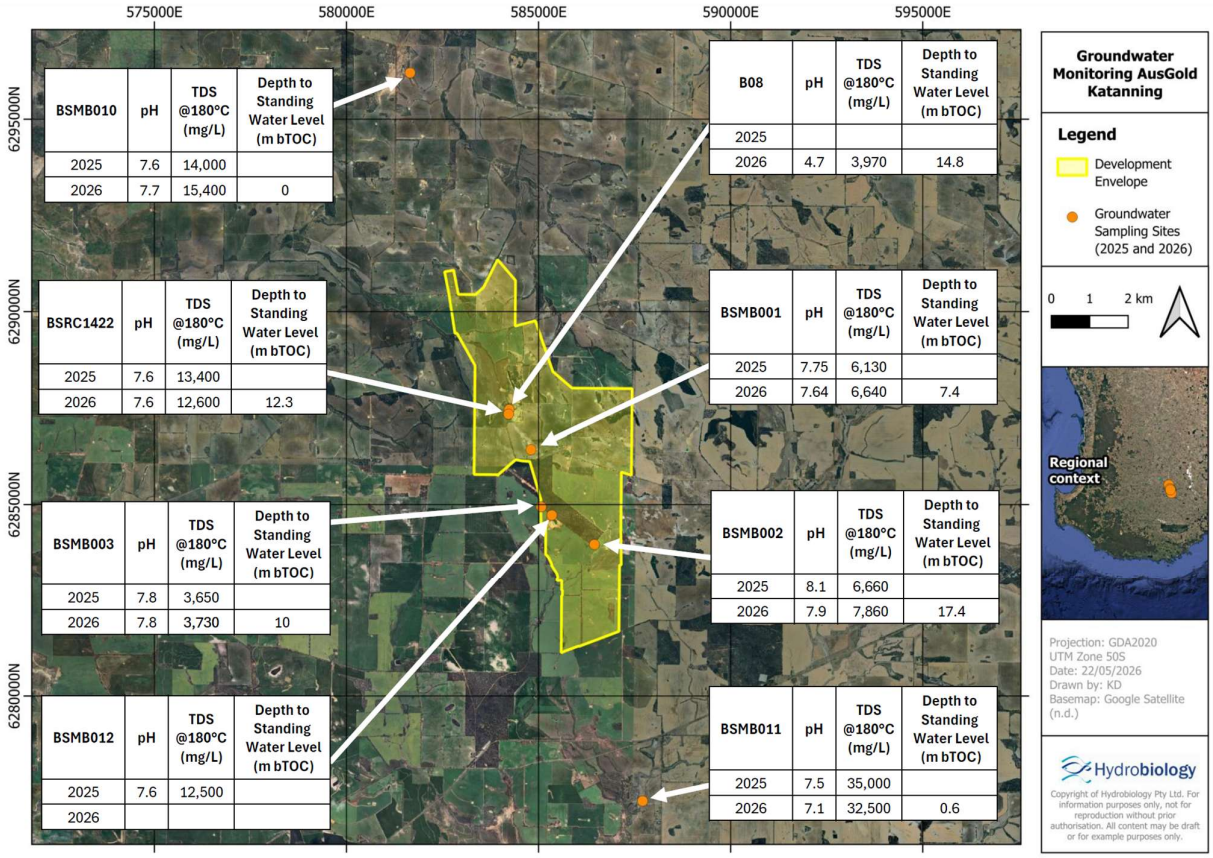


Figure 3-8: Recent annual field observations at care & maintenance bores for pH, salinity (TDS) and depth to water table

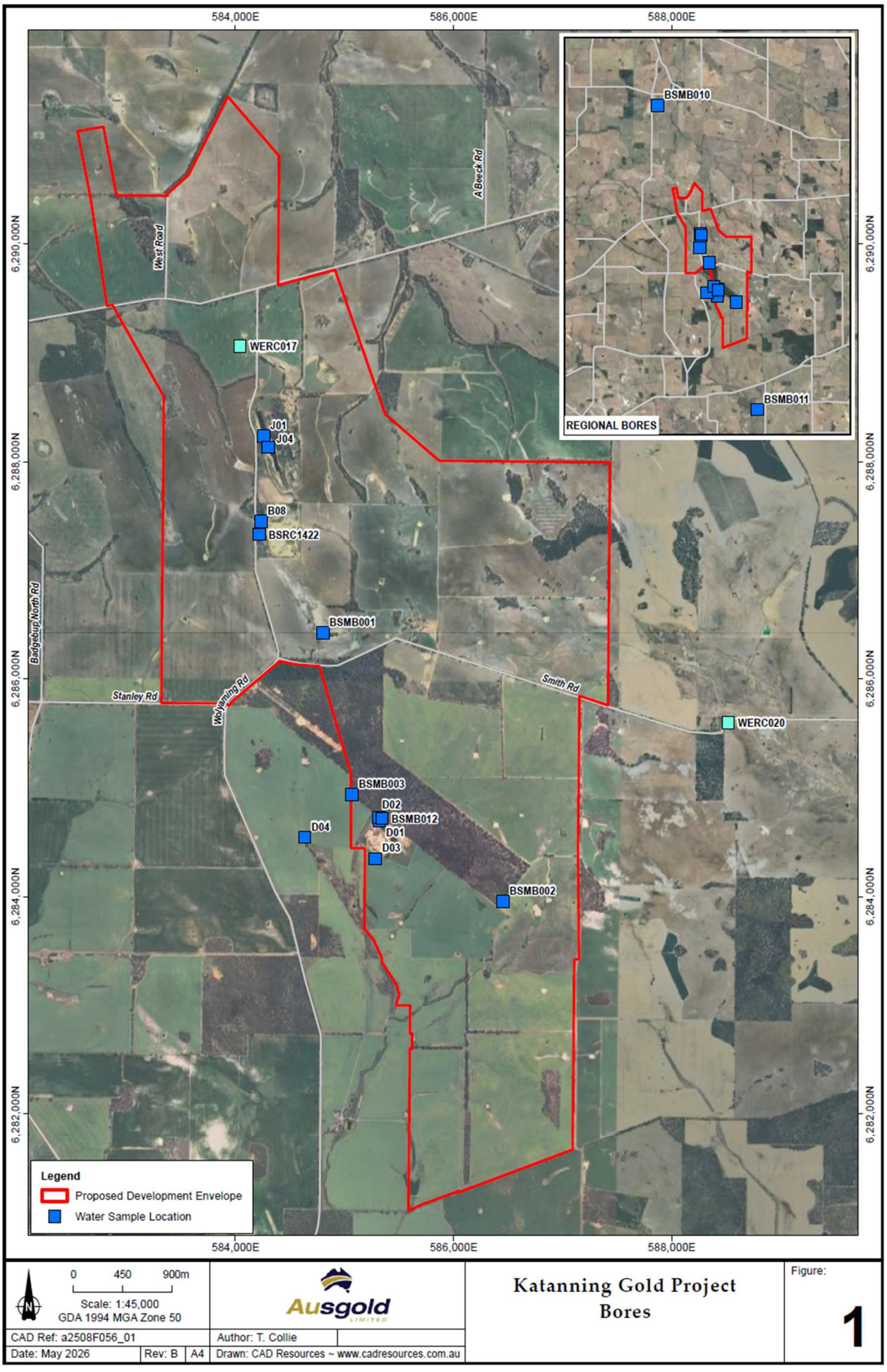


Figure 3-9: Site monitoring bores and surface sampling sites ('J' and 'D') on Ausgold mining tenements – 2025 and 2026

Ongoing groundwater discovery continues at KGP in line with Programme of Works (POW) and 26D permissions. The most recent 2026 groundwater discovery data are shown below, noting that WE_2 is sited immediately north of the final (Year 10) Jinka Main pit and the other at WE_3 is approximately one kilometre east of the KGP on Ausgold freehold land (Figure 3-9). The depth to water, at a site just beyond the pit crest for the completed Year 10 Jinka pit, was more than sixty metres below the terrain (>60m btoh). Water at depth there was hosted in consolidated gneiss rocks. Waters were saline and pH was near neutral.

Hydrogeology data: WERC017 (WE_2)

- **20 m outside Jinka Main north pit crest**

Depth (m BGL)	pH	EC (mS/cm)	Salinity (TDS, mg/L)
6 to 60	No water		
60 (first water)	Insufficient sample		
66	7.19	14.83	9,640
72	7.64	16.69	10,850
78	7.52	17.25	11,210
84	7.49	17.42	11,320
90	7.77	17.45	11,340
96	7.76	17.36	11,280
102	7.6	17.35	11,270
108	7.81	17.42	11,320
114	7.51	17.07	11,100
120	7.18	17.27	11,230
126	7.48	17.65	11,470
132	7.41	17.62	11,450
138	6.98	17.2	11,180
144 (EOH)	7.36	17.29	11,240

As described below, further to the east in the direction of the flow gradient to the east (WE_3), the surface elevation is much lower and the depth to groundwater was only just over twenty metres below a surface cover of silt and hosted in weathered granulite and deeper intact granulites. Interestingly, the water table sat at 24m below terrain surface and it was saline, but below 100m deep it was much fresher with TDS of 5,000-6,000 mg/L. This was possibly due to persistent evaporative draw and salt rise through the column on the target site at lower elevation.

Hydrogeology data: WERC020 (WE_3)
– Near Smith State Reserve on Ausgold land (non-tenement)

Depth (m BGL)	pH	EC (mS/cm)	Salinity (TDS, mg/L)
24 (first water)	7.59	21.7	14,105
30	7.61	21.6	14,040
36	7.56	20.8	13,520
42	7.57	21	13,650
48	7.65	20.6	13,390
54	7.65	20.5	13,325
60	7.67	20.9	13,585
66	7.68	20.5	13,325
72	7.66	50.5	32,825
78	7.66	20.5	13,325

84	7.73	20.6	13,390
90	7.72	20.5	13,325
96	7.97	8.11	5,272
102	7.95	8.55	5,558
108	7.99	9.09	5,909
114	7.88	9.01	5,857
120 (EOH)	7.87	9.44	6,136

Collectively these findings indicate:

- Most recent groundwater testing at the KGP in May 2026, the average groundwater depth at established bores was 12.3m below top of case (btoc). The range of TDS was from 8.25 to 26.3 mS/cm, which is salinized tending to brackish, and the average pH was 7.4 (excluding site B08 which is downgradient from the old waste tailings dump).
- Additional water exploration holes (being converted to bores under 26D in 2026) showed slightly greater depth to groundwater than at the established bores. The TDS content was similar (saltine in the low to mid-range of seawater).
- Excluding the regional bores (BSMB010 and BSMB011 discussed below), for the bores shown in Figure 3-9, the range of pH values was 7 to 8 and the mean salinity (as TDS) at the five KGP monitoring bores were similar between these two years:
    - in May 2026, it was 7,700 mg/L with a range from 4,080 to 13,000 mg/L.
    - in June 2025, it was 8,980 mg/L with a range from 4,260 mg/L to 13,600 mg/L
    - sodium and chloride were dominant salts being:
        - average sodium concentrations in 2025 of 2,070 mg/L and 2026 of 1,900 mg/L; and
        - average chloride concentrations in 2025 of 4,750 mg/L and 2026 of 3,800 mg/L.
- In 2026, in the distant palaeovalley monitoring bores, at BSMB010 (southern borefield near WERC06A) and BSMB011 (northern bore near WERC07), standing water levels were near terrain surface (ie. <1m below top of case). It is known that the adjacent Production Bores are pressurised and would run as artesian wells if not capped with valves. These monitoring bores are slotted at depth with TDS ranging from 13,800 to 31,500 mg/L. These TDS levels are very similar to the results obtained in 2025 at these two bores with 14,600 mg/L in BSMB010 and 33,300 mg/L in northern bore. Note the northern bore is the same salinity as seawater.

3.5.5 Groundwater Water Quality – Conclusions

The Hydrobiology (2025) water quality analysis indicated that generally:

- At bore locations above 300 m topographic elevation, that are high in the catchment including the KGP footprint, the groundwater from the superficial and fractured rock aquifers is generally fresher than surface water and below livestock guidelines – discharge is unlikely to pose a salinity risk to the receiving environment. In fact, it could slightly dilute existing surface water salinity in some areas.
- At bore locations below 300 m topographic elevation, in the location of licenced bores (WERC06A; WERC07), groundwater from the superficial and fractured rock aquifers is generally more saline than surface water and exceeds livestock guidelines – discharge may increase salinity levels in surface waters and could be unsuitable for livestock use downstream unless managed or treated.

Given the nature of technical assessment, Ausgold will:

- Continue to collect and analyse groundwater and surface water data, including new bore construction, lithology, and updated field measurements, to underpin further spatial and vertical salinity trends;
- Conduct statistical and spatial analyses as the dataset expands, to validate observed relationships between salinity, elevation, depth, and aquifer type; and
- Use updated results to inform site-specific risk assessments for changing groundwater levels or quality, particularly where:
  - more saline groundwater at lower elevations may pose a risk to receiving surface water environments; and
  - fresher TDS water may be detected at shallow depths in proximity to potential GDEs (native bushland vegetation).

These undertakings are forecast to be adopted in a Groundwater Monitoring & Management Plan for the KGP, to be adopted as part of regulatory approvals by EPA, DWER and/or DMPE.

3.5.6 Groundwater Users and Management

The Project is situated within the Karri subarea of the Karri Groundwater Area proclaimed under the *Country Areas Water Supply Act 1947* (WA). The Project is located 40 km west of a Priority 1 public drinking water source area. Katanning drinking water comes from Great Southern Towns Water Supply Scheme, managed by the WA Water Corporation.

Records of bores within the region suggest there may be other users accessing groundwater. Proximal to the Project area, the DWER WIR presents publicly available bore records. In addition, the DPRID salinity map also has research bores within the area. A review of these datasets indicates that:

- Many bores (listed on WIR) within 5 km of the Project area are terminated at bedrock and contain no information on their usage or current functionality.
- There are bores listed as ‘Crown land’ in the region, although none are within 5 km of the Project area.
- The closest pastoral bore is approximately 20 km northwest of site.
- The DPIRD database has five bores (measuring and reporting EC) within 5 km of the Project area; none of these are affected by the mine pit draw down cones.

3.5.7 Permits Held under the *Rights In Water and Irrigation Act 1914*

Groundwater licences that associated with the Project held by Ausgold are listed in Table 3-2.

Table 3.2: Groundwater licensing held by Ausgold

Instrument		Granted	Expiry	Allocation	Status
26D	CAW209088(1)	05/09/2023	04/09/2025	Construct up to five production wells and five monitoring wells	Expired
	CAW213189(1)	08/01/2026	07/07/2028	Construct up to eight production wells and eight monitoring wells	**Current**
5C	GWL210294(1)	29/05/2024	28/05/2026	50,000 kL/annum	Replaced
	GWL210294(3)	22/05/2026	31/12/2027	100,000 kL/annum	**Current**

Following the EPA assessment of Inland Water under Part IV of the EP Act, Ausgold plans to apply for an amendment to GWL210294 to allow for groundwater abstraction as detailed in Section 4.

3.6 Geology

The regional bedrock geology is comprised of basement rocks of the Yilgarn Craton. The Yilgarn Craton is mainly composed of heterogeneous Archaean gneiss complexes and less intensely deformed Archaean granitoid rocks (De Silva et al., 2000).

The geological units from the State Interpreted Bedrock Geology 1:500,000 Map, from the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS, former), are described as:

- Yilgarn Craton granites unit (A-mgss-Y): foliated metagranite, locally gneissic, may include amphibolite lenses, includes deeply weathered rock;
- Yilgarn Craton granites unit (A-g-Y): granitic rock, undivided, metamorphosed; and
- Yilgarn Craton metamorphic unit (A-mn-Y): gneiss, undivided.

Regional west east trending faults are prominent features within this region of the Yilgarn Craton along with predominantly east-west (and occasionally north south) trending Proterozoic mafic dykes. Cenozoic cover sediments and lateritic regolith overlie the Yilgarn Craton, with exposed bedrock areas noted.

The geological units from the Regolith of WA 1:500,000 Map (from DEMIRS (former)) are described as:

- Alluvial/fluvial unit: clay, silt, sand and gravel on alluvial plains;
- Colluvial unit: colluvium derived from different rock types, includes gravel, sand and silt;
- Exposed unit: exposed bedrock; and
- Residual or relict unit: ferruginous duricrust, massive to rubbly, includes iron-cemented reworked products.

The regional stratigraphy of the area is summarised in Table 3-3

Table 3.3: Stratigraphy and Aquifer Potential of the Blackwood Catchment

Age	Formation	Lithology
Cenozoic	Alluvium (Qa)	Sand, silt and clays
Tertiary – Quaternary	Safety Bay Sand/Tamala Limestone (Qs)	Eolian and beach sand/eolian calcarenite
	Guildford Formation (sand/clay member) (Qs)	Sand, clay and gravel
	Alluvial and colluvial sediments (Czv)	Sand, silt, clay, gravel and minor laterite
	Alluvium (Cze)	Sand, clay, silt and gravel
	Fluvial and lacustrine deposits (palaeochannels) and Greenbushes Formation (Ts)	Sand, silt, clay, lignite and gravel
Mesozoic	Warnbro Group (Kw), (including the Leederville Formation)	Sandstone, siltstone and shale
Jurassic – Cretaceous	Bunbury Basalt (Kbb)	Basalt
	Yarragadee Formation (Juy)	Sandstone, siltstone and shale
	Cockleshell Gully Formation (Jlo)	Shale and Sandstone
	Lesueur Sandstone (Tru)	Sandstone
	Sabina Sandstone (Trs)	Sandstone and clay
Palaeozoic	Sue Coal Measures (Ps)	Siltstone, shale, sandstone and coal
Permian	Boyup Coal Measures and Barron Sandstone (Pcm)	Coal, sandstone and shale
Proterozoic	Mafic dyke and sill (Prd)	Dolerite and gabbro
	Quartz dyke (Prq)	Quartz
	Leeuwin Complex (Prn)	Gneissic rocks and granulites
Archaean	Granitoid basement rocks (Ag)	Granitic rocks
	Gneissic complexes (An)	Granitoid gneiss, migmatite and schist
	Quartzite (Aq)	Quartzite

Topographical and geological maps are shown in Figures 3-12 to 3-14.

The Jinka pit (shown for effect in Figure 3-10) and Dingo pit were mined up until 1997; these show the effect in time after pit lake rebound and incident rainfall has been captured since the end of previous mining (over 29 years). The thick oxide layer can be seen beneath the surface alluvium in the order of tens of metres deep. It sits above the transitional / fresh rocks targeted for mining at depth. In the case of the KGP geology, and known to occur at Jinka and Dingo pits, the oxide layer is comprised of saprolitic clays. Such clays have low permeability properties. In cases where the oxide layer is not mineralised by gold, mined clays will be used at site for construction in circumstances where material of low permeability is needed, including as a final capping layer over the closed TSF.

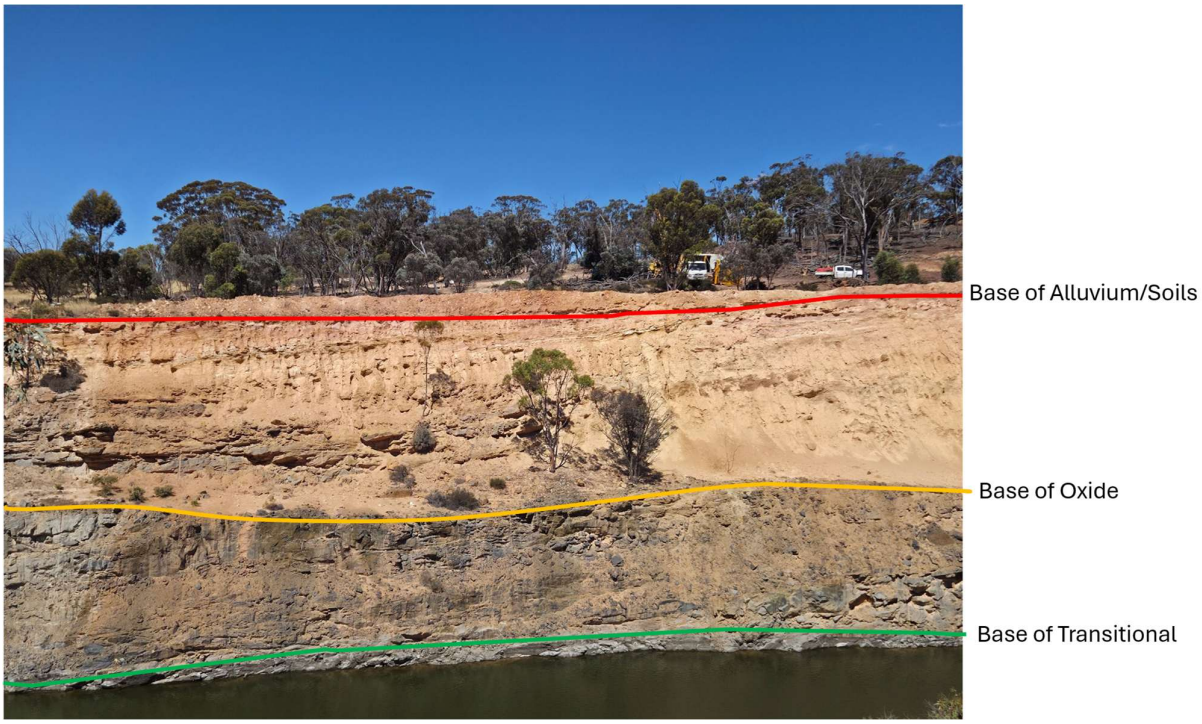


Figure 3-10: Existing Jinka Pit hanging wall in 2026 looking eastwards (above) and southwards (below)

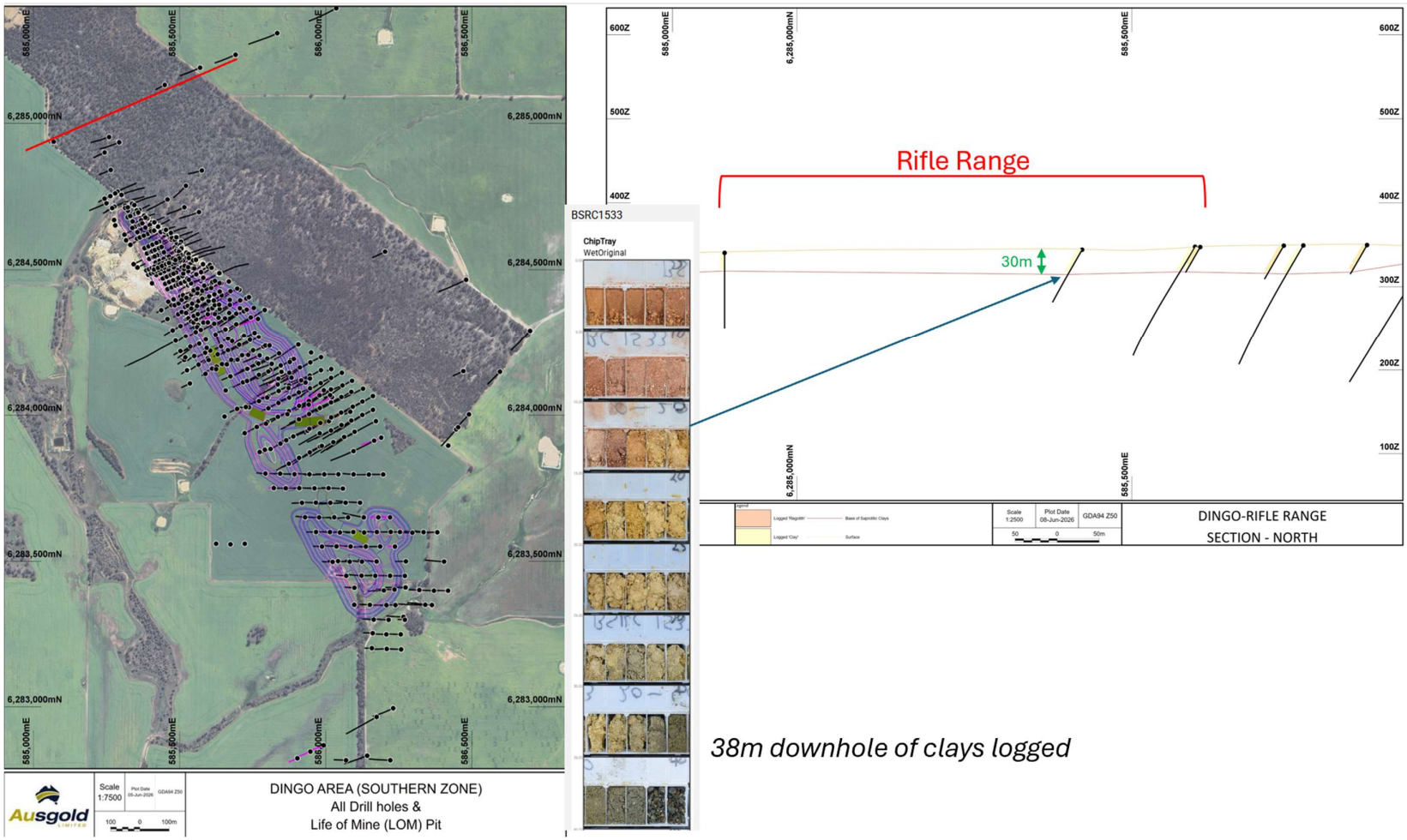
These clays have also been observed in the Southern zone/Dingo RC drilling campaign to install bores adjacent to the Wurgubup Reserve, which is summarised in Table 3-4.

Table 3.4: Lithology of Bore hole drill core logs – near Wurgubup Reserve (see Fig 3-8)

Hole ID	Depth (m bgl)	Extract from hydrogeological log	Observed flow rate (L/sec)
BSMB002	16-20	Extremely weathered sandy clay	0.05 (20 m bgl)
	24-33	Distinctly weathered Aphanitic Gabbro; weathered dyke, some minor clays	<0.25 (end of hole, 90 m bgl)
BSMB003	9-20	Sandy clay	0.1 (17 m bgl)
	31-66	Intermediate granite (Cross-cutting Gabbro at 48-51 m bgl)	0.16 (54 m bgl)
WERC015	6-8	Brown Clay and Silt	Not recorded below 15 m bgl

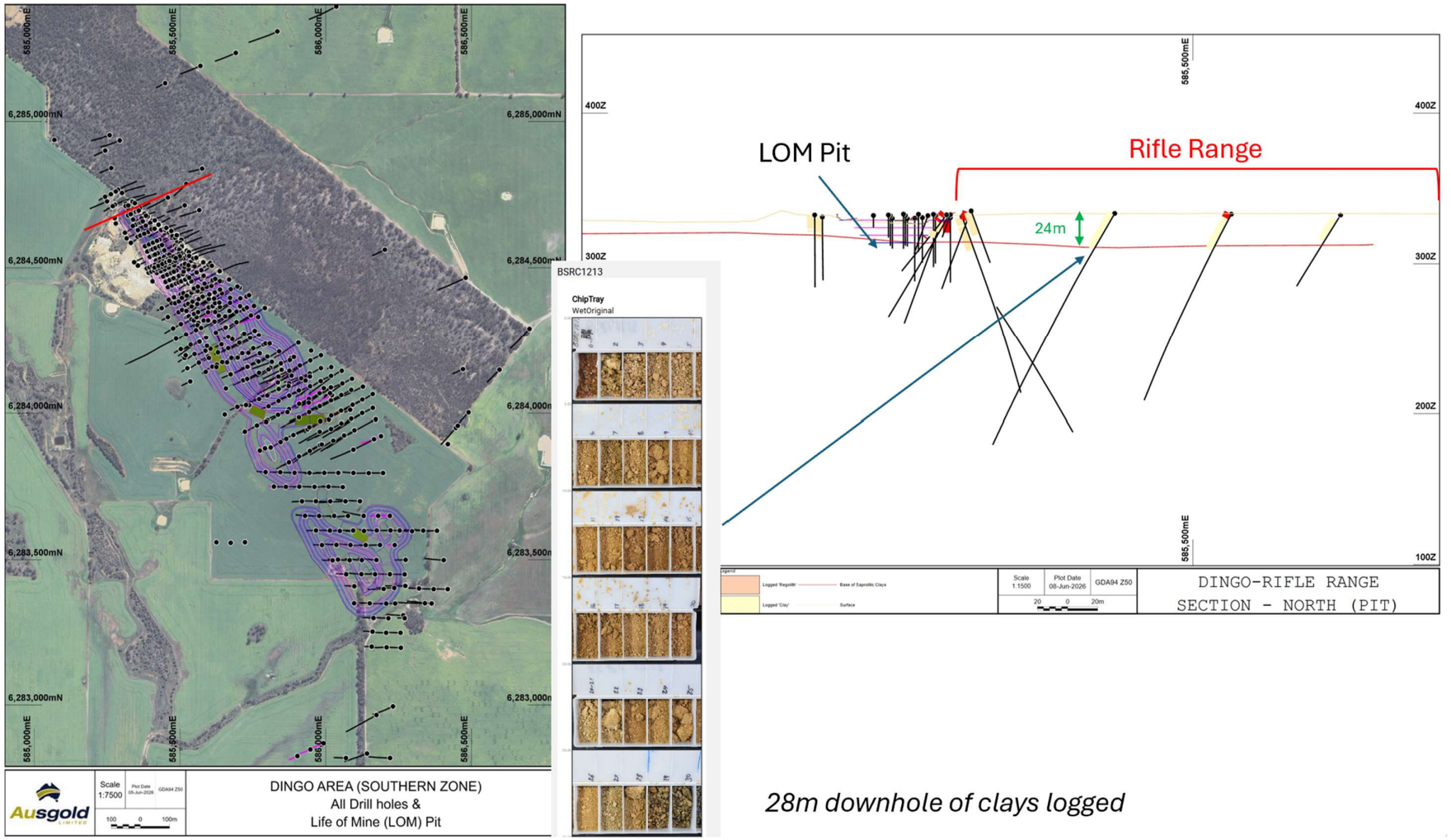
The drill logs above show that there are clayey layers within the alluvial and/or upper saprolites of drillholes that are associated with negligible to low observed flow rates. The lower saprolites, that makes up the remainder of the oxide layer these holes, is also associated with low observed flow rates. The oxide layer is underlain by a confined fractured rock aquifer.

Presence of clay layers within and beneath the alluvium as thick saprolites suggests little connection between the shallow alluvial layer and the deeper fractured rock aquifer that will be dewatered by mining activity. Sections have been extracted from the 3D geologic model developed by Ausgold for the mining tenements. These are represented below in Figure 3-11 (a), (b) and (c). It shows three long sections radiating around and partly through the Wurgubup Reserve (R12423), and tangential to the Dingo expanded pit. The records of geologic material layers are based entirely on original, empirical drill log records made and held by Ausgold (evidence collected in Wurgubup Reserve was by POW from DEMIRS). They show a layer of weathered clays (saprolites/kaolinites) up to a vertical depth typically of 20-30 metres beneath the shallow soils and above the deeper, hard country rock.



38m downhole of clays logged

Figure 3-11(a)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DINGO AREA (SOUTHERN ZONE)
All Drill holes &
Life of Mine (LOM) Pit
BSRC1213
ChipTray
WetOriginal
LOM Pit
Rifle Range
24m
400Z
300Z
200Z
100Z
Scale 1:1500
Plot Date 08-Jun-2026
GDA94 Z50
DINGO-RIFLE RANGE
SECTION - NORTH (PIT)
28m downhole of clays logged

Figure 3-11(b)

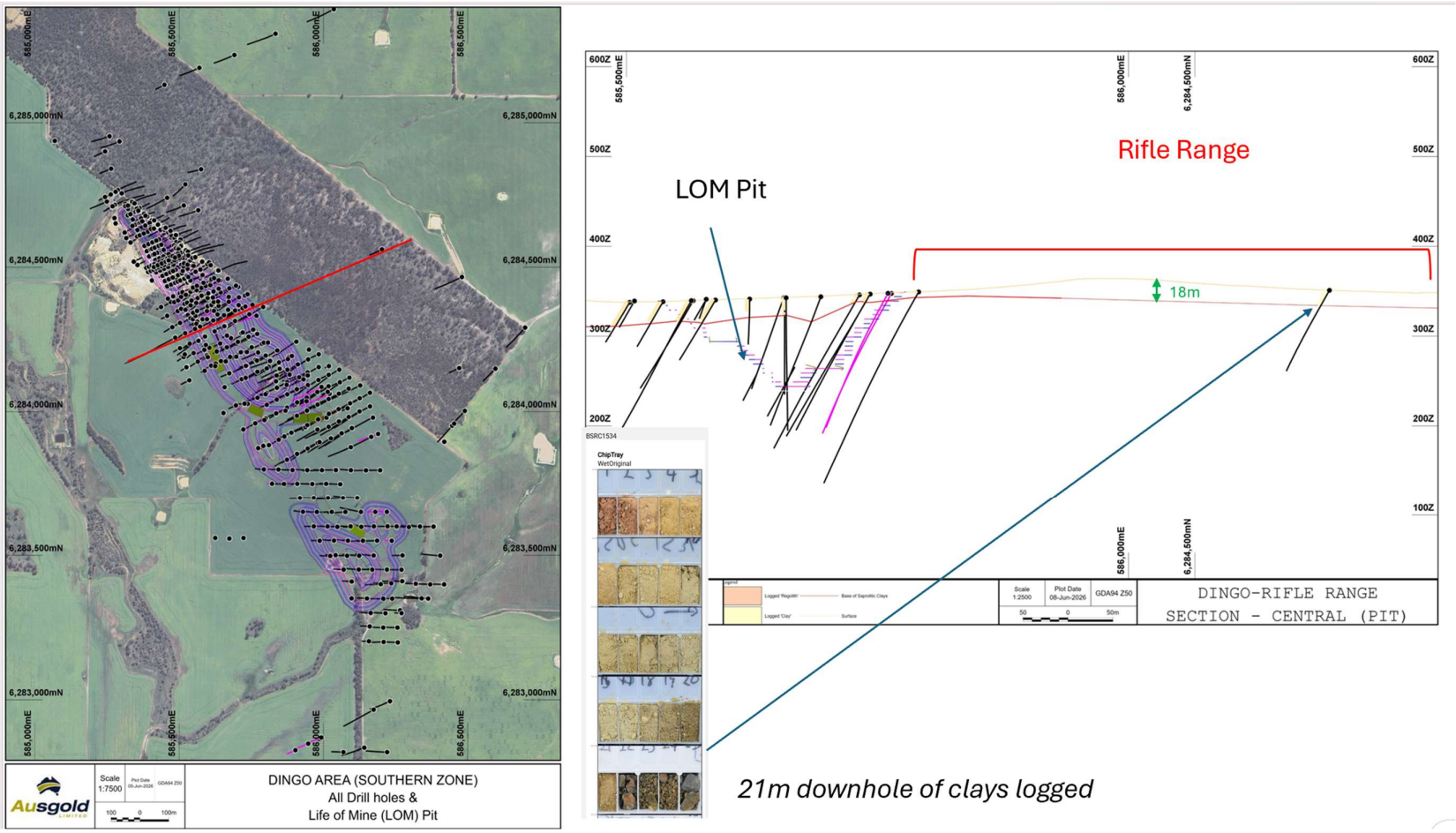


Figure 3-11(c)

Figure 3-11: Sections (a), (b) and (c) showing clay rich layers beneath Wurgubup Reserve

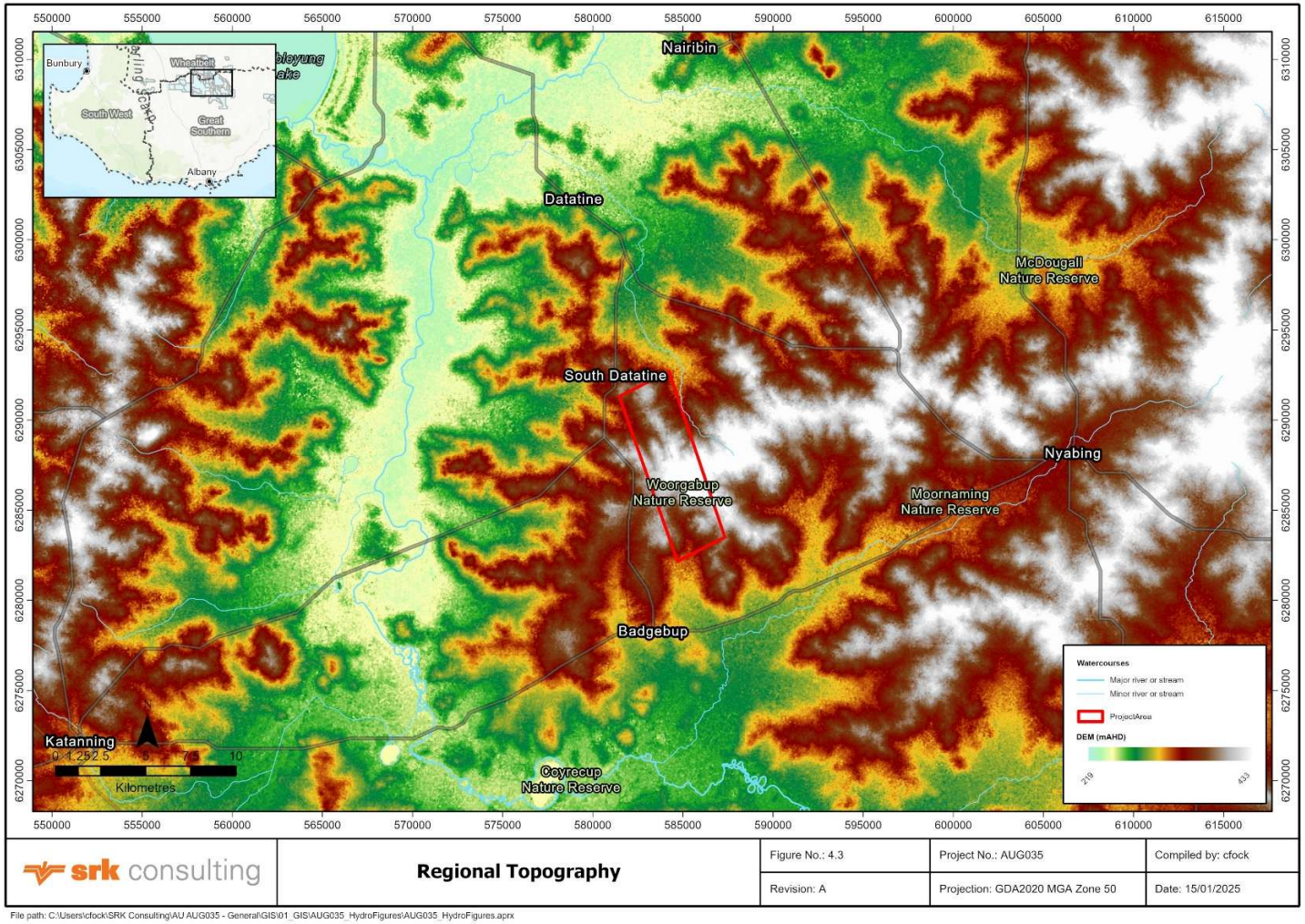


Figure 3-12: Regional Topography

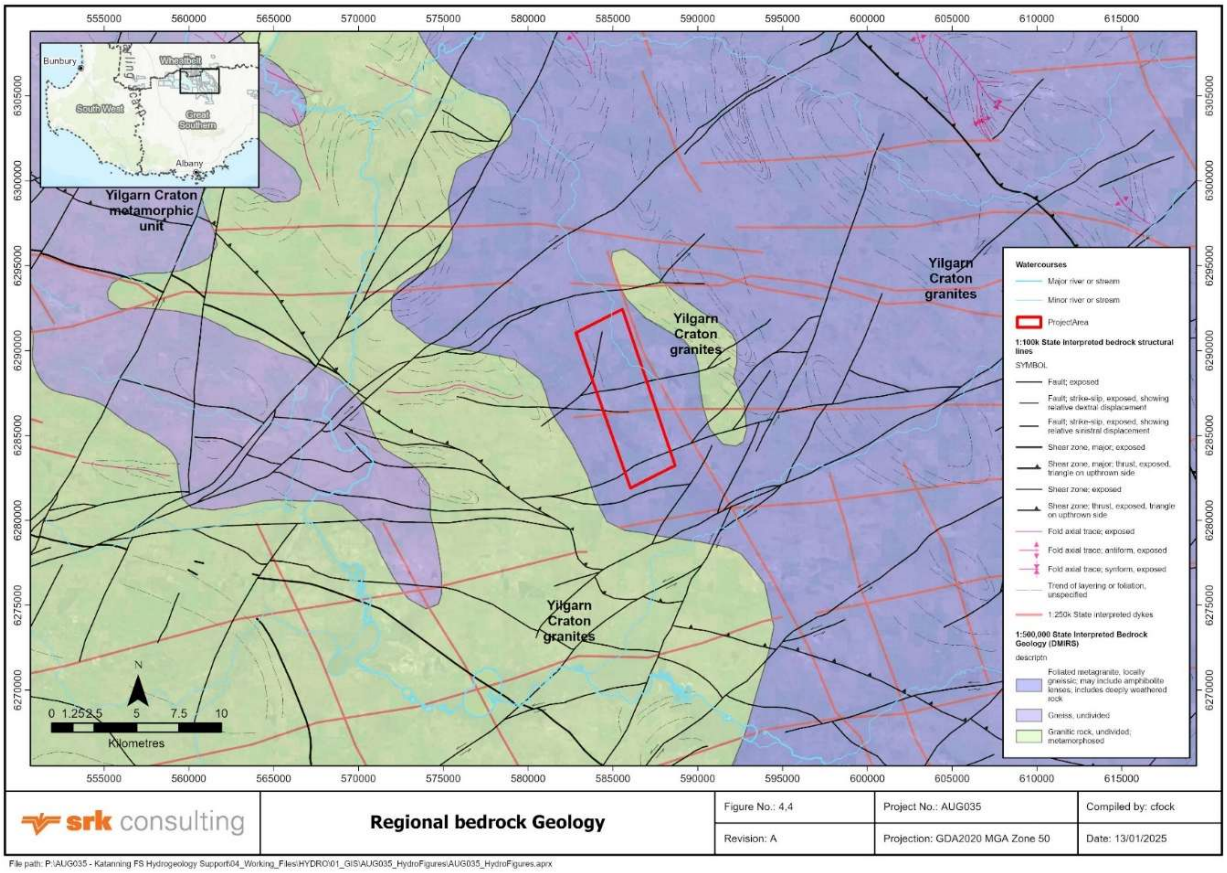


Figure 3-13: Regional Bedrock Geology (based on GSWA)

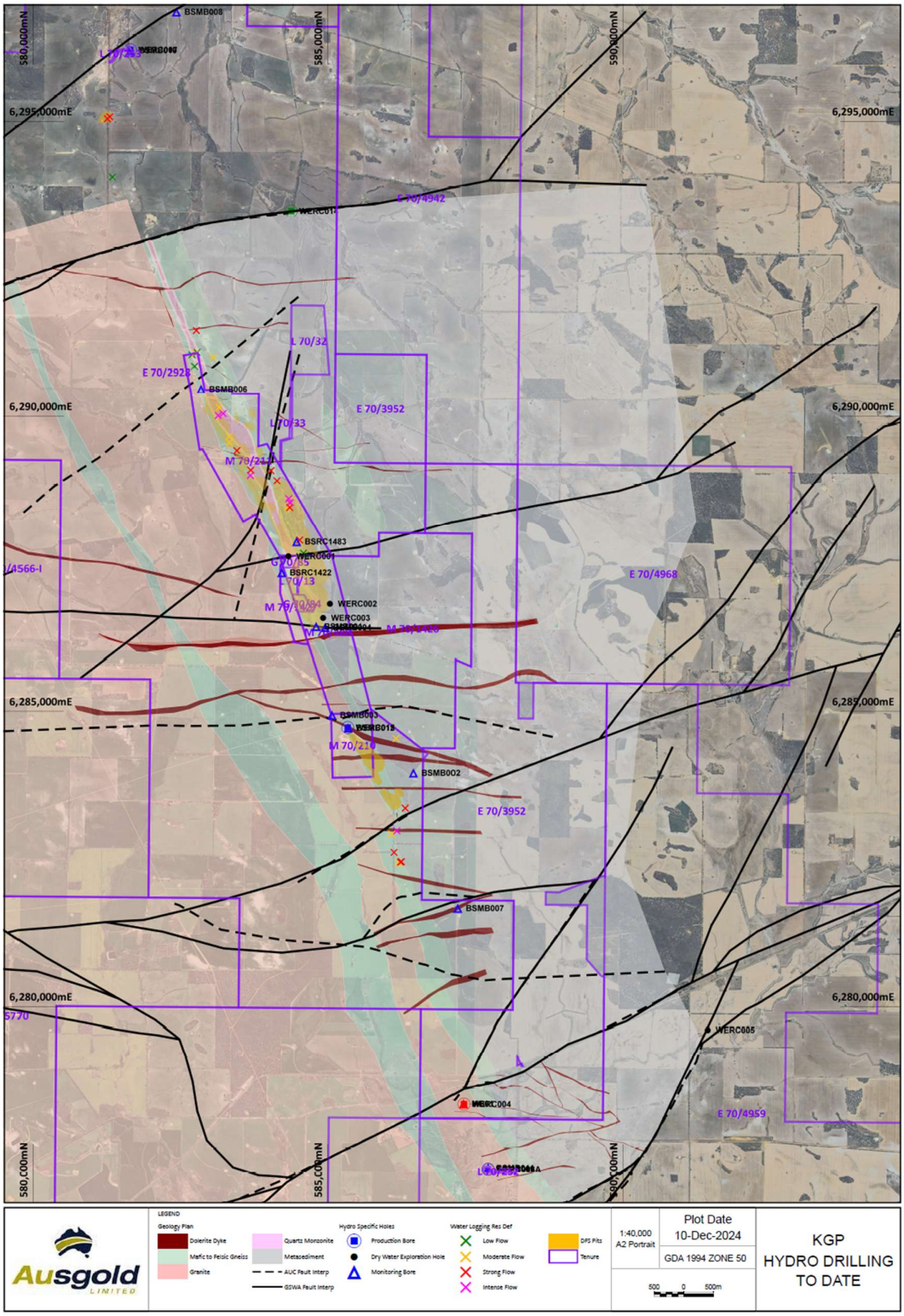


Figure 3-14: Mapped Surface Geology (Ausgold) (adopted by Rockwater (2025a))

3.7 Soils

The KGP sits largely in the East Katanning System with gently undulating to undulating rises, in the South-western Zone of Ancient Drainage. At surface, it is found with sandy gravels, grey sandy duplex soils and alkaline grey sandy duplex, often with hardsetting surfaces occupied by Wandoo and sheoak woodland mix with mallee.

Within the survey area, soil inspection sites were classified to the Australian Soil Classification (ASC) system, with four classes identified:

- Sodosol;
- Dermosol;
- Kurosol; and
- Rudosol.

The ASC enhanced by the Soil Groups of WA classification systems provides a high-level understanding of the soils. Landloch (2024) adopted and augmented these classification systems to understand the soils, in situ, to give better guidance on the mining land use that actively will strip, invert and/or stockpile soils, in order that such media are used for cover systems at closure. Three main soil management units (SMUs) were identified by Landloch (2024) at the KGP as (Figure 3-14):

- **Sodic Duplex:** Soils characterised by the contrast between sandy topsoils and well-structured yet highly sodic subsoils. Topsoils are typically dominated by loamy sands so does include loams. Clay content typically increases significantly and abruptly with depth. The Sodic Duplex soils are located in various landscape positions, from crests and upper slopes to the lower slopes and drainage lines.
- **Acidic Soils:** Soils where both the topsoils and subsoils are typically acidic. Topsoils are sand-dominated but can include loams. The subsoils have an increased clay content compared to other topsoils, ranging from loams to medium heavy clays. Coarse fragment abundance is variable. Acidic Soils are prone to low structural stability so not useful on sloping lands.
- **Shallow Sands:** Sandy soils that are restricted to a single area, with shallow structureless sands laying atop a cemented lateritic layer. Although these sands are considered to be sodic, they are prone to structural stability so useful in construction but not rehabilitation as a cover system.

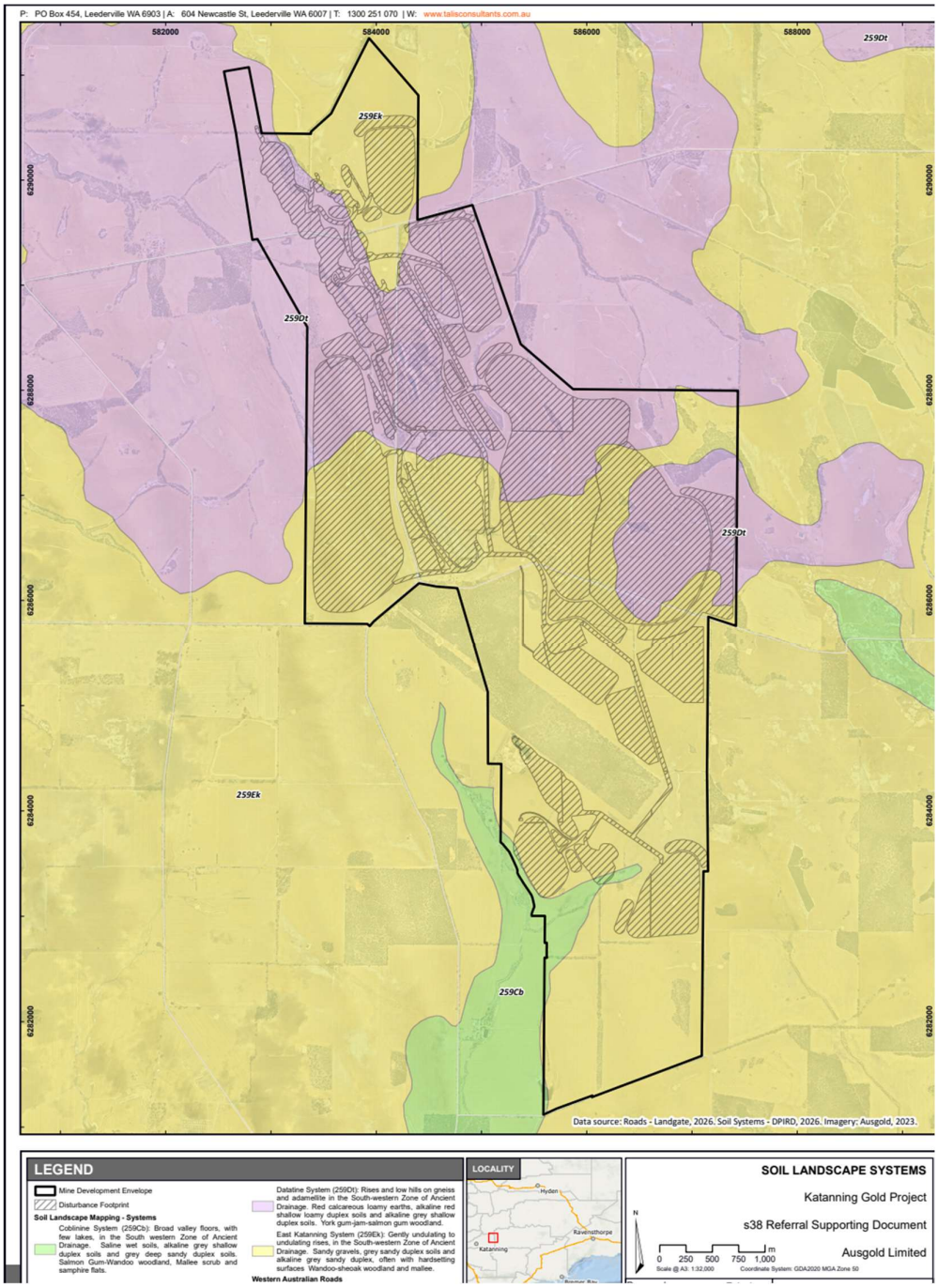


Figure 3-15: Indicative Mine General Arrangement over Baseline Soils

Figure 3-15 shows the mine's general arrangement, largely over sodic duplex and acidic soils. Further work continues in refining the mapping and measurement of soils to future rehabilitation purposes. Generally, stored soils would be used as post-closure surface covers for:

- flat areas, not prone to rainfall-runoff, including former mining domains such as the processing plant, mine services area, low grade ore stockpile, flat tops of the waste rock landforms (WRLs);
- as a final cover above the earthen blanket atop the tailings storage facility (TSF); and
- WRL flat berms which are retained as constructed benches sited within the outer faces.

3.8 Materials Characterisation

Materials refers to all soil and rock that will be removed or mined by mining activities, including material that will be physically or chemically processed on site (e.g., plant tailings from processed ore). Materials characterisation identifies the typical physical and geochemical properties of each main class of those materials (soils; waste rock; ore) and whether they have potential to cause become hostile, form pollution, and/or contribute to, or detract from, the success of rehabilitation and closure.

In accordance with the Statutory Guidelines for Mining Proposals (DMIRS, 2020), materials characterisation programs address risk factors potentially associated with:

- Acidic and/or metalliferous drainage (AMD) inclusive of acidic drainage, metalliferous drainage, and saline materials and/or drainage;
- Erosive, sodic and/or dispersive material, especially soils or weatherable rocks;
- Fibrous minerals;
- Naturally occurring radioactive material (NORM), and
- Material with other chemical/physical properties that will affect stability or success of rehabilitation (e.g., low pH, low fertility, poor structural integrity, water holding capacity).

Ausgold has conducted materials characterisation testwork on soil, waste rock and ore materials planned to be mined at the Project. The waste characterisation program will be developed in accordance with Draft Guidance: Materials characterisation baseline data requirements for mining proposal (DMP, 2016).

The Project is comprised of several defined resources within the mining zones. Overall, the zone is thrust fault bound block comprising of a folded sequence of granite/monzonites, granulite ranging from felsic to mafic and metasediments.

Detailed analysis has been done informed by SRK (2024) which used a Sampling Analysis Plan to target the relative proportion of each lithology planned to be mined. Preliminarily, Knight Piésold (2022) identified the major lithologies for testing as:

- Metasediments
- Felsic Granulites
- Intermediate Granulites (Minor host rock)
- Mafic Granulites (Main host rock)
- Speckled Granulites
- Quartz Monzonite
- Granites.

3.9 Low Risk of Acidic and/or Metalliferous Drainage (AMD)

Generally, sulphide minerals were typically noted within the mafic granulites with both sulphur-containing pyrite and pyrrhotite noted as being associated with the gold mineralisation. Sulphide grade generally increases with increasing gold grade, so is totally associated with ore feeding into the processing plant and it ultimately residing in the engineered TSF.

Knight Piésold (2022) initially reported results to indicate that the total sulphur content varied from <0.01% to 1.35% at an average of 0.2% which is very low. With most samples (79%) having a total sulphur content less than 0.3%, which is a limit sometimes adopted for preliminary screening and identification of Potentially Acid Forming rock material. The maximum potential acidity (MPA) was calculated from the total sulphur contents and was minor for most samples with the highest being 39 kg H_2SO_4/t at an average of 5.4 kg H_2SO_4/t. The acid neutralising capacity (ANC) of the samples was determined along with the estimated carbonate content (based on total carbon in the absence of inorganic carbon test data). The ANC was measured from 13 to 177 kg H_2SO_4/t at an average of 30 kg H_2SO_4/t with the majority of the ANC attributable to the carbonate minerals in waste rocks; this indicates a significant amount of ANC material which should be readily soluble to counter acidity upon oxidation.

Further to the screening work of Landloch (2023), SRK (2024) and then SRK (2025) indicated the following for KGP waste rocks (approximately 300 test samples analysed):

- Over 90% of the test rock samples recorded total % S << 0.3% and were therefore classified as NAF (Landloch 2023).
- Only three of 111 rock samples had characteristics likely to be potential acid forming (PAF) low capacity and an ANC:MPA ratio of <2 (Landloch 2023).
- More targeted materials testing after a stratified sampling of rocks and ore from the optimised pit proportional to their representation in rock and ore feed to WRLs or the TSF (SRK, 2024).
- Total sulphur content of waste rock had a median value of 0.047% S (Landloch 2023).
- All waste rock lithologies have median sulphur content < 0.1% S, except for dolerites which have a maximum sulphur content of 0.4% S and a median of 0.2%.
- A slightly higher but small proportion of waste rock test samples (<10%) with > 0.3% S. Host lithologies are known to include mafic granulites (tm, gneiss), intermediate granulites (ti, gneiss) and monzogranites (gm) which are relatively abundant. Sixteen of the samples (<10%) generated acidic NAGG solutions with S content being slightly higher (ranging from 0.25% to 3.4%).
- Net acid production potential (NAPP) values of waste rock ranged from -650 kg H_2SO_4/t to 99 kg H_2SO_4/t with a median -11 kg H_2SO_4/t). Most test samplers generated negative NAPP values meaning an excess of neutralising capacity overall.

The SRK (2025) findings are summarised as shown in Figure 3-6. The low proportion of slightly PAF waste rock and a higher proportion of NAF with propensity to alkaline pH levels upon weathering and oxidation. Only 2.5% of the samples (four out of the 161) test samples had total S > 2% as shown below (SRK 2025).

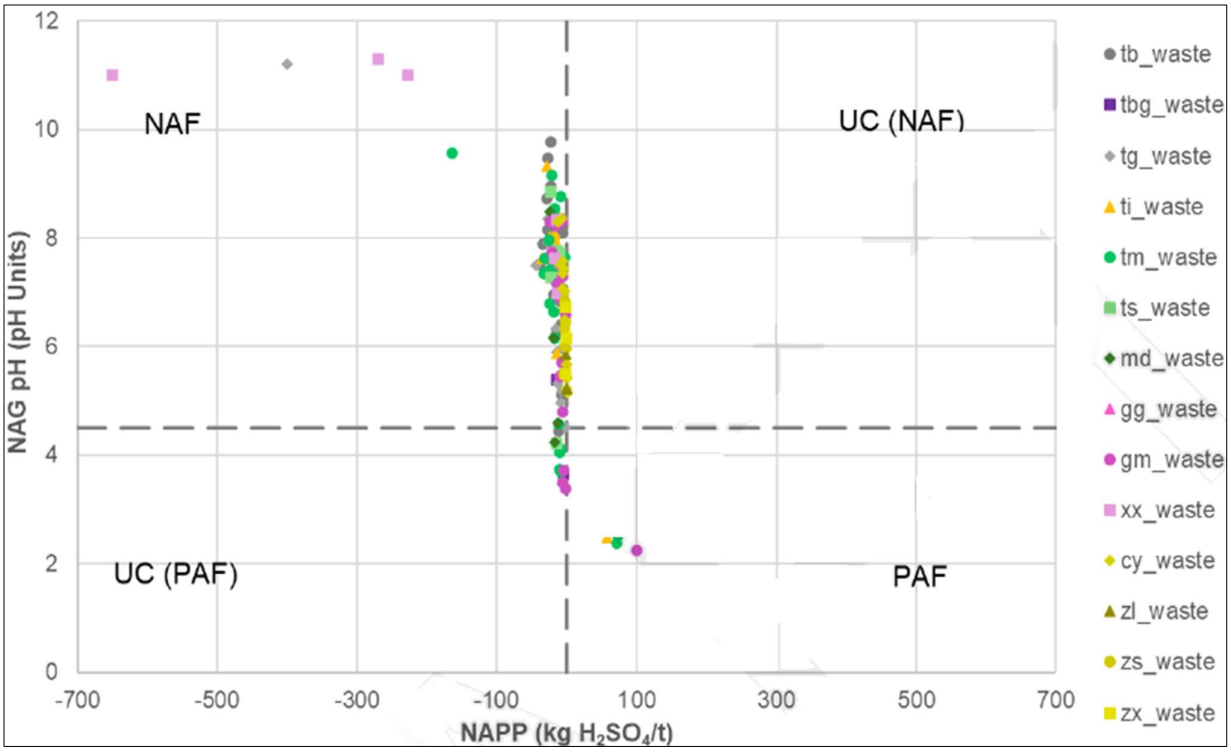


Figure 3-16: SRK (2025) Waste Rock Screening Results Summary

In general, the PAF potential is typically low to very low with net neutralising potential within the waste rocks. For those shown to have elevated sulphur content and/or high alkalinity, these are of small volumes inasmuch as they can be interred in dedicated cells in WRLs upon construction. Further static tests are in-train for a selection of prospective "hostile" rock types (those >1% S) in order that speciation and leach yield test work provides further information on site based management. Kinetic test work will be conducted later in 2025 to provide details of weathering and leaching rates, even in this case of limited suspect sulphur-laden waste rock materials.

4. Project Development and Implementation Overview

The Katanning Gold Project processing facility has been designed to process 3.6 Mtpa of open pit ore. The processing plant will be designed to operate seven days per week at a nominal treatment rate of 450 dry t/h at a grinding circuit utilisation rate of 91.3%.

The proposed processing facility design has been based on proven technology for gold recovery and comprises the unit processes outlined below:

- Single stage crushing using a primary jaw crusher to yield a final product of 80% passing 144 mm.
- Two stages of grinding in a primary SAG mill and secondary ball mill closed with hydro-cyclones to achieve a product size of 80% passing 75 µm.
- Treatment of a partial mill discharge stream by centrifugal gravity concentration, followed by batch intensive leaching of the gravity concentrate and electrowinning of the resulting pregnant solution.
- Thickening of the leach feed stream to 48% solids w/w prior to leaching.
- Leaching and adsorption in a hybrid carbon-in-leach (CIL) circuit comprising two leach tank and six CIL adsorption tanks.
- Acid washing and elution of the loaded carbon in a split AARL elution circuit, and thermal regeneration of the barren carbon prior to its return to the CIL circuit.
- Smelting of cathode sludge from electrowinning to produce a final product of gold doré.
- Thickening of the final tailings followed by cyanide detoxification using the INCO Air/SO_2 method and pumping the tailings to the TSF. Supernatant water will be recovered from the surface of the TSF for recycling back to the process plant.

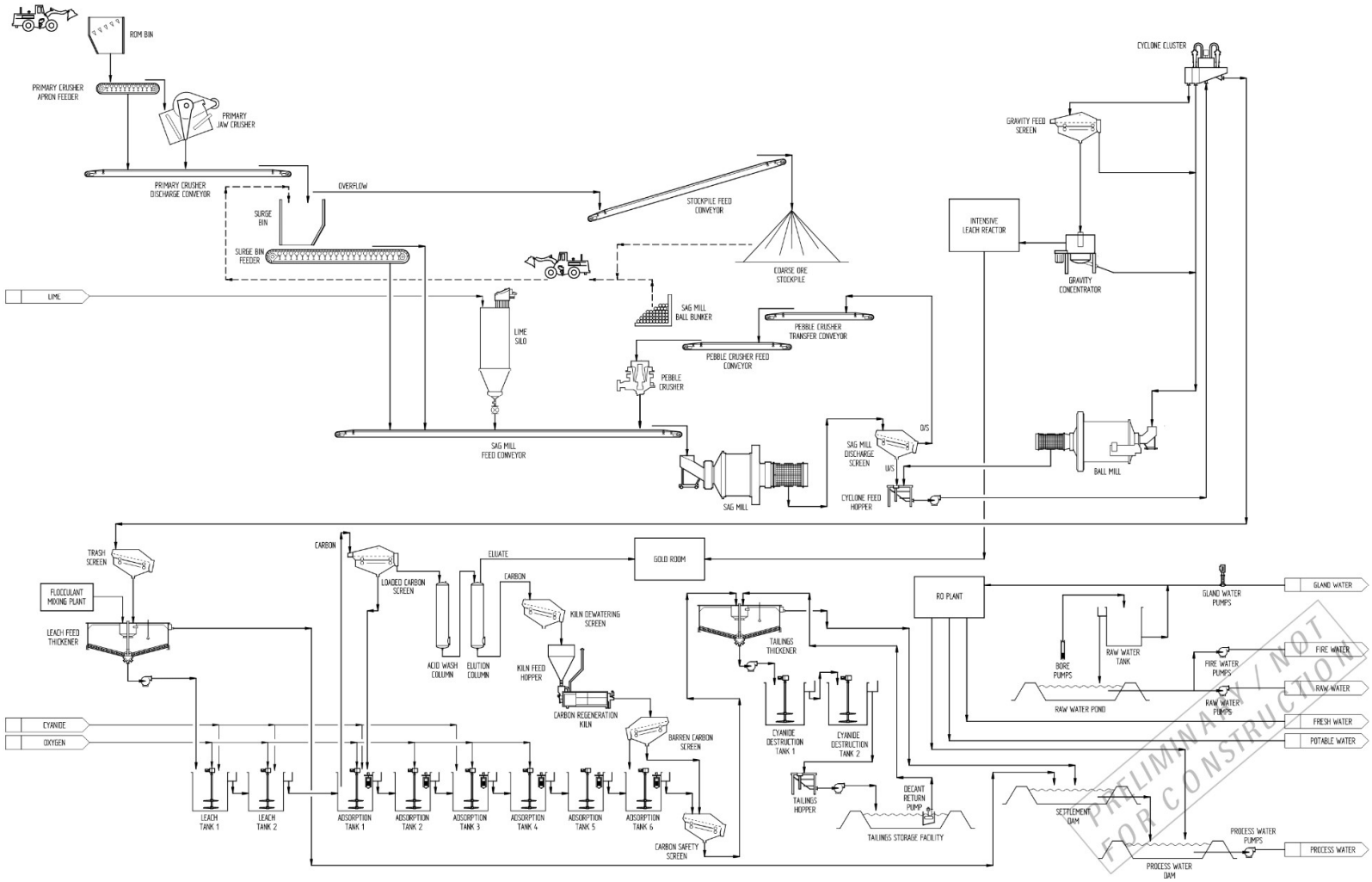


Figure 4-1: Ore Processing Flow Diagram

4.1 KGP Water Requirements

The site's annual average water demand is estimated at approximately 3.7 GL/year (as shown in detail in section 6). This demand is expected to be primarily met through return water from the TSF and inflows from pit dewatering below the water table. Inbound original water will be required early in site processing and then afterwards only make-up water to balance the water demand at site.

Groundwater inflow estimates into mine pits over the life of mine vary considerably, with initial numerical modelling undertaken highlighting for Ausgold uncertainty in predicted and likely pit inflows. The model was subsequently refined through more-granular field based geological data and definition that was adopted by Rockwater (2025a) (Appendix 2) in providing a more accurate forecast in estimated dewatering production and drawdown extents. As an additional internal verification process, a further source of pit dewatering forecast estimates was generated by EMM Consulting in 2025 (Appendix 4) which enables the preceding work of Rockwater to be confidently adopted by Ausgold.

For the purposes of the site-wide water balance, Rockwater's mine pit dewatering rates have been adopted by WSP (2026a) as the most likely input, pending field drilling and empirical data to support modelling refinements in future updates. Based on these inputs, additional makeup water will be required to supplement site demands, particularly during the summer and autumn months; these are estimated annual borefield makeup depending on climatic and operational conditions. However, after the first inbound volumes from the borefield to "prime" the KGP, and small forecast make-up water in years 2 and 3, no additional bore water is forecast.

Rockwater (2025) pit dewatering schedules over the ten-year life of mine (LOM) provided the quotient of water abstracted at site from below the floor of mined pits, in order that other sources of water could be forecast including, importantly, water to be abstracted and inbound from the regional borefield.

4.2 Raw Water Supply

In 2023, a drilling campaign was conducted to identify optimal locations for production bores for water supply and dewatering. The campaign comprised 16 bores and includes two monitoring bores, three pilot holes for dewatering bores, and 11 pilot holes for water production bores. In 2024, based in airlift yields from the pilot drilling and data from the groundwater monitoring, three sites were selected for test production bores and associated monitoring bores:

1. The southern area, comprising test production bore **WERC006A (and its monitoring bore BSMB011)**;
2. The north area, comprising test production bore WERC007 and monitoring bore BSMB010; and
3. The central area, comprising test production bore WERC015 and monitoring bore BSMB012.

The locations of the CAW208099(1) bores are shown in Figure 4-2. Note, only a select number of bores will be used; at this stage, WERC007 is not anticipated to be used for supply and the dominant inbound bore abstraction in year 1 of production would be from **WERC06A** at the southern borefield.

At steady state, the process plant will require approximately 3.7 GL/year of water, assuming that in all years other than the first year, approximately 3GL/year of water is returned from the TSF to the processing plant. Initially in Year 1, the amount of water returned from the TSF will be significantly less than the steady-state rate of recovery. Consequently, the water supply system (southern borefield) will need to be capable of providing water to the process plant at a rate equivalent of up to 2.5 GL/year in Year 1.

Further detail on the overall site water balance is presented in Section 6.

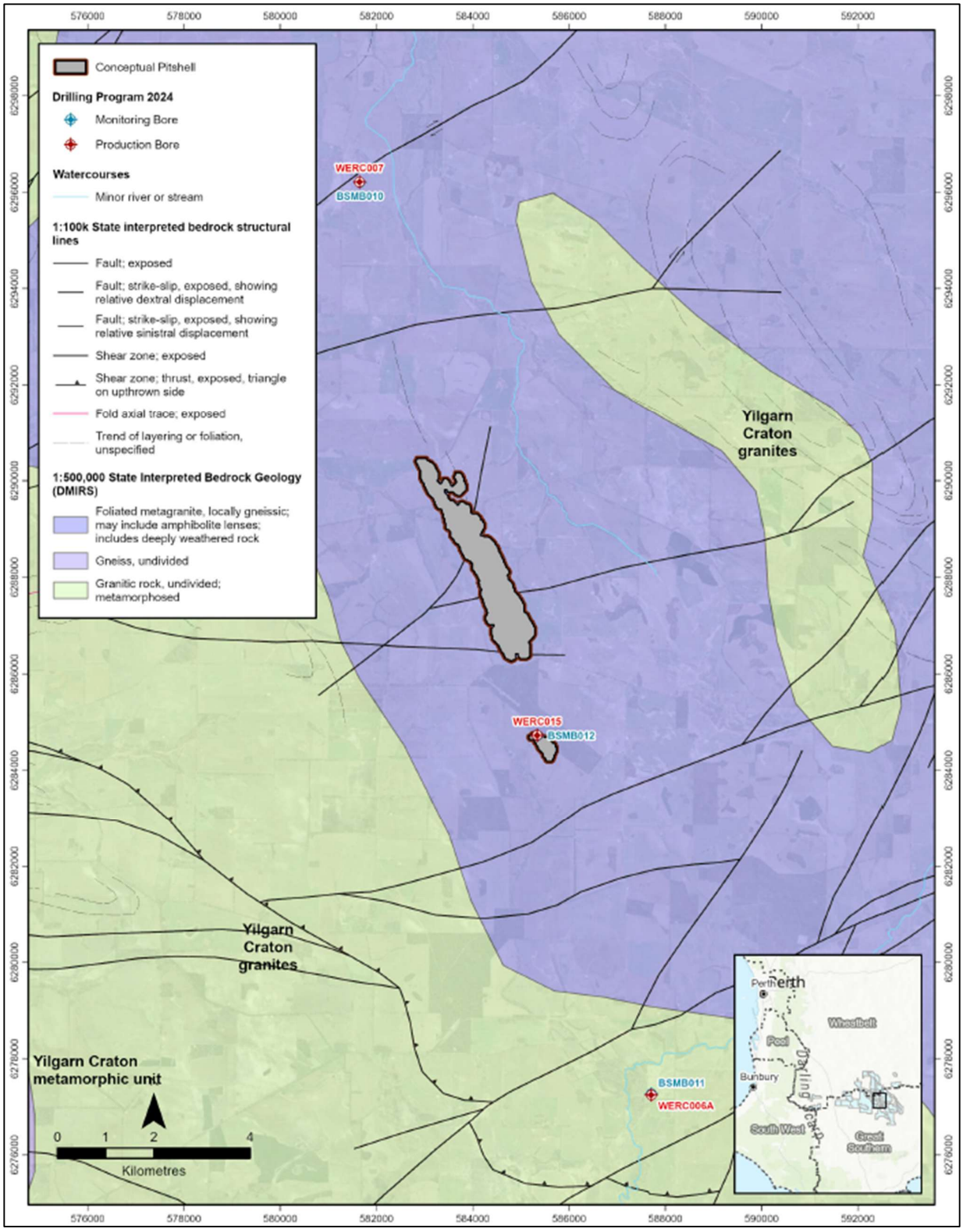


Figure 4-2: Three (3) existing Test Production Bore Locations (using CAW209088(1) between2023-2025)

4.3 Bores and Pipelines

Up to two bores located at the southern borefield will be used to abstract ground water. One of these production bores (WERC006A) was installed under 26D permit CAW209088(1) in 2024, and testing pumping for yields was completed in 2025 under GWL210294(1).

Bore water will be required to meet the initial operational demand at KGP in Year 1 and opportunistically afterwards (one operational and one standby bore). The pumps will be powered by diesel generators and remotely operated via telemetry controls. Water will be delivered to the raw water pond at the process plant by a high-density polyethylene (HDPE) pipeline, routed along a private corridor secured by easement on freehold title on one land tranche held under a long term access agreement (Figure 4-3).

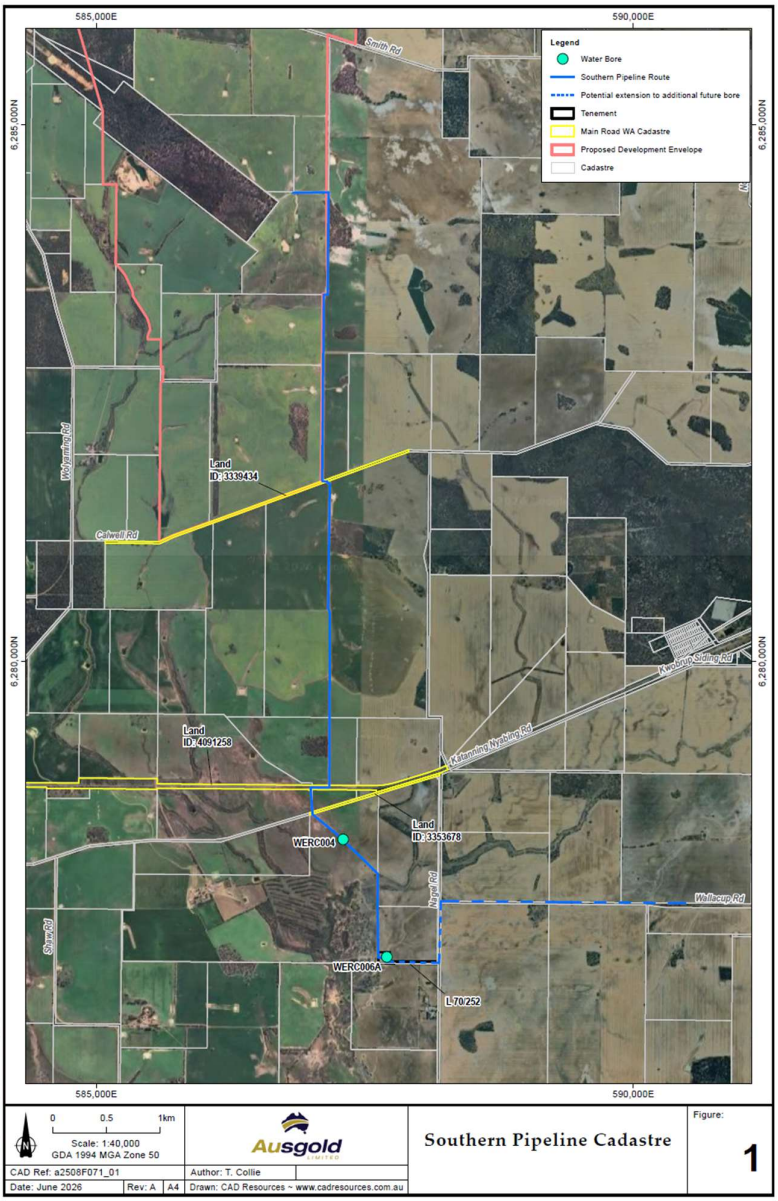


Figure 4-3: South inbound pipeline route to KGP from two CAW-permitted bores

4.4 Pit Dewatering

Water abstracted from the mine pit dewatering program will also be piped to the raw water dam at the processing facility. Minor inflows into the pits will be the responsibility of the mining contractor with any salinized water optimally used for dust suppression.

Reference should be made to Sections 5 and 5.1 to Section 7 relating to the range of hydrogeological and surface water assessments for further details regarding the nature and fate of dewatering waters in the context of the site wide water balance.

4.5 Site Water Conceptualisation

A simplified version of WSP (2026a) process flow diagram for the water balance is presented in Figure 4-3 showing the general interactions between the main storages. In general, the contact water flow during operations is as follows:

- **Pits**: There are four main pits on site (Jackson, Jinkas, Dingo, and Olympia), with each pit developed in stages. Pits in general receive water from direct precipitation, catchment runoff, pit wall runoff and groundwater inflow, the latter as a result of the pit being mined below the regional groundwater level (except Olympia). Water ponding within a pit is mainly lost through dewatering pumping to the process plant.
- **Sediment Ponds and Storm Water Pond**: 16 sediment retention ponds would collect runoff and seepage from the WRDs across the mine area, and one Storm Water pond is expected to collect runoff from the run-of-mine (ROM) pad. Operational rules governing pumping from the sediment ponds to the process plant are applied. The sediment ponds are expected to be clay lined, and therefore only minimal seepage is expected.
- **Tailings Storage Facility**: The TSF comprises two cells (Northern cell and Southern cell). The TSF cells receive water from direct precipitation, water released from the tailings slurry, and runoff from the tailings surface. The main outflow from the TSF cells is decanting pumping directed to the process plant. Minimal seepage is expected to be captured via an underdrainage system. The models consider this seepage as a loss in the water balance.
- **Process Plant**: The process plant receives water from the pits, sediment ponds, and TSF cells. It has an annual water demand of approximately 3,700 ML and if the inflow is insufficient, borefields are used to supplement the water supply.

As discussed in Section 6, water losses will be evaporation. These will be modulated relative to the seasons (dry hot summers; wet cool winters) and from year to year as drier and wetter periods may occur. Any potential loss by seepage from the 141 ha TSF will be contained by a dedicated manufactured liner beneath the solid tailings materials disposed into the TSF.

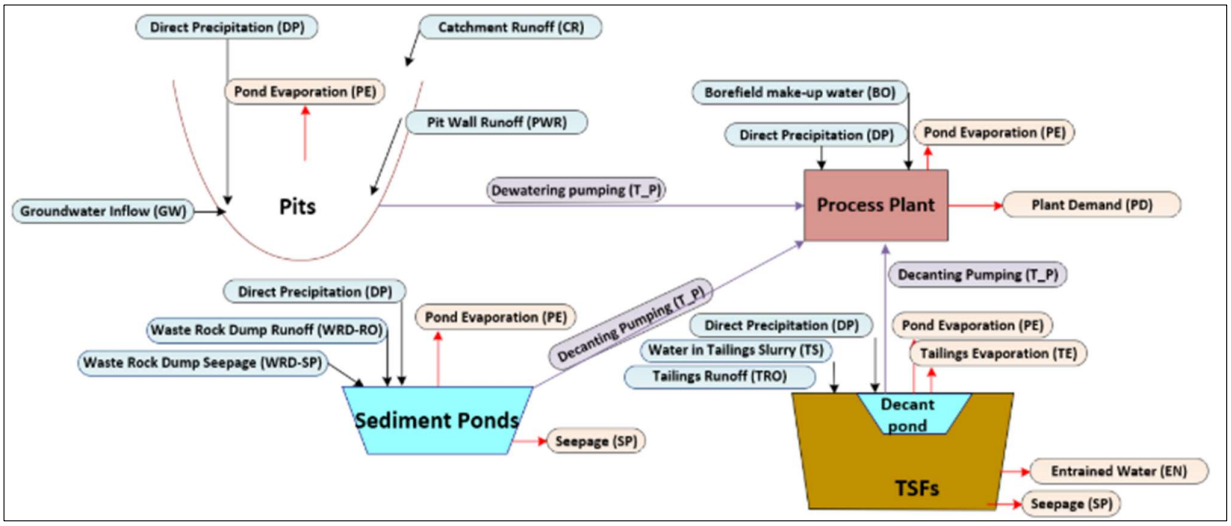


Figure 4-43: Conceptual Project Water Sources and Sinks

Raw water could be supplied by from a number of licensed bores. WERC06A in the southern borefield is the primary supply bore to be used. The bore pumps will pump directly to a raw water tank onsite. Gland water pumps (duty and standby) will draw water from the raw water tank to supply gland seal water to centrifugal slurry pumps. A reverse osmosis (RO) feed pump will draw water from the raw water tank the RO plant. The RO plant will treat the water to produce permeate to provide fresh water and potable water (with chlorine sterilisation). The brine will flow to the process water pond.

At construction or in Year 1 of operations, there is also 150ML of water held as pit lakes in the legacy Jinka and Dingo Pits of the Badgebup Gold mine. This would be introduced into the site's water balance.

Overflow from the raw water tank will flow to the HDPE lined raw water pond, which also acts as the fire water reserve. Raw water pumps (duty and standby) will draw water from the raw water pond and supply a range of plant uses.

Thickener overflow water will report to the settlement pond, which will discharge into the process water pond. Process water pumps will draw from the process water pond to supply the following plant users:

- Service points throughout the plant.
- Grinding area dilution.
- Gravity area dilution.
- Tailings flushing water.

A site drainage pond will be installed to capture site run-off. A pontoon pump will return water to the settlement pond.

The borefield will be operated by telemetry to permit the remote starting and stopping of pumps.

The borefield transfer pumps will stop and start based on level in the raw water tank. The bores will be started and stopped based on an operator selected priority.

4.6 Proposal Development Schedule

Indicative Project milestones are shown in Table 4.1 below.

Table 4.1: Forecast Project Milestones

Milestone	Timeframe
H3 Report and application for 5C licence	Before end H2 CY26
Ausgold's KGP Financial Investment Decision	Before end H2 CY26
Commencement of KGP construction and borefield and pipeline	Within H1 CY27
Provision of bore water to KGP	By H2 CY27

5. Water Modelling and Assessments

In order to characterise the nature and scale of surface and sub-surface hydrogeological impacts resulting from the Project Ausgold has commissioned a series of investigations that has iteratively refined the knowledge base and informed the significance of potential impacts associated with surface and groundwater resources within and in proximity to the Projects zone of influence.

The series of hydrogeological assessments conducted to date allow definition of proposed management and mitigation measures that could be adopted to minimise adverse impacts on the local and regional aquifer as well as surface water regimes over the Project life.

Data and reports from public databases and previously completed geological and hydrogeological studies for the Project were reviewed for this assessment, including:

- Geological mapping (DEMIRS).
- Water level data from regional bores available on the WIR government database (DWER).
- Government digital elevation modelling.

Subsequent to the above, assessments undertaken to date include:

SRK Consulting – Completion of initial hydrogeological field investigations, aquifer testing, and associated assessments, including the development of a numerical groundwater flow model for the Project which was intended to support a H3 assessment to satisfy permitting requirements for the estimated groundwater abstraction needed to support the Project. However, the basis of the model was constructed on GSWA geology that was inferred and not informed by hundreds of thousands of metres of Ausgold's in-field drilling, empirical observations and 3D modelling. As a result, the H3 report based on their modelling was abandoned in 2025. The field investigations and empirical data collated by SRK continued to inform the subsequent work completed by others, as below.

Rockwater (2025a) – Completion of an independent technical assessment of SRK's hydrogeological report and creation of a newly constructed numerical groundwater model; in particular, to verify the basis of assumptions applied in resultant predictions on dewatering volumes and to determine revised dewatering predictions on the basis of fine-scale field based geologic mapping and an updated numerical groundwater model developed by Rockwater. The Rockwater Technical Memos are provided as **Appendix 2.**

EMM Consulting (2025) – Evaluation of the reasonableness of pit dewatering estimates produced using the two existing numerical groundwater models developed for Ausgold. Key findings were that SRK reported model-derived dewatering estimates yield an average of 4.8 GL/yr and a maximum of 8.4 GL/yr for a 11 year mine life. EMM considers this to be an overestimate and unlikely when benchmarked against dewatering data from existing mine operations located in similar hydrogeological settings in Western Australia. Rockwater (2025a) dewatering estimates provided an average of 0.4 GL/yr with a maximum of 0.5 GL/yr for a 10 year mine life, which are reasonable in comparison to the range of measured values gathered from existing projects. EMM considered that, by reducing the long-term drainable capacity of the initial SRK model to 0.1% (as performed by EMM), the modelled dewatering estimates significantly decrease with an average of 1.5 GL/yr and a maximum value of 2.3 GL/yr, which are more reasonable values compared to benchmarked data and to the maximum values reported by Rockwater (2025a)). Lastly, EMM noted that there is an identified risk from relying on pit dewatering volumes as a primary water supply source for the Project and recommended that a conservative approach on pit dewatering volume is taken (as per Rockwater), unless there is clear evidence of the existence of high-yield water bearing zones connected to the pits. EMM's work is contained in **Appendix 4.**

Hydrobiology (2026a) – Completion of assessment of potential GDE adjacent to the Project location to assess the potential risk of impacts from dewatering drawdown effects on potential GDEs. A total of 21 mapped terrestrial (114.91 ha) and 10 aquatic GDE (137.67 ha) instances were identified across the four discrete GDE Assessment Units. The GDE classification was derived solely from the national level assessment (BoM, 2025). The study concluded that risks from groundwater abstraction were rated between moderate-low to very low. Their GDE Risk Assessment is provided as **Appendix 1.**

On the basis of the Rockwater (2025a) and Hydrobiology (2026a) assessments, project design and implementation will adopt a precautionary approach to managing potential ecological effects as far as practicable and commensurate with identified risks to these systems. The need for ground truthing to refine the GDE distribution on site will be determined and implemented as necessary.

Hydrobiology (2025b) – Completion of an assessment to characterise salinity gradients within the hydrogeological profile within and surrounding the proposed mine pits for the Project focussing on describing the distribution of groundwater salinity with depth, elevation and aquifer type. Baseline salinity conditions in nearby surface water systems, potential receptors for any future discharge, were also evaluated. The findings inform subsequent considerations for the potential discharge of lower salinity groundwater generated through dewatering activities. The Hydrobiology Technical Review is provided as **Appendix 3.**

WSP Australia Pty Ltd (WSP) (2026a) – Development of a *Site-wide Water Balance* (SWB) to provide an understanding of site water requirements, delineation of contact and non-contact waters and how each stream is quantified and how the estimated annual water surplus can be managed, e.g., through site based evaporator system. Non-contact water will be diverted and segregated from contact water and managed according to the site SWMP discussed below. It adopts the mine pit inflow volumes to input to the GoldSim model. The full *Site-Wide Water Balanc*e report is provided as Appendix 5 and should be read in conjunction with results derived by Rockwater (2025a).

WSP (2026b) – Development of a site-based Storm Water Management Plan (SWMP) and design of surface water management structures for the Project. The SWMP is provided as **Appendix 6.**

5.1 Basis of Hydrogeological Assessment

Early hydrogeological assessments were conducted by SRK since 2022:

- Groundwater quality sampling of monitoring bores in the Project vicinity between 2022 and 2024. Completed monthly between September 2022 and December 2023, and quarterly in 2024.
- A preliminary hydrogeological assessment and targeting technical memorandum (SRK, 2022).
- Two groundwater investigation pilot bore drilling programs (2022 and 2023) to establish potential bore yields across the Project area.
- A groundwater investigation drilling and pumping test program.
- A hydrogeological conceptual model and design basis memorandum for the numerical modelling (SRK, 2024).
- A draft H3 report (SRK, 2025).

As previously stated, in order to improve the robustness of predicted groundwater impacts and to characterise the nature and scale of surface and sub-surface hydrogeological effects resulting from the Project, Ausgold's iterative approach led to the most recent modelling assessment by Rockwater (2025a) based on independent technical review of SRK's hydrogeological report and newly-constructed numerical groundwater model in 2025. This review resulted in revised predictions on dewatering volumes and dewatering predictions on the basis of fine-scale field based geologic mapping and an updated numerical groundwater model developed by Rockwater (2025a).

Key elements of the modelling approach and assumptions are summarised below.

5.2 Numerical Groundwater Model

Rockwater (2025a) developed a groundwater model with the following settings and assumptions:

- **Type and domain**: The model is a two-layer, confined groundwater model which was set up in Processing Modflow 11, covering an area 30 km E-W by 40 km N-S, centred over the mine area.
- **Topography:** The top of the model was derived from the local DEM.
- **Cell size:** Model cell size was set at 100 m by 100 m.
- **Layer description**:
  - Layer 1 – Superficial alluvium and clay (up to 30 m thick).
  - Layer 2 – Weathered and fractured rock (90–205 m thick, including faults and dykes).
  - Layer 3 – Fresh bedrock (150 m thick).
- **Boundaries:**
  - Surface drainage lines are represented along the western boundary with river bed conductance set at 1.42 m/d;
  - Recharge zones are applied, with higher rates on topographic highs.
  - No-flow boundaries are assigned to the north, south, and east model limits.
- **Recharge:** This was calibrated within realistic ranges for the Wheatbelt climate, and consistent with the low infiltration expected under semi-arid conditions and high evaporation losses. The base case was assigned 2.0×10^{-6} and 5.0×10^{-5}.
- **Timesteps**: The model was temporally discretised into 41 stress periods, each of three months duration spanning the period of mine operations (i.e., 10 years), followed by a 100-year post-closure period.
- **Calibration:** Steady-state calibration was undertaken using PEST, with Kh/Kv values of superficial and fractured units, recharge, and river-bed conductance adjusted. Fault and dyke Kh values were fixed at 1.5 m/d and 0.5 m/day respectively. Weighting favoured measured groundwater level data derived from the project area. The calibration achieved an SRMS error of approximately 8.38 %, meeting adopted criteria for predictive simulations. The calibrated parameters adopted for the dewatering simulations are summarised in Table 5.1.

Table 5.1: Model Parameters

Layer and Description		Kh, Kv (m/day)	Specific Storage (SS)	Specific Yield (Sy)
1	Tertiary clay and alluvium	0.007	5.0×10^{-4}	0.02
2	Weathered bedrock	0.009	5.0×10^{-5}	0.02
	Faults	1.50	1.0×10^{-4}	0.02
	Dykes	0.50	5.0×10^{-4}	0.02
3	Fresh bedrock	0.0001	1.0×10^{-5}	0.02

5.3 Rockwater (2025) Model Results

Pit inflow volumes for each year have been simulated using the calibrated model and are presented in Table 5.2. The model predicts that despite being mined below baseline water levels, the Olympia pits are not predicted to require dewatering due to being passively dewatered through the advancement of nearby Jinkas and Jackson pits. There may be minor inflows if perched groundwater is encountered in the weathered zone or if the dewatering schedule is changed (i.e., if the nearby Jinkas and Jackson dewatering is reduced due a mine plan change).

Table 5.2: Predicted Dewatering Rates for each Pit Area

Year	Dingo	Jackson	Jinkas	Olympia	Total
Y1	0.0	0.0	323.7	0.0	323.7
Y2	0.0	0.0	255.5	0.0	255.5
Y3	0.0	0.0	199.6	0.0	199.6
Y4	0.0	159.3	151.3	0.0	310.6
Y5	0.0	272.5	137.0	0.0	409.4
Y6	0.0	195.6	370.8	0.0	566.4
Y7	472.3	0.0	314.4	0.0	786.7
Y8	789.8	61.8	30.2	0.0	881.9
Y9	133.0	250.4	0.0	0.0	383.4
Y10	0.0	0.0	158.2	0.0	158.2

The above assessment and analysis allowed a refinement to the initial site-wide water balance discussed in Section 6p.

5.4 Modelled Drawdown and Recovery

Based on the assumptions and methods outlined in Section 5.2, Rockwater (2025a) simulated composite drawdowns over a 110-year period (including 10-years of mine operations and then forecast over 100-years of closure) to quantify the impact that the proposed dewatering, water supply and TSF activities would have on the groundwater levels. The results are summarised in Table 5.3, leading to the following findings:

- Drawdown is mainly tightly centred on the proposed dewatering pits and to a lesser extent the southern borefield where the abstraction is forecast during the initial KGP start-up.
- Drawdown propagates where hydraulic conductivity is higher preferentially along the faults and to a lesser degree dykes. Drawdown contours for Years 3, 5, 7, 10 and Year 20 (10 years post mining) are presented in Figure 5-1 through to Figure 5-5.
- After 100 years post-operations, pit lakes recover to on average of 99.2% of baseline water levels, noting that full recovery will never be reached in the pit lakes due to evaporative losses. Drawdown and recovery hydrographs for each draw point are in Figure 5-6.
- Seepage from the wet TSF is negligible, with no observable mounding because of its planned design.

Table 5.3: Drawdown Recovery Statistics for each Mine Pit and Supply Borefield (WERC006A)

Pit stage / Bore	Initial simulated WL (m AHD)	Minimum simulated WL (m AHD)	Maximum simulated drawdown (m)	Minimum simulated WL / Maximum simulated drawdown (Year)	95% recovered WL (m AHD)	95% (Recovery Year)
Jinka 3 pit	355.51	150.10	205.41	Year 4	345.24	~Year 13
Jackson 1 pit	331.54	234.16	97.38	Year 5	326.67	~Year 24
Dingo 1 pit	332.12	210.01	122.11	Year 8	326.02	~Year 15
Southern Borefield (average)	293.38	274.28	19.10	Year 1	292.42	~Year 30

The recovery (rebound) of the short-term groundwater drawdown has been modelled by Rockwater (2026) (Appendix 8).

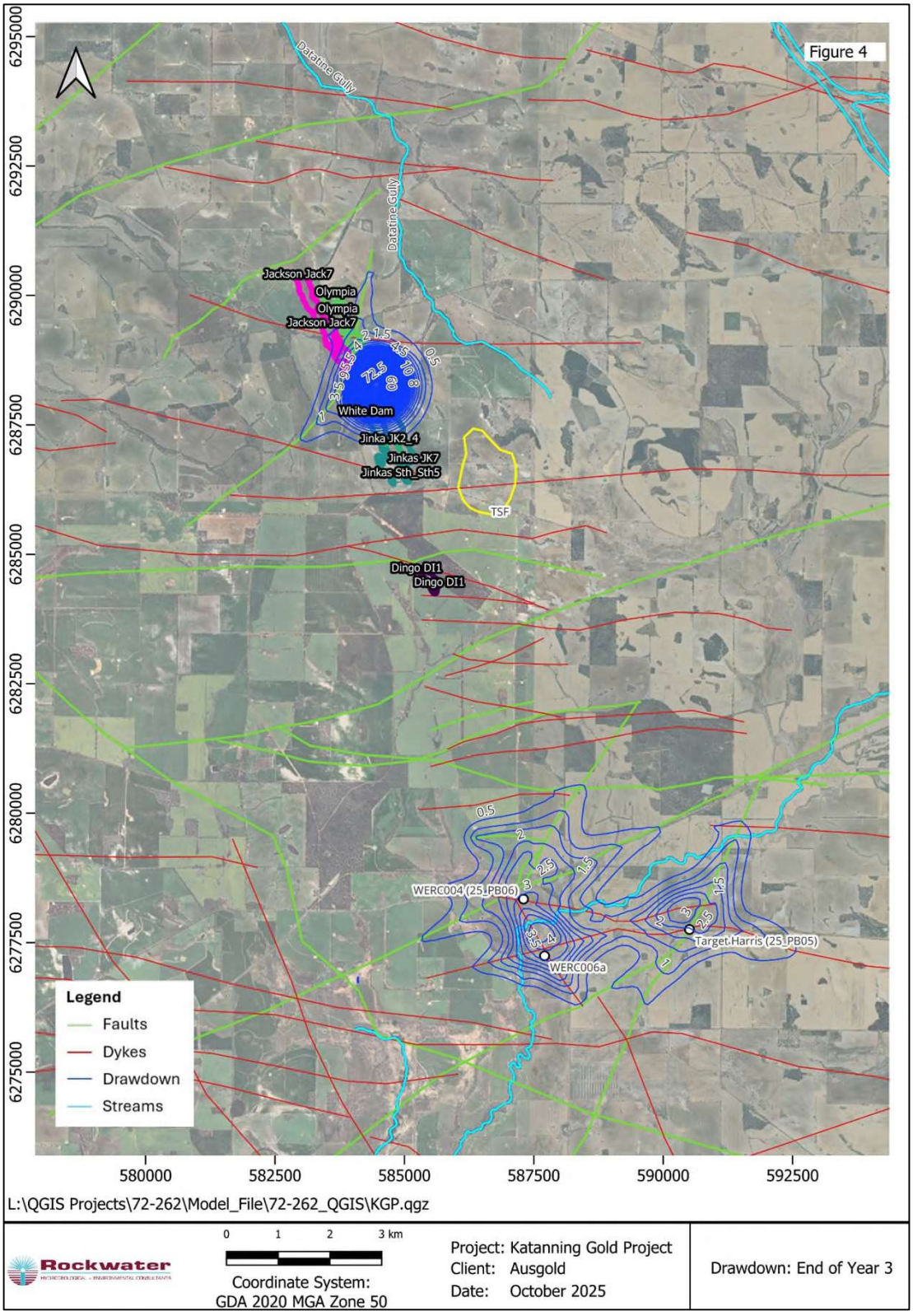


Figure 5-1: Forecast Groundwater Drawdown Contours at end of Year 3

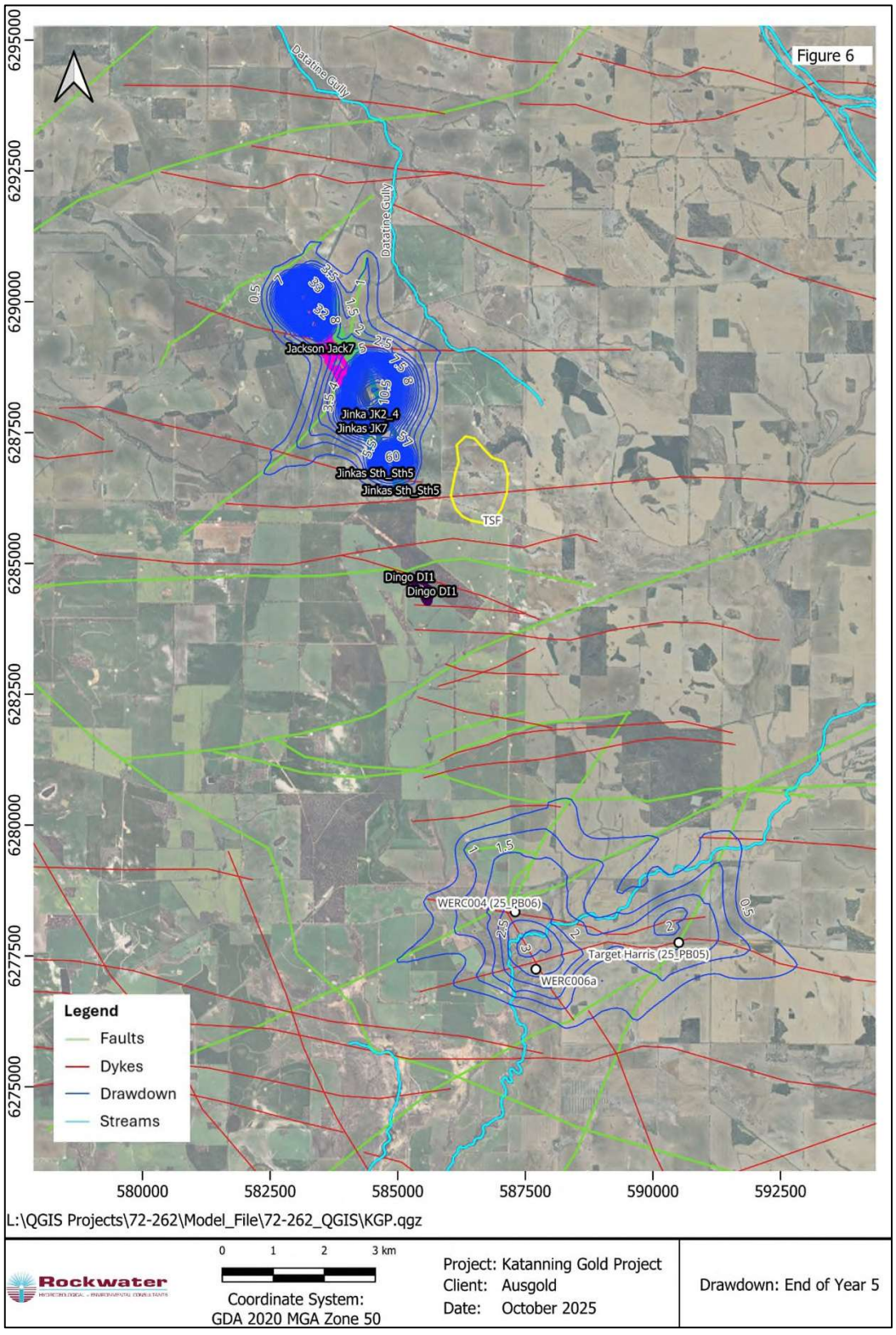


Figure 5-2: Forecast Groundwater Drawdown Contours at end of Year 5

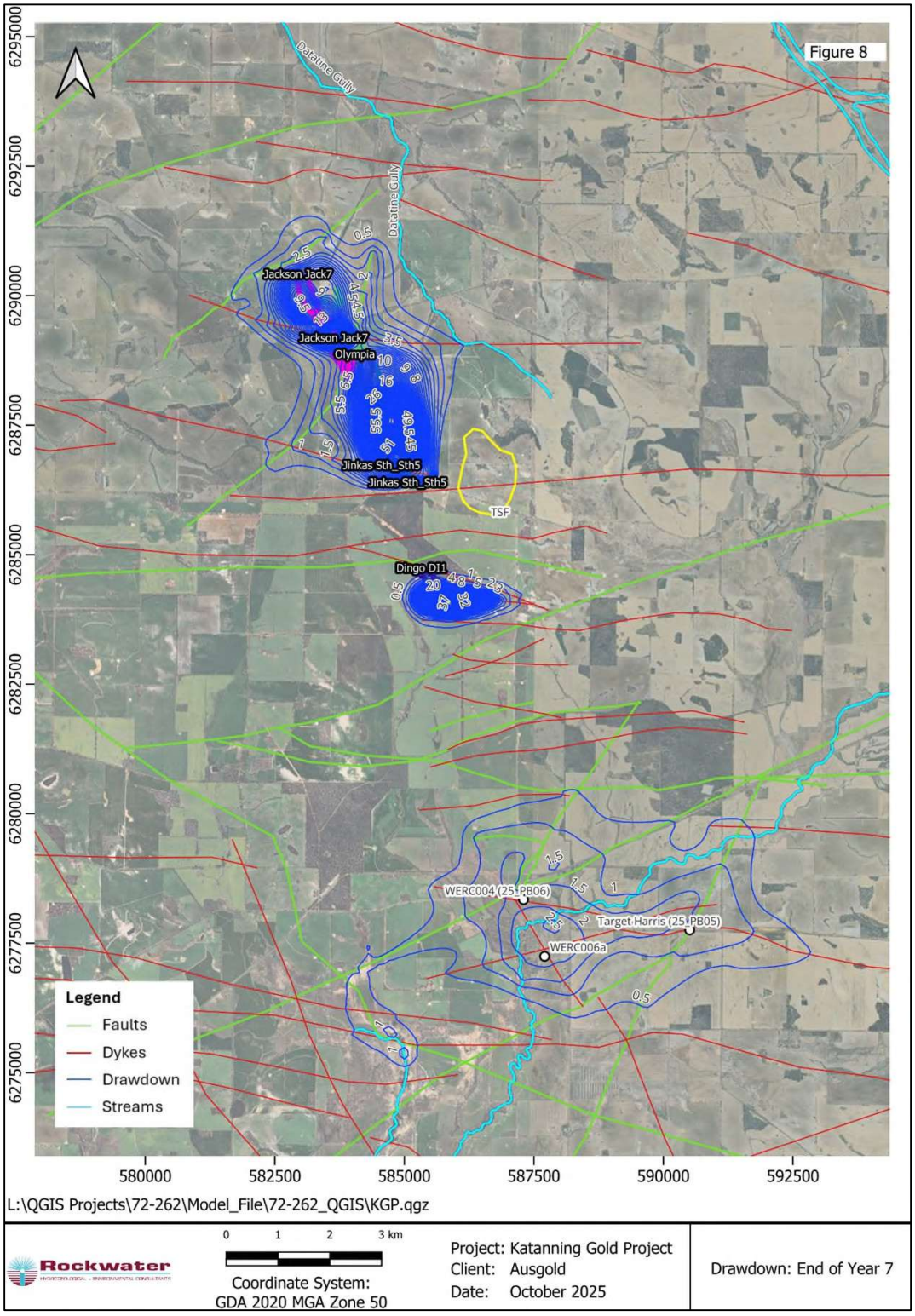


Figure 5-3: Forecast Groundwater Drawdown Contours at end of Year 7

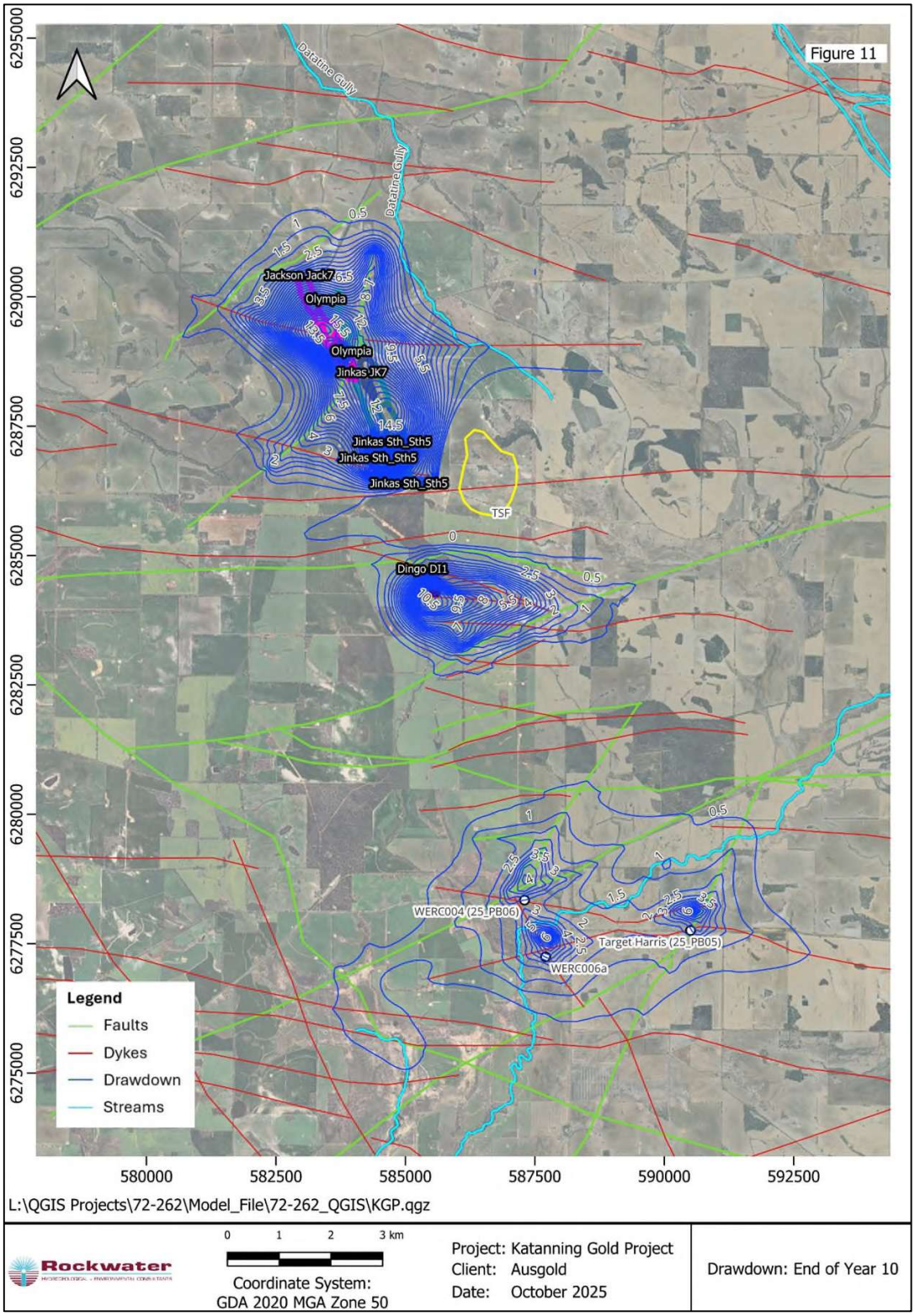


Figure 5-4: Forecast Groundwater Drawdown Contours at end of Year 10

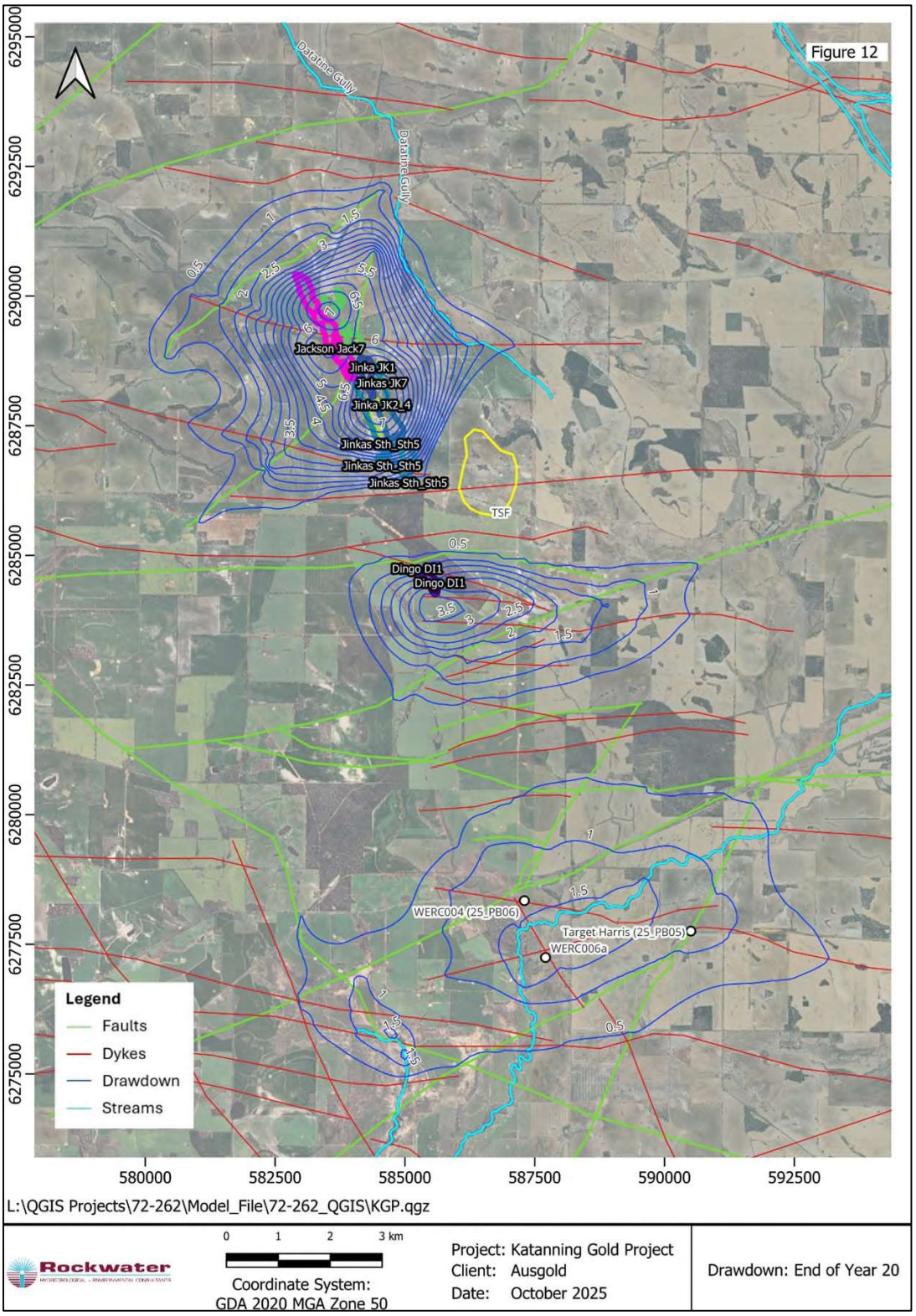
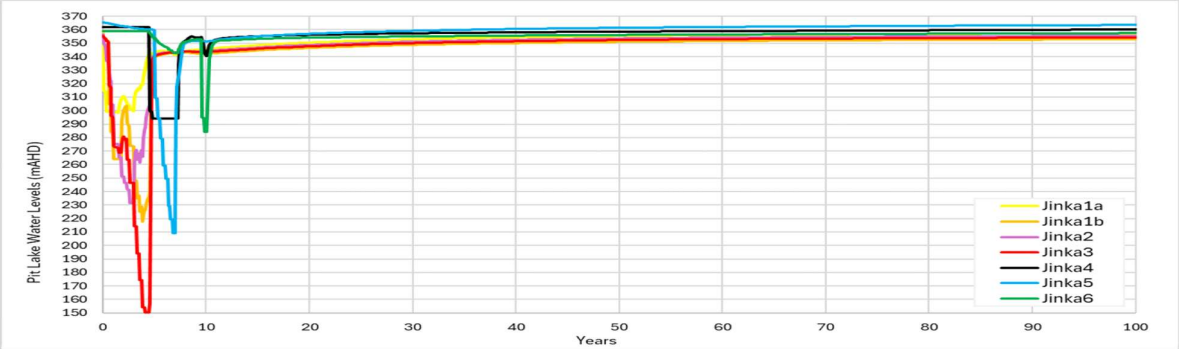
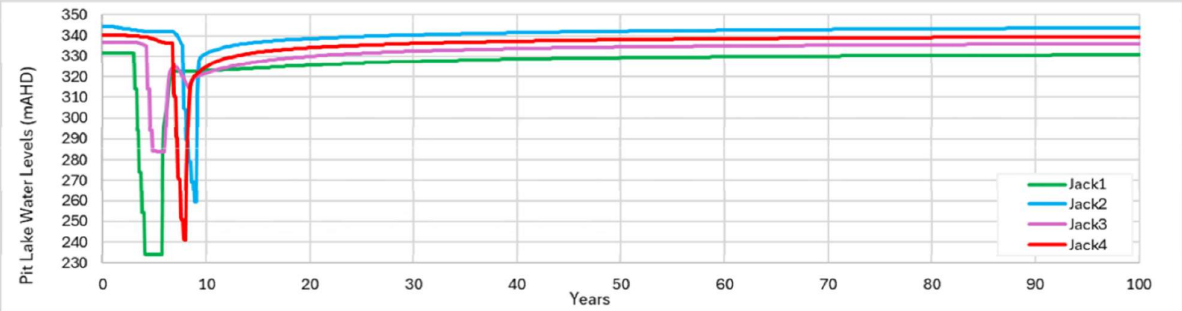


Figure 5-5: Forecast Groundwater Drawdown Contours at end of Year 20

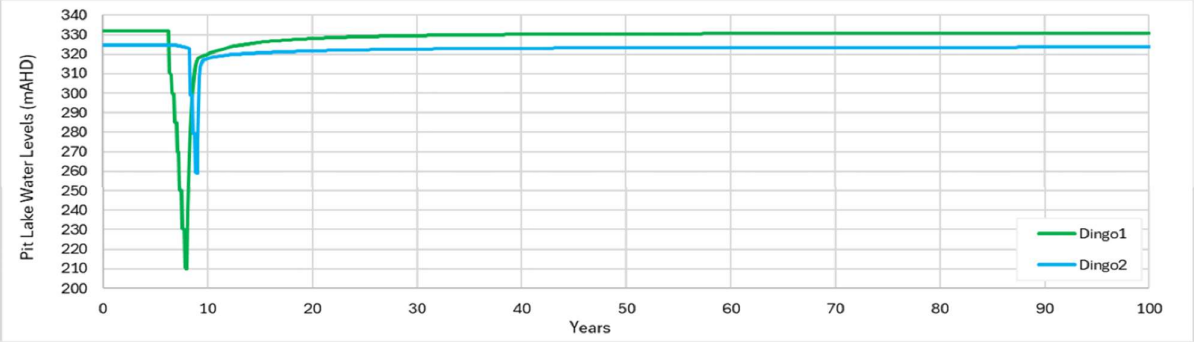
Jinkas Pit 100-year simulated drawdown and recovery



Jackson Pit 100-year simulated drawdown and recovery



Dingo Pit 100-year simulated drawdown and recovery



Southern borefield 100-year simulated drawdown and recovery

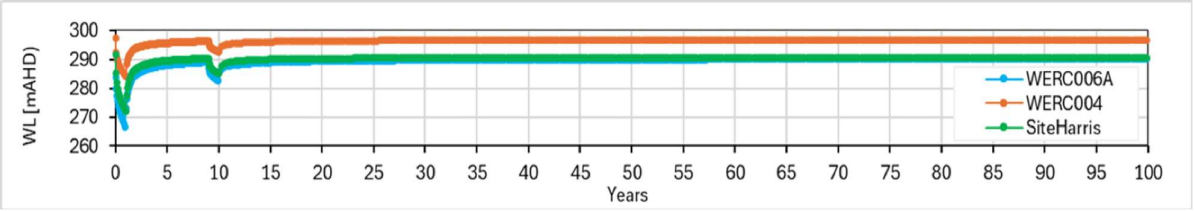


Figure 5-6: Simulated Groundwater Drawdowns and Recoveries over Time during and post mining

5.5 Identified Groundwater Risks

5.5.1 Potential GDEs within Modelled Drawdown Extents

The distribution of potential aquatic and terrestrial GDEs proximal to the Project and drawdown zones are shown in Figure 5-7, Figure 5-8 and Figure 5-9. Modelled drawdown extents of pit dewatering indicate that adverse effects on GDEs are of low to moderate risk when considering the following factors:

- It is anticipated that there is little connection between the bedrock aquifer and near-surface surficial aquifer systems, with the latter from where GDEs will be drawing any groundwater, due to the presence of aquitards. Therefore, drawdown response within the bedrock aquifer would not transmit significantly through to the surficial aquifers.
- The GDEs identified reside in upper-catchment settings, reducing the susceptibility to widespread drawdown impact. The higher rates of natural recharge in upper catchments can also help mitigate the potential effects of groundwater fluctuations.
- The local watercourses are largely ephemeral, meaning they are naturally resilient to intermittent water availability.
- Groundwater drawdown due to pit dewatering could also have a positive influence on nearby ecosystems or farmlands already impacted by clearing and associated dryland salinity.
- Cessation of the legacy mining operations in 1997 caused a groundwater rebound in each of the Jinka and Dingo pits. The elevation at Jinka's is higher and the pit lake surface is lower and also much lower than the remnant vegetation on the adjacent slopes, because of the lower depth to groundwater at that topographic high. The close proximity of Dingo pit to Wurgubup Reserve and a small difference in RLs has not caused any undue impacts between 1997 to date. It is anticipated that the final rebound of Dingo 1 and Dingo 2 at the end of the life of mine in Year 10, similarly would not have any impact, as deep saltine groundwater will be drawn back into the pit after closure.

Hydrobiology (2025a) recorded a total of 67 GDEs in the wider region of the Project area with a low to moderate potential for being terrestrial GDEs. Seven high potential aquatic GDEs were identified within the Project area with only two located within 500 metres (m) of proposed bores. GDEs exhibited sensitivities to reduced water availability therefore potentially indicating that these vegetation units may not be obligate GDEs. Instead, they display characteristics of phreatophytes which access shallow groundwaters sporadically and only when needed.

Of the mapped potential GDEs within the drawdown threshold zone, the largest areas are of low or moderate potential. Where the mapped area was high potential Aquatic GDE, field observations in Hydrobiology (2025a) reported that such areas or highly modified or completely degraded.

A low-moderate risk to GDEs from groundwater abstraction was determined to be likely across the Project extent at identified features, however it was stated that a clay-rich soil layer has the potential to reduce this risk to low, since it may prevent tree roots from accessing deeper aquifers. Whilst this has been considered, the stronger potential is for terrestrial ecosystems drawing from perched aquifer systems.

Rockwater (2025a) undertook groundwater modelling incorporating dewatering, water supply borefield operation and use of a wet tailings storage facility (TSF). The modelled drawdown outputs were compared against mapped GDE potential areas using BoM national GDE Atlas mapping. A 10 mbgl threshold for lowering the groundwater was applied to areas that are expected to experience more than 1 m drawdown after ten years of mining.

Table 5.4: Calculated drawdown area in the 10 years LOM

	Total area 1.0 m drawdown	Total Forecast drawdown threshold zones
Area	km^2	km^2
Mine area	22.6	3.6
Southern Borefield	10.6	10.6
Total	33.2	14.2

Rockwater (2025a) examined potentially affected aquatic GDEs that occur near the proposed southern borefield (refer Figure 5-8 and Figure 5-9). They determined that in terms of terrestrial GDEs, there are only 0.388 km^2 of low-potential GDEs occurring in the vicinity of the southern borefield, and 0.586 km^2 at the mine site. As the project area is largely agricultural in use, much of the native vegetation has been cleared; therefore, the mapped potential GDEs may not represent currently functioning ecosystems. It would therefore be fair to conclude that:

- Little to no areas of exposure to any mapped potential GDE from drawdown of greater than 1m in the deep aquifer at or around the mine pits; and
- Some exposure to mapped potential GDE from drawdown of greater than 1m in the deep aquifer at or around the southern bore (WERC006A).

As detailed previously, Ausgold commissioned Hydrobiology to undertake a desktop risk assessment (2025b) of potential GDEs near the proposed groundwater production zones which used national GDE mapping, groundwater drawdown zones, and satellite-derived vegetation and climate data. NDVI and Aridity Index were analysed to assess vegetation responses during drought periods. Vegetation that remained relatively healthy during drought was considered more likely to access groundwater, while vegetation with low or seasonal NDVI was excluded as groundwater dependent. Both terrestrial and aquatic GDE exhibited similar NDVI-aridity relationships, reinforcing the sensitivity of these systems to reduced water availability. This indicates that these vegetation units are not true GDEs, but instead display a more phreatophytic life cycle with vadose zone water supply.

The risk assessment evaluating potential impacts to GDEs from proposed groundwater abstraction is summarised in Table 5.5 below (Hydrobiology, 2025a).

In summary, Rockwater (2025a) mapped intersections and Hydrobiology's (2025a) field-based risk assessment therefore provide useful screening tools to conservatively identify and prioritise the need for and focus on additional monitoring to establish local representative GDEs within the drawdown cones in areas potentially at risk. In conclusion, Hydrobiology (2025a) determined that of a total of 21 GDE areas that were identified and assessed, terrestrial GDEs were classified as 'Low Potential'.

Note that the modelled potential GDEs areas which may be at risk does not account for the presence of an aquitard which would likely comprehensively constrain any drawdown of seasonal water in the surface lithographies hosting any fresh water.

To examine potentially susceptible areas under the project's future monitoring program, these will be targeted in areas shown in pink shaded zones in Figure 5.7 (derived from threshold model shown Figure 5-8 & Figure 5-9), being:

- North of Woorgabup Nature Reserve on Smith Road, south of the Jinka South pit;
- Bounding the eastern part of the Wurgubup Rifle Range Reserve, on the north and south sides, adjacent to Dingo Pit;
- At a mapped stand of terrestrial vegetation west off Nagel Road, near the WER06A targeted production bore which also may potentially be an obligate aquatic GDE associated with degraded, salinised surface drainage.

Project design and implementation will therefore adopt a precautionary approach to managing potential ecological impact as far as practicable and commensurate with identified risks to these systems.

Four (4) Aquatic GDEs were classified as 'high potential', four (4) 'moderate potential' and one (1) 'Low Potential'. Of the four 'high potential' Aquatic GDEs, only one was assessed by satellite image analysis using NDVI/AI to be an obligate GDE; this is near the southern borefield selected production bore WER06A. Hydrobiology's study found moderate to low risk from groundwater abstraction and supported a precautionary approach to managing potential ecological impacts.

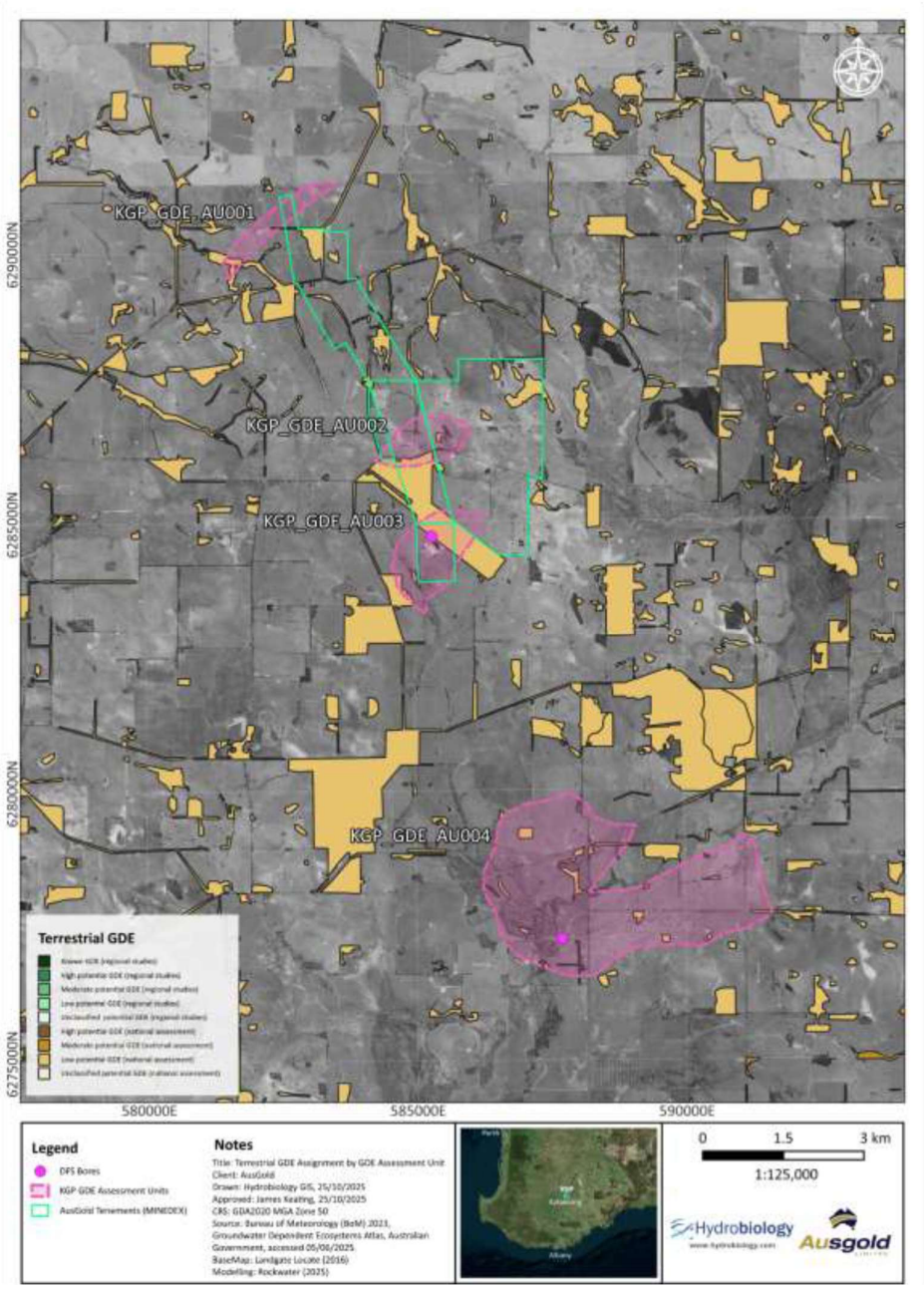


Figure 5-7: Potential GDEs relative to Production Bores (supply sites, WERC06A at south bore and also near mine WERC015 at Dingo Pit)

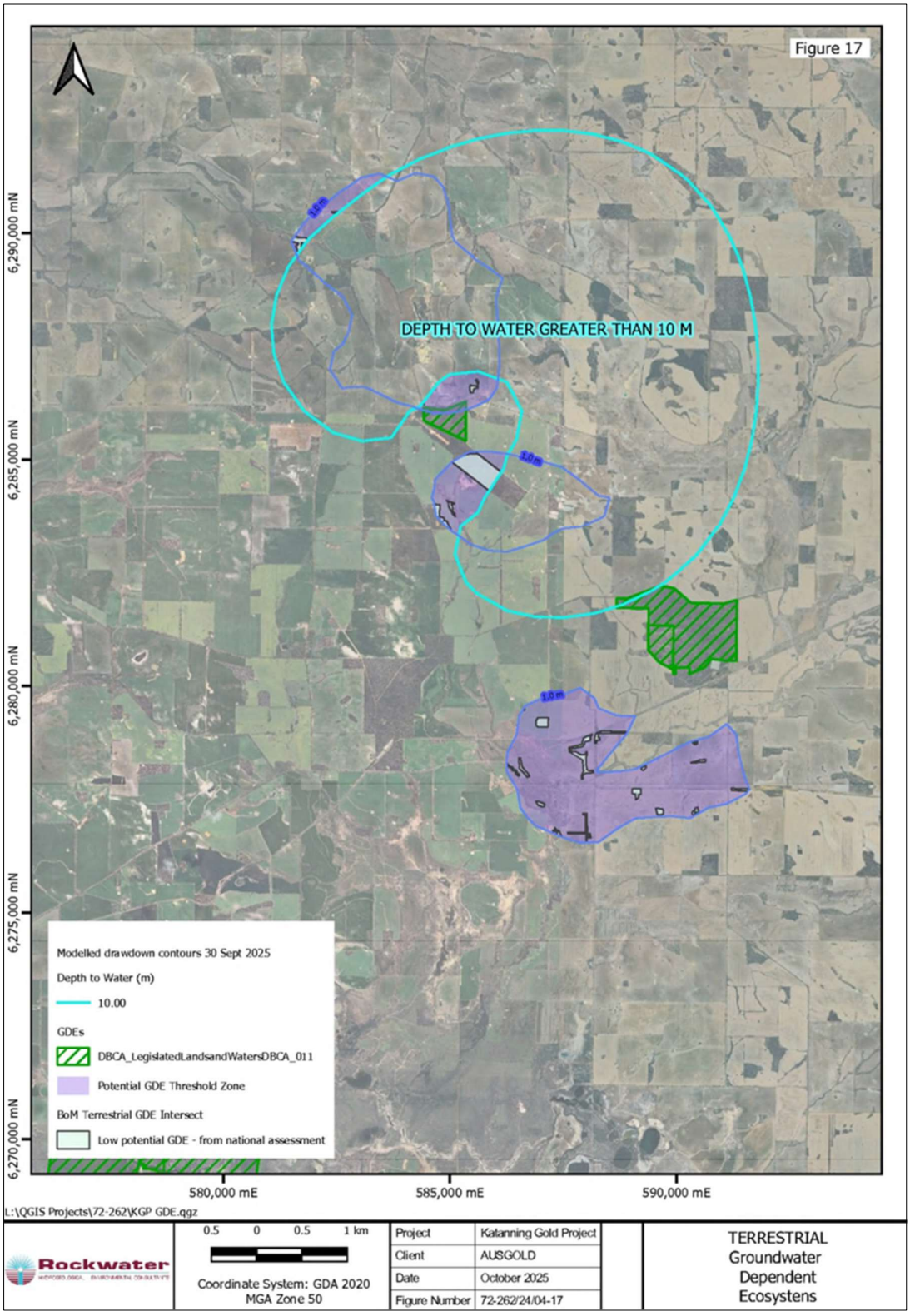


Figure 5-8: Potential Terrestrial GDEs within 10 m depth to water where > 1.0 m drawdown (purple area)

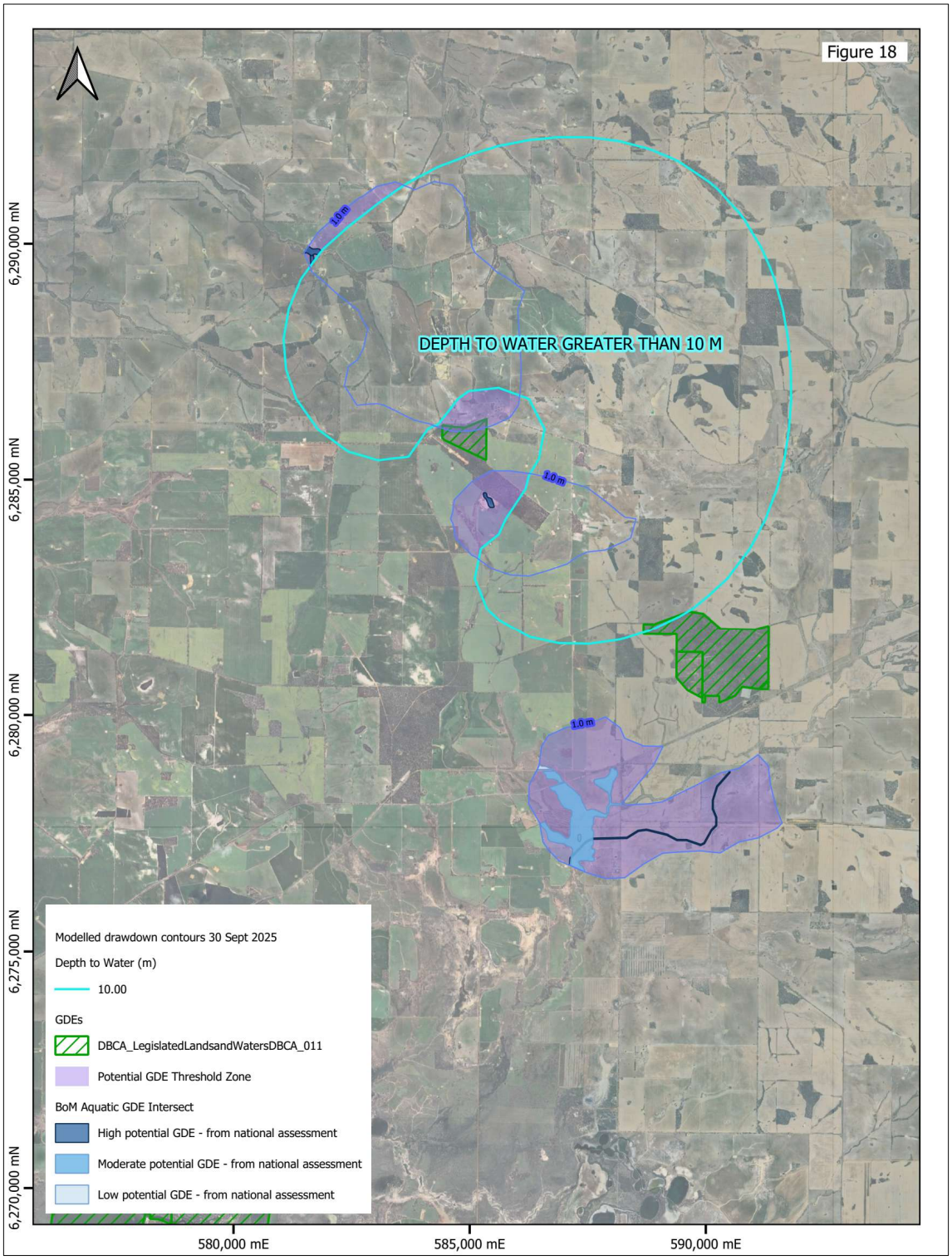


Figure 5-9: Potential Aquatic GDEs within 10 m depth to water where > 1.0 m drawdown (purple area)

Table 5.5: GDE Assessment

	Initial Assessment Ratings				Revised Assessment		
Potential impact	**Severity**	**Likelihood**	**Risk**	**Mitigations**	**Severity**	**Likelihood**	**Risk**
Climate change is expected to reduce natural groundwater recharge by rainfall, leading to lower water availability and long-term declines in GDE resilience and stream baseflows.	**Moderate**	**Possible**	**M**	KGP groundwater drawdown limited to lifetime of the mine (10 years). Only Low Potential Terrestrial GDE were identified within the area where predicted drawdown is >1.0 m after 10 years extraction, and where depth to groundwater <10 m. High Potential Aquatic GDE were also identified, but only 1 was determined to be likely to be a true GDE. This was located on the boundary of the area where predicted drawdown is >1.0 m after 10 years extraction, and where depth to groundwater <10 m. A clay-rich soil layer prevents roots from accessing deeper aquifers tapped by mining (DeSilva et al. 2000). Instead, vegetation may rely on shallow soil moisture from rainfall, making it unlikely to be impacted by groundwater abstraction unless drawdown is extreme or sustained (Zencich et al., 2002; O'Grady et al., 2006). This hypothesis is supported by an assessment of aridity (drought periods) and vegetation vigour (NDVI).	**Moderate**	**Unlikely**	**M**
Groundwater extraction near surface water lowers water tables, reducing discharge to gaining streams or increasing losses from losing streams, ultimately decreasing surface water availability to riparian GDE.	**Moderate**	**Likely**	**M**	A clay-rich soil layer prevents roots from accessing deeper aquifers tapped by mining (DeSilva et al. 2000). Instead, vegetation may rely on shallow soil moisture from rainfall, making it unlikely to be impacted by groundwater abstraction, unless drawdown is extreme or sustained. (Zencich et al., 2002; O'Grady et al., 2006). This hypothesis is supported by an assessment of aridity (drought periods) and vegetation vigour (NDVI).	**Minor**	**Unlikely**	**L**
Poor bore construction or decommissioning can cause aquifer leakage or blowouts, leading to pressure loss, contamination, or flooding.	**Major**	**Unlikely**	**M**	Bore construction to meet rigorous engineering standards. Non-artesian bores.	**Major**	**Rarely**	**L**
Excessive drawdown in confined aquifers can cause depressurisation and compaction, leading to permanent loss of storage and transmissivity.	**Major**	**Unlikely**	**M**	A clay-rich soil layer prevents roots from accessing deeper aquifers tapped by mining (DeSilva et al. 2000). Instead, vegetation may rely on shallow soil moisture from rainfall, making it unlikely to be impacted by groundwater abstraction, unless drawdown is extreme or sustained (Zencich et al., 2002; O'Grady et al., 2006). This hypothesis is supported by an assessment of aridity (drought periods) and vegetation vigour (NDVI).	**Moderate**	**Unlikely**	**M**

5.6 Risk assessment

A risk assessment has been developed to summarise the potential impacts above within the anticipated 1 m drawdown extent associated with pit dewatering and depressurisation. Risks are given a rating based on the severity of the impact (Negligible, Minor, Moderate, Significant and Severe), and the likelihood of this impact occurring (Very likely, Likely, Possible, Unlikely, Very Unlikely) once any risk mitigation strategies are included.

Table 5.6: Risk Assessment Matrix

Risk	Risk description and potential impact	Risk mitigation currently in place or part of project plan	Severity	Likelihood after risk mitigation	Final rating
Negatively impacting GDEs by lowering groundwater levels through dewatering activities	Partial/full removal of the groundwater source for GDEs through lowering of groundwater levels, leading to partial or full degradation and removal of GDE from area.	The conceptual model has negligible connectivity between any surface aquifer and deeper salty aquifers. Ongoing hydraulic testing will increase confidence.	Moderate	Unlikely	Low
Impacting surface water ponds/soaks/drainage channels	Hydraulic connection between shallow aquifer and deeper fracture/fault aquifers.	Shallow aquifer is clay rich with low permeability. Most country rock is also very low permeability. Hydraulic connection between surface feature and fracture/fault is possible but likely to have low seepage rates.	Minor	Unlikely	Low
Reducing yields of local borehole users through dewatering	Reduction of operational pumping yields from local borehole users within the modelled maximum drawdown radius during dewatering activities.	Based on the WIR borehole dataset, there are no operational bores abstracting groundwater within the modelled maximum drawdown radius, so no impact is anticipated.	Negligible	Very Unlikely	Low
Increased salinity of surface water and shallow groundwater	Introduction of higher salinity groundwater to lower salinity surface water/shallow groundwater, causing a subsequent increase in salinity through mixing, potentially impacting GDEs and any abstractions downstream.	Containing all abstracted groundwater from dewatering operations on site (as per requirements for 5C licence).	Moderate	Very unlikely	Low
Reduction of groundwater levels along major structures through additional groundwater abstractions to meet mine water supply requirements	If additional groundwater abstraction is required in addition to dewatering activities through regional bores, the subsequent lowering of groundwater levels may have a negative impact on any proximal GDEs and/or borehole users.	Regional structures are observed to have high yields and recharge rates with pressure heads close to or above ground level. Drawdown extent is likely to be minor and temporary in nature.	Moderate	Unlikely	Low

5.7 'Low Potential' Terrestrial GDE at Wurgubup Reserve - proposed risk management actions

A low risk to GDEs from groundwater abstraction was determined to be likely across the Project extent at identified features; a clay-rich soil layer has the potential to reduce this risk to low, since it may prevent tree roots from accessing deeper salty aquifers. Note tree roots naturally also would avoid penetration into a salty aquifer of the lower strata. Whilst this has been primarily considered, the marginal risk of the potential for terrestrial ecosystems also to be drawing from seasonal and/or perched aquifer systems can be further considered too. As a result, a field assessment is planned in H2 2026 to include:

- Vegetation type and condition assessment at target locations to assess baseline 'current' conditions to compare with for future field assessments during operations including, given concern of vegetation community health, primarily at:
  - Woorgabup Nature Reserve – north side on Smith Road, due south of Jinka South pit;
  - Wurgbubup Rifle Range Reserve – bounding the northern and eastern sides and on the south sides, adjacent to Dingo Pit.
- Assessment of selected mature trees for pre-dawn leaf water potential (LWP) at target locations to assist in understanding water status and ability to access soil moisture; and collection of twig samples for stable isotope analysis.
- Construction of an auger hole to refusal at each target location, to investigate the geological and hydrogeological characteristics underlying the target area:
- Undertaking soil logging/lithological descriptions and sampling at approximately 0.25–1 m intervals for stable isotope analysis and measurement of Soil Moisture Potential (SMP), also referred to as matric potential, to inform moisture availability down the soil profile.
- Sampling groundwater bores and surface water for stable isotope and water quality analysis to compare the isotopic signatures of tree xylem, soil moisture, surface water, and groundwater to identify the source, or sources of moisture utilised by trees within the assessment areas.
- Entrainment of a groundwater monitoring component of the KGP *Flora & Vegetation Monitoring & Management Plan* (FVMMP) to include routine monitoring to extend the above baseline and to determine trigger action response levels during mine pit dewatering operations.

A conceptual layout of the monitoring network to inform the FVMMP is shown below in Figure 5-10.

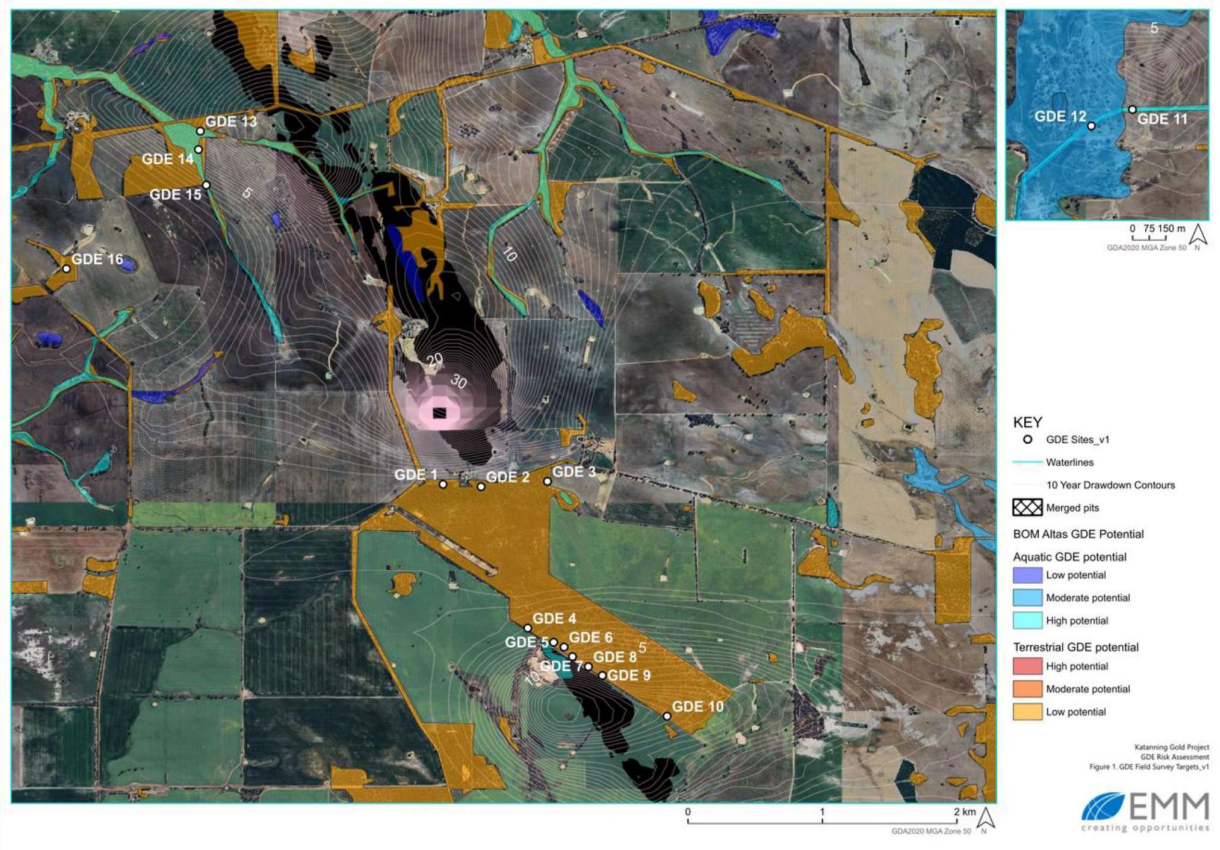


Figure 5-10: Conceptual arrangement of BOM (2025) Atlas GDE ratings and target monitoring locations

5.7.1 Other Considerations

If groundwater abstraction rates are lower than anticipated, water supply will be required from other regional bores (within the Ausgold tenements) along structures known to provide higher yields. This will have potential to decrease groundwater levels within these local geologic structures.

The Wheatbelt region faces salinity challenges due to deforestation, which has led to rising saline groundwater levels, impacting both crop yields and remnant native vegetation health, especially in lower catchment elevations. There is a risk of negative impact to aquatic GDEs if saline groundwater is released to the environment. The current 5C licence conditions mandate containment or disposal of all abstracted groundwater on site, and this approach has been adopted for the site wide water management strategy for the proposed KGP mine.

The management of potential project emissions that have the potential to impact on groundwater quality will be assessed and regulated under Part V of the *Environmental Protection Act 1986* (EP Act) by DWER during the Works Approval and licensing process.

5.8 Hydrogeological assessments – Conclusions and Recommendations

The region has a complex network of geologic faults and dykes cross-cutting the country rock. Groundwater flows transmits along these features as flow conduits, but water "compartmentalisation" likely exists between individual features because of dykes and other geologic features.

Within the Project area, the groundwater investigation programs completed between 2022 and 2026 have identified available groundwater with potential to meet the indicated raw water demand of (3.6 GL/year) for operational requirements. A numerical groundwater model constructed by Rockwater (2025a) was used to estimate pit inflows under a series of predictive scenarios recorded the following outcomes:

- The faults and dykes network that cross-cut the Project area are the most prospective for sustainable water supply, providing 82% of all modelled inflows from mine pit dewatering.
- Total annual pit inflow volumes across mine life, for the majority of predictive scenarios, are much less than the annual raw water demand at the processing plant. The largest inflow of borefield make-up water is in Year 1. Surface water management controls are required during operations to hold and recycle the annual water demand. Make-up inbound bore field water will be very unlikely to be needed in later years of mining.
- The surrounding country rock has low permeability forming a drawdown extent that loosely follows the orientation of the fault and dyke network. Maximum drawdown by end of mine life is modelled to be 200 m.

There is a low risk to all identified potential groundwater receptors (including groundwater users and GDEs) due to pit dewatering activities in the fractured and country rock strata at depth.

6. Site-wide Water Balance

As previously discussed, WSP (2026a) was engaged by Ausgold to develop a Site-wide Water Balance (SWB) for the Project. This study developed a site-wide water balance model to provide a general understanding on the site water management requirements and to support the regulatory approval process.

This section provides further details of the setup and outputs of the water balance.

The focus of the SWB is on tracking the accumulation of water from various sources and estimating the annual water surplus (or deficit) that would require management though either a mechanical evaporator (ME) system or balancing storage (also sent to evaporation). Scenarios of ME use is shown in WSP (2026a). Non-contact water will be diverted and managed according to the site SWMP which was developed in parallel scope. This approach will prevent any mixing of contact and non-contact water.

The report (Appendix 5) summarises the methodology adopted, outlines the conceptualisation of the model, and presents the findings of the water balance modelling.

6.1 Model Overview

6.1.1 Objectives and Considerations

The WB model was developed using the GoldSim software. The model operates on a daily time step to predict the water storage volumes for key structures. The predictive simulations incorporate a probabilistic (stochastic) climate generator to account for uncertainties related to future climatic conditions and variability in selected model inputs and parameters. This approach enables the prediction of the likely long-term interactive performance of the site's infrastructure under alternative climatic sequences.

The objective of the site-wide water balance was to establish a base model to inform the strategic planning for the operational phase focusing on:

- Understanding fluxes: Analysing the inflows and outflows of the main infrastructure under stochastic climate time series.
- Quantifying the yearly water surplus that will require management though either a mechanical evaporator system and/or water storage on site balancing out water surplus conditions, so adhering to the 'zero release' assumption.

A simplified mass-balance analysis was conducted exclusively for the pits to evaluate the impact of TDS from groundwater inflow on potential evapo-concentration within the pit. TDS concentrations from other inflows were not considered. This approach represents a high-level assessment and does not account for geochemical processes such as precipitation, dissolution, adsorption, or other chemical reactions. The model operates on a daily time step to predict the water storage volumes for key structures. The predictive simulations incorporate a probabilistic (stochastic) climate generator to account for uncertainties related to future climatic conditions and variability in selected model inputs and parameters. This approach enables the prediction of the likely long-term interactive performance of the site's infrastructure under alternative climatic sequences. Dry, drought and climate change scenarios have been presented.

6.1.2 Software

The water balance was developed in GoldSim (Version 15.0) (GoldSim Technology Group, 2021). GoldSim is used globally to simulate dynamic systems, to understand the factors which control the systems and to predict the future behaviour. Any system that can be quantitatively described using equations and/or rules can be modelled using GoldSim.

GoldSim models are composed of containers and functional elements such as inputs, expressions, stocks, events, delays, cell pathways and results. Each functional element forms part of the model structure which is developed specifically for a particular modelled system. The calculations within and relationship between functional elements are built by the modeller. Input data are stored within the model and can come in the form of a scalar value, a vector or a matrix.

Model simulations are run at a daily time-step over an identified simulation period with one or multiple model realisations. A realisation is defined as a single model run under one set of stochastic inputs (e.g., climate dataset). The purpose of using multiple realisations in this case is to test the system under multiple alternative rainfall/evaporation time series or other input patterns.

In general, the contact water flows during operations are as follows:

- **Pits:** There are four main pit domains on site (Jackson, Jinkas, Dingo, and Olympia), with each pit developed in stages involving cut backs and deepening. Pits in general then receive water from direct precipitation, catchment runoff, pit wall runoff and groundwater inflow, the latter as a result of the pit being mined below the regional groundwater level (except Olympia). Water ponding within a pit is mainly lost through dewatering pumping to the process plant.
- **Sediment Ponds and Storm Water pond:** 16 Sediment ponds are expected to collect runoff and seepage from the Waste Rock Dumps (WRDs) across the mine area, and 1 Storm Water pond is expected to collect runoff from the ROM pad. Operational rules governing pumping from the sediment ponds to the process plant are applied. The sediment ponds are expected to be clay lined, and therefore only minimal seepage is expected.
- **Tailings Storage Facility (TSF):** The TSF comprises two cells (Northern cell and Southern cell). The TSF cells receive water from Direct precipitation, Water released from the tailings slurry, and runoff from the tailings surface. The main outflow from the TSF cells is decanting pumping directed to the process plant. A minimal seepage is expected to be captured via an underdrainage system. The models consider this minor seepage as a loss in the water balance.
- **Process Plant:** The process plant receives water from the pits, sediment ponds, and TSF cells. It has an annual water demand of approximately 3700 ML and if the inflow is insufficient, borefields are used to supplement the water supply.

6.1.3 Model Input Data

6.1.3.1 Climate

Based on climate conditions at the site, the water balance simulates the system based on daily rainfall and evaporation data. The Project is located within a temperate climate zone with a hot dry summer and cold winter, typically featuring low but highly variable annual rainfall in which there is a significant surplus of evaporation over rainfall. Baseline climate conditions were derived from the Queensland Department of Environment and Science's SILO Data Drill (SILO) gridded data for the period 1986-2005. Monthly climate change factors were derived from publicly available data from Climate Change in Australia (CCiA) for rainfall and evaporation based on future period 2020 to 2040 (centred in 2030) and are applicable to the adopted baseline data period form 1986-2005.

Model input data comprised climate conditions at the site particularly daily rainfall and evaporation data. Three climate change scenarios were considered:

- Wetter scenario
- Drier Scenario
- Maximum consensus scenario.

Table 6.1: TSF Inflows and Outflows

Flow ID	Flow	Description	Rationale for calculation
Inflows			
DP	Direct precipitation	Direct precipitation over the ponding area	Water volumes generated by direct precipitation over the decant pond assuming a runoff coefficient of 1 (i.e., no losses). Area was considered variable depending on the pond volume at each time step.
TR	Tailings runoff	Run off from the tailings area	Runoff from the tailings was calculated based on the saturation level (beach condition) and runoff coefficient for each area. The values presented in the table below are adopted from the TSF design report (WSP, 2025c). Area contributions and runoff coefficients for different areas of the tailings **Saturation level** / **% Area** / **Runoff coefficient** Wet beach / 30% / 90% Drying beach / 10% / 80% Dry beach / 40% / 60%
TS	Water in tailings slurry	Water within the tailings	Tailings pumped into the TSF includes slurry water of which some is released from the tailings and eventually flows to the TSF pond. The water in slurry released from the tailings depends on the tailings characteristics, and in particular the tailings solids content, defined as follows: $(eq1)\ Water\ in\ \text{tailings}\ slurry = \frac{Production\ Rate}{\delta_w} \times \frac{1 - Tailings\ Solids\ Content}{Tailings\ Solids\ Content}$ δw = Density of water (1 t/m^3)
Outflows			
PE	Pond evaporation	Evaporation over the ponding area	Evaporation was estimated by applying pan evaporation rates scaled by a pan evaporation factor (EF=0.7) to the ponding surface area.
TE	Tailings evaporation	Tailings evaporation	To estimate the evaporation from the different beach areas within the TSF (as mentioned in the table above), the parameters presented in the table below were considered. Factors to derive evaporation from different beach areas **Saturation levels** / **% Area** / **Evaporation factor** Wet Beach Factor / 30% / 60% Drying beach / 10% / 30% Dry beach / 40% / 10%
T_P	Decanting pumping	Decanting pumping	TSF decant pond is designed to have a decant pond no larger than 20% of the tailings area, therefore excess water in the TSF pond was pumped out to the process plant, even if the process plant has no capacity to store any water in excess of process requirements.
EN	Entrained water	Entrained water	As tailings is pumped to the TSF some water is entrained as interstitial water. The proportion depends on the tailings characteristics, and in particular the initial settled dry density (δdi), specific gravity (SG) of tailings material and tailings solids content, defined as follows:

Flow ID	Flow	Description	Rationale for calculation
			$(eq2)\ Entrained\ water = \frac{Production\ Rate \times w}{\delta_w}$ $(eq6)\ w = \frac{(SG \times \delta_w) - \delta_{di}}{SG \times \delta_{di}}$ where: w = Moisture content of tailings (% w/w) SG = Specific gravity of tailings material (dimensionless) δw = Density of water (1 t/m³) δdi = Initial settled dry density of pumped tailings (t/m³).
SP	Seepage	Seepage	Seepage water from tailings is assumed to occur at a rate 0.044 L/s for the Southern Cell and 0.045 L/s for the Northern Cell based on the TSF Design report (WSP, 2025c. Although seepage is expected to be minimal and negligible in terms of its impact on the overall water balance, it is tracked as an outflow. This is to ensure that in case the seepage is not captured by the underdrainage system, the total volumes can be tracked for environmental checks. Seepage is considered a loss in the system.
OV	Overtopping	Overflow from the TSF	Overflow from the TSF.

Table 6.2: Pit Inflows and Outflows

Flow ID	Flow	Description	Rationale for calculation
Inflows			
DP	Direct precipitation	Direct precipitation over the ponding area	Water volumes generated by direct precipitation over the decant pond in a Pit assume a runoff coefficient of 1 (i.e., no losses). A constant pond area of 2240 m² was adopted considering the dewatering will aim to maintain the pond (sump) in a pit at a minimal water depth of 0.5 m.
CR	Catchment runoff	Catchment runoff	This inflow was estimated by the rainfall-runoff relationship established by McCullough, Marchand and Unseld (2013) and varies depending on the magnitude of the daily rainfall and the preceding day's rainfall to account for antecedent moisture conditions as summarised in the table below. **Runoff coefficients for pit walls** **Current day rainfall** / **Previous day rainfall** / **Runoff coefficient for catchment area (CR)** / **Runoff coefficient for pit wall (PWR).** < 5 mm/d / N/A / 0 / 0 < 40 mm/d / < 20 mm/d / 0.15 / 0.30 < 40 mm/d / > 20 mm/d / 0.40 / 0.65 ≥ 40 mm/d / N/A / 0.40 / 0.65
PWR	Pit wall runoff	Pit wall runoff	This inflow was estimated by the rainfall-runoff relationship established by McCullough, Marchand and Unseld (2013). Refer table above.
GW	Groundwater inflow	Groundwater inflow	Continuous groundwater (GW) inflow occurs due to the head difference between the regional GW level and the pit lake level. Ausgold has provided GW inflow data for each pit as a yearly inflow. It is assumed the GW inflow has a TDS concentration of (12,600 ppm=mg/L) (Pers comm, 2025b).
Outflows			
PE	Pond evaporation	Evaporation over the ponding area	Evaporation was estimated by applying two factors to the pan evaporation rates as follows: • Pan evaporation factor (EF): To convert pan evaporation to pond evaporation a factor of 0.7 adopted.

Flow ID	Flow	Description	Rationale for calculation
			• Salinity factor (SF): Leanny and Christen (Leaney, 2020) estimated the decrease in the evaporation rate due to the increase in salinity as per equation 1, where S corresponds to salinity in g/L: $$eq1. SF = 1.025 - 0.0246\, e^{0.00879 * S}$$
T_P	Dewatering pumping	Dewatering pumping	Excess water in the pit voids will be pumped out and directed to the process plant. The pump rate will be defined based on the requirement to maintain a constant water level of 0.5 m in the pond.
OV	Overtopping	Overflow from the pits	Overflow from the pit if pond surface elevation exceeds perimeter ground elevation

Table 6.3: Sediment Pond Inflows and Outflows

Flow ID	Flow	Description	Rationale for calculation
Inflows			
DP	Direct precipitation	Direct precipitation over the ponding area	Water volumes generated by direct precipitation over the sediment ponds assume a runoff coefficient of 1 (i.e., no losses). The water surface area of the pond was considered for the calculation.
WRD_RO	Run off	Run off	A 10% runoff coefficient is applied to the WRDs and 90% to the ROM pad for daily rainfall.
WRD_SP	Seepage from the WRD	Seepage from the WRD	A 35% coefficient for daily rainfall is assumed to represent seepage from the WRDs.
Outflows			
PE	Pond Evaporation	Evaporation over the ponding area	Evaporation was estimated by applying pan evaporation rates scaled by a pan evaporation factor (EF=0.7) to the surface area of the pond.
T_P	Dewatering pumping	Dewatering pumping	A pump capacity of 200 m^3/hour was adopted with pumping assumed to be activated when the water level in the pond is within 1 meter of the crest (using the crest as a reference due to variable pond depths) and deactivated when the water level reduces below 0.5 m.
SP	Seepage	Seepage	Calculated considering a clay lined pond with a seepage rate of 10 mm/d over the ponded area.
OV	Overtopping	Overflow from the sediment ponds	Overflow from the sediment ponds.

To assess climate variability, the model utilised daily stochastically generated rainfall and evaporation data. In summary, for a defined modelled period, climate conditions adopted may be summarised as follows:

- **Rainfall:** The average annual rainfall is 379 mm, with summer rainfall, i.e., November to April, averaging 109 mm and winter rainfall, i.e., May to October, averaging 269 mm. Further rainfall statistics based on SILO data.
- **Pan Evaporation:** The average annual Pan evaporation is 1553 mm, with summer evaporation, i.e., November to April, averaging 1019 mm and winter evaporation, i.e., May to October, averaging 434 mm.

6.1.3.2 Climate change

A climate change assessment was carried out to provide an understanding of the projected future climate conditions (i.e., rainfall and evaporation) at the project site based on a range of global Greenhouse Gas emission scenarios. The assessment was carried out for the near future (2020-2040) centred in 2030 (herein referred to as 2030) to estimate the possible climatic conditions for the operational period, considering a Life of Mine ending in 2035. The projected monthly changes for rainfall and evapotranspiration were incorporated into the water balance model as an additional scenario to assess the potential impacts of climate change on the water balance model.

6.1.3.3 Pit Inflows and Dewatering Model Assumptions

Inflows, outflows, and water transfers for each storage as modelled in the Site Wide Water Balance (WSP, 2026a) are summarised in Table 6.1 and Table 6.2 for each storage type.

6.2 Water Balance Model Results

The focus of the site water balance is to estimate sources of raw water and track the contact water to estimate the annual water surplus-deficit that will require site based management (WSP, 2026a). Non-contact water will be diverted away from site and managed according to the site Surface Water Management Plan (SWMP). This approach prevents mixing of contact and non-contact water generated at the active mine site and maintaining environmental conditions beyond the site's footprint.

The objective of the site water balance (SWB) established a base model to inform the strategic planning for the operational phase focusing on:

- Understanding fluxes: Analysing the inflows and outflows of the main infrastructure under stochastic climate time series.
- Quantifying the yearly water volumes and surplus that will require on site management.

In summary, on-site management will be provided by site water retention within the operating circuit, on the surfaces of engineered storages and/or by applying mechanical evaporators in dry and/or hot conditions. Additionally, although not forecast by the SWB, storage capacity can also be augmented by using voided pits (>2+GL volume) as temporary raw water holding or by constructing the Water Balancing Storage (>2+GL volume) accounted for in the ultimate KGP design.

Rockwater (2025a) used WSP's detailed water balance model for the updated pit inflow modelling and updated pit void storage volumes, from which recalculated supply borefield makeup volumes and surplus water volumes were made. The revised water balance shows that additional makeup water will only be required in the largest quantities in Year 1 and smaller volumes in Years 2 and 3. The revised water balance (Table 6-4) shows that additional makeup water will only be required in those years. Surplus water from Years 4 onwards would be managed in a way that will not impact downstream surface waters or groundwater levels (i.e., through direct recharge or infiltration or discharge back into the aquifer via creeks, or bores). In most likelihood, the estimated demand assumes that water will not be abstracted from pits post-closure (and groundwater levels would recover). If water was to be abstracted from these pits post-mining, the need for bore make-up water would be eliminated which is the likely case for Year 10.

The preferred makeup water supply strategy will abstract from the "southern borefield" centred at licensed bore WERC06A (Figure 3-). It is assumed in the base case that these bores would be operated at equal abstraction rates of 29 L/s in Year 1 (Rockwater, 2025a).

In general, the water balance model assumed that contact water is derived from four main sources:

- **Borefield:** initially, in Year 1, 2.572GL water is forecast would be inbound to KGP to be processed via the raw water pond and then returned from the TSF during the first year and in subsequent years. Only small additional supplementary inflows are forecast in Years 2 and 3.
- **Tailings Storage Facility (TSF):** Return water from the TSF (mean = ~2,990 ML/year), which constitutes about ~70% of the total water the TSF receives resulting from slurry water release, incident rainfall and surface runoff.
- **Pits:** Dewatering of groundwater inflow in the pits as they deepen over time (~ mean = 427 ML/year).
- **Sediment Ponds:** Runoff and seepage from the WRDs in each winter wet season period (or whenever heavy rainfall-runoff occurs) (mean = ~472 ML/year).

Based on the average results under baseline climate conditions, the Plant demand is approximately 3.7 GL/yr, resulting in an annual surplus of water forecast ("Managed Surplus") to be processed via a mechanical loss (i.e., mechanical evaporators (MEs) or water cannons) of approximately ~400 ML/yr in later six years of the mine life. The 5-unit evaporator (ME) system would provide a balanced outcome, substantially reducing storage accumulation at KGP over the years, while maintaining operational practicality. Note that dry or drought conditions would moderate that forecast need, as would wetter periods accentuate it. Due to the year-to-year climate variations and no entrained surplus capacity to simply retain excess water during wet periods (eg. seasonal or short duration large storm events on the TSF), annual surplus of water required to be processed via mechanical loss system is estimated to range from 150 ML/year to 560 ML/year. The modelling by WSP 2026a shows that MEs would provide capacity and flexibility as the first operational response to handle surplus water.

Should there be unforeseen wet weather events to accentuate above-average water surplus at the KGP and in support a 'nil discharge' operating condition at the KGP, to manage the swinging water inventory (of typically no more than one-half Gigalitre), further actions and mitigations would be applied in addition to use of MEs:

- Should it further be required as contingency, temporary storage of surplus water (towards the back end of LOM) could be undertaken into mined pit voids using Part V and Mining Proposal assessment and approval mechanisms. The available volume in the northern Jackson 1 and Jackson 3 pit voids by Year 5 is well over 2GL. These pits are destined to become flooded pit lakes once groundwater runs to the voids in post closure years; and/or

- A water balancing storage (WBS), allowed in the mine footprint, would be constructed during an operational period when further water storage and additional evaporative loss is required. The area of 32 hectares is nominated in the mine layout with adequate volume to hold 2+GL, held for water loss during the warm/hot dry summers or to preclude any need to draw from the borefield.

Table 6-4: Updated Water Balance Table (modified by Rockwater from Table 4.28 from WSP, 2026a)

	Input (ML/a)						Output (ML/a)			Balance (ML/a)		
Year	**Rainfall**	**Transfer From Pit Lakes**	**Transfer from TSF**	**Pit Inflow**	**Sed. Pond**	**Supply Borefield Makeup**	**Pan Evap**	**Plant Demand**	**Managed Surplus #**	**Total In**	**Total Out**	**In – Out**
Y1	1.4	150.0	0.0	*323.7*	220.6	2571.9	3.9	3263.7	0.0	3267.6	3267.6	0.0
Y2	1.3	0.0	3096.2	*255.5*	222.3	80.9	3.9	3652.3	0.0	3656.2	3656.2	0.0
Y3	1.4	0.0	3131.3	*199.6*	276.6	175.1	3.9	3780.1	0.0	3784.0	3784.0	0.0
Y4	1.4	0.0	3191.7	*310.6*	505.2	0.0	3.9	3822.7	182.3	4008.9	4008.9	0.0
Y5	1.4	0.0	3079.3	*409.4*	500.7	0.0	3.9	3811.7	175.2	3990.8	3990.8	0.0
Y6	1.4	0.0	3041.7	*566.4*	551.4	0.0	3.9	3703.8	453.2	4160.9	4160.9	0.0
Y7	1.4	0.0	3045.2	*786.7*	591.8	0.0	3.9	3766.1	655.1	4425.1	4425.1	0.0
Y8	1.3	0.0	2998.3	*881.9*	616.3	0.0	3.9	3677.9	816.0	4497.8	4497.8	0.0
Y9	1.3	0.0	3005.3	*383.4*	611.1	0.0	3.9	3841.0	156.2	4001.1	4001.1	0.0
Y10	1.4	0.0	2312.8	*158.2*	626.2	*592.8*^	3.9	3687.5	0.0	3691.4	3691.4	0.0

* The estimated demand assumes that all available water from actively mined pits at site is used, reducing or eliminating the need for bore make-up water. # surplus will be managed by mechanical evaporators and, if required, in pit storage to retain balance water to ultimately be evaporated ^ modelling 'anomaly' that forecasts a closed final balancing volume that could be required but unlikely with final on-site storage ('Transfer from pit lakes') being consumed preferentially.

7. Surface Water Management Plan

On the basis of findings from the Site-Wide Water Balance described in Section 6, Ausgold commissioned WSP (2026b) to develop a SWMP which included proposed designs of surface water management structures for the Project. The full SWMP report is provided as Appendix 6.

Proposed surface water management considerations include measures to protect proposed infrastructure for example, from erosion and scouring of WRDs, establish of diversion drains of suitable capacity to particularly during flood events, and establishment of sedimentation ponds that are optimised for sizing and location to achieve a zero discharge philosophy as far as practicable.

7.1 SWMP Basis of Design

The key basis of design for the SWMP is as follows:

- *Design life*: the SWMP assumes a 10-year operational period considering mining operations commencing in year 2028. SWMP for closure and post-closure periods are not part of this assessment.
- *Surface water control structures protecting critical mine infrastructure*: Structures (including non-contact diversion channels) are sized to withstand the 1 in 100 AEP event which is typically selected for open drains/bunds to protect critical infrastructure on other mine sites. The selected AEP storm event is estimated to withstand an event with a probability of exceedance of 10% over the 10-year life of the current proposed operation. This means that the likelihood to experience at least one event exceeding the design event over a given Project life of 'n = 10' years is 10%. This is based on recommendations in Austroads (1994), and risk management approaches used widely in other mining operations in WA that are independent (or external) to tailings storage facilities noting the latter has more prescriptive requirements for extreme flood events.
- *Surface water control structures for local catchments*: these are sized to the 1 in 20 AEP 24-hour event for storage, or critical duration for conveyance. The design intent of the structures is not to protect critical mine infrastructure, rather provide management of more frequent storm events. Freeboard for all structures has been adopted as 0.3 m.
- *Design peak flows*: Design peak flows used to design the surface water control structures is based on the hydrological and hydraulic (TUFLOW) model.
- *Climate change considerations*: Climate change considerations have been applied to the baseline IFD according to the 10-year operational period and follows the procedure developed by ARR (Ball, et al. 2019).
- *Sediment retention ponds for the WRDs*: Minimum required volume, pond dimensions (i.e., length by width ratio 1:3) and sediment storage volume has been calculated using RUSLE equation (K.G. Renard, 1997).
- *Stormwater pond*: Minimum required volume to store the 1 in 20 AEP, 24-hour storm event runoff volume but to also provide settling capacity for sediment laden runoff from the adjacent ROM pad. Perimeter drains capturing runoff from the catchment is also recommended to be sized to the 1 in 20 AEP design peak flow.
- *Pond emergency spillways*: Sized to convey the peak flow resulting from the 1 in 50 AEP storm event with a minimum freeboard of 0.3 m.
- *Perimeter drains reporting to ponds:* Perimeters drains capturing runoff from the pond catchment areas are recommended to be sized to the 1 in 20 AEP design peak flow.

7.2 Hydrologic and Hydraulic Modelling

Flood flow estimation (including flowpath levels, depths, and velocities) was completed using the TUFLOW hydraulic modelling software version 2025.0.2. TUFLOW is a two-dimensional hydraulic modelling software whereby a rainfall depth is applied to every active cell within a digitised polygon based on an input rainfall hyetograph which provides simulated flood depths, flows, and velocities. The input rainfall hyetograph was developed in accordance with ARR (Ball, et al. 2019), in which web-based design rainfall information specific to the Project location has been retrieved. Note that while the term "flood" is applied to the hydrograph generated by rainfall scenarios, these are relatively small (low heights and widths of flows via dry drainage scours and surface depressions); they are not floods in the common form of the term.

A direct rainfall approach enables reliable representation of the physiographic characteristics of the mine site, and its upstream catchment. This is due to several factors including greater consideration of the storage effects of depressions, better representation of sheet flow conditions associated with surrounding topography, and the ability to vary coefficients of roughness with increasing flow depths.

7.3 Model Results

The hydrologic and hydraulic modelling was completed adopting the three scenarios provided in Table 7.1.

Table 7.1: Surface Water TUFLOW Modelling Scenarios

Scenario number	Description
1 Baseline	Pre-development condition to understand the local flooding without considering any mine and surface water control structure.
2 Ultimate site development – without mitigation	Post-development condition considering the proposed mine layout and without surface water control structures.
3 Ultimate site development – with mitigation	Post-development condition considering both the proposed mine layout and surface water control structures.

Flood mapping and results including the mine structures and the proposed surface water control structures are shown in following figures.

Figure 7-1 presents the channel depths across the site under post-development conditions for the 1 in 100 AEP event. Ponding areas were identified around site structures, with instantaneous flow depths reaching up to 3 m in some locations, highlighting the need for surface water control structures. Maximum flow depths within the channels are generally below 1.5 m.

Surface water controls are proposed based on the results of hydrologic modelling for the post-development scenario without mitigation measures and were incorporated into the model. The open channel diversions are located at key ponding locations around the site infrastructures to manage surface runoff. Figure 7-2 presents the post-development condition and showing the 1 in 100 AEP flood event.

7.4 Surface water management

Features to be adopted, their location, functionality and footprints are subject to ongoing feasibility assessments with proposed infrastructure yet to be finalised. Once proposed infrastructure is determined, these will be presented in applicable approvals documentation for assessment by DWER under Part V of the EP Act and by the Department of Mines, Petroleum and Exploration (DMPE) under the *Mining Act 1978*.

During operations, the control and management of surface runoff and discharges in and immediately downstream of the mine area are essential to provide:

- Protection to personnel and mine infrastructure during larger storm events.
- Diversion of non-contact surface runoff around mine infrastructure to be discharged to the downstream environment
- following the existing hydrology.
- Retain sediment and clean out at a prescribed frequency generated from the WRDs and TSF embankments onsite to
- maintain zero discharge of the sediment material to the downstream environment.

In adopting appropriate design criteria for the sizing of the surface water control structures, several factors have been considered:

- separation of contact and non-contact water as reasonably practicable.
- zero discharge for frequent storm events.
- risk to infrastructure in the event of inundation during more extreme storm durations of the mining operation.
- magnitude of design discharges, flow velocities and associated critical durations of flows in the mine area locations of mine infrastructure in relation to the existing hydrology.

Surface water control structures including drains, sumps and stormwater ponds are shown in Appendix 7 which is the stormwater management design extract from WSP (2025). Note the final details of design would be resolved during the Mining Development and Closure Proposal (MDCP) approval to be obtained from the DMPE.

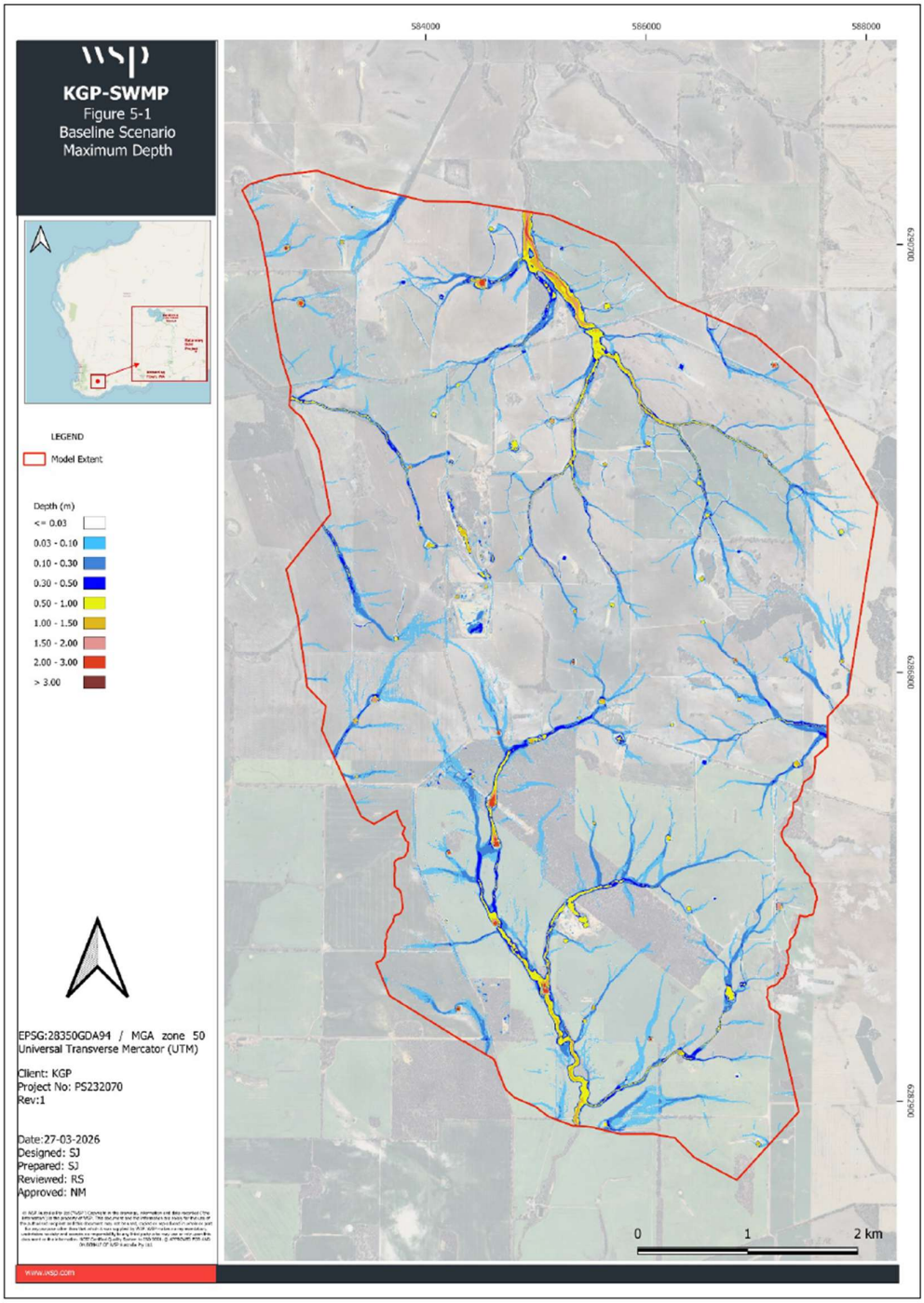


Figure 7-1: Maximum Channel Depth pre-Development

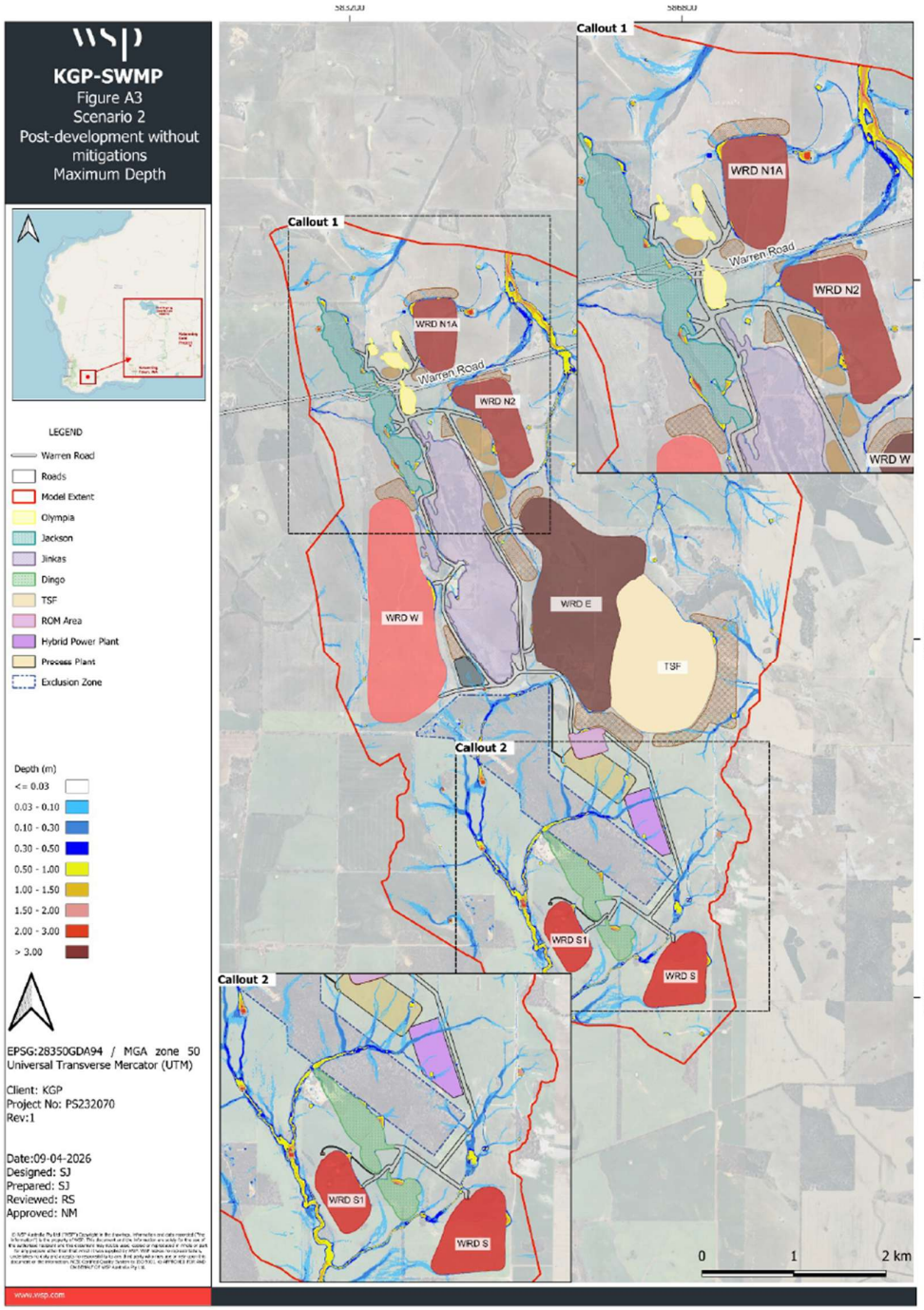


Figure 7-2: Maximum Channel Depth for developed KGP site

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Appendices

Appendix 1: Groundwater Dependent Ecosystems (Hydrobiology, 2026)

Appendix 2: Groundwater Modelling Summary, Katanning Gold Project. (Rockwater, 2026a)

Appendix 3: Assessment of Groundwater Salinity (Hydrobiology, 2025)

Appendix 4: Katanning Gold Project – Review of Model-derived Pit Dewatering Estimates (EMM, 2025)

Appendix 5: Site-Wide Water Balance (WSP, 2026a)

Appendix 6: Surface Water Management Plan (WSP, 2026b)

Appendix 7: Surface Water Management Plan - Stormwater Design extract (WSP, 2025)

Appendix 8: Pit Lake Post-closure Recovery (Rockwater, 2026)

Appendix 1: Groundwater Dependent Ecosystems (Hydrobiology, 2026)

Hydrobiology

GROUNDWATER DEPENDENT ECOSYSTEMS

BRAZIL | BRISBANE | PERTH | SINGAPORE

KATANNING GOLD PROJECT

Ausgold LIMITED

P24130
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VERSION 1.2

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THIS COMPANY IS REGISTERED FOR GST.

STREET
1/71 Troy Terrace
Jolimont 6014
WESTERN AUSTRALIA

REGISTERED
c/- de Blonk Smith and
Young Accountants
GPO 119, Brisbane 4001
QUEENSLAND

POSTAL
PO Box 1034
West Leederville 6901
WESTERN AUSTRALIA

CONTACT
+61 (0)8 6218 0900 P
infowa@hydrobiology.com

ABN 68 120 964 650

www.hydrobiology.com

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EXECUTIVE SUMMARY

Ausgold Ltd is progressing the Katanning Gold Project in southwest Western Australia. As part of feasibility investigations, Hydrobiology undertook a desktop risk assessment of potential groundwater dependent ecosystems (GDE) near proposed groundwater production bores.

The study used national GDE mapping, groundwater drawdown zones, and satellite-derived vegetation and climate data. NDVI and Aridity Index (AI) were analysed to assess vegetation responses during drought periods. Vegetation that remained relatively healthy during drought was considered more likely to access groundwater, while vegetation with low or seasonal NDVI was excluded as groundwater dependent.

A total of 21 terrestrial and 10 aquatic GDE were identified and assessed. Of these, all Terrestrial GDE were classified as Low Potential. Four Aquatic GDE were classified as High Potential, four Moderate Potential and one Low Potential. Of the four High Potential Aquatic GDE, only one was assessed to be an obligate GDE. It is proposed that 4 monitoring sites are established to detect potential impacts to GDE as a result of groundwater abstraction. Our study found moderate to low risk from groundwater abstraction and supports a precautionary approach to managing potential ecological impacts.

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1. INTRODUCTION

1.1 BACKGROUND

Ausgold (AUC) are developing the Katanning Gold Project (KGP) in Western Australia. The KGP is located 275 km south-east of Perth and approximately 40 km north-east of the town of Katanning in southwest Western Australia. The tenements are located within the Blackwood River drainage basin and the Hardy Estuary-Coblinine River Catchment, covering approximately 3,500 km^2 of the Katanning Greenstone Belt in the south-west corner of the Yilgarn Craton.

KGP encompasses the historical Jinkas Hill and Dingo open pits, which were mined between 1995 and 1997 before being placed into care and maintenance. AUC acquired a significant tenure position in the region in 2009 with the objective of redeveloping the project. In 2017, the geological model was reinterpreted to support ongoing drilling aimed at expanding the defined mineral resource, forming a key input into the project's preliminary feasibility study.

AUC are currently undertaking resource delineation, metallurgical testing, and feasibility studies to support the development of a large-scale open pit mining operation. To support this phase of works, Hydrobiology was commissioned by AUC to undertake a desktop assessment of potential groundwater dependent ecosystems (GDE) adjacent to the project location.

1.2 STUDY AREA

The study area is approximately 40 kilometres northeast of the town of Katanning, within the Blackwood River drainage basin and the Hardy Estuary-Coblinine River Catchment. The KGP Mining Leases (M-70/211, M-70/488, M 70/210, M-70/1426 and M-70/1427) are typical of the Wheatbelt, featuring gently rolling landscapes with a mix of sandy plains, low hills, and broad valleys (Figure 1-1). These valleys often contain salt lakes and seasonal wetlands, though surface water is generally limited and flows are mostly short-lived after rainfall. The land has been heavily cleared for farming, with broadacre cropping and livestock grazing being the main land uses. Remnant patches of native vegetation, including eucalypt woodlands and shrublands, remain mostly along roadsides and rocky outcrops. Dryland salinity and salinisation of both surface and groundwaters of the region has

occurred over the last century. This has created salinity tolerant GDE and altered terrestrial and aquatic habitats across the region (Clarke et al, 2002).

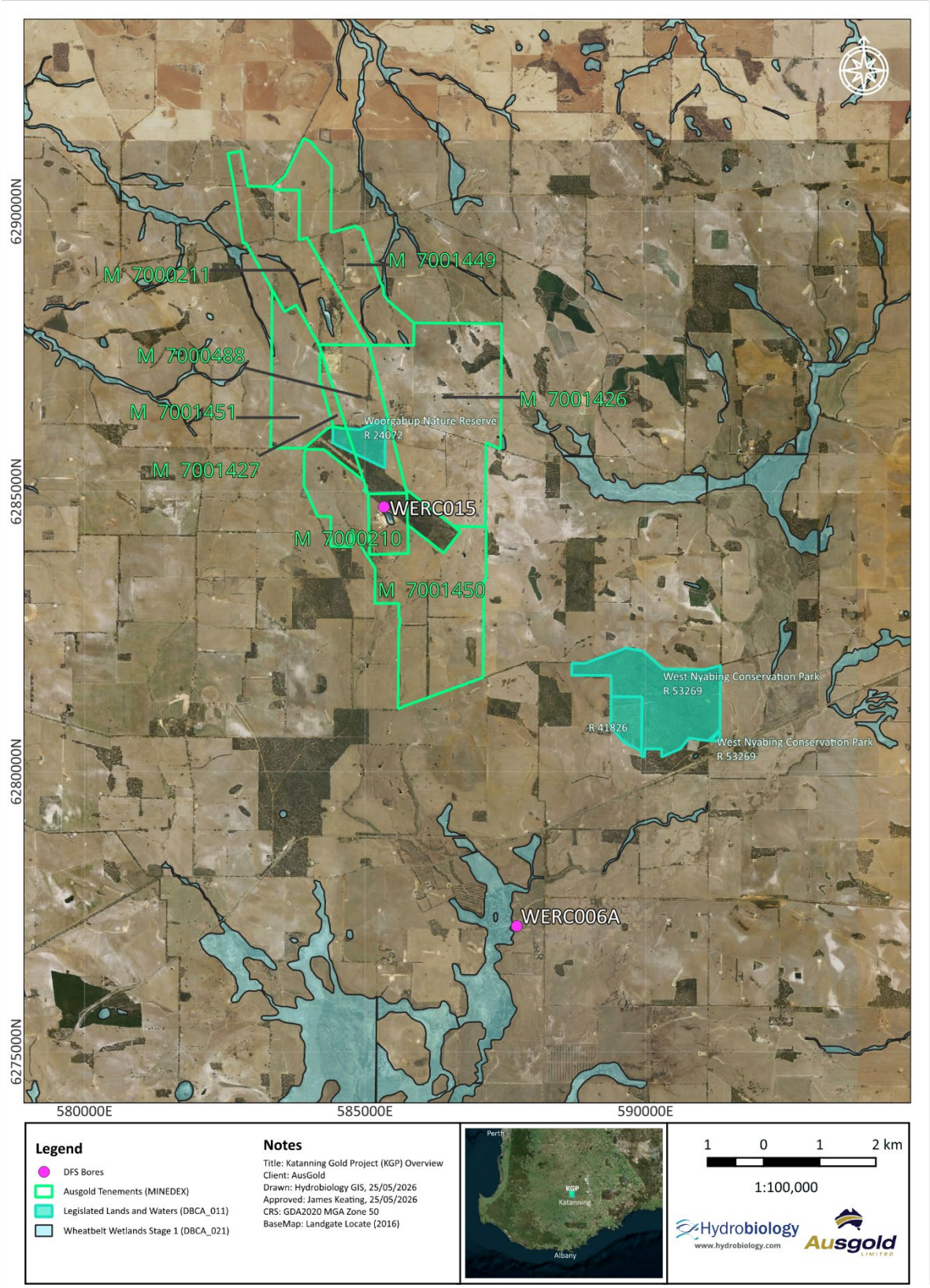

Figure 1-1 Overview of AUC KGP project

1.3 STUDY OBJECTIVE

The objective of this study is to undertake a desktop risk assessment of potential groundwater dependent ecosystems at the KGP study area.

1.4 LIMITATIONS

This is a desktop study based on remote sensing observations, groundwater modelling outputs and field surveys completed for flora and vegetation assessments. Our conclusions are constrained to the quality and representativeness of the information supplied.

1.5 GROUNDWATER DEPENDENT ECOSYSTEMS

Groundwater Dependent Ecosystems (GDE) are ecosystems that rely on groundwater to survive, either continuously or intermittently during dry periods (Eamus & Froend, 2006). In the Goldfields region of Western Australia, these include wetlands, salt lakes, samphire shrublands, and some types of woodland. The GDE Atlas (BoM, 2022) is the main tool used to identify and map potential GDE across Australia, although some of the information is based on older surveys. It classifies GDE as aquatic (e.g., wetlands and springs), terrestrial (vegetation), or subterranean (e.g., cave ecosystems). Only aquatic and terrestrial GDE are considered relevant to this study area.

1.5.1 AQUATIC GDE

Aquatic GDE in this region are mostly found around naturally salty areas such as lakes and drainage lines. These are often dominated by samphires (Tecticornia species), which are salt-tolerant plants. While they can survive in high salinity, changes in water availability, especially reduced rainfall or lowered groundwater levels, can affect their health, growth, and ability to reproduce (Rabhi et al., 2012; English & Colmer, 2013). Freshwater inputs after rain are important, especially during long dry periods. If mining lowers the water table, this could reduce both groundwater availability and surface water expression, putting extra stress on these systems (Monie et al., 2025; Moir-Barnetson, 2014).

1.5.2 TERRESTRIAL GDE AND PHREATOPHYTES

Terrestrial GDE in the Goldfields include Eucalyptus woodlands, some of which may include phreatophytic species (plants that use deep roots to tap into the water table). These species don't always rely on groundwater, but they may use it when surface moisture is low. In the study area, these woodlands are mostly classified as 'low potential' GDE in the Atlas, meaning they are not likely to be strongly reliant on groundwater. The surficial and weathered rock aquifers of the Blackwood River Catchment, which due to the pallid zone and tertiary clays that act as an aquitard, has the potential restrict roots from reaching the deeper aquifers (SRK, 2024; Figure 1-2). Instead, most of the vegetation is likely to be using moisture stored in the upper soil after rainfall (Zencich et al., 2002). Because of this, deeper groundwater abstraction is unlikely to affect these woodlands unless the drawdown is very large or prolonged.

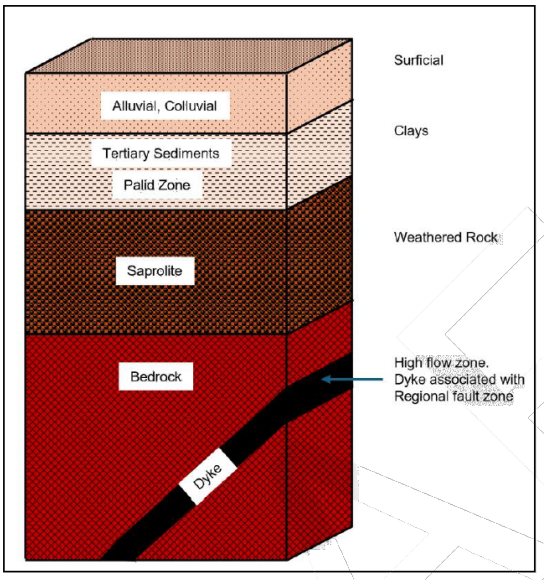

Figure 1-2 Hydrogeological schematic column (SRK, 2024)

2. METHODS

2.1 STUDY DESIGN AND DATA SOURCES

This study uses satellite imagery and climate data to assess whether vegetation mapped in the GDE Atlas is likely to rely on groundwater. The main datasets used are the Normalized Difference Vegetation Index (NDVI), which provides a proxy for vegetation health, and the Aridity Index (AI), which compares rainfall to potential evaporation. Data sources are summarised in Table 2-1.

We identified a suitable drought period by analysing changes in the Aridity Index and rainfall data. NDVI values during this period was then checked for seasonal variation. Vegetation that stays green (has a relatively elevated NDVI value) during the drought may be using groundwater, while vegetation that dries out (has a lower NDVI value) is more likely to depend on rainfall. This helps separate groundwater-dependent plants from those that respond only to surface water. Vegetation was determined to be unlikely to be groundwater-dependent if it showed low or highly seasonal NDVI, (i.e. likely to track seasonal rainfall). The approach will also consider whether the species present are typically phreatophytes. This process helped refine GDE mapping where field data are limited.

Table 2-1 Summary of data sources used in this assessment

Data	Source	Summary	Spatial Resolution	Temporal Resolution
Groundwater Dependent Ecosystems (GDE) Atlas	Australian Bureau of Meteorology (BoM, 2025)	The BoM Groundwater Dependent Ecosystems (GDE) Atlas is a national mapping tool that identifies ecosystems reliant on groundwater, including wetlands, vegetation, and subterranean habitats.	The national assessment layers are mapped at a 1 km² grid resolution across Australia. The regional study layers have variable resolutions, typically ranging from 1:25,000 to 1:100,000, depending on the original study and available data quality.	The national assessment layer is based primarily on modelling and spatial inference using datasets available up to 2011–2012 with updates in subsequent versions (latest release ~2023). Regional datasets may reflect fieldwork, studies, or mapping efforts carried out at various times, with some datasets dating from the early 2000's and others more recent depending on jurisdictional input.
Keighery vegetation condition scale for the Southwest and Interzone Botanical Province	Botanica Consulting, 2024 Mattiske Consulting, 2019; 2020; 2021 Hydrobiology, 2025	Vegetation units within a study area adjacent to the AUC tenements were assigned a vegetation condition score from field botany surveys. Additional scores were assigned to un-surveyed areas using an integrated remote sensing predictive model (refer to Hydrobiology, 2025 for further details).	Vegetation unit polygons accuracy is < 10 m	161 vegetation units across 2,599 ha were surveyed by Botanica Consulting in September 2023 and Mattiske Consulting in October 2018, February 2019 and November 2019.
Monthly Rainfall	Australian Bureau of Meteorology (BoM, 2025)	Monthly rainfall data	Point data measured at Katanning RS (BoM 010916). Lat: -33.69, Lon: 117.61	Monthly totals, 2020 - 2025

Data	Source	Summary	Spatial Resolution	Temporal Resolution
Potential Evapotranspiration **FAO56 Penman-Monteith for short crops**	Queensland Government (2025) SILO - Australian climate data from 1889 to yesterday	The FAO-56 Penman-Monteith equation estimates reference evapotranspiration (ET_0) from a short, well-watered grass crop under standard conditions. It combines energy balance (net radiation) and aerodynamic factors (temperature, humidity, and wind speed) to model water loss. This method is widely used for calculating PET in agriculture, water balance studies, and aridity assessments.	Point data calculated from SILO Grid Point; Lat: -33.55, Lon: 117.90.	Monthly, 2020 - 2025
Aridity Index (AI)	Derived from BoM (2025) monthly rainfall and SILO PET data (Queensland Government, 2025)	AI is calculated as the ratio of monthly precipitation to potential evapotranspiration (AI = P/PET), following UNEP (1997) methodology.	Point-based estimate using matched rainfall (BoM 010916) and PET (SILO Grid Point)	Monthly, 2020 – 2025
Normalised Difference Vegetation Index (NDVI)	European Space Agency Sentinel-2 satellite program	Normalized Difference Vegetation Index (NDVI) is a proxy for vegetative health through a measurement of the photosynthetic functions of plants	10 x 10 m ground sampling resolution	Monthly averages, 2020 - 2025

Data	Source	Summary	Spatial Resolution	Temporal Resolution
Groundwater Modelling **Drawdown Threshold**	Rockwater Report No. 710.0/25/01 (2025)	Groundwater modelling, which was undertaken to: Quantify the extent of drawdown from base-case pit dewatering and water supply extraction, evaluate the resultant groundwater mounding from the proposed base case TSF design, simulate post mining recovery timeframes, and integrate findings into a single concise groundwater assessment report.	Modelling cell size: 100 x 100 m	The model was temporally discretised into 41 stress periods, each of three months duration spanning the period of mine operations (i.e. 10 years), followed by a 100-year post-closure period.

2.1.1 GDE ATLAS

The Groundwater Dependent Ecosystems (GDE) Atlas, developed by the Bureau of Meteorology (BoM), provides a national-scale inventory of ecosystems across Australia that are potentially reliant on groundwater (BoM, 2025). It categorises GDE into three broad types; aquatic, terrestrial, and subterranean - and assigns each a likelihood classification (e.g., known, high, moderate, low potential) based on their potential dependency on groundwater (BoM, 2025; Table 2-2). The original assessments were undertaken between 2009 and 2012, with limited updates from regional studies incorporated since.

While the GDE Atlas serves as a valuable desktop screening tool, it has several limitations. Firstly, the spatial resolution of the underlying datasets is relatively coarse, which restricts the Atlas's ability to identify smaller-scale or cryptic GDE, especially in data-poor or ecologically complex regions such as the arid and semi-arid zones of Western Australia. Secondly, the modelled nature of the data means that classifications are based on indirect indicators rather than empirical measurements of groundwater use by vegetation or ecosystems. Consequently, the Atlas may produce both false positives (e.g., areas mapped as high potential GDE that are not functioning ecosystems) and false negatives (e.g., unrecognised but functioning GDE).

Given these constraints, the GDE Atlas should not be used as a definitive source of GDE presence or condition. Instead, it is best applied as a preliminary tool to guide further investigation. Site-specific studies are required to confirm the presence, dependency, and vulnerability of GDE, particularly where mining-related groundwater abstraction is proposed. This is especially important in the context of regulatory approvals, where evidence-based risk assessment is necessary to inform sustainable groundwater use and ecosystem protection.

Table 2-2 Categories applied from the GDE Atlas (BoM, 2025)

Layer Type	GDE Potential Category	Description
Regional Study	Known GDE	Confirmed groundwater dependence based on local studies or field data.
	High potential GDE	Strong evidence of groundwater reliance, though not directly confirmed.
	Moderate potential GDE	Moderate likelihood of groundwater dependence based on spatial indicators.
	Low potential GDE	Some indicators suggest groundwater use, but less likely.
	Unclassified potential GDE	Possible GDE identified but not yet classified due to insufficient information.
National Assessment	High potential GDE	Modelled likelihood of groundwater dependence based on national-scale datasets.
	Moderate potential GDE	Moderate modelled probability of groundwater use.
	Low potential GDE	Low modelled likelihood of dependence on groundwater.
	Unclassified potential GDE	Areas where modelled results were inconclusive or data were insufficient.

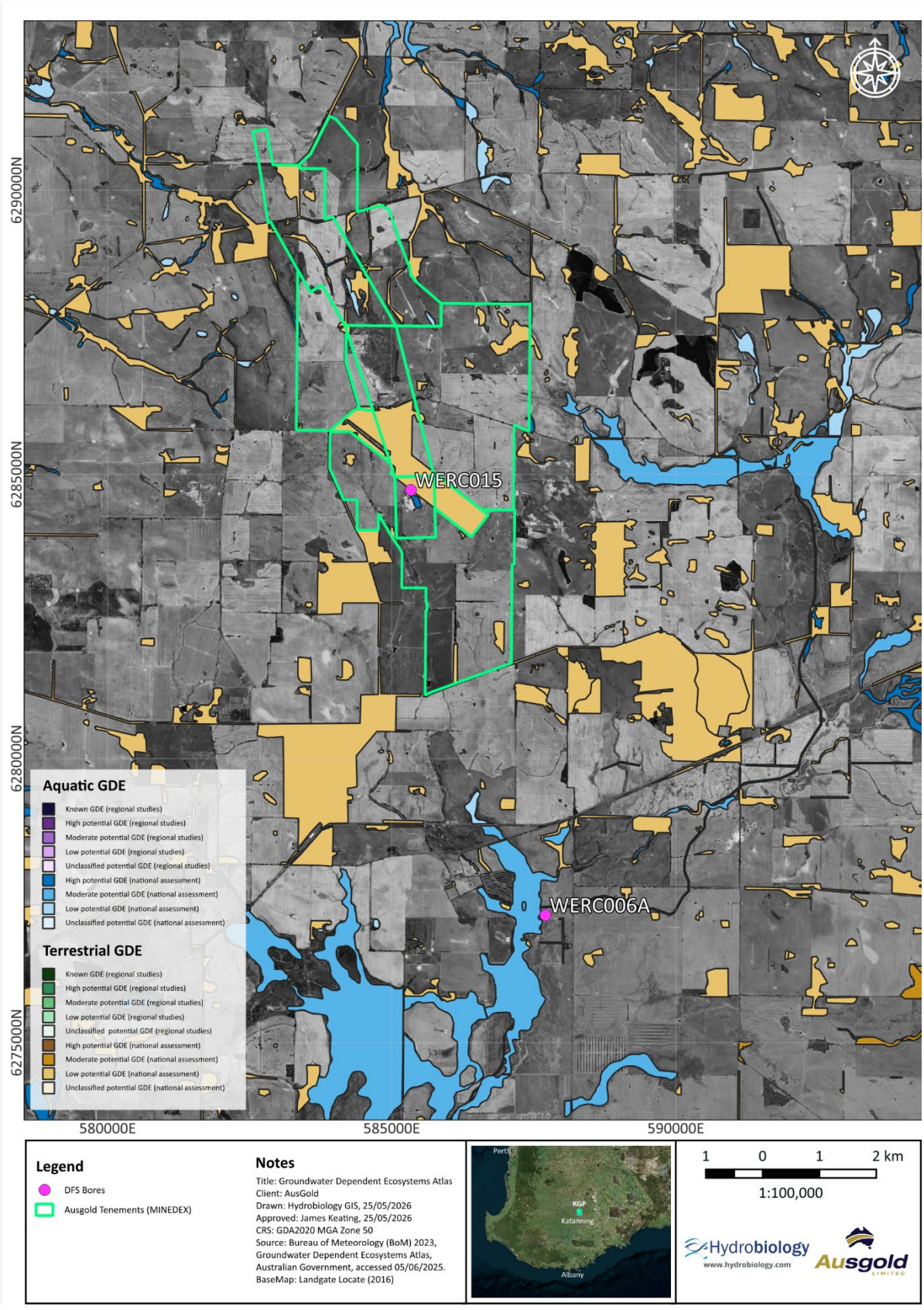

Figure 2-1 Aquatic and terrestrial groundwater dependent ecosystems

2.1.2 VEGETATION CONDITION

Vegetation condition at the Katanning Gold Project was assessed using the Keighery (1994; Table 2-3) vegetation condition scale, consistent with EPA Technical Guidance (2016). The method used is presented in Hydrobiology (2025) and summarised below.

Field surveys by Botanica Consulting (2023) and Mattiske Consulting (2018–2019) provided baseline condition scores for accessible areas. These assessments evaluated vegetation structure, disturbance, and species composition to assign scores ranging from Pristine to Completely Degraded.

Vegetation condition was estimated for unsurveyed areas using a combination of LiDAR-derived Canopy Height Models (CHM) and Sentinel-2 NDVI data. A Generalised Linear Model (GLM) was developed using field-surveyed units to relate NDVI and canopy height to Keighery scores. The model showed that NDVI was a significant predictor of vegetation condition, particularly distinguishing Good from Completely Degraded areas, while canopy height was not statistically significant.

Vegetation condition assessments were limited to the central extent of the KGP only and are used in this study for reference only.

Table 2-3 Vegetation condition as described by Keighery (1994)

Vegetation Condition	Description: South-West and Interzone Botanical Provinces
Completely Degraded	The structure of the vegetation is no longer intact, and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.
Degraded	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
Good	Vegetation structure significantly altered by obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and grazing.
Very Good	Vegetation structure altered, obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
Excellent	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Pristine	Pristine or nearly so, no obvious signs of disturbance.

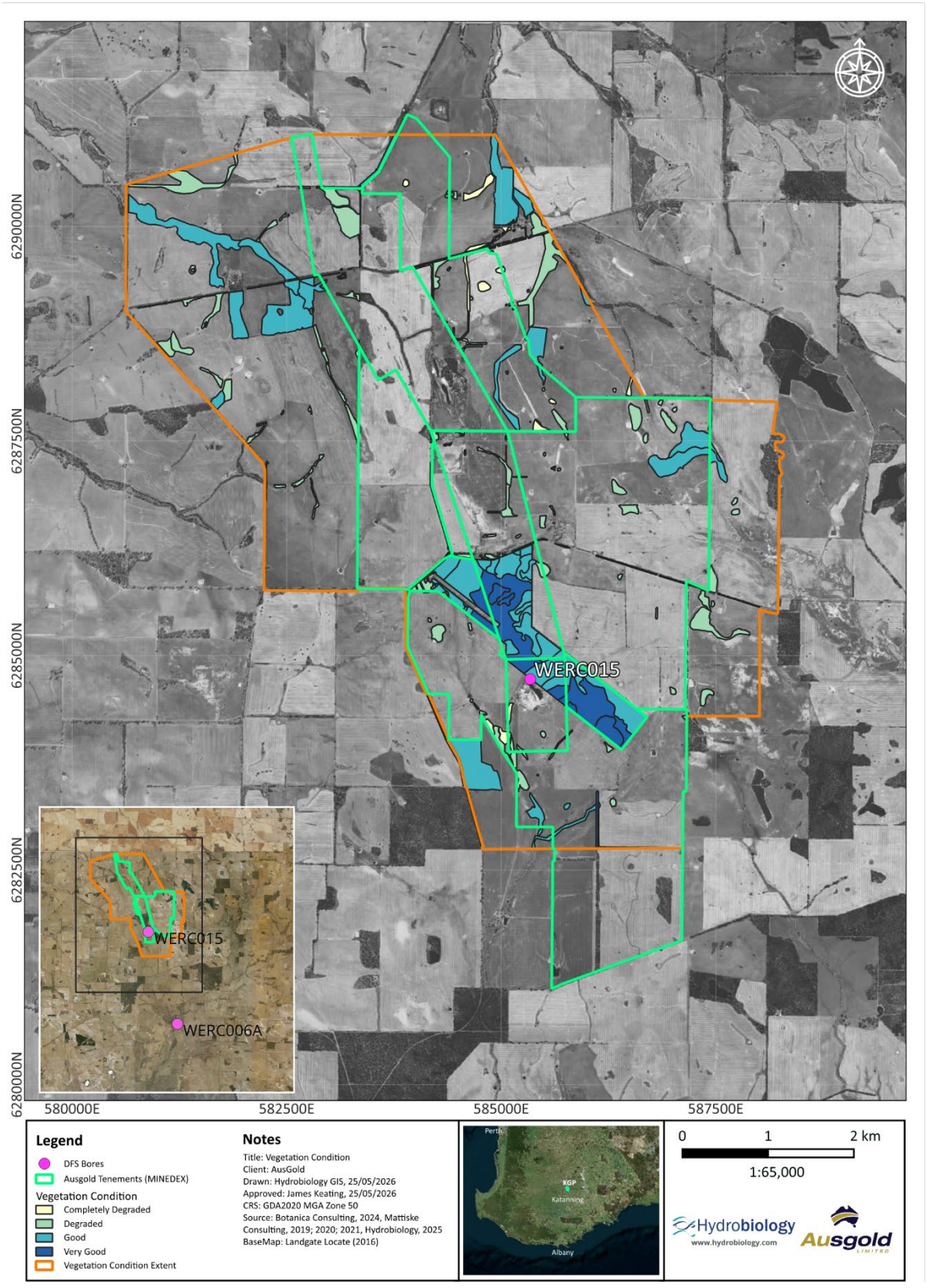

Figure 2-2 Vegetation Condition, orange polygon indicates extent of available data

2.1.3 ARIDITY INDEX

Monthly Aridity Index (AI) values were calculated for the period 2020–2025 using the ratio of total monthly precipitation to potential evapotranspiration (PET), as defined by the United Nations Environment Programme (UNEP, 1997; Table 2-4). The AI provides a standardised indicator of climatic water availability and is widely used to assess drought severity and classify climatic conditions relevant to ecological and hydrological assessments;

$$Aridity\ Index\ (AI) = \frac{Precipitation\ (P)}{Potential\ Evapotranspiration\ (PET)}$$

Monthly rainfall observations were sourced from the Bureau of Meteorology's Katanning weather station (Station ID: 010916; Lat: –33.69, Lon: 117.61; Figure 2-3). PET estimates were obtained from the SILO Data Drill at a nearby grid point (Lat: –33.55, Lon: 117.90), based on the FAO56 Penman–Monteith method (Allen et al., 1998; Figure 2-4). This approach incorporates local temperature, solar radiation, vapour pressure, and wind data to model evapotranspiration from a reference crop under standardised conditions. This analysis identified 2024 as a potentially drought impact year (indicated in Figure 2-3 and Figure 2-4.

Aridity classifications followed UNEP (1997; Table 2-4), where AI values below 0.20 indicate arid conditions. Based on this criterion, the period from January to April 2024 exhibited persistently low rainfall and elevated PET, resulting in AI values consistently below the arid threshold. These conditions support the designation of early 2024 as a candidate drought phase, with implications for landscape-scale water balance and the vulnerability of groundwater-dependent ecosystems (GDE). The monthly Aridity Index is presented in Table 2-4.

Table 2-4 Aridity Index (UNEP, 1997)

Aridity Index (AI = P / PET)	Climate Class
< 0.05	Hyper-arid
0.05 – 0.20	Arid
0.20 – 0.50	Semi-arid
0.50 – 0.65	Dry sub-humid
> 0.65	Humid

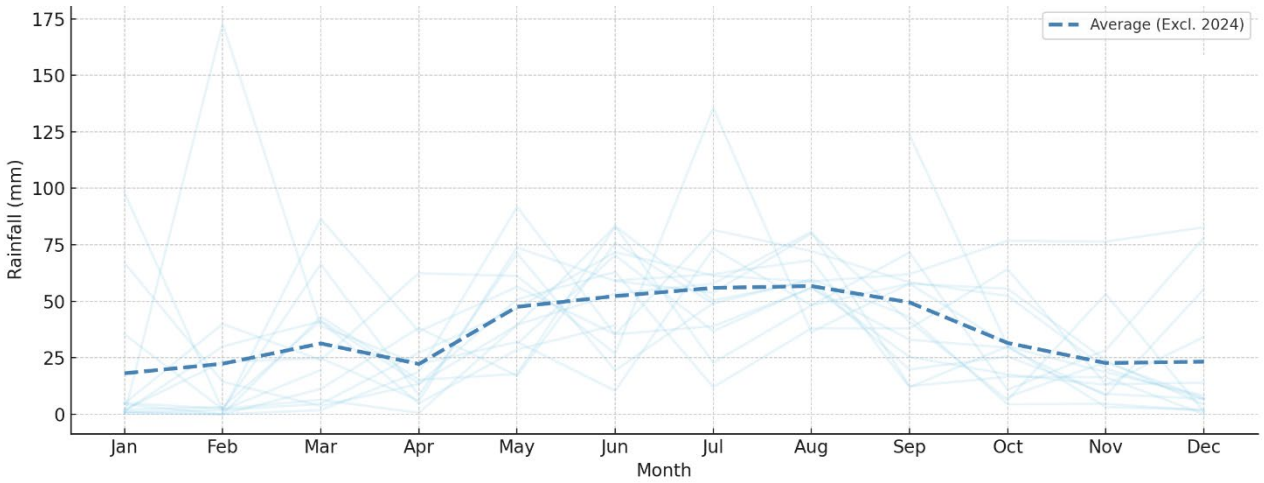

Figure 2-3 Monthly rainfall observations at Katanning (BoM 010916; Lat: -33.69, Lon: 117.61; 2020-2025). Dashed line indicates the average (2020 – 2025)

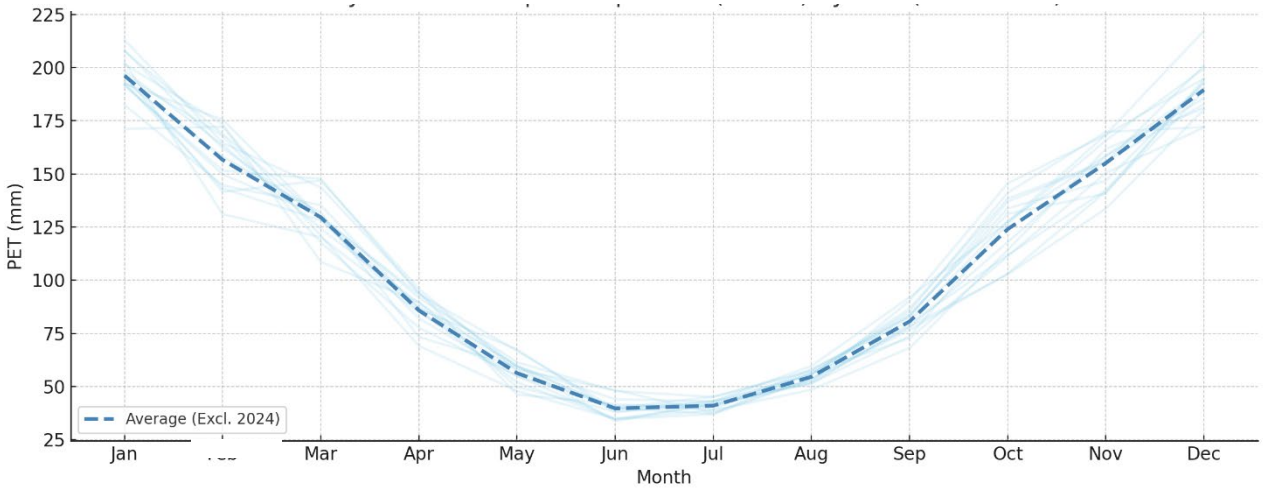

Figure 2-4 Monthly Evapotranspiration (SILO Grid Point; Lat: -33.55, Lon: 117.90; 2020-2025). Dashed line indicates the average (2020 – 2025).

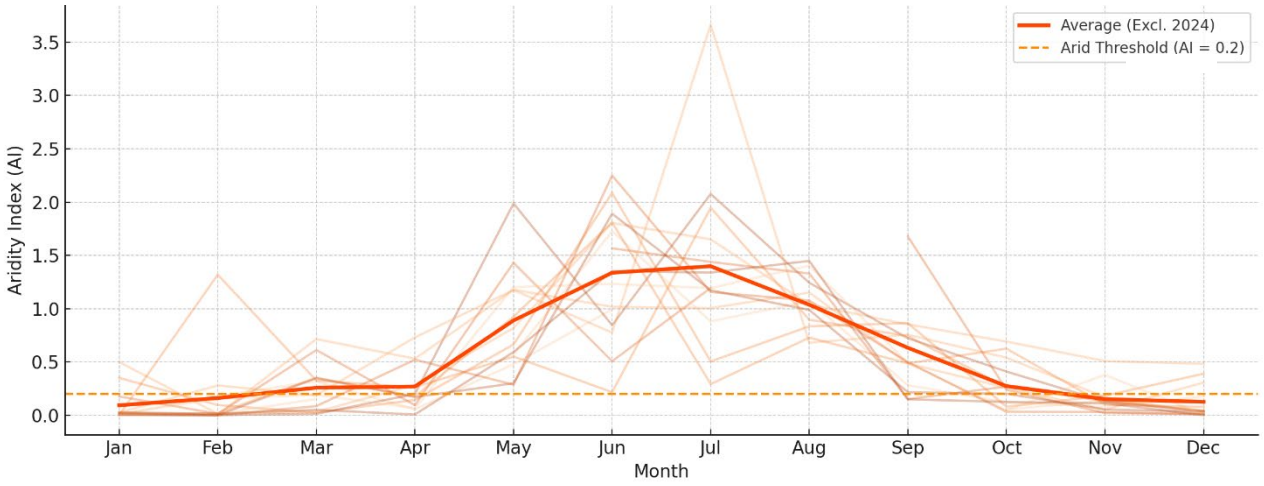

Figure 2-5 Monthly Aridity Index 2020 - 2025

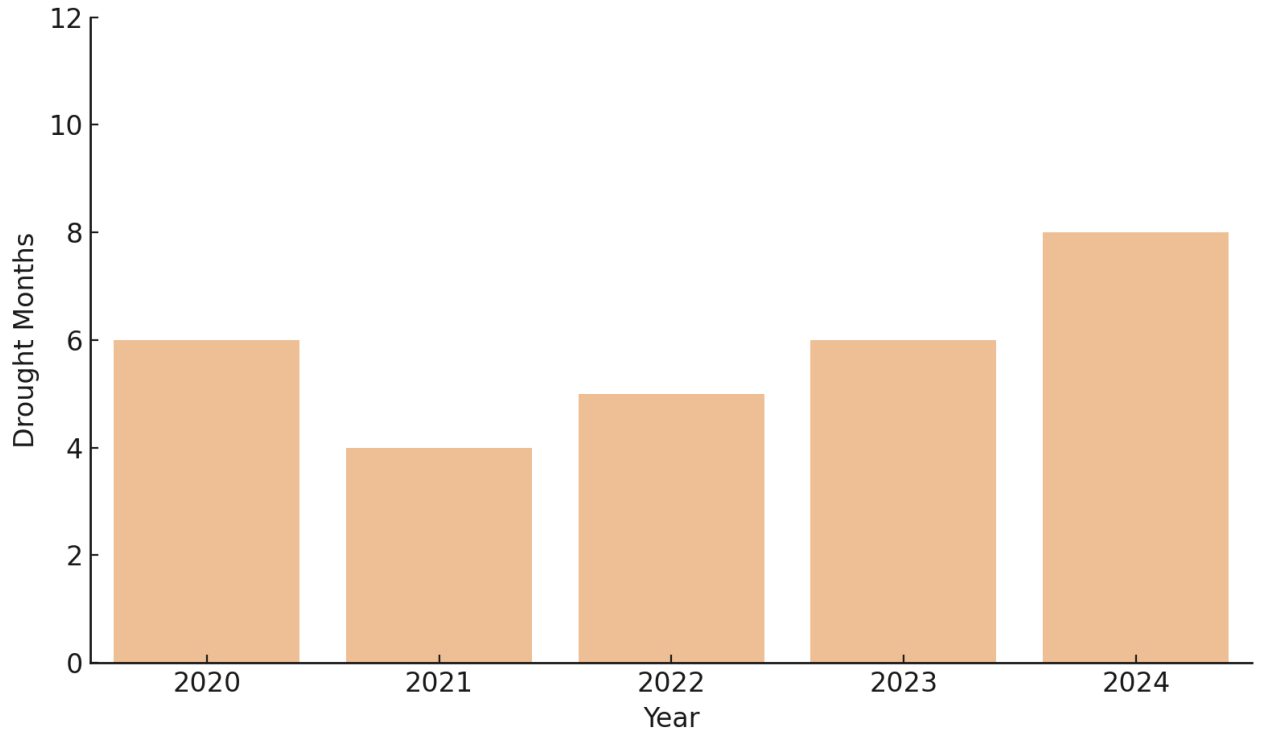

Figure 2-6 Number of months in each year that met the threshold for drought conditions (Aridity Index <0.2)

2.1.4 NORMALISED DIFFERENCE VEGETATION INDEX

Multispectral satellite imagery was acquired to provide an index for vegetation health. The European Space Agency Sentinel-2 satellite program was preferred due to the temporal and spatial availability of imagery and the relatively high ground sampling resolution, which was appropriate to the size of the vegetation units (Table 2-5).

Table 2-5 Sentinel-2 specification

Satellite	Processing and Quality Control	Red wavelength (µm)	NIR wavelength (µm)	Resolution (m)
Sentinel-2	Level 2A data are high quality data where the effects of the atmosphere on the light being reflected off of the surface of the Earth and reaching the sensor are excluded.	0.65 – 0.69	0.85 – 0.88	10 x 10

Normalized Difference Vegetation Index (NDVI) is an accepted proxy for quantifying vegetative health through a measurement of the photosynthetic functions of plants (Santin-Janin et al., 2009). The NDVI is calculated by measuring the difference between near-infrared (NIR) light (which vegetation strongly reflects) and red light (which vegetation absorbs) following the equation (as described in Barron et al., 2014) shown below;

$$NDVI = \frac{NIR - Red}{NIR + Red}$$

The resolution of the resulting NDVI layer matched that of the original satellite imagery (*i.e.*, each pixel measures 10 m x 10 m on the ground). The NDVI ranges from -1 to +1, where higher values represent healthier, denser vegetation. Lower values indicate low reflectance. This may be caused by poor vegetation quality or areas that have been cleared.

Google Earth Engine (GEE) was used to extract monthly median NDVI values for polygons mapped as potential Groundwater Dependent Ecosystems (GDE). The analysis relied on the Sentinel-2 Surface Reflectance (L2A) image collection, filtered for the period January 2020 to December 2025 and limited to scenes with less than 20% cloud cover. NDVI was calculated using the normalized difference between the near-infrared (B8) and red (B4) bands.

Monthly median composites were generated for each calendar month, and zonal statistics were applied to extract the median NDVI for each GDE polygon. This time series supports the assessment of vegetation persistence and potential groundwater reliance.

2.1.4.1 NDVI LIMITATIONS

NDVI is not a direct measurement of vegetation health, however strong relationships between in-situ measurements on the ground with satellite derived indices are common in the literature (Higginbottom and Symeonakis, 2014). That said, the application of NDVI to sparsely vegetated areas (typical NDVI values of < 0.1) can be compromised by the soils reflectance signature that can influence or obscure true NDVI values (Higginbottom and Symeonakis, 2014). Those low NDVI levels in the context of this study are indicative of agriculturally degraded land.

2.1.5 GROUNDWATER DRAWDOWN ZONES

The following groundwater bores have been identified for this study (Table 2-6).

Table 2-6 Groundwater bores (GDA 2020 MGA Zone 50)

Bore	Northing mN	Easting mE
WERC015	6284726	585337
WERC006A	6277244	587705

Modelling outputs by Rockwater (2025) were used to determine the extent of groundwater drawdown of greater than 1.0m after 10 years extraction from these bores. In addition, depth to groundwater that is greater than 10m was estimated by Rockwater, based on groundwater elevation data from January 2025 (*pers comms*, Rockwater 2025). These outputs were applied to inform the risk assessment criteria for impacts to GDE.

These results are mapped and presented below in Figure 2-7.

Figure 2-7 Predicted groundwater drawdown of >1.0m after 10 years extraction (blue shaded polygons) and depth to groundwater >10m (dashed cyan polygon; Rockwater, 2025)

2.2 RISK ASSESSMENT

A risk assessment was undertaken to evaluate potential impacts to groundwater-dependent ecosystems (GDE) from proposed groundwater extraction. The assessment combined estimates of consequence (severity of ecological impact; Table 2-7) with likelihood (probability of occurrence over a defined time period; Table 2-8) to determine overall risk (Table 2-9).

Table 2-7 Consequence criteria (DEW, 2020).

Level	Criteria
Catastrophic	Irreversible damage causing permanent widespread decline in ecosystem health and/or habitat quality. Irreversible loss of species or ecological communities having state, national or international importance
Major	Severe impact to ecosystem health and habitat quality over a large area. Substantial impact or decline of species and/or ecological communities having state, national or international importance. Recovery is protracted, uncertain and requires extensive policy and management intervention and resources
Moderate	Severe temporary impacts to ecosystem health and habitat quality over a limited area. Observed impacts to species and/or ecological communities having state, national or international importance. Recovery is feasible with dedicated management intervention and resources.
Minor	Temporary impacts to ecosystem health and habitat quality affecting local area.
Insignificant	Nil or negligible damage or impacts to ecosystem health, habitat quality or species and/or ecological communities

Table 2-8 Likelihood criteria (DEW, 2020)

Category	Description	Likelihood
Rarely	Only occurs in exceptional circumstances	0-5%
Unlikely	Unusual but not exceptional	5-25%
Possible	Less than even chance but not unusual	25-50%
Likely	Greater than even chance but not certain	50-90%
Almost certain	Expected in all circumstances	90-100%

Table 2-9 Matrix of severity and likelihood of impacts used to assess risk of mining activities impact. The combination of severity and probability give the user a risk rank of Low, Moderate and High.

		Likelihood				
		Rarely	Unlikely	Possible	Likely	Almost certain
Severity	**Catastrophic**	M	H	H	H	H
	Major	L	M	M	H	H
	Moderate	L	M	M	M	H
	Minor	L	L	M	M	M
	Insignificant	L	L	L	M	M

2.2.1 IMPACT PATHWAYS

The following impact pathways and outcomes are proposed for the risk assessment (Table 2-10).

Table 2-10 Proposed impact pathways

Impact Driver	Impact Pathway	Potential Outcome
Groundwater extraction	Water table decline leads to reduced discharge to ecosystems	Loss of wetland or vegetation health; decline in GDE function
Climate change	Reduced recharge leads to lower groundwater availability	Long-term decline in GDE resilience; reduced baseflows
Groundwater extraction near surface water	Lowered groundwater levels result in reduced discharge to gaining streams or increased leakage from losing streams	Decrease in surface water availability; impact to water entitlements and riparian GDE
Poor bore construction or decommissioning	Inter-aquifer leakage or confined aquifer blowout	Groundwater pressure loss, contamination risk, or nuisance flooding
Excessive groundwater drawdown in confined aquifers	Depressurisation results in aquifer compaction	Permanent reduction in aquifer storage and transmissivity

3. RESULTS

3.1 GDE ASSESSMENT UNITS

An assessment of mapped aquatic and terrestrial groundwater-dependent ecosystems (GDE) was conducted using national datasets (BoM, 2025). GDE for assessment were defined using the following criteria;

- predicted drawdown is >1.0 m after 10 years extraction, and;
- where depth to groundwater <10 m.

This method of interpretation prioritises GDE in the most potentially groundwater-sensitive areas relevant to mining related activities. Using a spatially resolved approach supports improved risk assessments for ecological vulnerability under groundwater drawdown. Following this approach, four (4) discrete GDE Assessment Units were identified (Table 3-1; Figure 3-1).

Table 3-1 GDE Assessment Units; defined as areas where predicted drawdown is >1.0 m after 10 years extraction and where depth to water <10 m (GDA2020 MGA Zone 50)

GDE Assessment Unit	Centroid (Northing mN)	Centroid (Easting mE)	Area (Ha)
KGP_GDE_AU001	582422	6290524	77.19
KGP_GDE_AU002	585231	6286482	108.61
KGP_GDE_AU003	585355	6284403	181.70
KGP_GDE_AU004	588556	6278120	1,058.46

3.2 GDE ALLOCATION

A total of 21 terrestrial (114.91 ha) and 10 aquatic GDE (137.67 ha) instances were identified across the four discrete GDE Assessment Units (Table 3-2). The GDE classification was derived solely from the national level assessment (BoM 2025). No GDE from regional studies were present in the area, highlighting the limited ecological data coverage for the region. The BOM GDE Atlas incorrectly assigned the disused Dingo mine pit lake as a High Potential Aquatic GDE (3.08 ha). This was excluded from our assessment. In summary;

- All Terrestrial GDE were classified as Low Potential (national level assessment; Figure 3-2)
- Four (4) Aquatic GDE were classified as High Potential, four (4) Moderate Potential and one (1) Low Potential (Figure 3-3).
- No Aquatic GDE were identified in KGP_GDE_AU002 and KGP_GDE_AU003.

Integrated maps presenting the high resolution aerial imagery (Landgate), Terrestrial and Aquatic GDE and the Keighery vegetation condition score are presented in Figure 3-4 to Figure 3-7. Monitoring sites proposed as a precautionary measure to detect impacts to GDEs during groundwater abstraction are presented in Figure 3-2.

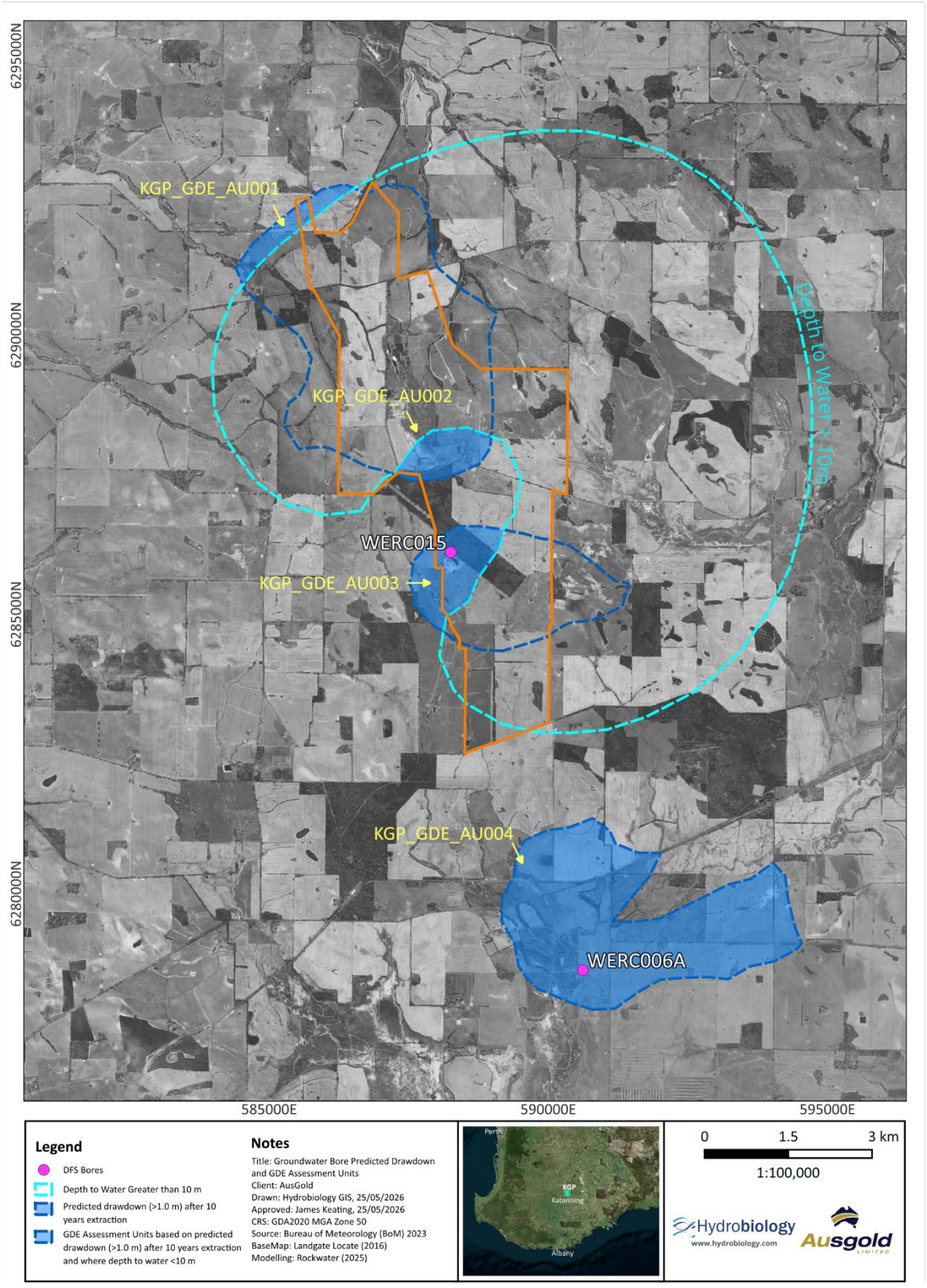

Figure 3-1 Katanning Gold Project GDE Assessment Units (KGP_GDE_AU001 - KGP_GDE_AU004)

Table 3-2 GDE Assessment Units

KGP_GDE_AU001	Terrestrial GDE		Aquatic GDE	
Category	**Count**	**Area**	**Count**	**Area**
High potential GDE	0	0 Ha	2	5.24 Ha
Moderate potential GDE	0	0 Ha	0	0 Ha
Low potential GDE	1	6.19 Ha	0	0 Ha

KGP_GDE_AU002	Terrestrial GDE		Aquatic GDE	
Category	**Count**	**Area**	**Count**	**Area**
High potential GDE	0	0 Ha	0	0 Ha
Moderate potential GDE	0	0 Ha	0	0 Ha
Low potential GDE	2	17.82 Ha	0	0 Ha

KGP_GDE_AU003	Terrestrial GDE		Aquatic GDE	
Category	**Count**	**Area**	**Count**	**Area**
High potential GDE	0	0 Ha	0[1]	0 Ha
Moderate potential GDE	0	0 Ha	0	0 Ha
Low potential GDE	2	52.18 Ha	0	0 Ha

KGP_GDE_AU004	Terrestrial		Aquatic	
Category	**Count**	**Area**	**Count**	**Area**
High potential GDE	0	0 Ha	2	12.98 Ha
Moderate potential GDE	0	0 Ha	4	1.88 Ha
Low potential GDE	16	38.72 Ha	1	114.49 Ha

1 Note that the BOM GDE Atlas has incorrectly assigned the disused Dingo mine pit lake as a High Potential Aquatic GDE. Hydrobiology has excluded this feature from our assessment based on the Landgate aerial imagery (see Figure 3-6)

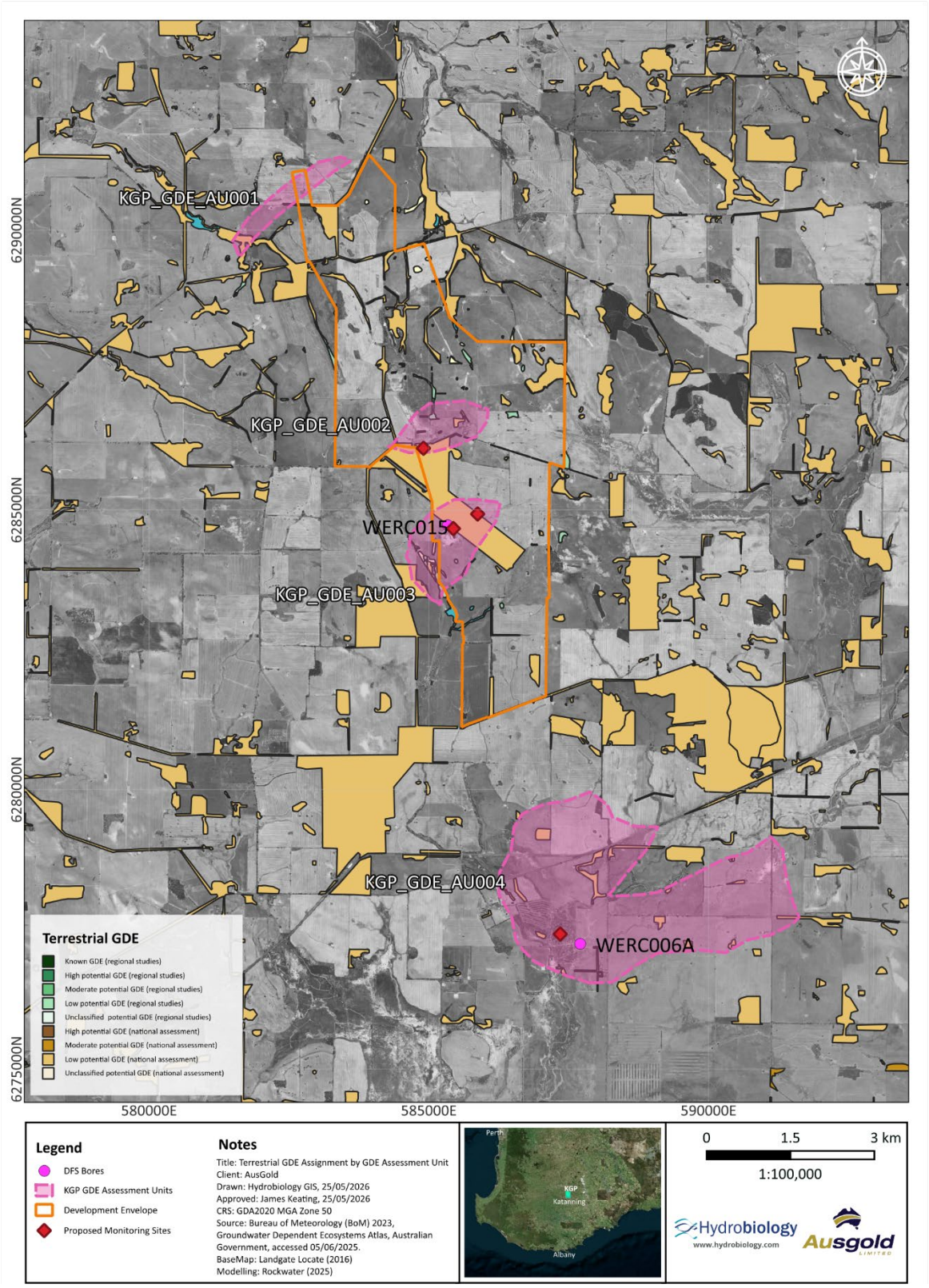

Figure 3-2 Potential Terrestrial GDE assignment for each KGP GDE Assessment Unit (pink filled polygons). Proposed monitoring sites are shown on this figure.

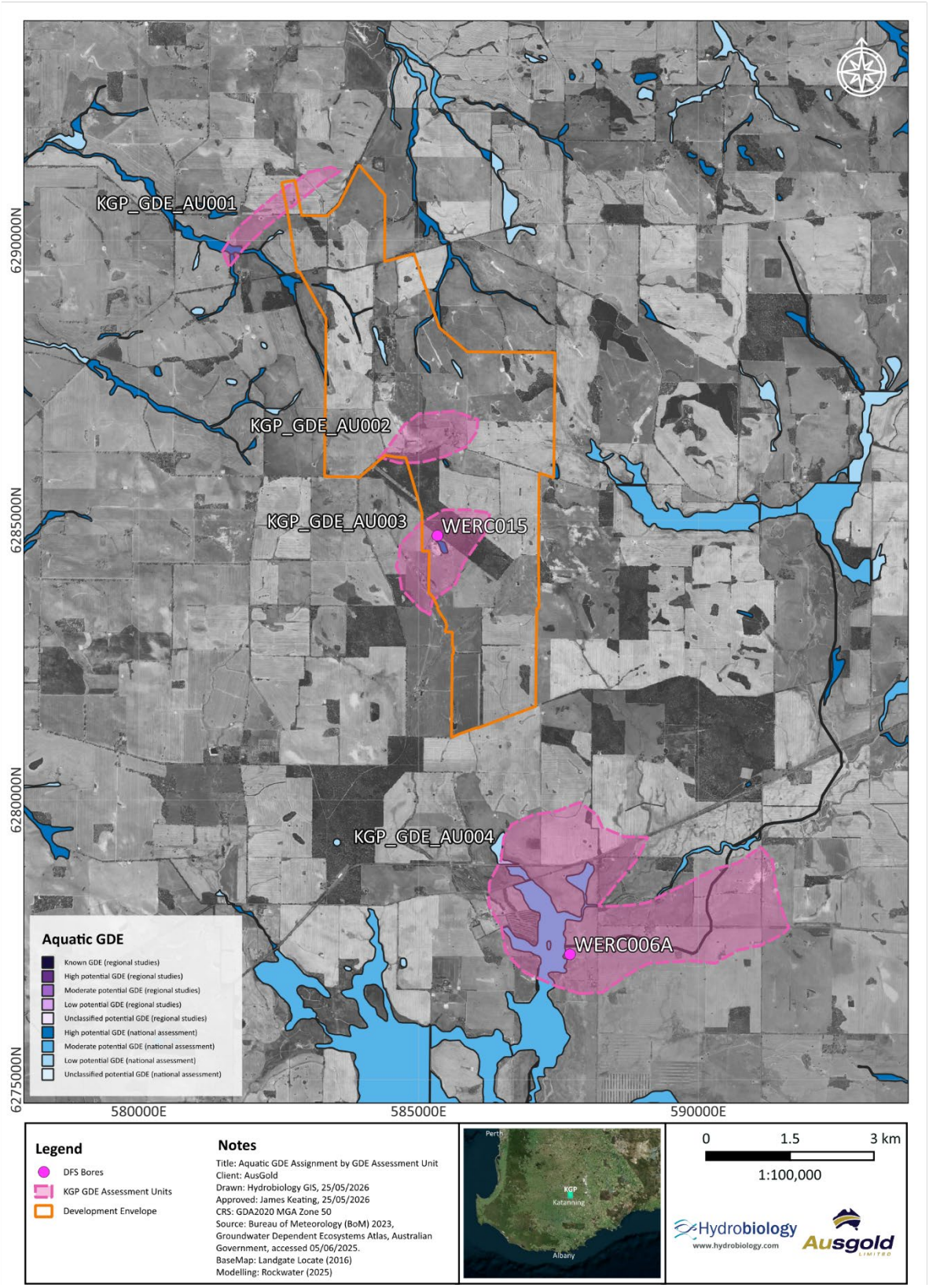

Figure 3-3 Potential Aquatic GDE assignment for each KGP GDE Assessment Unit (pink filled polygons)

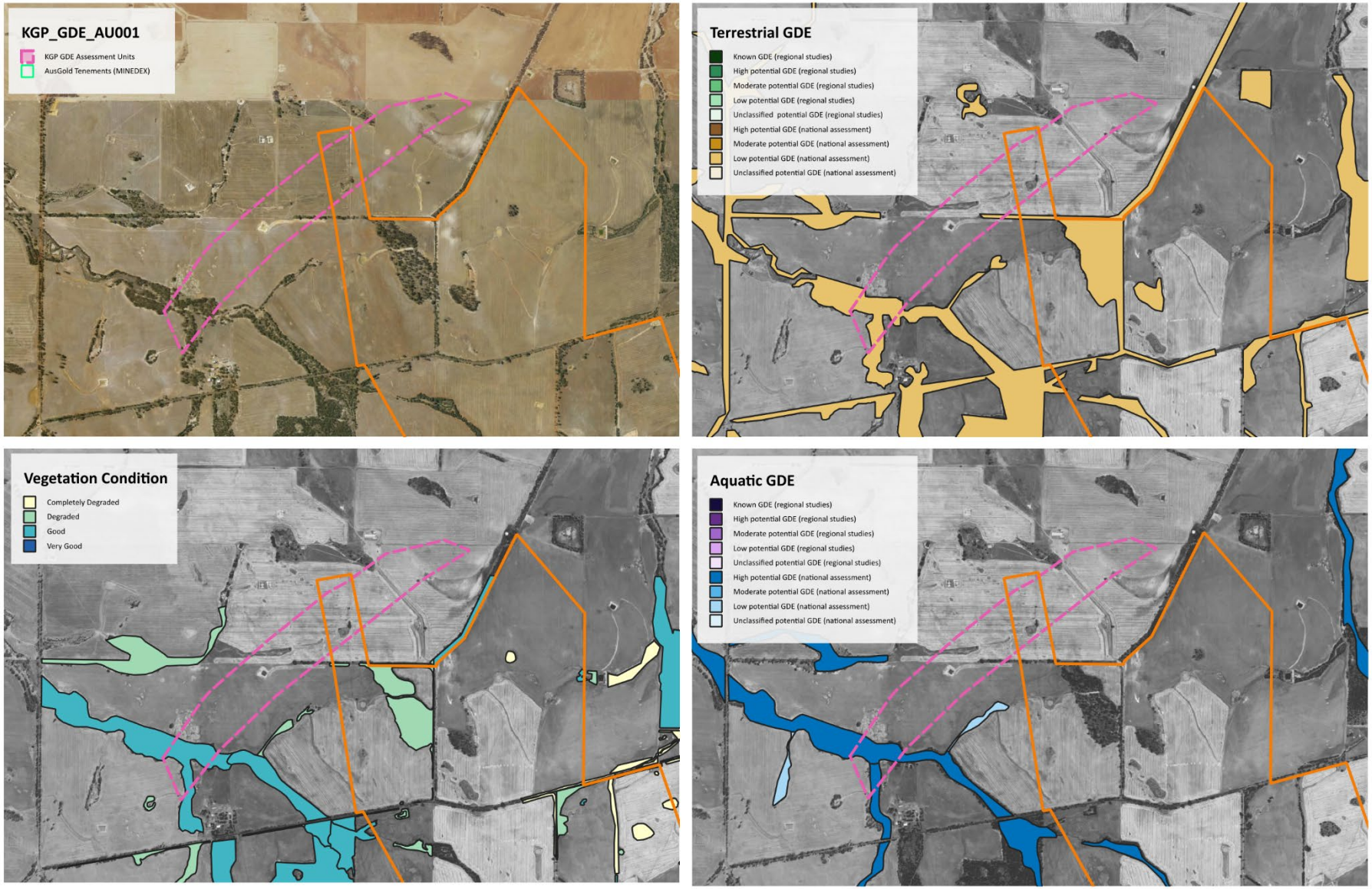

Figure 3-4 Integrated spatial assessment of KGP_GD_AU001 (1:40,000).

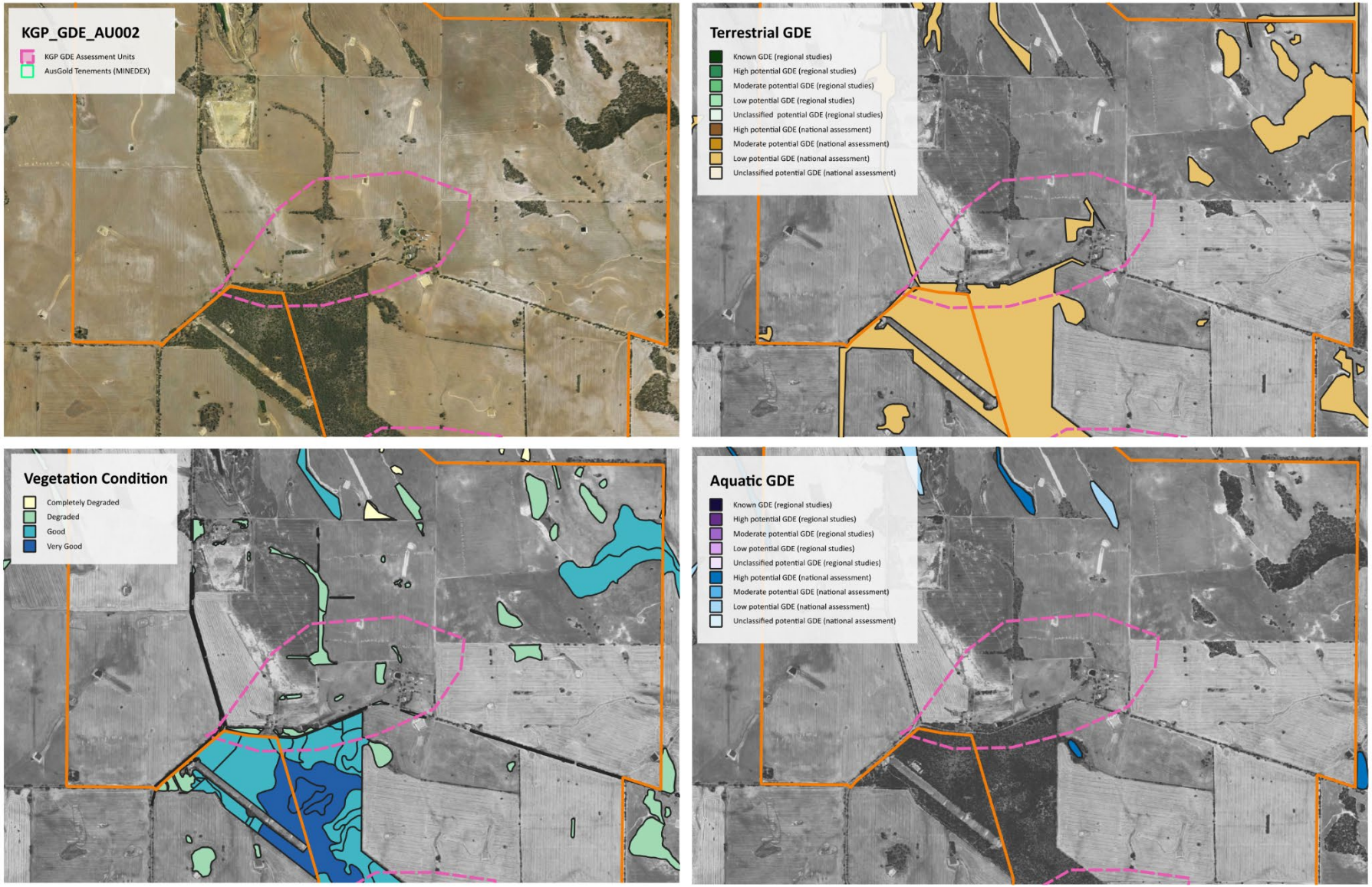

Figure 3-5 Integrated spatial assessment of KGP_GD_AU002 (1:40,000)

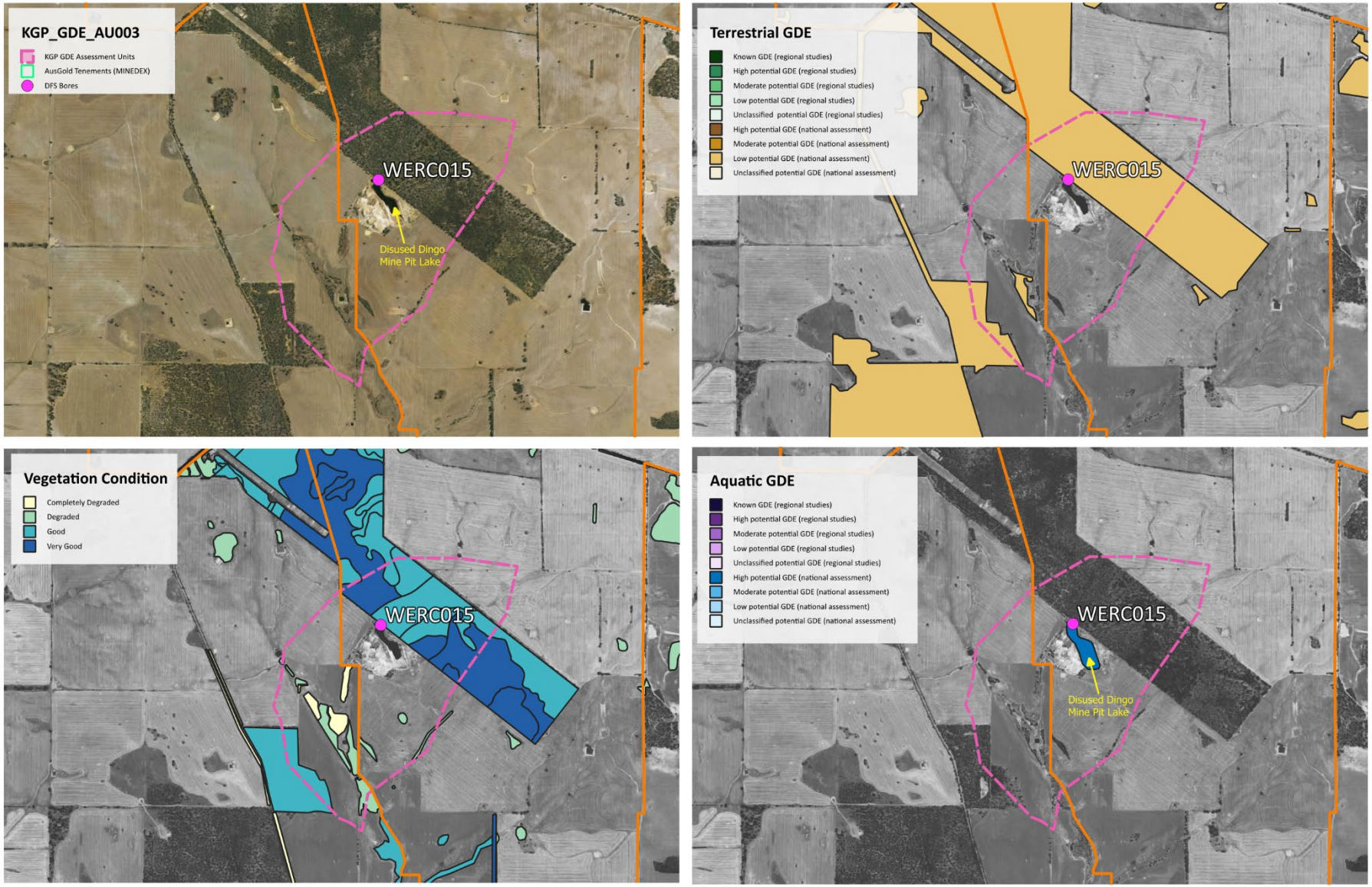

Figure 3-6 Integrated spatial assessment of KGP_GD_AU003 (1:40,000). Note that the BOM GDE Atlas has incorrectly assigned the disused Dingo mine pit lake as a High Potential Aquatic GDE. Hydrobiology has excluded this feature from our assessment based on the Landgate aerial imagery

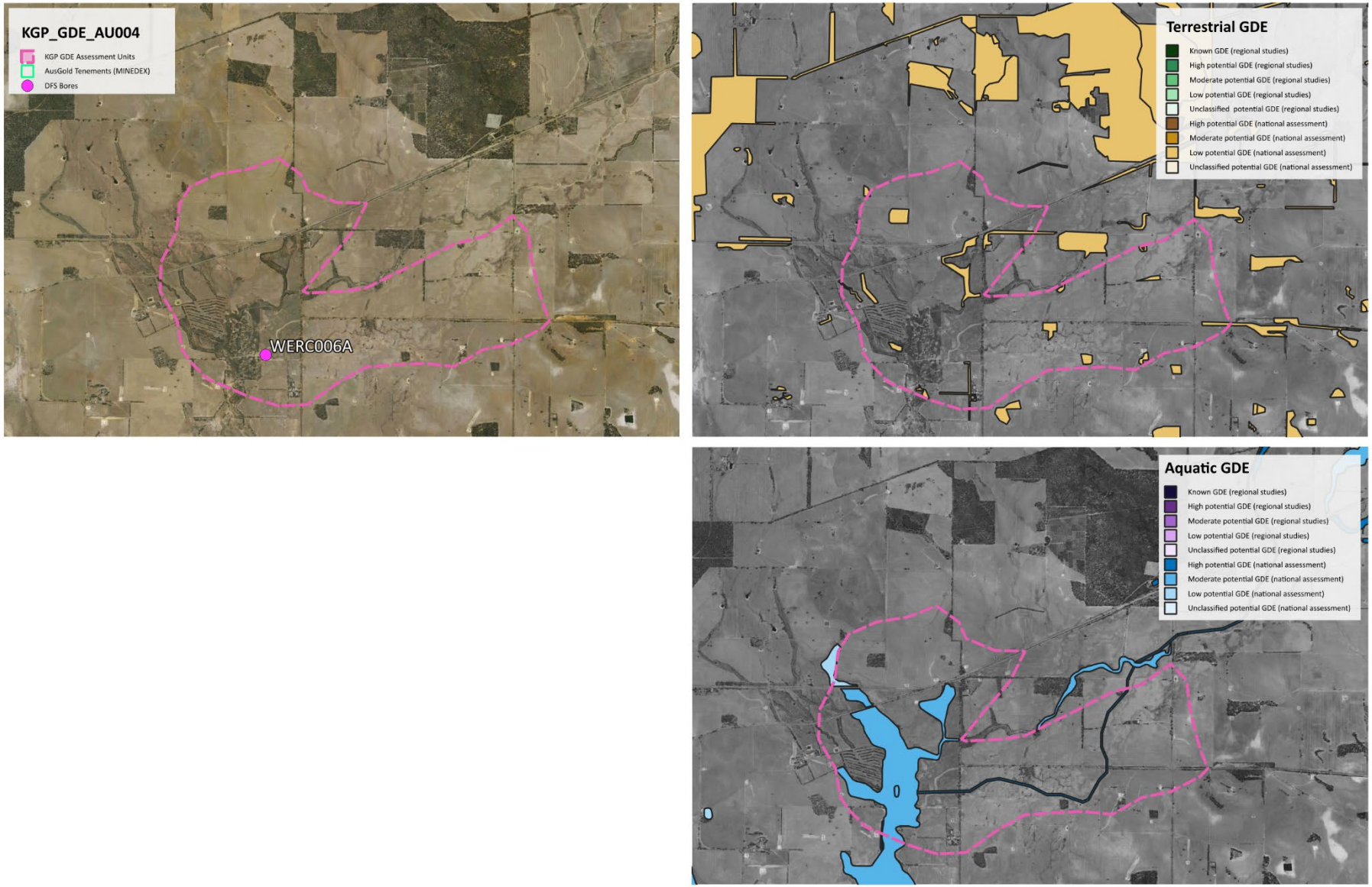

Figure 3-7 Integrated spatial assessment of KGP_GD_AU004 (1:80,000). Note that vegetation condition is not available for this location

3.2.1 TERRESTRIAL GDE SUMMARY

Table 3-3 Terrestrial GDE summary. Vegetation condition provided where data is available (Botanica, 2024).

GDE Assessment Unit	OBJECT ID	Type	Morphology Description	Landscape Description	Bioregional Description	GDE Potential	Area (Ha)	Vegetation Condition
KGP_GDE_AU001	3616137	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	6.19	Good
KGP_GDE_AU002	3088451	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	2.34	Degraded
KGP_GDE_AU002	3112836	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Slope	Katanning	Low	15.48	Very Good
KGP_GDE_AU003	2104069	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	1.83	No Data
KGP_GDE_AU003	3112836	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Slope	Katanning	Low	50.35	Very Good

GDE Assessment Unit	OBJECT ID	Type	Morphology Description	Landscape Description	Bioregional Description	GDE Potential	Area (Ha)	Vegetation Condition
KGP_GDE_AU004	2021519	Shrublands; mallee scrub, Eucalyptus eremophila & black marlock (Eucalyptus redunca)	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Western Mallee	Low	1.12	No Data
KGP_GDE_AU004	2071511	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	1.15	No Data
KGP_GDE_AU004	2110910	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	1.05	No Data
KGP_GDE_AU004	2604676	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	5.15	No Data
KGP_GDE_AU004	2604868	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	0.09	No Data

GDE Assessment Unit	OBJECT ID	Type	Morphology Description	Landscape Description	Bioregional Description	GDE Potential	Area (Ha)	Vegetation Condition
KGP_GDE_AU004	2605006	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	10.19	No Data
KGP_GDE_AU004	2605038	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	0.58	No Data
KGP_GDE_AU004	2605151	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	2.56	No Data
KGP_GDE_AU004	2605184	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	0.68	No Data
KGP_GDE_AU004	2605188	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	1.08	No Data
KGP_GDE_AU004	2605389	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	1.31	No Data

GDE Assessment Unit	OBJECT ID	Type	Morphology Description	Landscape Description	Bioregional Description	GDE Potential	Area (Ha)	Vegetation Condition
KGP_GDE_AU004	2622437	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	1.87	No Data
KGP_GDE_AU004	2632392	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	3.07	No Data
KGP_GDE_AU004	3068570	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	4.12	No Data
KGP_GDE_AU004	3611392	Medium woodland; wandoo, York gum & morrell	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	2.87	No Data
KGP_GDE_AU004	3620288	Shrublands; mallee scrub, Eucalyptus eremophila & black marlock (Eucalyptus redunca)	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Western Mallee	Low	1.83	No Data

3.2.2 AQUATIC GDE SUMMARY

Table 3-4 Aquatic GDE summary. Vegetation condition provided where data is available (Botanica, 2024).

GDE Assessment Unit	OBJECT ID	Type	Morphology Description	Landscape Description	Bioregional Description	GDE Potential	Area (Ha)	Vegetation Condition
KGP_GDE_AU001	1039986	Wetland	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	High	1.21	Good
KGP_GDE_AU001	1070665	Wetland	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	High	4.03	Good
KGP_GDE_AU003	1065119	Wetland	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Slope	Katanning	High	3.08	Completely Degraded
KGP_GDE_AU004	750957	River	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	High	0.35	No Data
KGP_GDE_AU004	799928	Wetland	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Low	1.88	No Data
KGP_GDE_AU004	924598	River	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	High	12.63	No Data

GDE Assessment Unit	OBJECT ID	Type	Morphology Description	Landscape Description	Bioregional Description	GDE Potential	Area (Ha)	Vegetation Condition
KGP_GDE_AU004	1000462	Wetland	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Moderate	0.12	No Data
KGP_GDE_AU004	1038381	Wetland	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Moderate	5.7	No Data
KGP_GDE_AU004	1044627	Wetland	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Moderate	0.87	No Data
KGP_GDE_AU004	1063857	Wetland	Gently undulating surface of sandplains and ferruginous divides; stripped granitic slopes; and broad valley floors with salt lake chains.	Low Lying	Katanning	Moderate	107.8	No Data

3.3 VEGETATION CONDITION AND ARIDITY ASSESSMENT

3.3.1 TERRESTRIAL GDE

Median NDVI values per month, per GDE were extracted and plotted (Figure 3-8). A substantial decrease in NDVI was observed when comparing the 2020-2021 period with the 2022-2024 period. This aligned with the Aridity Index for the same period of time (Figure 3-9). A Mann–Whitney U test was used to assess differences in median NDVI for terrestrial GDE (n=21) between the hypothesised non-drought (2020–2021) and drought periods (2022–2024). The analysis revealed a statistically significant reduction in NDVI during 2022–2024 (U = 299,385, $p < 0.001$; Appendix B), indicating a marked decline in vegetation vigour with increased aridity and water stress.

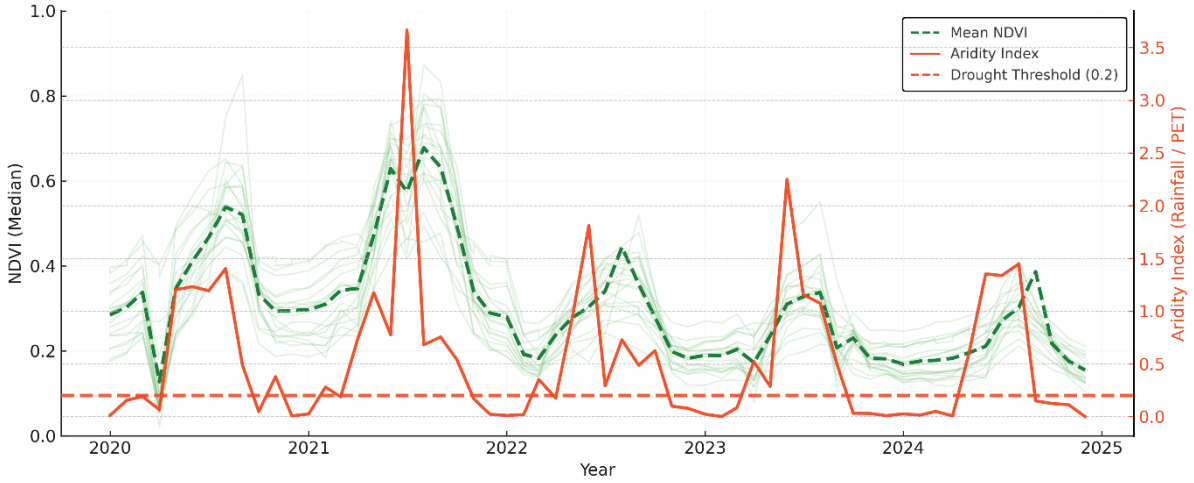

Figure 3-8 Median NDVI per month (2020-2025) for all potentially Terrestrial GDE polygons (n = 21). Aridity Index overlaid for reference.

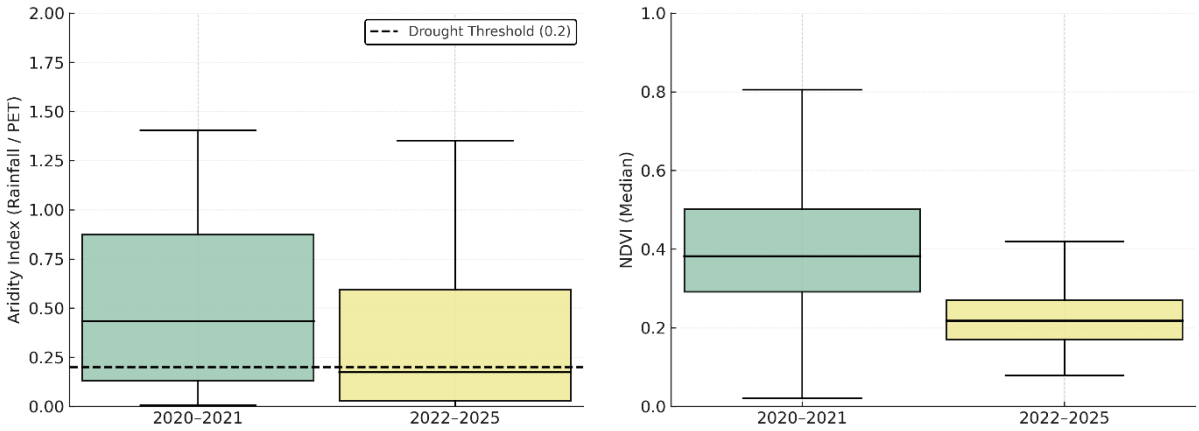

Figure 3-9 boxplots showing the distribution of data for the Aridity Index (left) and potentially Terrestrial GDE NDVI (right). The data is divided temporally into the hypothesised non-drought (2020-2021; median aridity index > 0.2) and drought (2022-2025; median aridity index < 0.2) periods.

3.3.2 AQUATIC GDE

Aquatic GDE presented a similar relationship to aridity as for the Terrestrial GDE, when comparing the 2020-2021 period with 2022-2024 (Figure 3-10 and Figure 3-11). A Mann–Whitney U test was used to assess differences in median NDVI for aquatic GDE (n=9) between the hypothesised non-drought (2020–2021) and drought periods (2022–2024). The analysis revealed a statistically significant reduction in NDVI during 2022–2024 (U = 48,937, p < 0.001; Appendix B), indicating a marked decline in vegetation vigour consistent with increased aridity during that period.

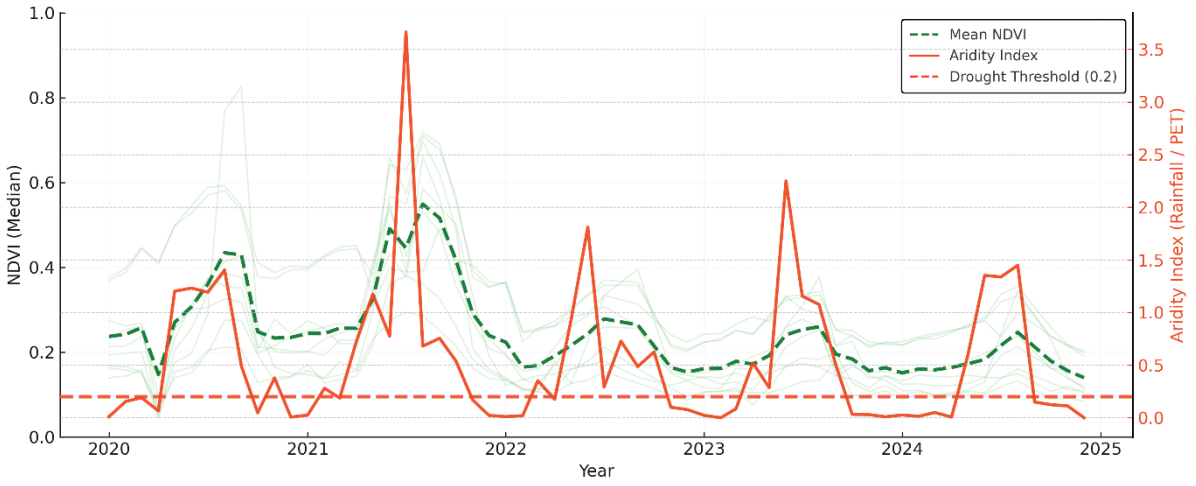

Figure 3-10 Median NDVI per month (2020-2025) for all potentially Aquatic GDE polygons (n = 9). Aridity Index overlaid for reference.

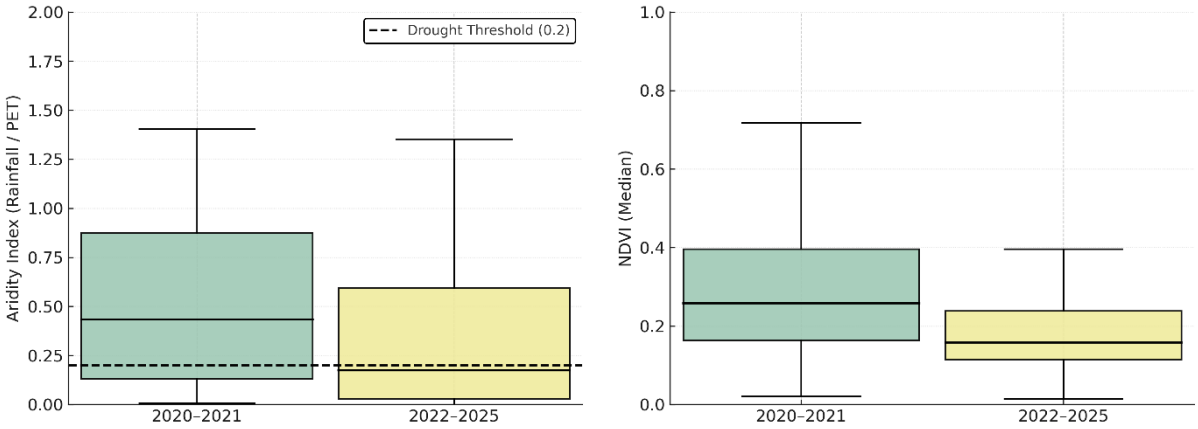

Figure 3-11 Boxplots showing distribution of data for the Aridity Index (left) and potentially Aquatic GDE NDVI (right). The data is divided temporally into the hypothesised non-drought (2020-2021; median aridity index > 0.2) and drought (2022-2025; median aridity index < 0.2) periods.

3.3.2.1 HIGH POTENTIAL AQUATIC GDE

Four (4) High Potential Aquatic GDE were identified and assessed in further detail due to their classification (Table 3-5,

Figure 3-15 GDE Assessment Unit KGP_GDE_AU001 field observations found standing water within a creekline (looking upstream). It is surrounded by open woodland vegetation and adjacent to land cleared for agriculture.

Table 3-6). A descriptive analysis of aerial imagery was augmented with a 5-year assessment of NDVI (2020-2025) to confirm vegetation conditions and/or inferences from GDE/groundwater drawdown interactions.

Table 3-5 Review of High Potential Aquatic GDE (KGP_GDE_AU001)

Assessment Unit/Object ID	Vegetation Condition Assessment	Botanica Description (2024)	Description from Aerial Imagery	NDVI
KGP_GDE_AU001 1039986 1070665	Good Sept 2023	*Eucalyptus loxophleba* low open woodland over *Acacia acuminata* tall sparse shrubland over mixed paddock species	Object IDs 1039986 and 1070665 appear to represent the same vegetation unit (Figure 3-12). They were likely split incorrectly as an artefact of the low quality of the national-level GDE assessment. This GDE appears to follow a dry creekline in the imagery, with extensive agricultural buildings to the SE. Some agricultural objects or infrastructure appear to be located under the canopy. Extensive tracks have been cleared around and through the polygons.	The 5-year NDVI monthly time series for Object ID 924598 concur with the aridity index analysis (Figure 3-13). Vegetation vigour appears reduced in the period described as a drought conditions (2022-2025). Therefore, it is likely that these GDE are not accessing groundwater. The strong seasonal signal also infers surface layer soil moisture is driving vegetation vigour more so than deep groundwater aquifers.

Figure 3-12 Aerial imagery of High Potential GDE identified in GDE Assessment Unit KGP_GDE_AU001 (Object ID 1039986 and 1070665)

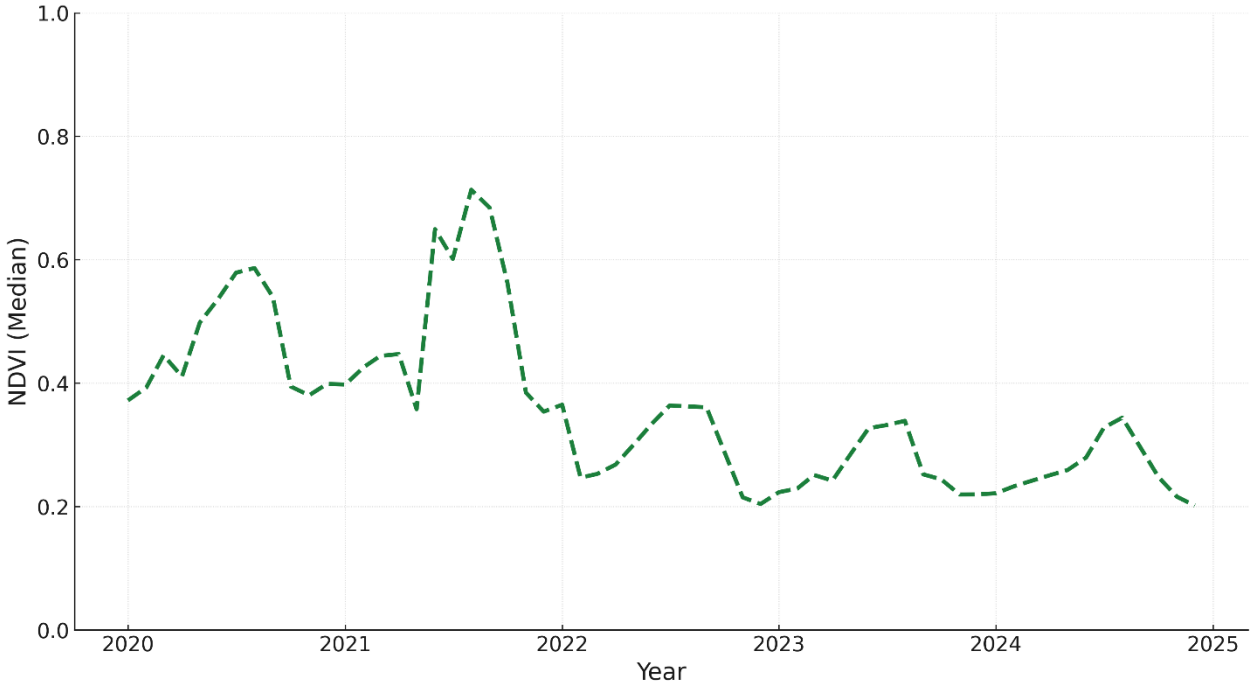

Figure 3-13 5-year monthly NDVI time-series for combined High Potential GDE 1039986 and 1070665.

Access restrictions meant field observations could not be made directly at the site. Consequently, observations are of a site where groundwater is modelled to be greater than 10 m downstream of GDE Assessment Unit KGP_GDE_AU001. Photos of the site downstream of this assessment unit are presented in Figure 3-14 and Figure 3-15.

Figure 3-14 GDE Assessment Unit KGP_GDE_AU001 field observations revealed open woodland vegetation and cleared agricultural land adjacent to the native vegetation.

Figure 3-15 GDE Assessment Unit KGP_GDE_AU001 field observations found standing water within a creekline (looking upstream). It is surrounded by open woodland vegetation and adjacent to land cleared for agriculture.

Table 3-6 Review of High Potential Aquatic GDE (KGP_GDE_AU004)

Assessment Unit/Object ID	Vegetation Condition Assessment	Botanica (2024) Description	Description from Aerial Imagery	NDVI
KGP_GDE_AU004 924598 750957	No Data	None	Object ID 924598 The GDE polygon appears to follow a narrow band of cleared agricultural land (Figure 3-16). This GDE is almost entirely devoid of natural vegetation and is likely due to the poor quality of the national-level GDE assessment. Object ID 750957 The GDE polygon abuts the edge of the modelled contour where predicted groundwater drawdown of >1.0m after 10 years extraction (Figure 3-17). The entire polygon is within 150m of this boundary. The vegetation appears to be remnant eucalypt, and is within proximity of an agricultural dam. The nearby waterway appears to be heavily modified, possibly to provide a drain into the dam.	The 5-year NDVI monthly time series for Object ID 924598 concur with the aridity index analysis (Figure 3-18). Vegetation vigour appears reduced in the period described as a drought conditions (2022-2025). Therefore, it is likely that these GDE are not accessing groundwater. The strong seasonal signal also infers surface layer soil moisture is driving vegetation vigour more so than deep groundwater aquifers. Although Object ID 924598 appears devoid of vegetation in the Landgate aerial imagery, the 5-year NDVI time series would infer healthy vegetation (Figure 3-19). This may be due to the type of crops being cultivated during the period. A cursory review of historical imagery (Google Earth) does not differ from the Landgate Imagery. The NDVI time-series for Object ID 750957 does not display the same seasonal signal as for other GDE polygons. This may indicate this vegetation is groundwater dependent.

Figure 3-16 Aerial imagery of High Potential GDE identified in GDE Assessment Unit KGP_GDE_AU004

Field observations of GDE Assessment Unit KGP_GDE_AU004 suggest that the modelled location of the potential GDE is not accurate, given the linear shape suggests it is a watercourse, yet no drainage lines or channels were discernable. Figure XXX and Figure XXX show the landscape context for Object ID 924598.

Salt-tolerant species such as Atriplex spp. were observed.

Figure shows land cleared for agriculture, short shrubland, and woodland to the back.

Figure shows land cleared for agriculture, a dried out tree, and a tree on the edge of the road next to small shrubs.

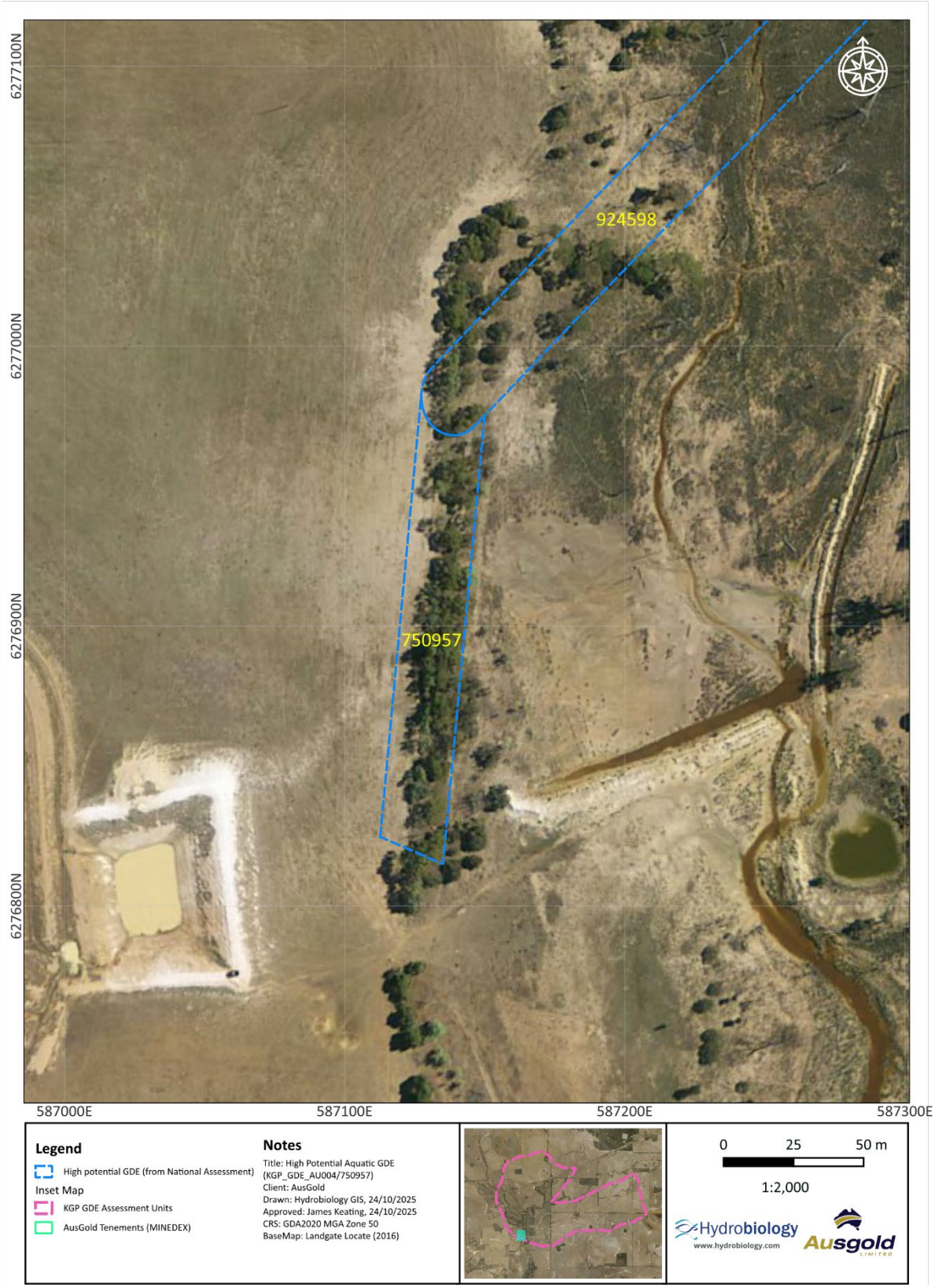

Figure 3-17 Aerial imagery of High Potential GDE identified in GDE Assessment Unit KGP_GDE_AU004 (Object ID 750957)

Field observations of Object ID 750957 are presented in Figure XXX and Figure XXX.

KGP
Veg
11.11.2025 16:02
-33.64105, 117.94381 (±6m)
Altitude: 258m
S

KGP
Veg
11.11.2025 16:02
-33.64105, 117.94419 (±6m)
Altitude: 258m
SW

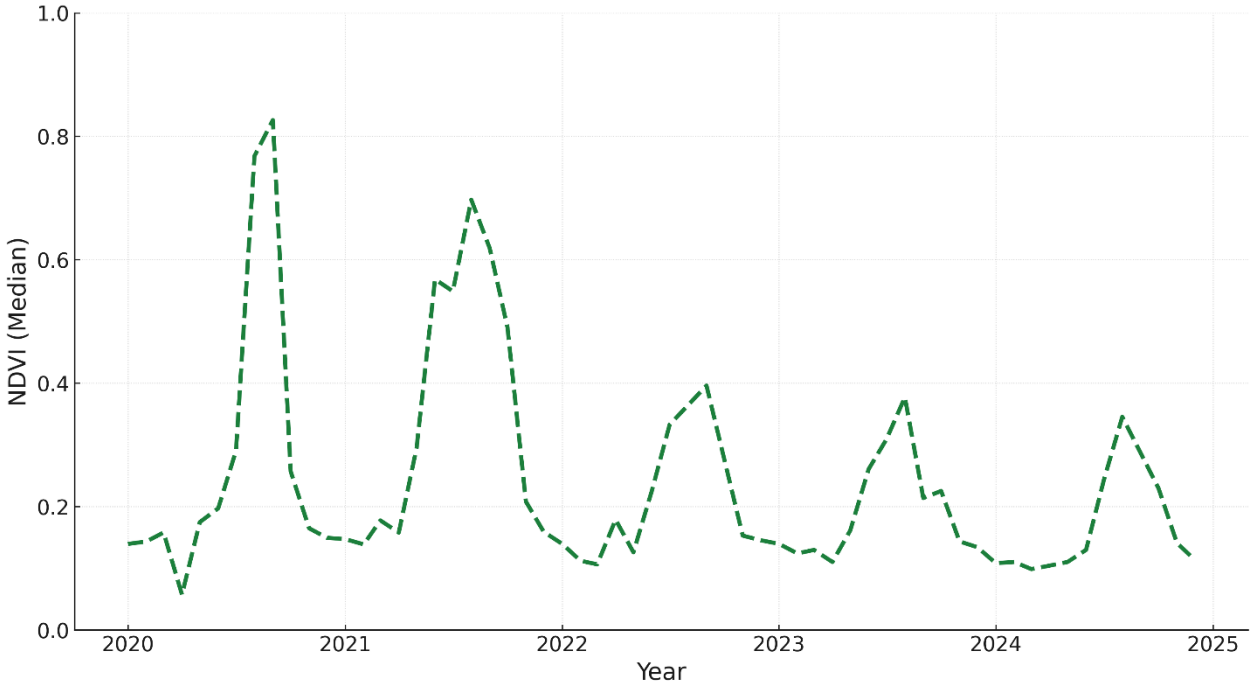

Figure 3-18 5-year monthly NDVI time-series for High Potential GDE 924598

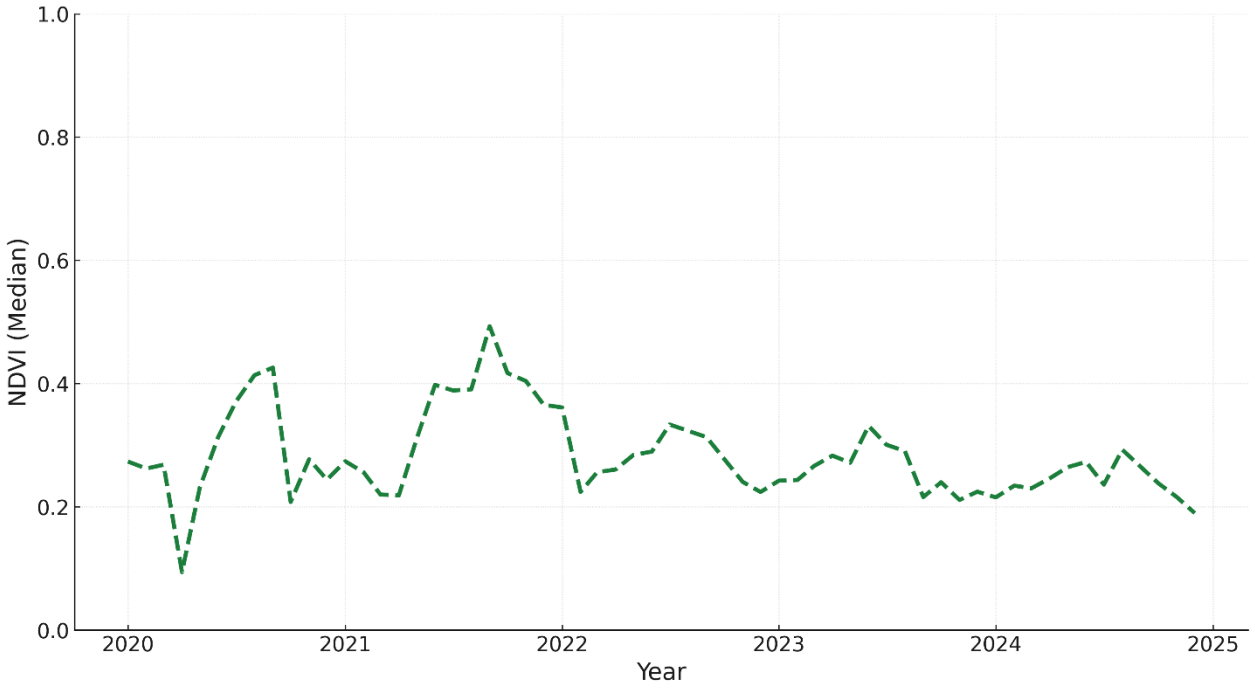

Figure 3-19 5-year monthly NDVI time-series for High Potential GDE 750957

3.4 GDE RISK ASSESSMENT

A risk assessment, based on the findings of our analysis is presented on the following page.

	Initial Assessment Ratings				Revised Assessment		
Potential impact	**Severity**	**Likelihood**	**Risk**	**Mitigations**	**Severity**	**Likelihood**	**Risk**
Climate change is expected to reduce groundwater recharge, leading to lower water availability and long-term declines in GDE resilience and stream baseflows.	Moderate	Possible	**M**	KGP groundwater drawdown limited to lifetime of the mine (current estimate is 10 years) Only Low Potential Terrestrial GDE were identified within the area where predicted drawdown is >1.0 m after 10 years extraction, and where depth to groundwater <10 m. High Potential Aquatic GDE were also identified, but only 1 was determined to be likely to be a true GDE. This was located on the boundary of the area where predicted drawdown is >1.0 m after 10 years extraction, and where depth to groundwater <10 m. A clay-rich soil layer potentially prevents roots from accessing deeper aquifers tapped by mining (DeSilva et al. 2000). Instead, vegetation may rely on shallow soil moisture from rainfall, making it unlikely to be impacted by groundwater abstraction unless drawdown is extreme or sustained (Zencich et al., 2002; O'Grady et al., 2006). This hypothesis is supported by an assessment of aridity (drought periods) and vegetation vigour (NDVI).	Moderate	Unlikely	**M**
Groundwater extraction near surface water can lower water tables, reducing discharge to gaining streams or increasing losses from losing streams, ultimately decreasing surface water availability to riparian GDE	Moderate	Likely	**M**	A clay-rich soil layer potentially prevents roots from accessing deeper aquifers tapped by mining (DeSilva et al. 2000). Instead, vegetation may rely on shallow soil moisture from rainfall, making it unlikely to be impacted by groundwater abstraction unless drawdown is extreme or sustained (Zencich et al., 2002; O'Grady et al., 2006). This hypothesis is supported by an assessment of aridity (drought periods) and vegetation vigour (NDVI).	Minor	Unlikely	**L**
Poor bore construction or decommissioning can cause aquifer leakage or blowouts, leading to pressure loss, contamination, or flooding.	Major	Unlikely	**M**	Bore construction to meet rigorous engineering standards. Non-artesian bores.	Major	Rarely	**L**

	Initial Assessment Ratings				Revised Assessment		
Excessive drawdown in confined aquifers can cause depressurisation and compaction, leading to permanent loss of storage and transmissivity.	Major	Unlikely	**M**	A clay-rich soil layer potentially prevents roots from accessing deeper aquifers tapped by mining (DeSilva et al. 2000). Instead, vegetation may rely on shallow soil moisture from rainfall, making it unlikely to be impacted by groundwater abstraction unless drawdown is extreme or sustained (Zencich et al., 2002; O'Grady et al., 2006). This hypothesis is supported by an assessment of aridity (drought periods) and vegetation vigour (NDVI).	Moderate	Unlikely	**M**

4. CONCLUSIONS

This desktop assessment integrated national-scale GDE mapping, groundwater drawdown zone proximity, and time-series NDVI analysis to identify and evaluate potential groundwater-dependent ecosystems near key bore locations.

A total of 21 terrestrial (114.91 ha) and 10 aquatic GDE (137.67 ha) instances were identified and assessed. Of these, all Terrestrial GDE were classified as Low Potential. Four Aquatic GDE were classified as High Potential, four Moderate Potential and one Low Potential. Of the four High Potential Aquatic GDE, only one was assessed to be an obligate GDE, however its location on the boundary of the area meeting the assessment criteria (where predicted drawdown is >1.0 m after 10 years extraction, and where depth to groundwater <10 m) reduces the risk. Most terrestrial and aquatic GDE across the study area were in close proximity to intensive agricultural operations or infrastructure. As a precautionary measure, it is proposed that 4 monitoring sites are established to detect potential ecological impacts as a result of groundwater abstraction, which are shown in Figure 3-2.

Vegetation health indices showed a statistically significant decline between 2020–2021 when compared with 2022–2024, corresponding with increased aridity, indicating potential ecological stress. Both terrestrial and aquatic GDE exhibited similar NDVI-aridity relationships, reinforcing the sensitivity of these systems to reduced water availability. This may indicate that these vegetation units are not true GDE, but instead display a more phreatophytic life cycle. Overall, we assigned a moderate-low risk from hypothesised impact pathways related to capital groundwater abstraction for the operation of KGP.

Our findings support a precautionary approach to managing potential groundwater impacts and highlight the value of integrated spatial and temporal assessments in ecological risk evaluations.

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APPENDIX A. ARIDITY INDEX

Table 5-1 Monthly Potential Evapotranspiration (PET), Rainfall (mm) and Aridity Index

year	Month	PET (mm)	Rainfall (mm)	Aridity Index
2010	1	207.7	1.2	0.01
2010	2	168.7	30	0.18
2010	3	129.4	41.2	0.32
2010	4	87.3	4.8	0.05
2010	5	59.8	28.6	0.48
2010	6	39.7	39.4	0.99
2010	7	41	N/A	N/A
2010	8	55.6	N/A	N/A
2010	9	85.4	N/A	N/A
2010	10	141.1	7.6	0.05
2010	11	169.7	23	0.14
2010	12	172	7	0.04
2011	1	196.1	98	0.50
2011	2	141.5	1.8	0.01
2011	3	146.9	4.6	0.03
2011	4	95.9	27.2	0.28
2011	5	57.2	46.8	0.82
2011	6	39.8	71.8	1.80
2011	7	37.2	61.4	1.65
2011	8	56.7	58.8	1.04
2011	9	72.7	62	0.85
2011	10	111.2	76.8	0.69

year	Month	PET (mm)	Rainfall (mm)	Aridity Index
2011	11	150.4	76.4	0.51
2011	12	171.8	82.8	0.48
2012	1	191.5	67	0.35
2012	2	151.5	14.4	0.10
2012	3	147.6	3.6	0.02
2012	4	93.6	13.4	0.14
2012	5	59.4	39.4	0.66
2012	6	39.9	83.2	2.09
2012	7	45.2	22.8	0.50
2012	8	57.8	48.2	0.83
2012	9	82.8	71.6	0.86
2012	10	136.9	10.8	0.08
2012	11	155.4	28.4	0.18
2012	12	200.9	78.2	0.39
2013	1	201.6	35.4	0.18
2013	2	173.3	2.2	0.01
2013	3	108.6	66.4	0.61
2013	4	89.7	8.4	0.09
2013	5	49.8	71.2	1.43
2013	6	38.3	19.4	0.51
2013	7	41.2	49.2	1.19
2013	8	51.5	N/A	N/A
2013	9	73.7	123.6	1.68

year	Month	PET (mm)	Rainfall (mm)	Aridity Index
2013	10	126.5	30.2	0.24
2013	11	165.7	3.2	0.02
2013	12	199.5	2	0.01
2014	1	212.9	0.4	0.00
2014	2	164.5	0	0.00
2014	3	143.6	1.8	0.01
2014	4	94.5	18.8	0.20
2014	5	46.2	91.8	1.99
2014	6	41.7	35.2	0.84
2014	7	39.3	81.6	2.08
2014	8	58.1	72.2	1.24
2014	9	80.9	58.4	0.72
2014	10	127.9	52.4	0.41
2014	11	158.5	20.2	0.13
2014	12	190.3	6.6	0.03
2015	1	207.9	1	0.00
2015	2	162.1	1.8	0.01
2015	3	129	19.6	0.15
2015	4	82.1	N/A	N/A
2015	5	54.8	31.2	0.57
2015	6	40.8	70.4	1.73
2015	7	41.8	36.8	0.88
2015	8	52.5	56.2	1.07

year	Month	PET (mm)	Rainfall (mm)	Aridity Index
2015	9	90.3	25.4	0.28
2015	10	145.5	17.6	0.12
2015	11	168.3	13	0.08
2015	12	194.8	34.2	0.18
2016	1	171.1	N/A	N/A
2016	2	172.1	1.2	0.01
2016	3	120.9	86.4	0.71
2016	4	69.1	36.6	0.53
2016	5	47.9	56.4	1.18
2016	6	34.8	35.4	1.02
2016	7	38.8	39	1.01
2016	8	48.5	55.8	1.15
2016	9	68.1	33	0.48
2016	10	114.2	29.4	0.26
2016	11	161.7	8.2	0.05
2016	12	181	55.4	0.31
2017	1	202.5	0.2	0.00
2017	2	131	172.8	1.32
2017	3	120.2	39	0.32
2017	4	84.9	22.2	0.26
2017	5	58.1	32	0.55
2017	6	48.3	10.4	0.22
2017	7	37.7	73.4	1.95

year	Month	PET (mm)	Rainfall (mm)	Aridity Index
2017	8	53.8	48.2	0.90
2017	9	77.9	57.8	0.74
2017	10	117.9	30.8	0.26
2017	11	158.3	N/A	N/A
2017	12	185.5	N/A	N/A
2018	1	182.4	N/A	N/A
2018	2	144.6	N/A	N/A
2018	3	135.2	N/A	N/A
2018	4	86.4	N/A	N/A
2018	5	67.4	N/A	N/A
2018	6	37.8	59.2	1.57
2018	7	43.1	62	1.44
2018	8	51.3	68.2	1.33
2018	9	79.5	12	0.15
2018	10	111.8	30	0.27
2018	11	142.2	18.6	0.13
2018	12	193.2	8.2	0.04
2019	1	198.4	1	0.01
2019	2	163.5	0	0.00
2019	3	124.2	43.2	0.35
2019	4	89.2	15.2	0.17
2019	5	59.5	17.8	0.30
2019	6	44	83.2	1.89

year	Month	PET (mm)	Rainfall (mm)	Aridity Index
2019	7	43	50.4	1.17
2019	8	59.7	59	0.99
2019	9	91.9	19.8	0.22
2019	10	127.3	25.6	0.20
2019	11	168.4	9	0.05
2019	12	217.3	6.8	0.03
2020	1	191.8	2	0.01
2020	2	149.7	23.2	0.15
2020	3	130.2	24.8	0.19
2020	4	91.8	6	0.07
2020	5	61.4	73.8	1.20
2020	6	47.9	59	1.23
2020	7	45.1	53.8	1.19
2020	8	57	80	1.40
2020	9	83.9	41	0.49
2020	10	131.2	6.2	0.05
2020	11	140.7	53.2	0.38
2020	12	194.6	1.2	0.01
2021	1	192.8	4.8	0.02
2021	2	143.2	40	0.28
2021	3	128.1	24	0.19
2021	4	85.5	62.4	0.73
2021	5	52.1	61.2	1.17

year	Month	PET (mm)	Rainfall (mm)	Aridity Index
2021	6	34.6	26.8	0.77
2021	7	37	135.6	3.66
2021	8	53.5	36.4	0.68
2021	9	76.6	57.8	0.75
2021	10	103	55.6	0.54
2021	11	141.6	23.8	0.17
2021	12	188.9	4.2	0.02
2022	1	196.2	2	0.01
2022	2	167.8	3.2	0.02
2022	3	117.7	41.4	0.35
2022	4	77.6	13.6	0.18
2022	5	55	50.8	0.92
2022	6	34.8	63	1.81
2022	7	41.1	12	0.29
2022	8	52.2	38	0.73
2022	9	78.1	38	0.49
2022	10	102.8	64.2	0.62
2022	11	133.6	13.2	0.10
2022	12	180.2	14	0.08
2023	1	193.5	4.4	0.02
2023	2	158	0	0.00
2023	3	131.7	11.2	0.09
2023	4	73.3	38.2	0.52

year	Month	PET (mm)	Rainfall (mm)	Aridity Index
2023	5	59.4	17	0.29
2023	6	33.7	75.8	2.25
2023	7	42.4	49	1.16
2023	8	55.6	59.8	1.08
2023	9	86.7	43.2	0.50
2023	10	138.3	4.4	0.03
2023	11	155.9	4.6	0.03
2023	12	182.8	1.6	0.01
2024	1	192.4	5	0.03
2024	2	175.5	2.4	0.01
2024	3	129.2	6.4	0.05
2024	4	93.4	0.6	0.01
2024	5	66.8	39.6	0.59
2024	6	39.5	53.4	1.35
2024	7	43.2	57.8	1.34
2024	8	55.8	80.8	1.45
2024	9	83.2	12.4	0.15
2024	10	133.8	16.6	0.12
2024	11	146.7	16.4	0.11
2024	12	192.7	0	0.00
2025	1	205.5	8.4	0.04
2025	2	156.7	2.4	0.02
2025	3	148.1	39.8	0.27

year	Month	PET (mm)	Rainfall (mm)	Aridity Index
2025	4	81.8	39.6	0.48
2025	5	63.4	13.2	0.21
2025	6	9.6	N/A	N/A

APPENDIX B. STATISTICAL ANALYSES

STATISTICAL APPROACH

Drought (2020-2021) and non-drought periods (2022-2024) were defined a-priori based on a review of the Aridity index, and considering the drought threshold (0.2).

To test whether vegetation condition changed between periods of contrasting aridity, we applied the Mann–Whitney U (Wilcoxon rank-sum) tests to monthly NDVI medians for two periods: 2020–2021 (non-drought) and 2022–2024 (drought). Analyses were run separately for terrestrial and aquatic GDE assessment units. As noted in the report, the BOM GDE Atlas incorrectly allocated the disused Dingo mine pit lake as a High Potential Aquatic GDE. This feature has been excluded from the analyses (OBJECTID 1065119). The test is non-parametric, does not assume normality, and compares the central tendency of two independent samples; when distributional shapes are similar, it is commonly interpreted as a test of median differences.

Both comparisons show statistically significant and substantively large reductions in NDVI during 2022–2024 ($p < 0.001$ in both cases), consistent with reduced vegetation vigour under increased aridity. We report the U statistic, two-sided p-value, sample sizes, group medians, and the rank-biserial correlation (effect size; negative values indicate lower NDVI in 2022–2024; Table 5-2).

Statistical analyses were carried out in R (R Core Team, 2025).

Table 5-2 Statistical results for the Mann–Whitney U (Wilcoxon rank-sum) tests

Dataset	Non-Drought Period	Sample Size	Median NDVI	Drought Period	Sample Size	Median NDVI	U	p-value	Effect size (Rank-biserial r)
Terrestrial NDVI	2020–2021	504	0.382	2022–2024	695	0.218	299,385	7.64×10^{-98}	−0.709
Aquatic NDVI	2020–2021	216	0.275	2022–2024	297	0.167	48,937	2.66×10^{-24}	−0.526

Hydrobiology

STREET
1/71 Troy Terrace
Jolimont 6014
WESTERN AUSTRALIA

POSTAL
PO Box 1034
West Leederville 6901
WESTERN AUSTRALIA

CONTACT
+61 (0)8 6218 0900 P
infowa@hydrobiology.com

ABN 68 120 964 650

www.hydrobiology.com

Appendix 2: Groundwater Modelling Summary, Katanning Gold Project. (Rockwater, 2026a)

KATANNING GOLD PROJECT

GROUNDWATER MODELLING SUMMARY

REPORT FOR
AUSGOLD

JUNE 2026

Report No. 72-262/25-04.3

Rockwater
HYDROGEOLOGICAL AND ENVIRONMENTAL CONSULTANTS

76 Jersey Street Jolimont 6014 Western Australia Postal: PO Box 201 Wembley 6913 Western Australia
Ph: 61 8 9284 0222 Fax: 61 8 9284 1785 Email: consult@rockwater.com.au www.rockwater.com.au ABN: 43 008 804 653

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REVISION	AUTHOR	REVIEW	AUTHORISED	ISSUED
Rev 3	GL/CN	MT	MT	22/06/2026

1 INTRODUCTION

Ausgold Limited (Ausgold) is developing the Katanning Gold Project (KGP) in the southern wheatbelt region of Western Australia (Figure 1). Gold mineralisation occurs within the Archaean Katanning Greenstone Belt, hosted within sheared metasediments and granitoids. The project area is underlain by a variably weathered saprolitic profile which together with the fractured bedrock constitutes the aquifer system that locally contains saline groundwater.

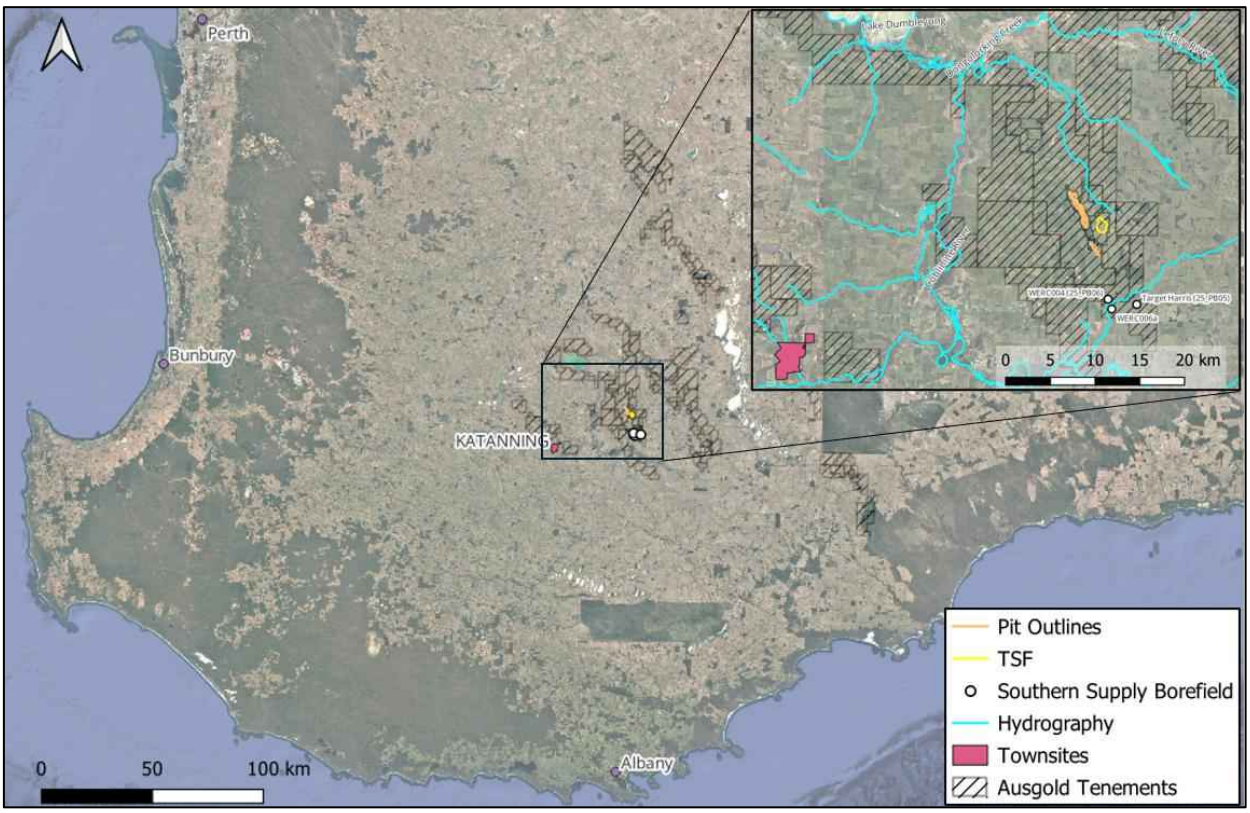

Figure 1 – Locality Plan – Katanning Gold Project

Between 2021 and 2024, SRK consulting completed groundwater investigations which included drilling, bore construction, test-pumping, and modelling in support of a hydrogeological conceptualisation, a groundwater model, and a H3 Hydrogeological Assessment. Subsequent peer reviews and revised groundwater modelling by Rockwater and EMM consulting concluded that SRK's predicted dewatering rates were likely over-estimated by one to two orders of magnitude, mainly due to use of an unrealistic specific yield value used to represent the fractured bedrock.

Ausgold subsequently engaged Rockwater to undertake new predictive groundwater modelling to reflect the broader water management strategy, incorporating dewatering, water supply borefield operation and use of a wet tailings storage facility (TSF), and to prepare an updated technical report to support a referral to the Environmental Protection Authority (EPA).

This report documents Rockwater's updated groundwater modelling, which was undertaken to:

- Quantify the extent of drawdown from base-case pit dewatering and water supply extraction
- Evaluate the resultant groundwater mounding from the proposed base case TSF design
- Simulate post mining recovery timeframes
- Integrate findings into a single concise groundwater modelling summary (this document).

A separate memorandum summarising potential future investigations and model refinements has been prepared and issued separately (Rockwater, 2026).

2 HYDROGEOLOGICAL SETTING

2.1 PHYSIOGRAPHY AND CLIMATE

The KGP project landscape is typical of the Wheatbelt, featuring gently rolling agricultural landscapes hosting a mix of low hills and broad valleys, with elevations ranging between 219 and 433 m Australian Height Datum (AHD). The regional climate is Mediterranean with average annual rainfall ~390 mm/yr and potential evaporation exceeding 2,000 mm/yr, resulting in limited groundwater recharge. Regionally, the project area sits within the Blackwood River Catchment, with surface water draining toward the north via the Datatine Gully into Dumbleyung Lake to the north, as well as toward the south via the Coblinine River before also discharging into Dumbleyung Lake.

Historic land clearing has resulted in dryland salinity issues in the area, particularly in low-lying areas where the groundwater table is close to the ground surface.

2.2 GEOLOGY

The project area is underlain by the Yilgarn Craton, comprising predominantly Archaean gneiss and granite. The bedrock is intersected by numerous south-west to north-east-trending faults and east–west-trending Proterozoic dykes composed of dolerite, gabbro, and quartz, which locally influence groundwater movement.

The upper bedrock is extensively weathered to form a saprolitic zone, marking the transition to the overlying regolith profile of variable thickness. This regolith includes both residual and transported materials, such as colluvial and alluvial sediments, derived from in-situ weathering of local lithologies.

2.3 HYDROGEOLOGY

Groundwater within the KGP area occurs in a multi-layered system that reflects the underlying geological profile. Three principal aquifer units are recognised:

- Superficial aquifers; comprising colluvial and alluvial deposits within the regolith. These host shallow groundwater that is variably connected to surface drainage and are generally unconfined to semi-confined.
- Weathered rock aquifers; corresponding to the saprolitic and lateritic zones developed at the top of the bedrock. Groundwater is stored within fine-grained pore spaces and minor secondary fractures, typically forming low-permeability, semi-confined systems.
- Fractured rock aquifers; comprising fractured gneiss and greenstone units that provide the main transmissive pathways for groundwater flow and potential dewatering inflows. Hydraulic conductivity is controlled primarily by the density and orientation of faults, joints, and dykes.

Groundwater levels across the project area range from about 19 m below ground level (bgl) to up to 2 m above ground level (agl), with elevations between 265 m and 360 m AHD. Levels are highest near Jinkas Pit

on a topographic high and lowest near the surface-water tributaries draining toward Lake Dumbleyung. The regional groundwater flow is radial and outward from the higher topography of the project area toward these lower-lying discharge zones.

3 MODEL BASIS OF DESIGN

Given the inherent heterogeneity of the KGP hydrogeological system, the numerical groundwater model was designed as a fit-for-purpose, simplified three-layer representation of the conceptual hydrogeology. The model was developed to efficiently quantify base-case drawdown associated with combined pit dewatering, wet TSF operation, and water-supply extraction, while remaining consistent with available hydrogeological data and the conceptual understanding of aquifer behaviour.

3.1 MODEL SETUP

The numerical groundwater model was set up as follows:

Software: FloPy 3.10.0 (Bakker et al., 2016), Processing Modflow 8 (Modflow 2005) and Modpath7 (Pollock, 2016). **Grid and cell size:** The model grid spans a 30 km by 40 km area centred on the project. This is discretised into 400 rows and 300 columns equivalent to a homogenous cell size of 100 m x 100 m.

Topography: The top of the model was derived from the local Digital Elevation Model (DEM).

Layers:

- Layer 1 – Superficial alluvium and clay (up to 30 m thick)
- Layer 2 – Weathered and fractured rock (90 – 205 m thick, including faults & dykes)
- Layer 3 – Fresh bedrock (150 m thick)

Boundaries:

- Surface drainage lines are represented along the western boundary with riverbed conductance set at 1.42 m/d
- Recharge zones are applied, with higher rates on topographic highs
- No-flow boundaries are assigned to the north, south, and east model limits

Recharge: This was calibrated within realistic ranges for the Wheatbelt climate, and consistent with the low infiltration expected under semi-arid conditions and high evaporation losses. The base case was assigned 2.0×10^{-6} and 5.0×10^{-5}.

Timesteps: The model was temporally discretised into 41 stress periods, each of three months duration spanning the period of mine operations (i.e. 10 years), followed by a 100-year post-closure period.

Calibration: Steady-state calibration was undertaken using PEST, with Kh/Kv values of superficial and fractured units, recharge, and river-bed conductance adjusted. Fault and dyke Kh values were fixed at 1.5 m/d and 0.5 m/day respectively. Weighting favoured measured groundwater level data derived from the project area. The calibration achieved an SRMS error of ~8.38 %, meeting AGMG (2012) criteria for predictive simulations. The calibrated parameters adopted for the dewatering simulations are summarised in Table 1.

Table 1 - Base case model parameters

Layer and Description		Kh, Kv (m/day)	Specific Storage (SS)	Specific Yield (Sy)
1	Tertiary clay and alluvium	0.007	5.0×10^{-4}	0.02
2	Weathered bedrock	0.009	5.0×10^{-5}	0.02
	Faults	1.50	1.0×10^{-4}	0.02
	Dykes	0.50	5.0×10^{-4}	0.02
3	Fresh bedrock	0.0001	1.0×10^{-5}	0.02

3.2 BASE CASE ASSUMPTIONS

The KGP plans to develop four open cut pits, each of which are planned to be mined below the groundwater table. Mining is currently planned to take place over a ten-year period. Pit advancement details are in Appendix 1.

Simulation of the TSF seepage and associated mounding was undertaken based on the following base case assumptions:

- The base of the TSF was assumed to be horizontal at 360 m AHD (both cells) and above the simulated pre-mining groundwater table
- The deposition and thickness of the tailings was assumed identical in both cells and followed the predicted consolidated tailings thicknesses at the thickest section (WSP 2025, Figure 8.4). Thickness of tailings material during operation and post-closure used for the seepage modelling in shown in Chart 1.
- The base and internal benches of the TSF are fully lined with a Linear Low-Density Polyethylene (LLDPE) geomembrane of low hydraulic conductivity (8.64 $x10^{-6}$ m/d).
- Modflow's reservoir package was used to simulate the seepage, assuming a continuous 15-year of seepage from a fully saturated tailings residue (i.e. no decant) based on the TSF progression provided in Chart 1.

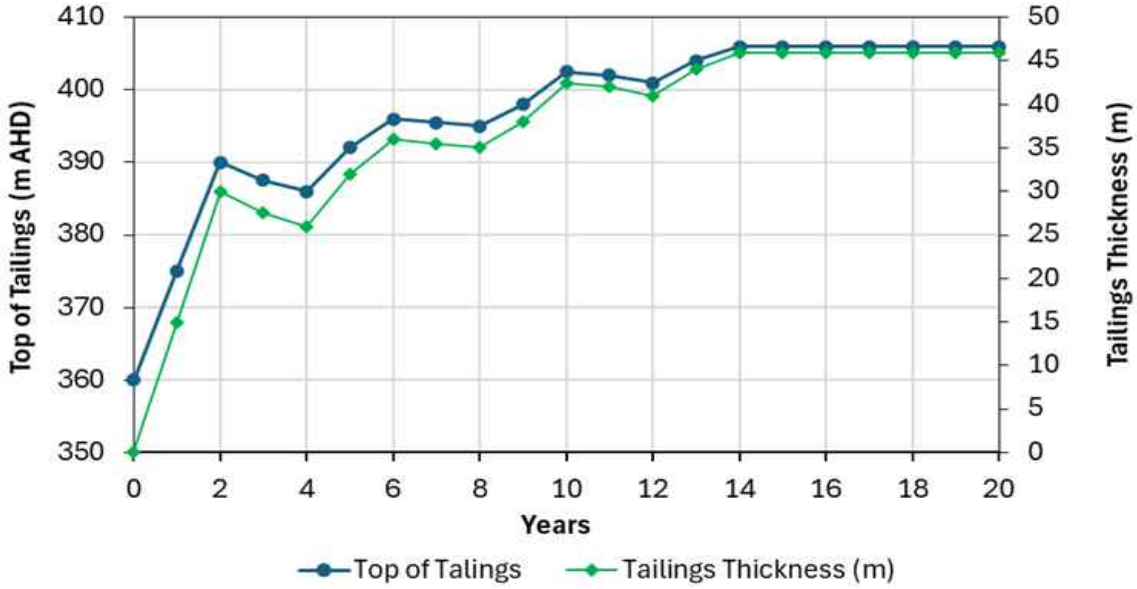

Chart 1 – Tailings depositional thickness over time in TSF

4 MODELLING RESULTS

4.1 PREDICTED PIT INFLOWS

Pit inflow volumes at each bench elevation for each year have been simulated using the calibrated model and are presented in Table 2. Despite being mined below baseline water levels, the Olympia pits are not predicted to require dewatering due to being passively dewatered through the advancement of nearby Jinkas and Jackson pits, however, there may be minor inflows if perched groundwater is encountered in the weathered zone or if the dewatering schedule is changed (i.e. if the nearby Jinkas and Jackson dewatering is reduced due a mine plan change).

Table 2 – Predicted pit inflow volumes (ML/a)

Year	Dingo	Jackson	Jinkas	Olympia	Total
Y1	0.0	0.0	323.7	0.0	323.7
Y2	0.0	0.0	255.5	0.0	255.5
Y3	0.0	0.0	199.6	0.0	199.6
Y4	0.0	159.3	151.3	0.0	310.6
Y5	0.0	272.5	137.0	0.0	409.4
Y6	0.0	195.6	370.8	0.0	566.4
Y7	472.3	0.0	314.4	0.0	786.7
Y8	789.8	61.8	30.2	0.0	881.9
Y9	133.0	250.4	0.0	0.0	383.4
Y10	0.0	0.0	158.2	0.0	158.2

A detailed water balance model for the site was initially provided by the client (WSP, 2025) and later revised (WSP, 2026), which has been further revised in Table 3 based on updated pit inflow modelling and updated pit void storage volumes, from which recalculated supply borefield makeup volumes and surplus water volumes were made. The revised water balance shows that additional makeup water will only be required in Years 1 to 3 and Year 10. Surplus water from Years 4 to 9 is assumed to be managed in a way that will not impact downstream surface waters or groundwater levels (i.e. through direct recharge or infiltration or discharge back into the aquifer via creeks, or bores).

Table 3 – Updated water balance table (modified from Table 4.28 from WSP, 2026)

	Input (ML/a)						Output (ML/a)			Balance (ML/a)		
Year	Rainfall	Transfer from Pit lakes	Transfer from TSF	Pit inflow	Sed. Pond	Supply Borefield Makeup	Pan Evap	Plant Demand	Unmanaged Surplus	Total In	Total Out	IN - OUT
Y1	1.4	150.0	0.0	323.7	304.4	2571.9	3.9	3263.4	0.0	3267.3	3267.3	0.0
Y2	1.3	0.0	3100.6	255.5	299.6	80.9	3.9	3652.2	0.9	3657.0	3657.0	0.0
Y3	1.4	0.0	3137.3	199.6	480.5	175.1	3.9	3779.1	35.8	3818.8	3818.8	0.0
Y4	1.4	0.0	3196.8	310.6	459.1	0.0	3.9	3823.7	140.3	3967.9	3967.9	0.0
Y5	1.4	0.0	3087.7	409.4	457.3	0.0	3.9	3811.3	140.6	3955.8	3955.8	0.0
Y6	1.4	0.0	3047.5	566.4	473.5	0.0	3.9	3704.9	380.0	4088.8	4088.8	0.0
Y7	1.4	0.0	3055.0	786.7	536.7	0.0	3.9	3766.1	609.8	4379.8	4379.8	0.0
Y8	1.3	0.0	3004.9	881.9	523.3	0.0	3.9	3679.2	728.3	4411.4	4411.4	0.0
Y9	1.3	0.0	3015.2	383.4	533.3	0.0	3.9	3839.8	89.5	3933.2	3933.2	0.0
Y10	1.4	0.0	2323.5	158.2	552.7	592.8	3.9	3686.5	0.0	3690.4	3690.4	0.0

The preferred makeup water supply strategy will be to focus extraction on three bores within the "southern borefield" (Figure 1). It is assumed in the base case that these bores would be operated at equal extraction rates of 27, 0.9, 1.9 and 6.3 L/s for Years 1 to 3 and Year 10 respectively.

4.2 MODELLED DRAWDOWN AND RECOVERY

Based on the assumptions and methods outlined in Section 3, composite drawdowns were simulated over a 110-year period (including 10-years of mine operations and 100-years of closure) to quantify the impact that the proposed dewatering, water supply and TSF activities would have on the groundwater levels. The results are summarised in Table 4, from which the following findings can be drawn:

- Drawdown is mainly centred on the proposed dewatering pits commensurate with mine bench progression and dewatering requirements, and to a lesser extent the southern borefield
- Drawdown propagates preferentially along the faults and dykes where hydraulic conductivity is higher (i.e. faults, and to a lesser degree, dykes). Drawdown contours for Years 1 to 10 and Year 20 (10 years post mining) are presented in Figure 2 through to Figure 12
- After 100 years post-operations, pit lakes recover to on average of 99.2% of baseline water levels, noting that full recovery will never be reached in the pit lakes due to evaporative losses. Drawdown and recovery hydrographs for each draw point are in Figure 13 through to Figure 16

- Seepage from the wet TSF is negligible, with no observable mounding because of its planned design.

Table 4 – Drawdown and recovery statistics for each pit and supply borefield

Pit Stage/Bore	Initial Simulated WL (m AHD)	Minimum Simulated WL (m AHD)	Maximum Simulated Drawdown (m)	Minimum Simulated WL / Maximum Simulated Drawdown Year	95% Recovered WL (m AHD)	95% Recovery Year
Jinka 3 pit	355.51	150.10	205.41	Year 4	345.24	~ Year 13
Jackson 1 pit	331.54	234.16	97.38	Year 5	326.67	~ Year 24
Dingo 1 pit	332.12	210.01	122.11	Year 8	326.02	~ Year 15
Southern Borefield (average)	293.38	214.66	71	Year 1	292.42	~ Year 30

5 POTENTIAL IMPACTS ON GROUNDWATER DEPENDENT ECOSYSTEMS

To assess potential risks to groundwater dependent ecosystems (GDEs), modelled drawdown outputs were compared against mapped areas of potential high, moderate, and low GDE likelihood using the Bureau of Meteorology's (BoM) national GDE Atlas (BoM, 2023). A notional drawdown threshold was applied, defined as areas where groundwater levels in 'Layer 1' (tertiary clay and alluvium) are within 10 m of ground surface and are predicted to experience greater than 1.0 m drawdown after ten years of mine operation. The calculations do not consider the current land use/vegetation at these sites (i.e. GDE may not be currently present due to historic land clearing practices or salinisation effects).

Within the mine area, the total zones of modelled drawdown threshold covered approximately 3.647 km², while the southern borefield encompassed approximately 27 km², giving a combined area of 30.6 km² (Table 5). These zones represent areas where any shallow rooted vegetation or aquatic ecosystems that rely on near surface fresh quality groundwater could be most at risk of stress.

Table 5 – Calculated area of potential impacts after 10 years extraction

Area	Total area 1.0 m drawdown	Total Potential GDE drawdown threshold zones[1]
	Km²	Km²
Mine area	22.6	3.6
Southern Borefield	10.6	27.0
Total	33.2	30.6

[1] >1.0 drawdown with modelled water level <10 m bgl

An overlay of the modelled drawdown threshold zones with the BoM GDE polygons indicates that the majority of potentially affected aquatic GDEs occur near the proposed southern borefield (Figure 17, Figure 18). Within this area, approximately 1.43 km² coincide with moderate potential Aquatic GDEs, and 0.28 km² with high potential Aquatic GDE's, in contrast with the mine area having 0.80 km² in high potential GDE's. In terms of terrestrial GDE's, there are 1.41 km² of low-potential GDEs occurring in the vicinity of the southern borefield, and 0.59 km² at the mine area. Calculated drawdown zones and GDE potential categories, as defined by the BoM, are presented in Table 6.

Table 6 – Calculated drawdown threshold zones intersection areas with potential GDE presence after 10 years extraction

Area	Aquatic GDE (km2)			Terrestrial GDE (km2)		
	Low	Moderate	High	Low	Moderate	High
Mine area	0	0	0.80*	0.59	0	0
Southern Borefield	0.09	1.43	0.28	1.41	0	0
Total	0.09	1.43	1.08	0.97	0	0

*Note: an additional 0.031 km^2 is classed as GDE, however, was excluded due to corresponding to the outline of existing Dingo Pit

As the project area is largely agricultural in use, much of the native vegetation has been cleared; therefore, the mapped potential GDE's may not represent currently functioning ecosystems. Nevertheless, these mapped intersections provide a useful screening tool for identifying where future flora, fauna, or vegetation surveys should be prioritised to confirm absence of effects.

Dated: 22 June 2026

Rockwater Pty Ltd

Craig Noble
Principal Hydrogeologist

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FIGURES

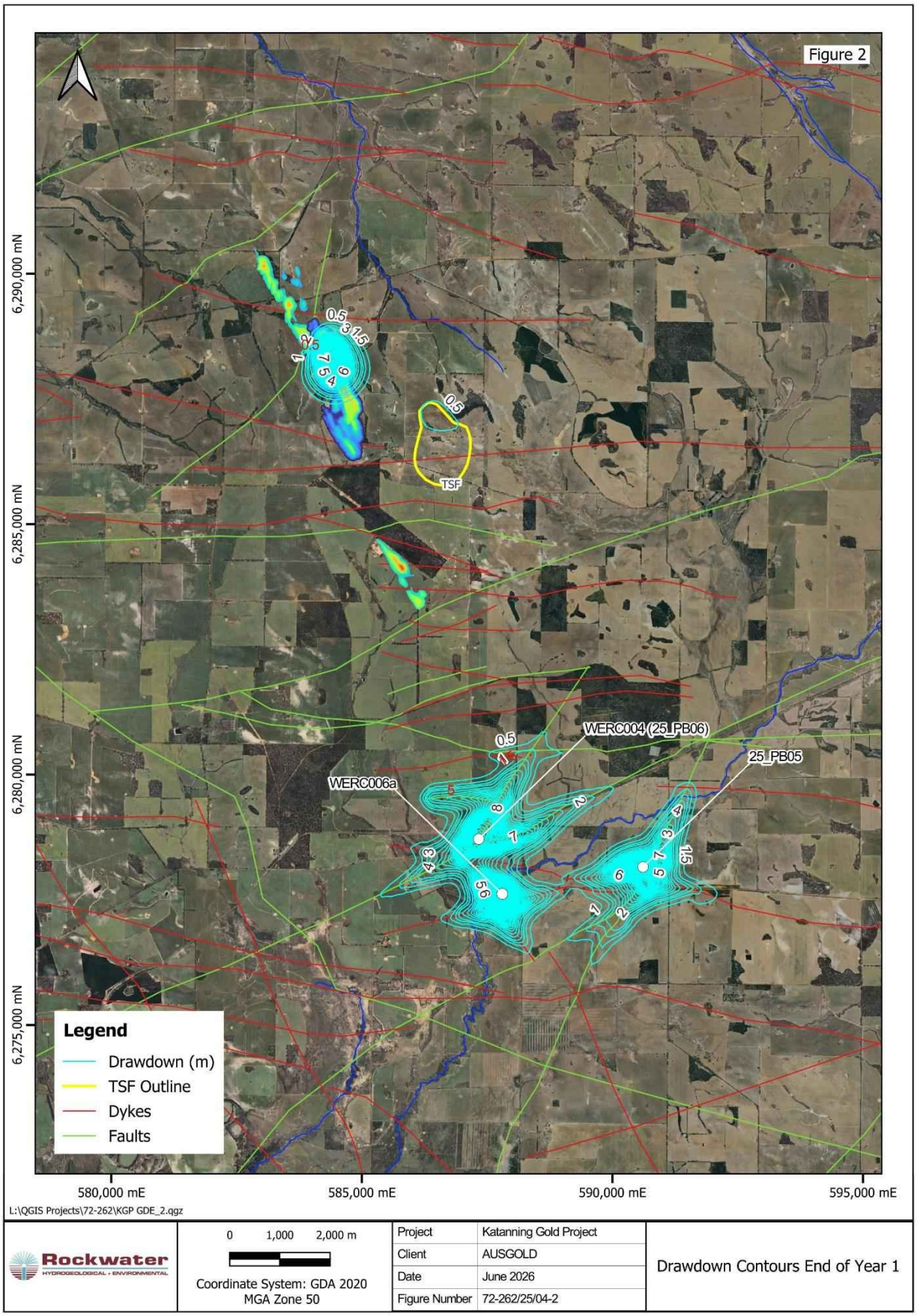

Figure 2 – Groundwater drawdowns (layer 2) at end of year 1

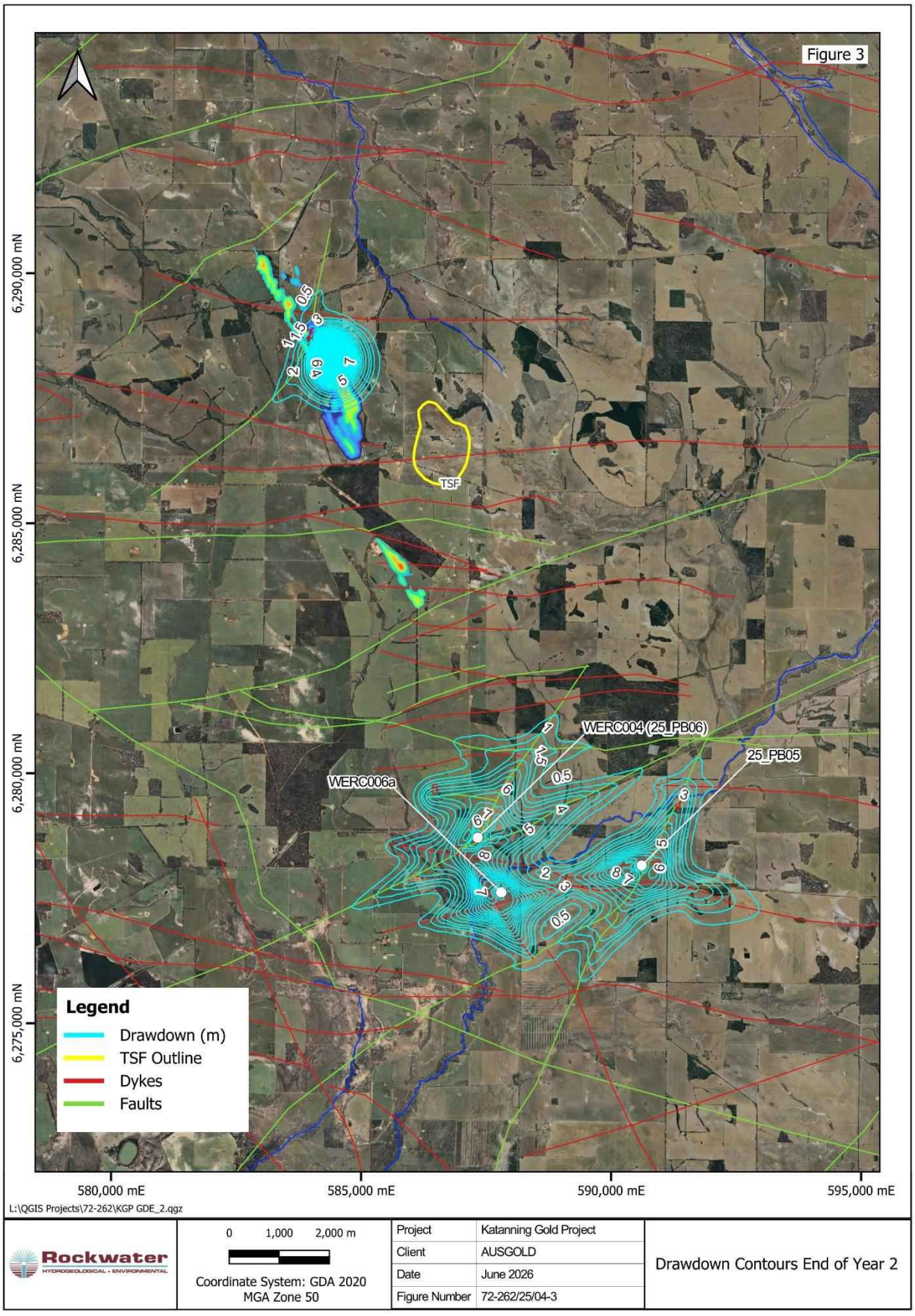

Figure 3 – Groundwater drawdowns (layer 2) at end of year 2

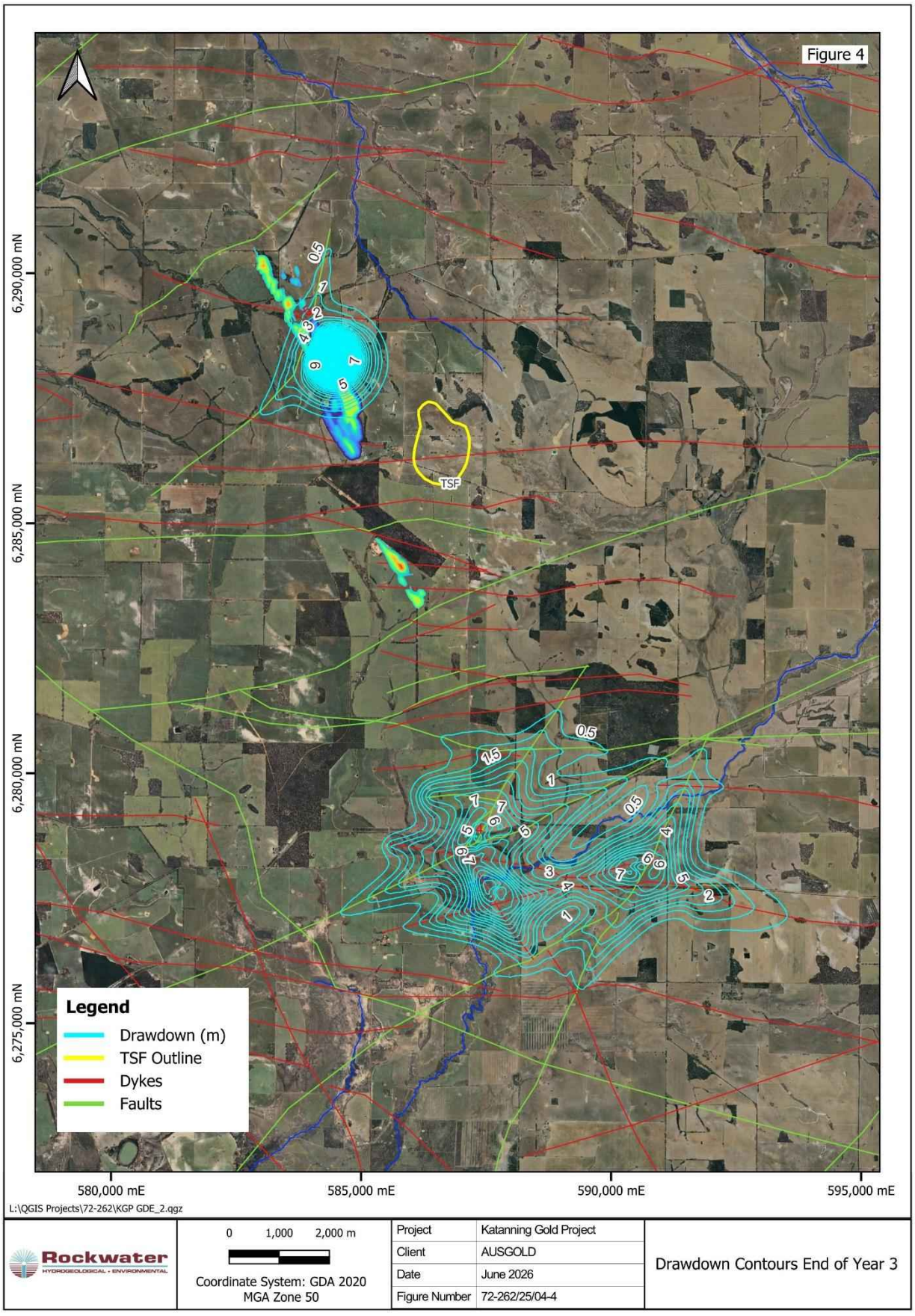

Figure 4 – Groundwater drawdowns (layer 2) at end of year 3

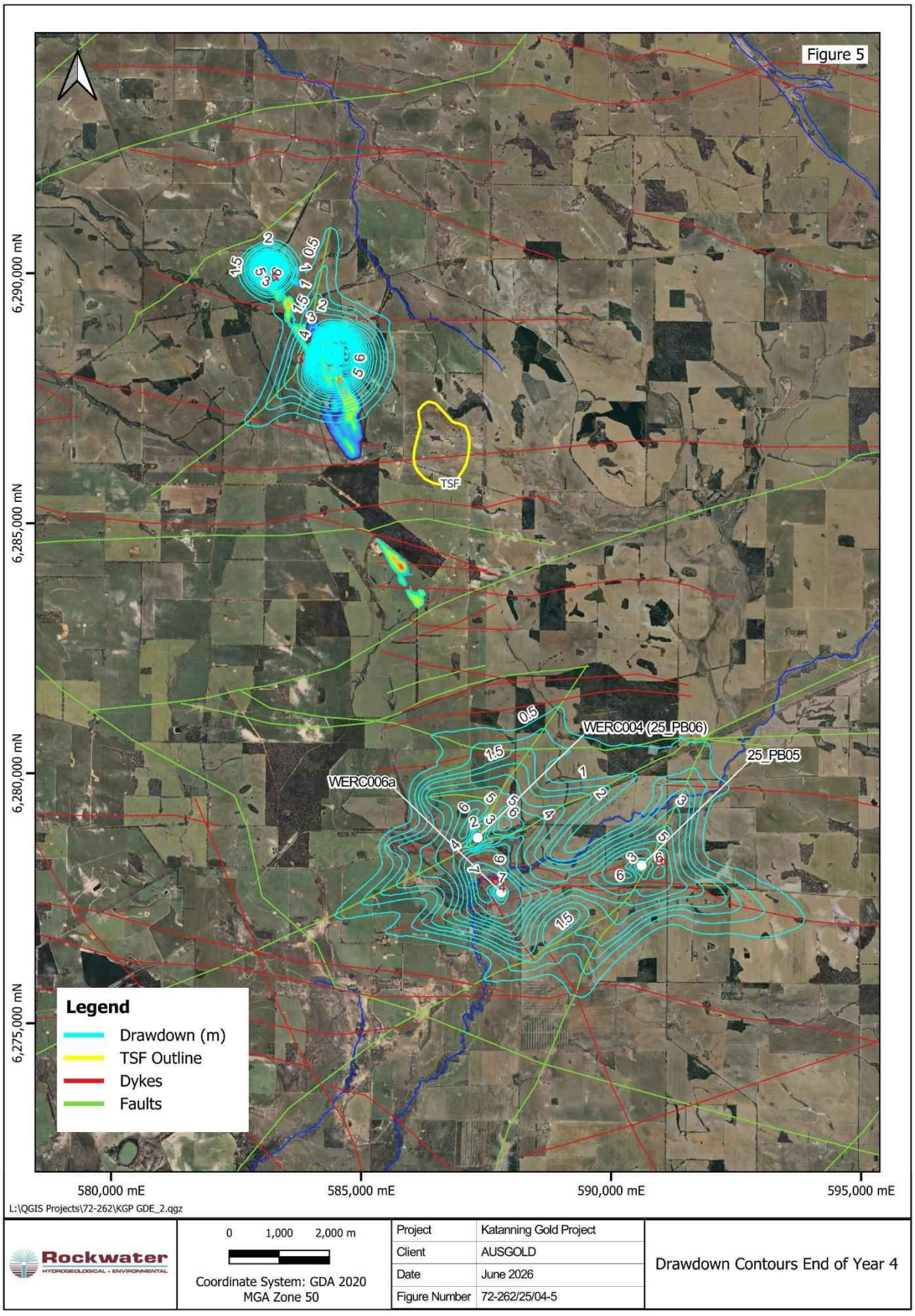

Figure 5 – Groundwater drawdowns (layer 2) at end of year 4

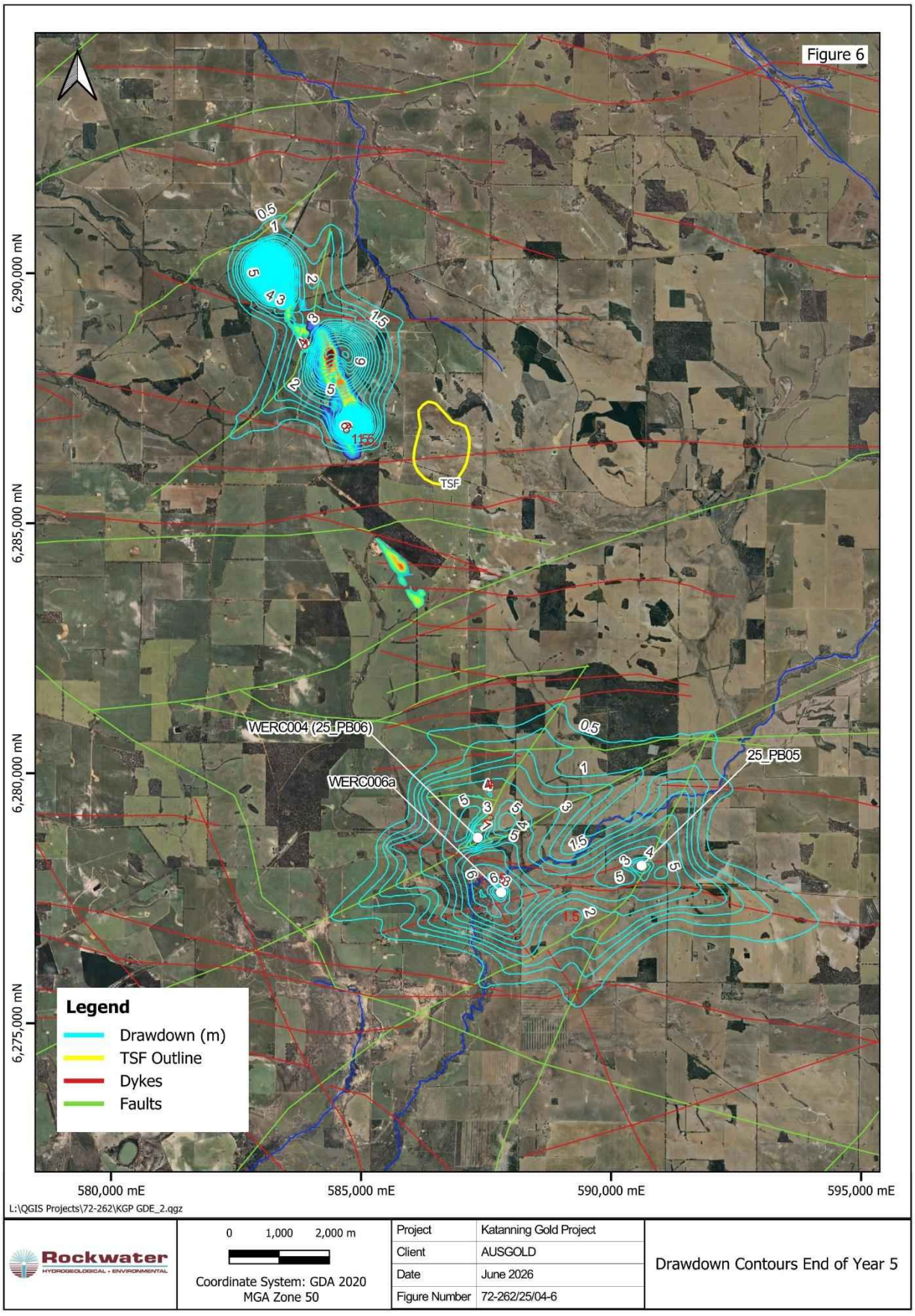

Figure 6 – Groundwater drawdowns (layer 2) at end of year 5

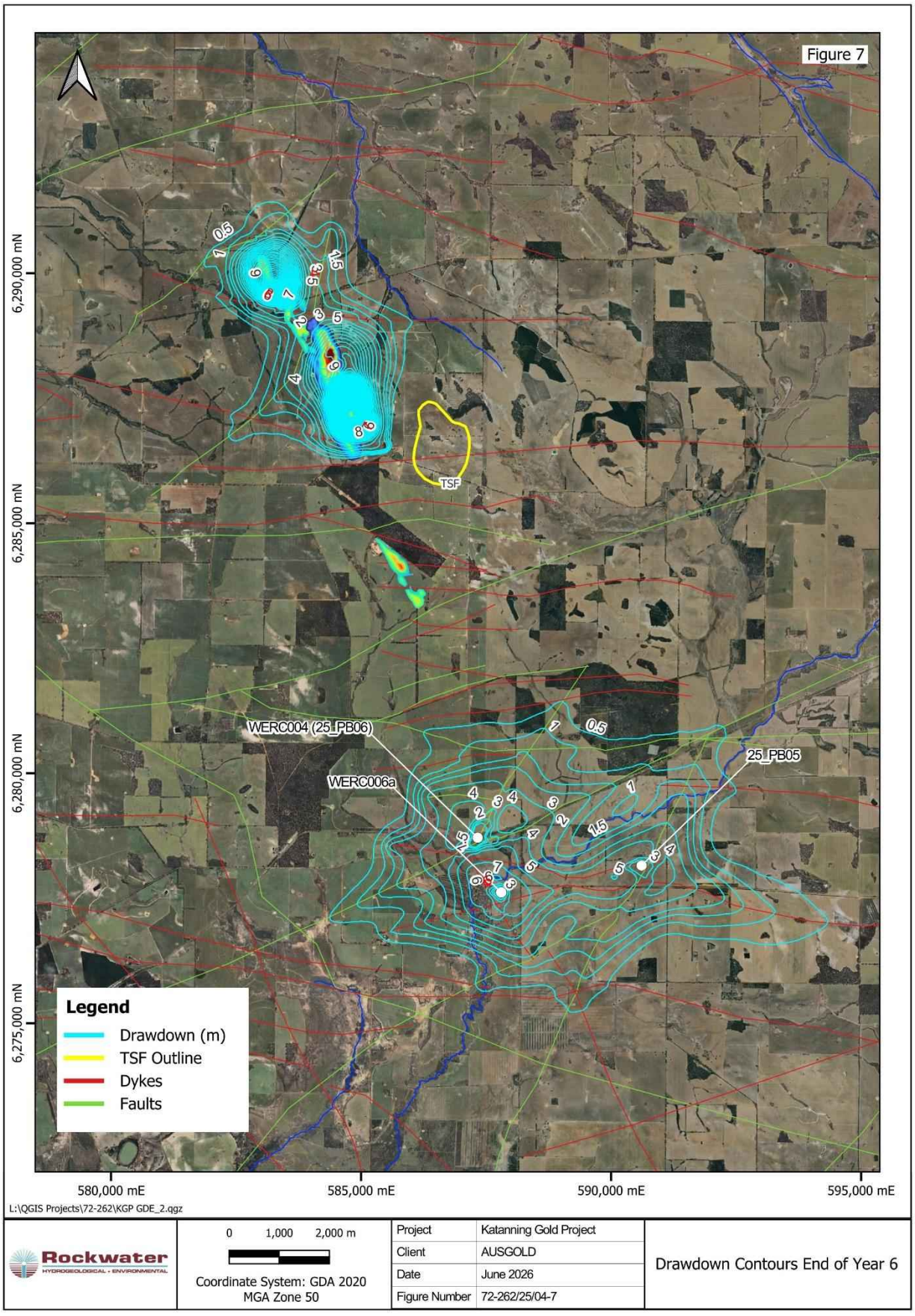

Figure 7 – Groundwater drawdowns (layer 2) at end of year 6

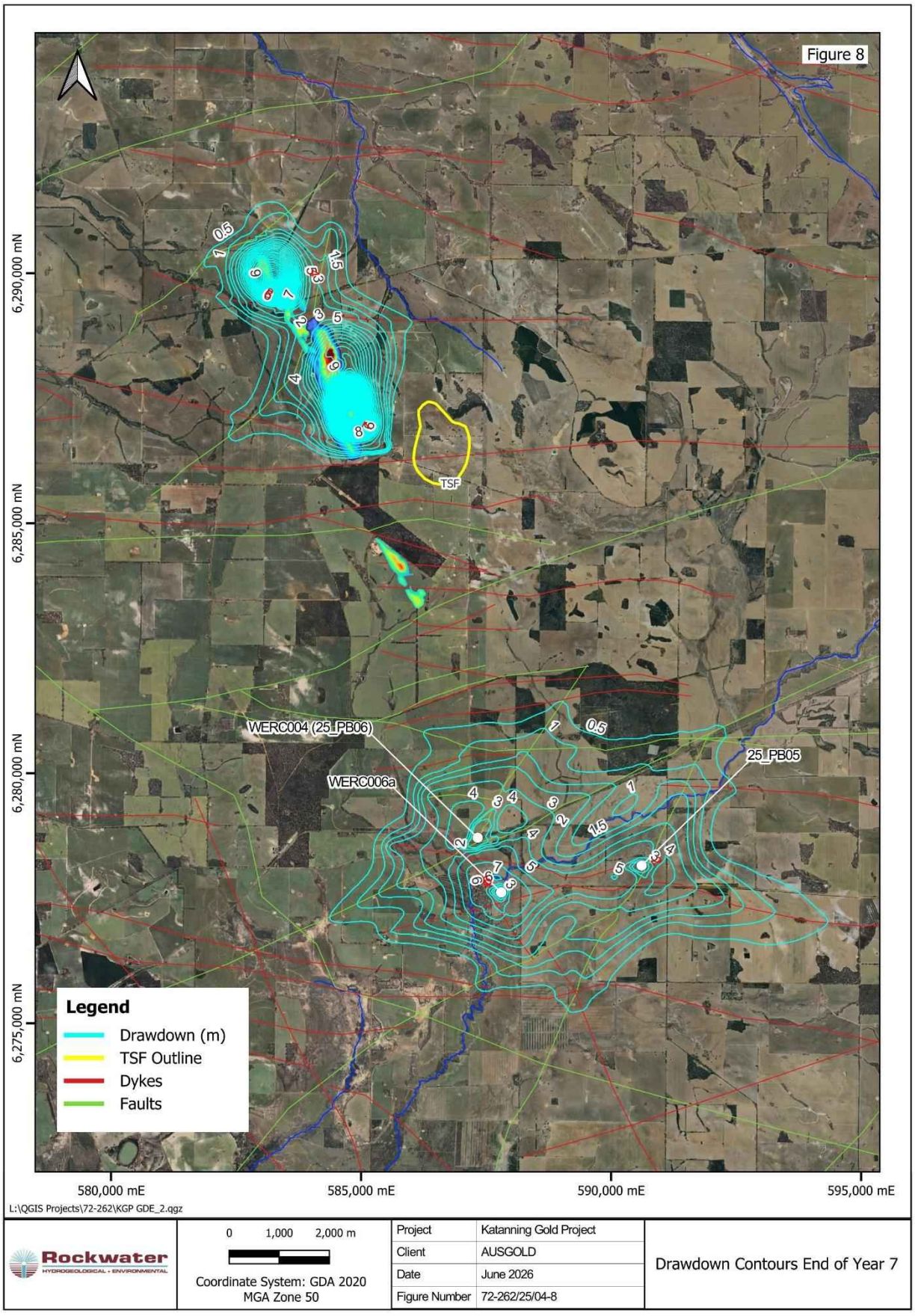

Figure 8 – Groundwater drawdowns (layer 2) at end of year 7

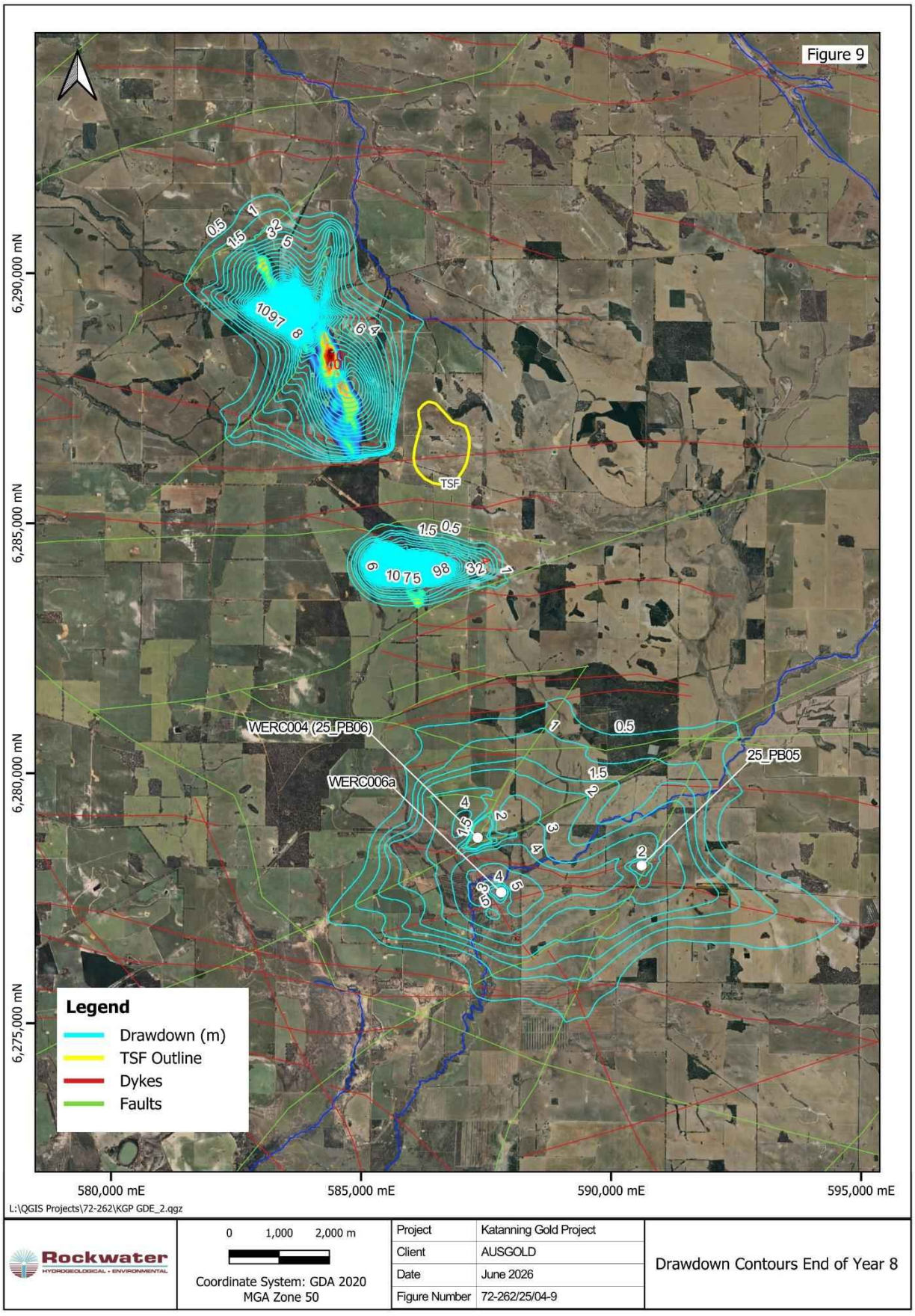

Figure 9 – Groundwater drawdowns (layer 2) at end of year 8

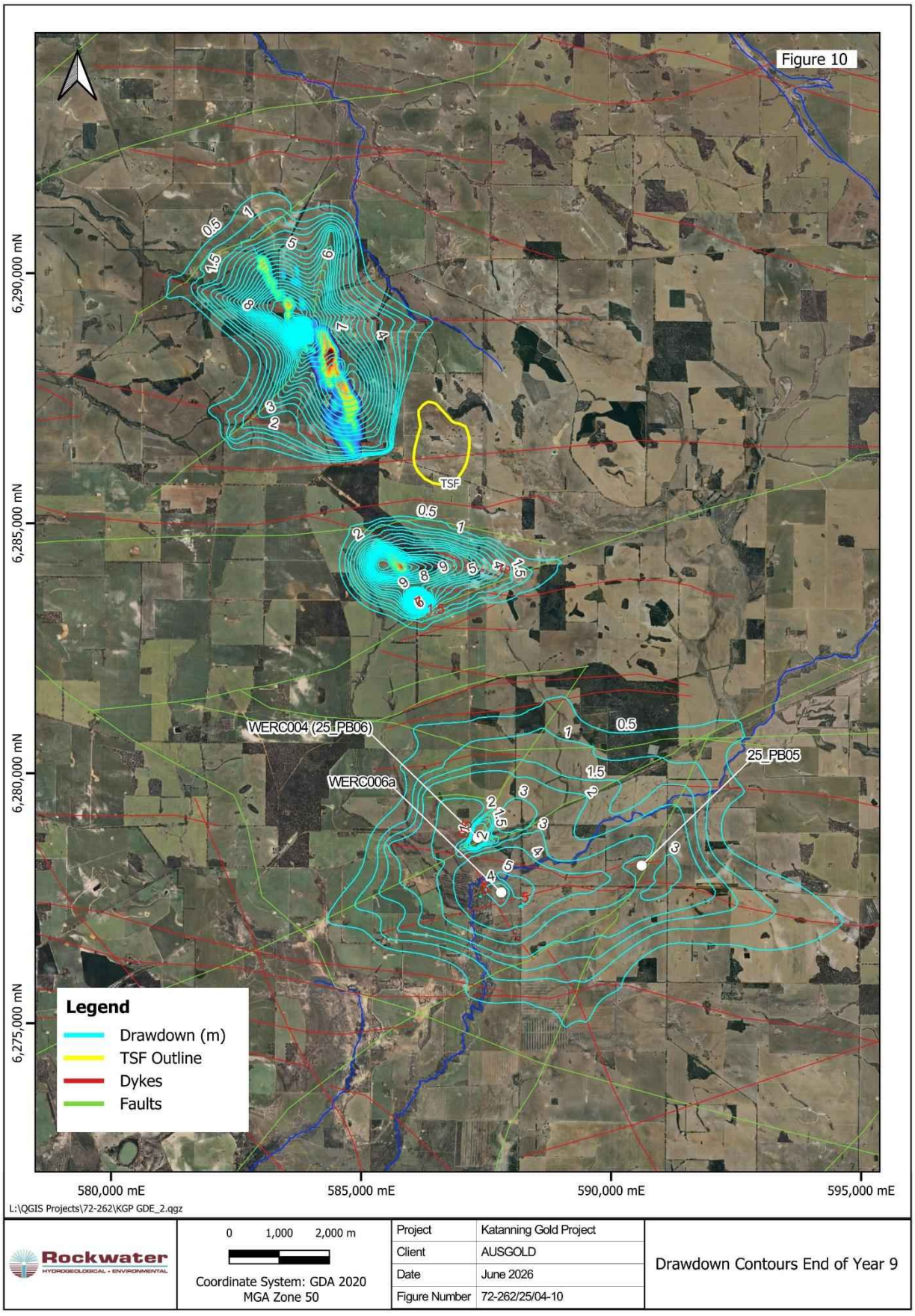

Figure 10 – Groundwater drawdowns (layer 2) at end of year 9

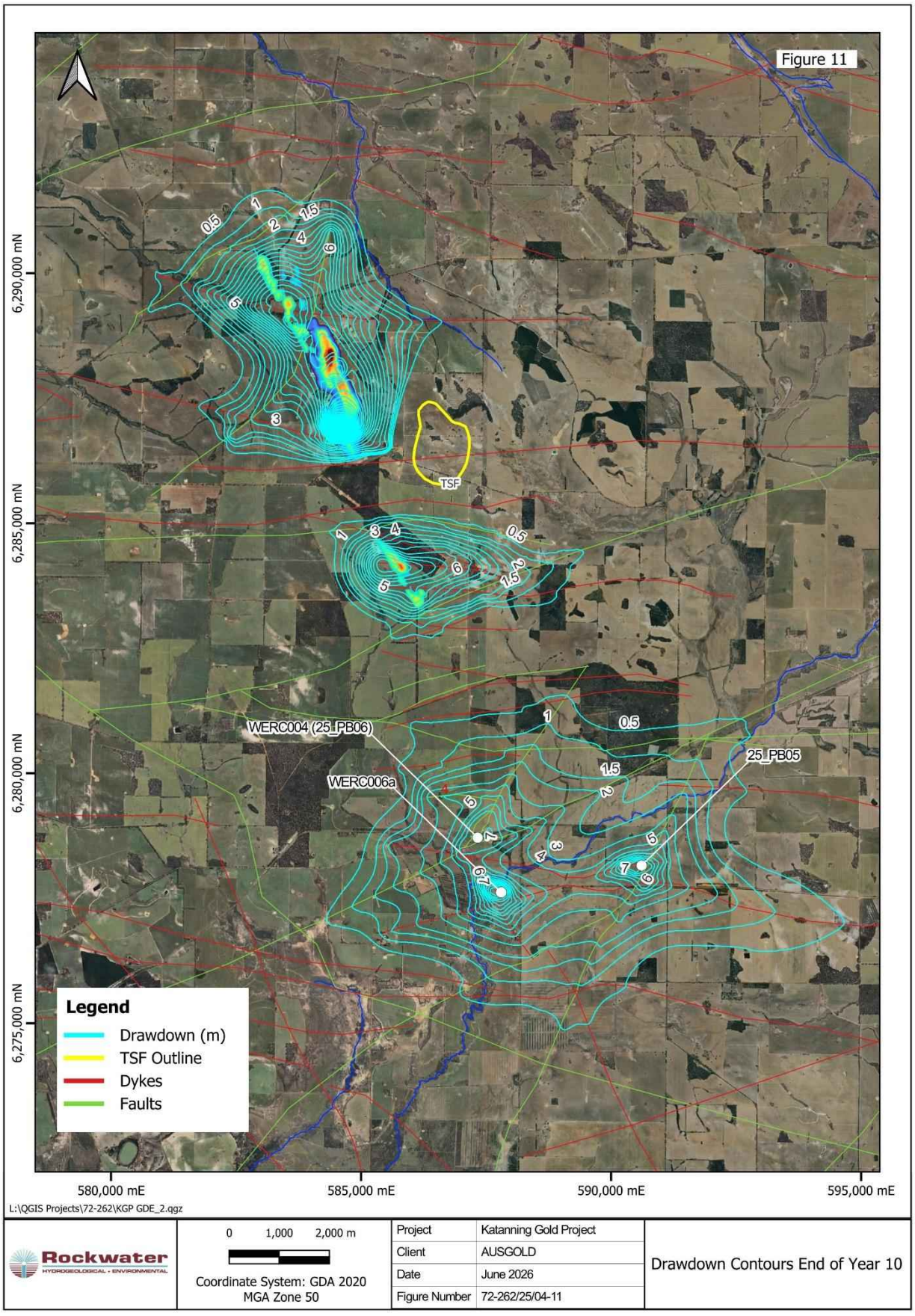

Figure 11 – Groundwater drawdowns (layer 2) at end of year 10

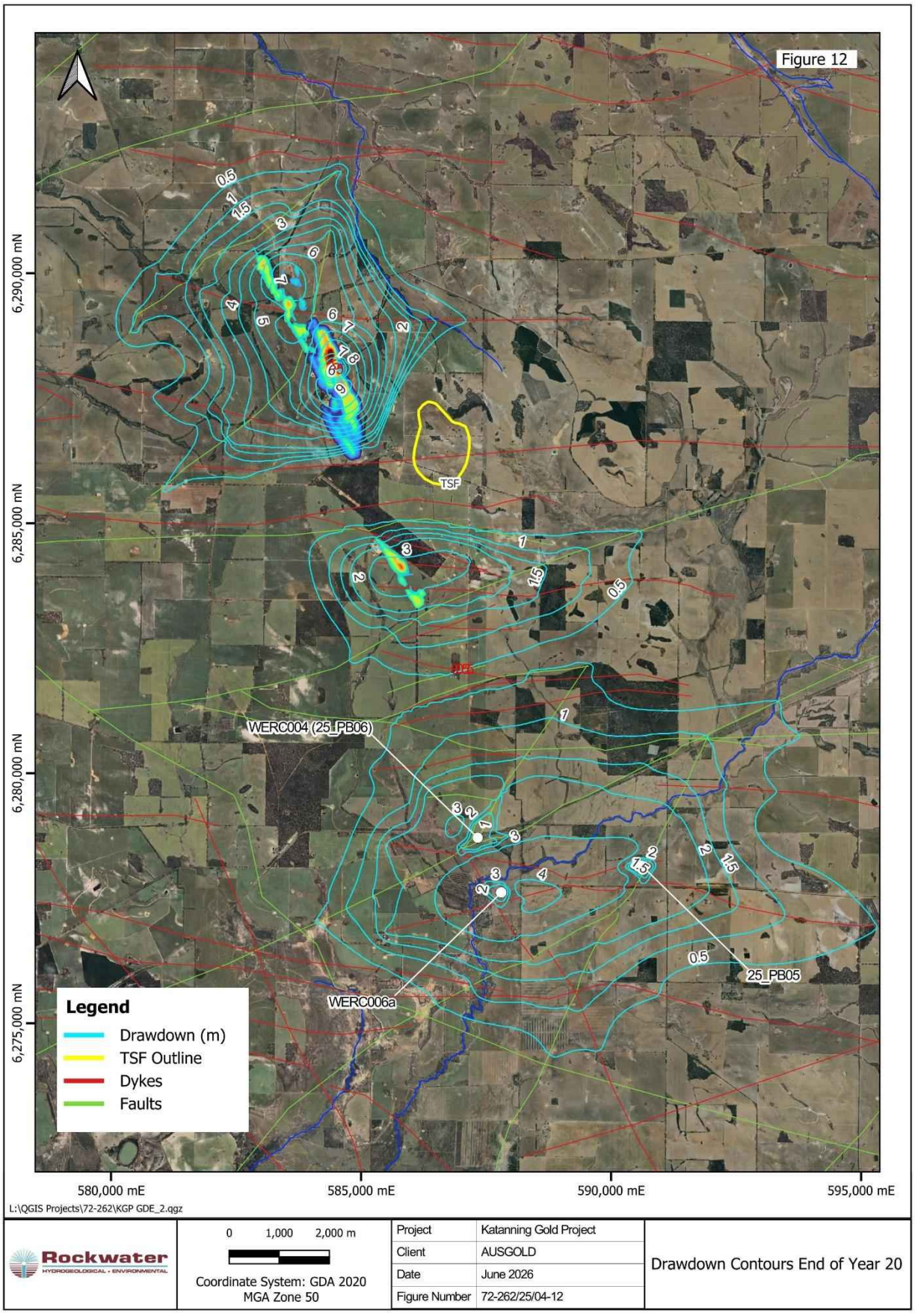

Figure 12 – Groundwater drawdowns (layer 2) at end of year 20

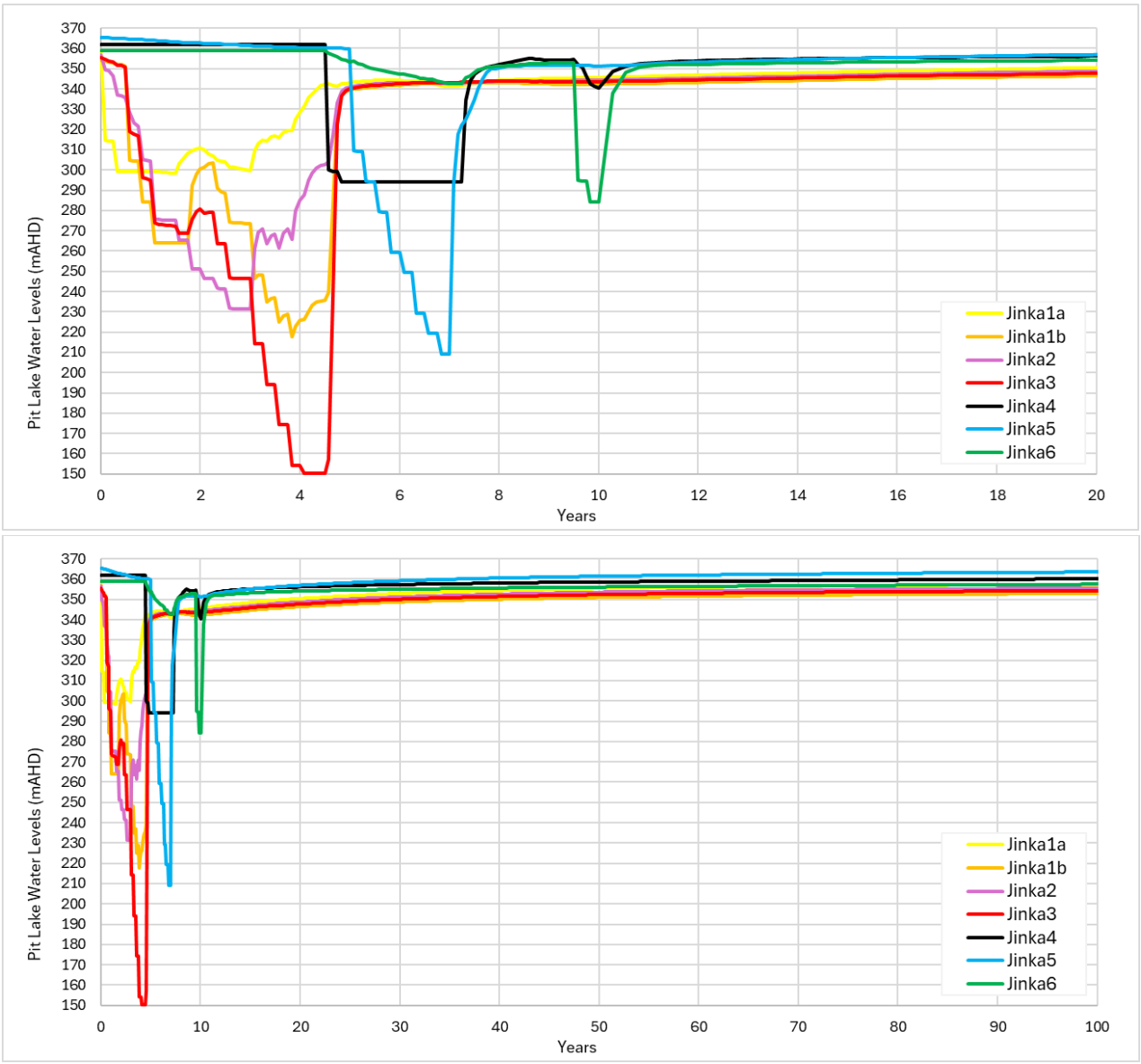

Figure 13 – Jinkas Pit 20-year and 100-year simulated drawdown and recovery

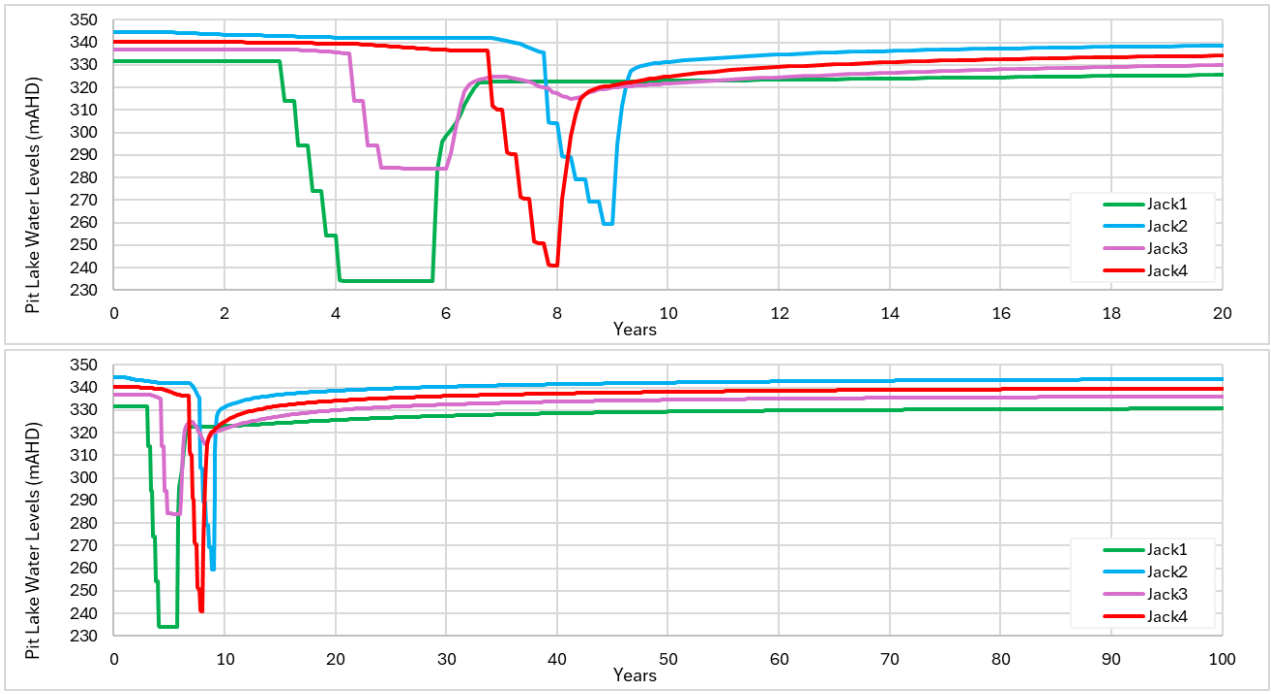

Figure 14 – Jackson Pit 20-year and 100-year simulated drawdown and recovery

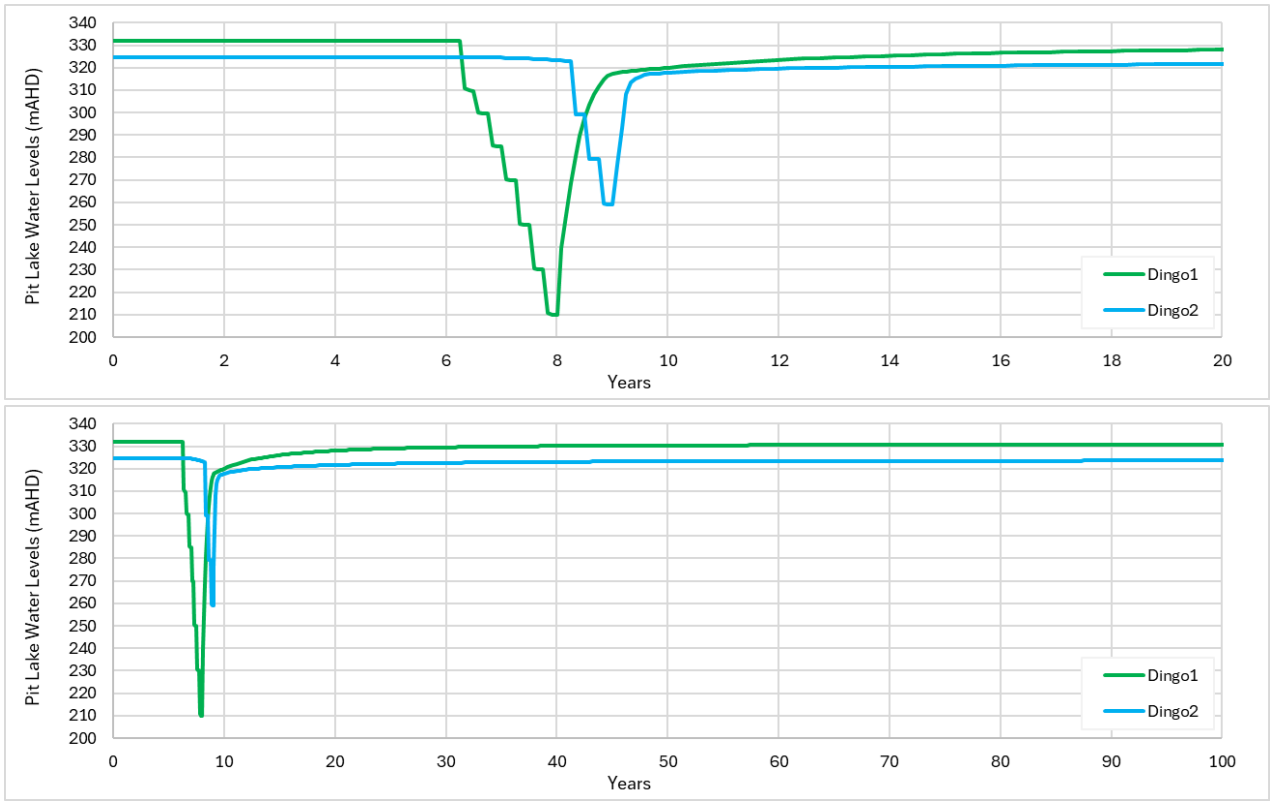

Figure 15 – Dingo Pit 20-year and 100-year simulated drawdown and recovery

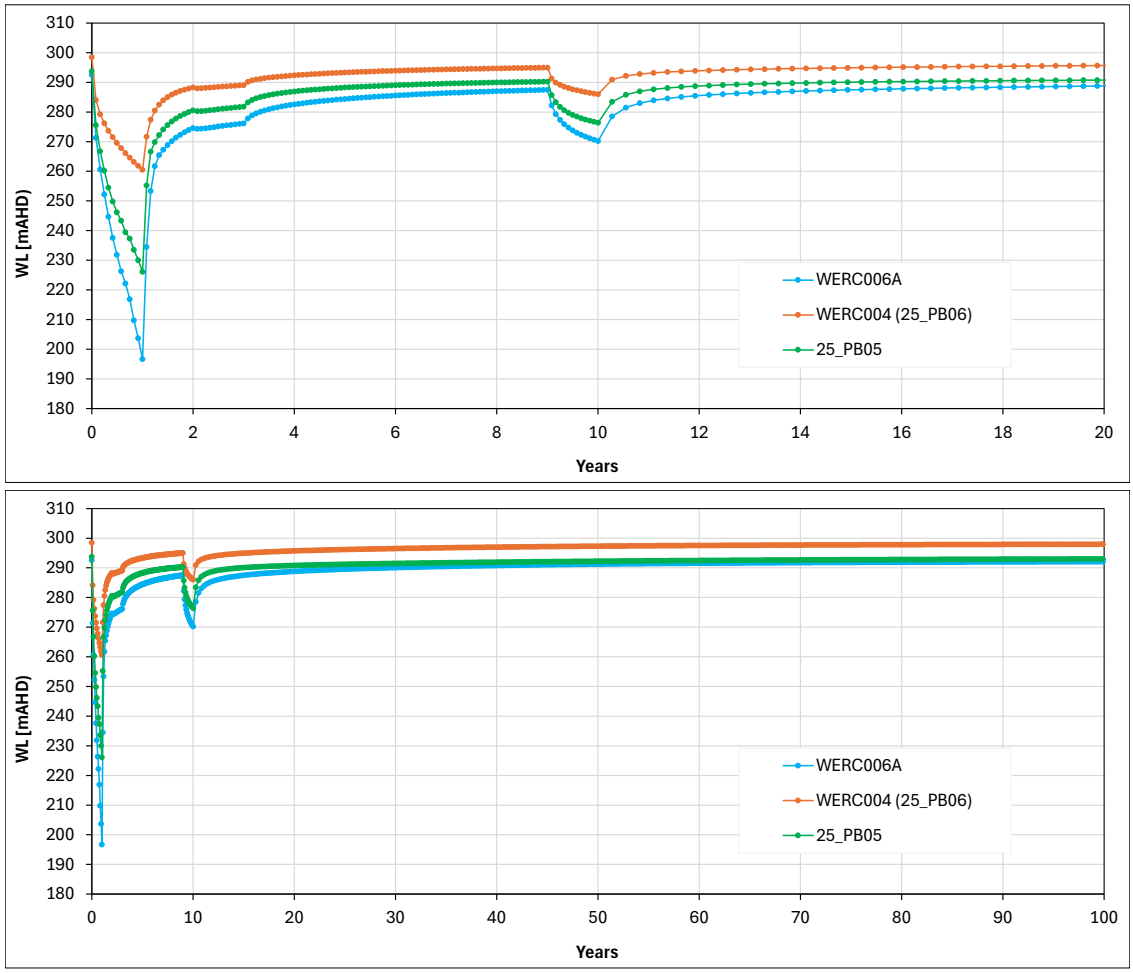

Figure 16 – Southern borefield 20-year and 100-year simulated drawdown and recovery

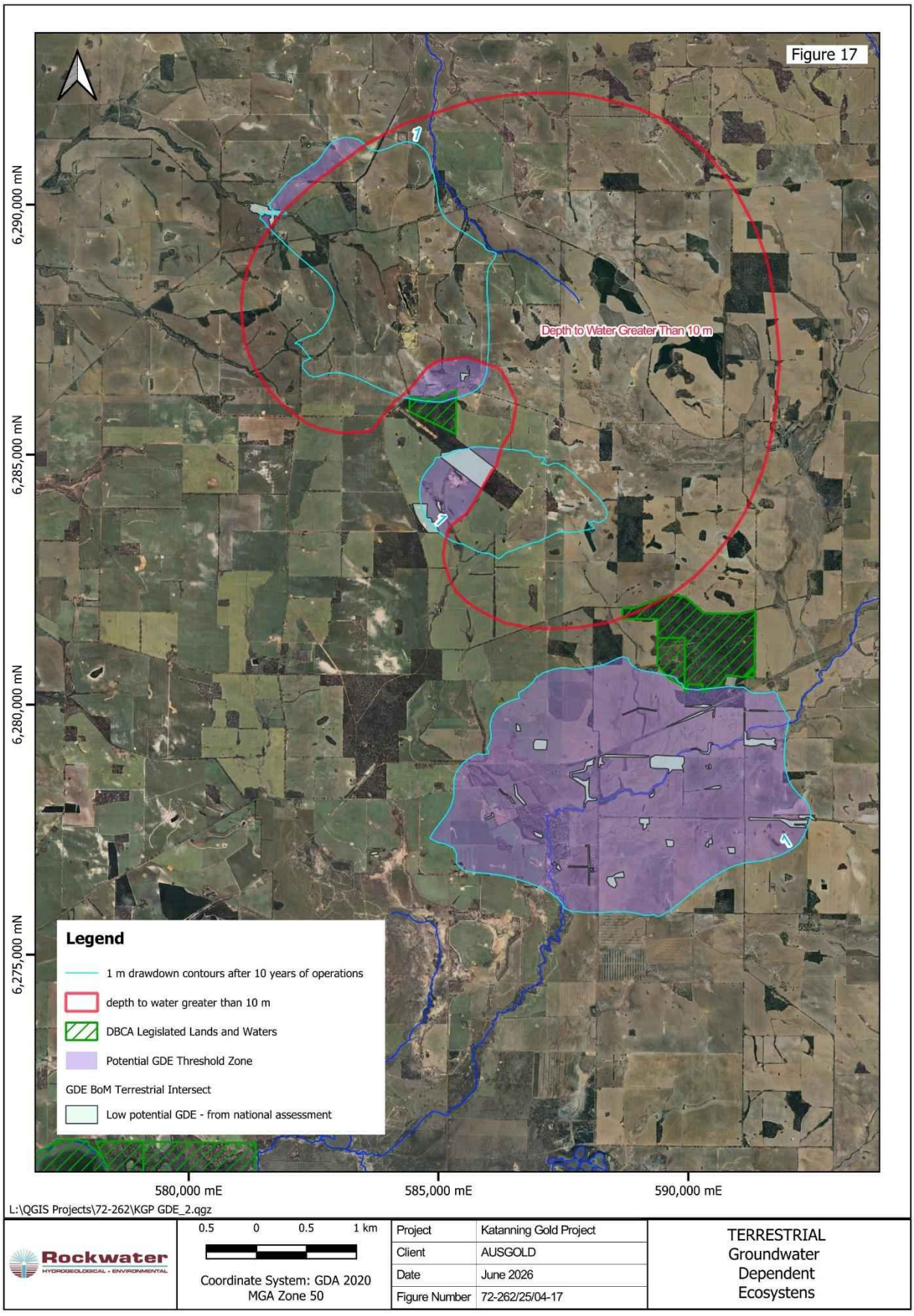

Figure 17 – Terrestrial GDE's within 10 m depth to water where > 1.0 m drawdown (layer 1) predicted

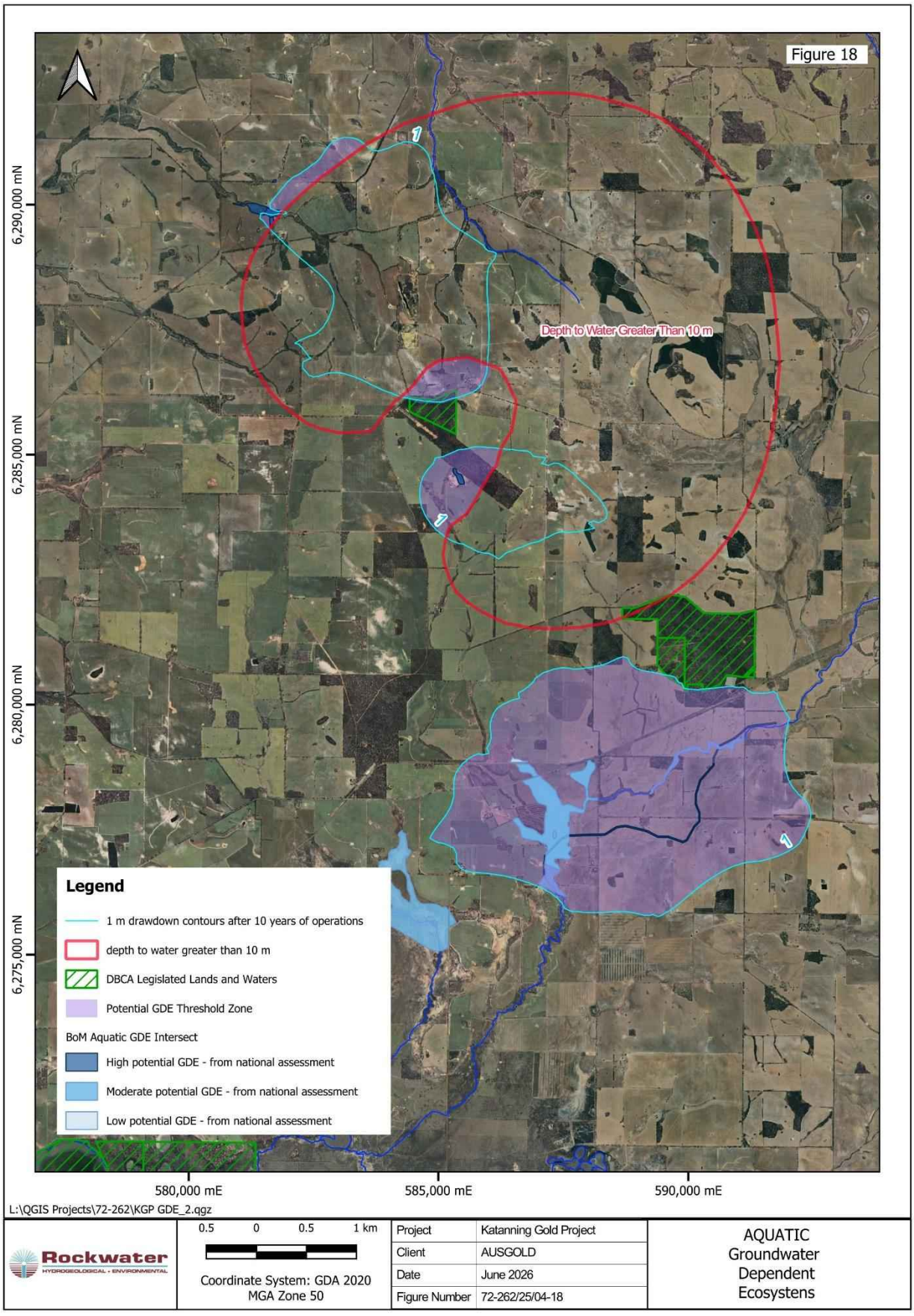

Figure 18 – Aquatic GDE's within 10 m depth to water where > 1.0 m drawdown (layer 1) predicted

APPENDICES

Appendix 1 - Mine plan bench elevations for each pit (below pre-mining water table elevations in blue)

Model Yr	Qtr	Timestep	Dingo		Jackson				Jinkas							Olympia				
			ding1	ding2	jack1	jack2	jack3	jack4	jink1a	jink1b	Jink2	Jink3	Jink4	Jink5	Jink6	olym1	olym2	olym3	olym4	olym5
0	0	1 (steady state)																		
1	1	2							314	354	379									
	2	3							299	334	349									
	3	4							299	304	329									
	4	5							299	284	304	369								
2	5	6							299	264	274	349								
	6	7							299	264	274	339								
	7	8								264	264	329								
	8	9									249	314								
3	9	10									244	294				344	334	339		
	10	11									239	274				319		319		
	11	12									229	254	369							
	12	13			329							234	364							
4	13	14			314							214	364							349
	14	15			294							194	364							339
	15	16			274							174	359							329
	16	17			254							154	349	369					314	
5	17	18			234		329					149	339	354						
	18	19			234		314					149	319	349						
	19	20			234		294						299	344						
	20	21			234		284						294	324						
6	21	22			234		284						294	309						
	22	23			234		284						294	294						
	23	24			234		284						294	279						
	24	25					284						294	259						
7	25	26	319										294	249						
	26	27	309					349					294	229						
	27	28	299					329					294	219						
	28	29	284					309					294	209						
8	29	30	269			359		289					294							
	30	31	249			339		269												
	31	32	229			324		249												
	32	33	209	339		304		239												
9	33	34		319		289									369					
	34	35		299		279									359					
	35	36		279		269									349					
	36	37		259		259									344					
10	37	38													329					
	38	39													319					
	39	40													294					
	40	41													284					

Appendix 3: Assessment of Groundwater Salinity (Hydrobiology, 2025)

MEMORANDUM

TO:	Ausgold: Troy Collie – Manager, Environment & Approvals
AUTHORS:	Bronwyn Woodward, Keisha Desmond
REVIEWER:	Phil Whittle, Troy Collie
SENDER:	Bronwyn Woodward
VERSION/DATE:	Version 0.2 (Final) 21/07/2025

KATANNING GOLD PROJECT - ASSESSMENT OF GROUNDWATER SALINITY

This report presents the results of an assessment undertaken to characterise salinity gradients within the hydrogeological profile within and surrounding the proposed mine pits for the Katanning Gold Project (KGP). The assessment focused on describing the distribution of groundwater salinity with depth, elevation and aquifer type. Baseline salinity conditions in nearby surface water systems, potential receptors for any future discharge, were also evaluated. The findings are intended to support discussions with regulatory authorities regarding the potential discharge of lower salinity groundwater generated through dewatering activities.

Hydrogeological and Surface Water Context

According to the H3 Hydrogeological Assessment for the project (SRK 2025), the site is underlain by a sequence of geological units that influence groundwater occurrence and behaviour. These units correspond to the layers used in the groundwater model developed for the site and provide a framework for a simple aquifer classification relevant to our analysis. The units, listed in order of increasing depth, include:

- Alluvial and colluvial sediments near the surface (~0–13 m), representing an unconfined aquifer
- Interbedded clay and sand deposits (~13–30 m), which may behave as partially confined or unconfined aquifers depending on local conditions
- Bedrock and high-permeability fractured bedrock (dykes and faults) at approximately 50 m depth, considered confined aquifers
- Deeper bedrock and fractured zones near 100 m depth, also confined
- Basement bedrock devoid of faults or dykes at ~110 m depth, representing a confined aquifer with low permeability

Saline groundwater occurs in fractured rock aquifers in the project area due to dissolution of salts from marine-derived sediments or mineralised bedrock, a natural source of primary salinity (George et al. 2006; DWER 2019). The Wheatbelt region has also experienced significant land clearing for agriculture, leading to rising water tables and secondary salinisation, especially in shallow, unconfined aquifers in low-lying areas where saline discharge and waterlogging occur (DPIRD 2002; South Coast NRM 2020; UWA 2024).

STREET
1/71 Troy Terrace
Jolimont 6010
WESTERN AUSTRALIA

POSTAL
PO Box 1034
West Leederville 6901
WESTERN AUSTRALIA

CONTACT
+61 (0)8 6218 0900 P
infowa@hydrobiology.com

ABN 68 120 964 650

www.hydrobiology.com

Surface water drainage is highly modified by agriculture, with artificial contour drains and earthen dams altering natural flows (SRK 2025). Salinity affects many wetlands and streams regionally, driven largely by secondary salinisation. However, the area also contains natural salt lakes formed by regional processes of salt accumulation in low-lying discharge zones. The project area drains primarily into Dumbleyung Lake, a natural salt lake typical of the Wheatbelt's semi-arid landscape, where evaporation and limited outflow concentrate salts. Coyrecup Lake, a near-permanent saline lake on the floodplain of the upper Coblinine River, receives minor drainage from the site. Dumbleyung Lake discharges into the Blackwood River, which flows to its estuary at Augusta (SRK 2025).

Methodology

Groundwater and surface water salinity data, including electrical conductivity (EC) and total dissolved solids (TDS), were compiled from datasets and reports provided by Ausgold for the Katanning Gold Project (KGP), and from the Department of Water and Environmental Regulation's (DWER) Water Information Reporting (WIR) database. Only data within an approximately 10-kilometre buffer around the mining tenement were included, as shown on Figure 1. Where TDS measurements were not available, EC values were converted to TDS. Where both field and laboratory measurements were available, field readings were prioritised.

For groundwater records the bore depth, elevation, and aquifer type were attributed where possible. Bore depth was derived from field notes or bore logs. Elevation was derived from Digital Elevation Models (DEMs) available through Geoscience Australia (2008, 2020).

For the purposes of our analysis, bores were grouped into the following categories based on depth and geology:

- **Perched** — Shallow bores intersecting isolated groundwater above clay-rich layers
- **Superficial** — Bores screened within the near-surface alluvial and colluvial sediments, representing unconfined aquifers
- **Fractured rock** — Bores intercepting groundwater within deeper fractured or basement bedrock, under confined conditions
- **Unknown** — Bores with insufficient geological logging or bore construction data, mostly drilled using reverse circulation methods, preventing confident aquifer classification.

After applying the spatial buffer and excluding records lacking sufficient attribute information, a total of 554 groundwater samples and 39 surface water samples were retained for analysis.

Groundwater and surface water salinities were compared to livestock water quality guidelines. Ecosystem protection trigger values from the Australian and New Zealand Guidelines for Fresh and Marine Water Quality (ANZECC & ARMCANZ 2000) were not applied as salinity in the Katanning region, driven by both natural processes and secondary salinisation, commonly exceeds even the upper end of default values for slightly disturbed systems, as demonstrated by the data presented in this study.

Instead, livestock water quality guidelines from ANZECC & ARMCANZ (2000) were considered a more appropriate benchmark, given the already saline nature of local surface water bodies and their relevance as potential receptors in an agricultural landscape. A conservative threshold of 2000 mg/L TDS was used to highlight potential areas of elevated salinity, while 10,000 mg/L TDS represents a higher level of salinity commonly associated with reduced livestock water quality. These values provide context for understanding salinity variation and potential implications, without constituting a formal risk assessment.

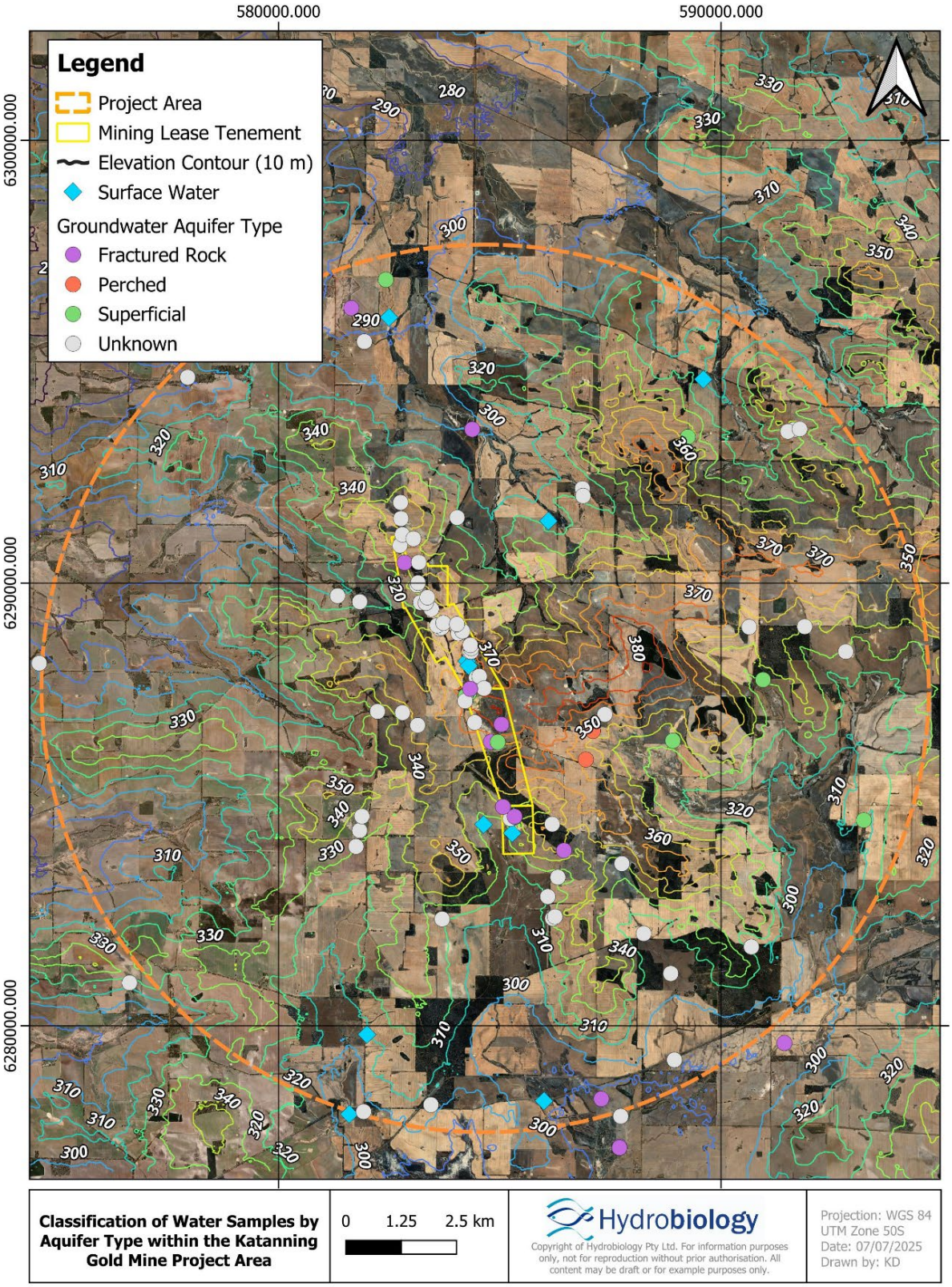

Figure 1 Location of groundwater and surface water sampling sites within and around the Katanning Gold Project area.

Results

Figure 2 and Figure 3 illustrate the relationship between groundwater salinity (TDS) and depth, elevation and aquifer type. The scatter plots show TwDS plotted against elevation and bore depth, with data points colour-coded by aquifer category.

Groundwater in the perched aquifer is fresh, while salinity in the superficial and fractured rock aquifers varies widely from fresh to saline. Regarding depth trends, groundwater salinity in the superficial aquifer generally increases with bore depth (Figure 2).

The most pronounced pattern is that groundwater salinity in both the superficial and fractured rock aquifers decrease with increasing elevation (Figure 3), reflecting fresher conditions at higher ground and higher salinity in lower drainage valleys irrespective of depth below natural surface. This is consistent with observations made by SRK Consulting (2025).

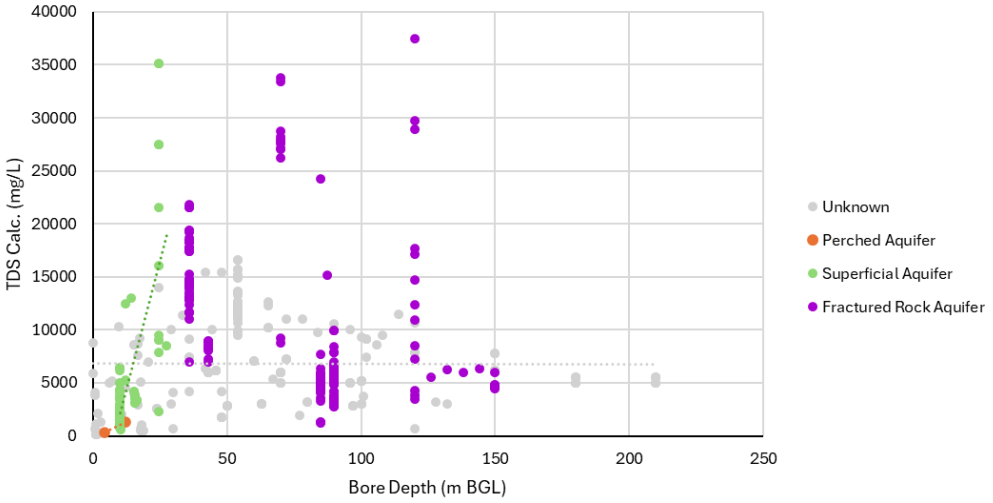

Figure 2 Groundwater Salinity vs. Depth across various aquifer types

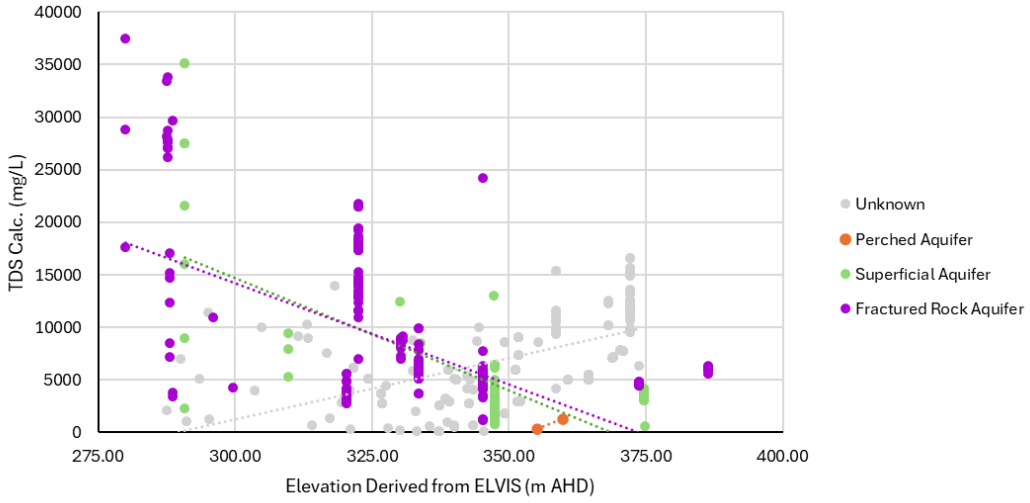

Figure 3 Groundwater Salinity vs. Elevation across various aquifer types

As shown on Figure 4, groundwater salinity in bores located at elevations greater than 300 m AHD is generally lower than surface water, with both the medians and 80th percentiles below those of surface water and below the upper livestock guideline of 10,000 mg/L TDS (Table 1). This indicates that groundwater is fresher than surface water at these elevations, and likely that near surface salts are yielded into runoff and shallow seeps after rainfall.

Table 1 Surface water and groundwater salinity in TDS (mg/L) at varying elevation ranges in the Katanning Gold Project Area. Exceedances of the ANZECC & ARMCANZ (2000) livestock water quality guideline (10,000 mg/L) are bolded*

	TDS (mg/L)			
Elevation Range	Median	80th percentile	Minimum	Maximum
Surface	**11,400**	**15,629**	838	25,208
>275 to <300 m	**17,378**	**28,512**	1,117	37,500
>300 to <325 m	5,715	8,120	305	14,000
>325 to <350 m	5,995	**9,955**	105	21,800
>350 m	5,140	**10,802**	618	24,255

The median salinity for both surface water and groundwater from bores located at elevations below 300 m AHD exceeds the upper livestock guideline (Table 1). While part of the central range of groundwater salinity overlaps with that of surface water, a substantial portion extends above it, and the groundwater has a higher median salinity.

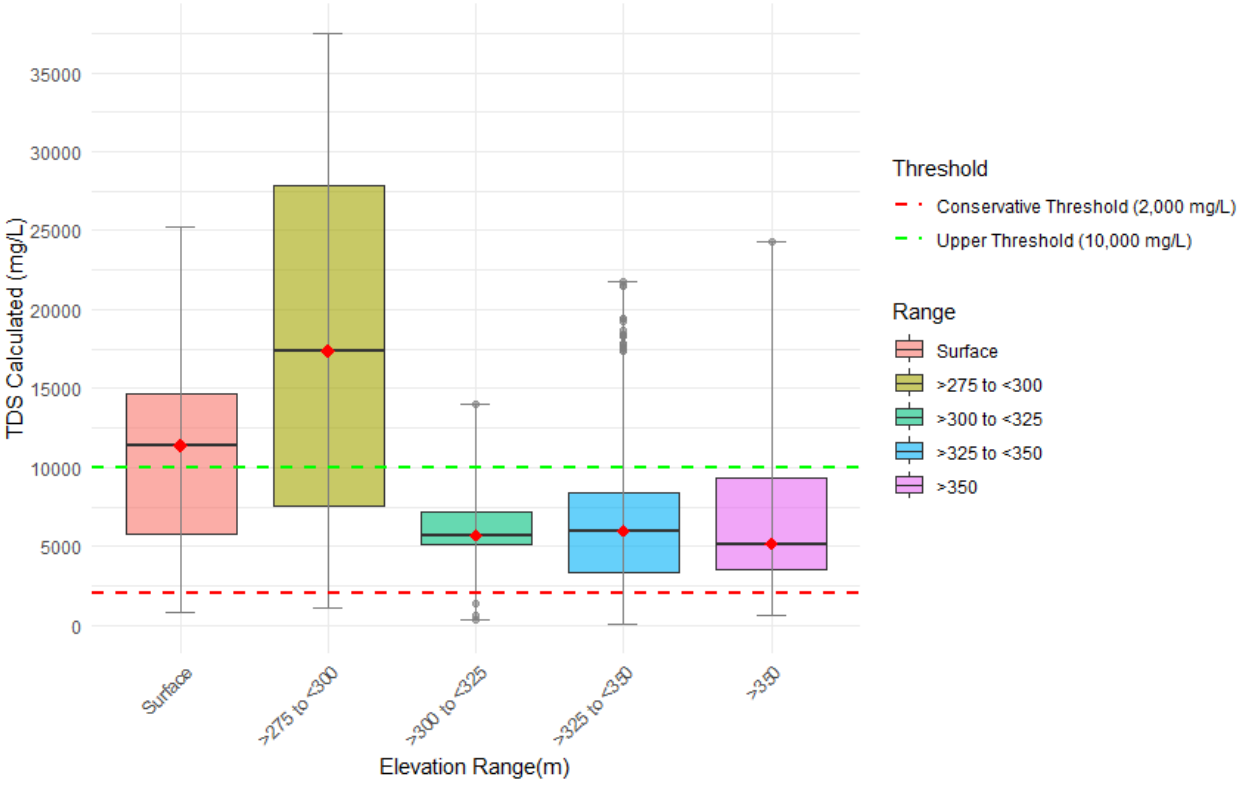

Figure 4 Medians and 20th to 80th percentile ranges for surface water and groundwater salinity at varying elevation ranges, compared against livestock drinking water guidelines.

Conclusions and recommendations

This assessment provides a preliminary understanding of salinity variation within the hydrogeological profile at the Katanning Gold Project.

This preliminary analysis indicates that:

- At bore locations above 300 m elevation, groundwater from the superficial and fractured rock aquifers is generally fresher than surface water and below livestock guidelines - discharge is unlikely to pose a salinity risk to the receiving environment. In fact, it could slightly dilute existing surface water salinity in some areas.
- At bore locations below 300 m elevation, groundwater from the superficial and fractured rock aquifers is generally more saline than surface water and exceeds livestock guidelines - discharge may increase salinity levels in surface waters and could be unsuitable for livestock use downstream unless managed or treated.

Given the preliminary nature of this assessment, the following recommendations are made:

- Continue to collect and refine groundwater and surface water salinity data, including bore construction details, lithology, and updated field measurements, to improve confidence in spatial and vertical salinity trends.

- Examine by detailed statistical and spatial analyses as the dataset expands, to validate observed relationships between salinity, elevation, depth, and aquifer type.
- Consider developing a 3D visualisation of groundwater salinity, if further data collection provides sufficient spatial coverage. While not essential at this stage, a 3D model could serve as a useful communication tool for regulatory engagement or operating 'health checks'.
- Use updated results to inform site-specific risk assessments for groundwater discharge, particularly where more saline groundwater from lower elevations may pose a risk to receiving surface water environments.

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Appendix 4: Katanning Gold Project – Review of Model-derived Pit Dewatering Estimates (EMM, 2025)

Suite 3.03
111 St Georges Terrace
Perth WA 6000
ABN: 28 141 736 558

08 6430 4800

www.emmconsulting.com.au

Memorandum

6 August 2025

To: Troy Collie
General Manager - Planning, Environment & Approvals
Ausgold Limited

From: Tomas Opazo

Subject: Katanning Gold Project - Review of model-derived pit dewatering estimates

Dear Troy,

This technical memorandum presents EMM Consulting Pty Limited's (EMM) evaluation of the reasonableness of pit dewatering estimates produced using the two existing numerical groundwater models developed for Ausgold Limited's Katanning Gold Project.

1 Summary

EMM have reviewed reports on groundwater models from SRK (2025) and Rockwater (2025), and compared their pit dewatering estimates with dewatering data from other gold mining operations, the main findings are the following:

1. SRK (2025) reported model-derived dewatering estimates yield an average of 4.8 Gigalitres per year (GL/yr) and a maximum of 8.4 GL/yr for a 11 year mine life. EMM considers this to be an overestimate and unlikely when benchmarked against dewatering data from existing mine operations located in similar hydrogeological settings in Western Australia. It was found that the fractured rock long-term drainable capacity (specific yield) assumed in the SRK (2025) model is excessively high (10%) leading to the large dewatering rates simulated by the model. In general, and without site-specific data, it is expected that 1 cubic metre (m^3) of rock produces about 1 litres (L) of water (specific yield of 0.1%).

2. Rockwater (2025) dewatering estimates provide an average of 0.4 GL/yr with a maximum of 0.5 GL/yr for a 10 year mine life, which are reasonable in comparison to the range of measured values gathered from existing projects. A sensitivity analysis of increased permeability resulted in maximum dewatering rates of near 1.0 GL/yr, which can be thought of as feasible flows.

3. By reducing the long-term drainable capacity of the SRK (2025) model to 0.1% (exercise performed by EMM using the SRK (2025) model), the modelled dewatering estimates significantly decrease with an average of 1.5 GL/yr and a maximum value of 2.3 GL/yr, which are more reasonable values compared to benchmarked data and to the maximum values reported by Rockwater (2025).

4. There is an identified risk from relying on pit dewatering volumes as a primary water supply source for the Katanning Project. Without site-specific data it is recommended that a conservative approach on pit dewatering volume is taken, unless there is clear evidence of the existence of high-yield water bearing zones connected to the pits.

2 Introduction

Ausgold Limited (Ausgold) owns the Katanning Gold Project (the Project), located approximately 275 kilometres (km) southeast of Perth and 40 km northeast of the town of Katanning, in the Great Southern Region of Western Australia. Ausgold has estimated a total of 3 GL/year of water will be required for the Project, to be sourced primarily from dewatering of the four future pits and the remainder from water supply borefields.

Ausgold previously commissioned SRK to provide hydrogeological services for the Project, including field investigations, aquifer testing and the development a numerical groundwater model. One of the objectives of numerical modelling was to estimate pit dewatering requirements during operations. Rockwater (2025) provided a review of SRK (2025) dewatering estimates and updated values from a new numerical groundwater model, which resulted in significantly lower flows than the SRK estimates. As a result, Ausgold has requested to EMM to provide a technical opinion on the contrasting pit dewatering estimates derived from the two existing groundwater models.

EMM's scope of works comprised a review of five documents provided by Ausgold and the SRK (2025) model files (as listed in Appendix A), a synthesis of the conceptual model and the two numerical models, and a gap analysis.

3 Synthesis of conceptual and numerical groundwater model

A schematic hydrogeological column for the project is presented in Figure 3.1 (SRK, 2024b). The column starts at the bottom with 300 metres (m) thick bedrock of heterogeneous Archaean gneiss complexes and less intensely deformed Archaean granitoid rocks (De Silva et al., 2000), compartmentalised by numerous crosscutting faults and dykes that SRK (2025) interpret as groundwater flow pathways based on slug testing, drillhole water cut exploration data, and the artesian condition of several bores.

SRK (2025) adopted reasonable hydraulic conductivity (K) values for the bedrock unit that reduce over depth from 5 x 10^{-2} metres per day (m/d) to 5 x 10^{-5} m/d, similar to the range 5 x 10^{-2} m/d – 5 x 10^{-3} m/d used by Rockwater (2025). However, SRK (2025) used unreasonable specific yield (S_y) values of 10%[1] to simulate the long-term drainable water hosted in bedrock. To put this number in context, S_y values (i.e. long-term drainable capacity of an aquifer) in the 10–20% range are typical of unconsolidated materials such as sands and gravels but very uncommon in fractured rocks. In general, and without site-specific data, it is expected that 1 m^3 of rock produces about 1 L of water (S_y = 0.1%). Regionally discrete crosscutting faults/dykes were assumed by both SRK (2025) and Rockwater (2025) as permeable and continuous features from top of bedrock to the bottom of the model, with K values of 2 m/d and 0.5 m/d, respectively. Although the presence of faults will likely impact the groundwater drawdown spatial propagation due to pit excavation, this does not necessarily translate into a significant groundwater inflows to the pits[2]. Specific yield values used by SRK (2025) for faults/dykes are reasonable (2.5%). Rockwater (2025) did not report S_y values.

Both SRK (2025) and Rockwater (2025) models were calibrated to measured heads to a reasonable level sufficient to perform predictions. However, SRK (2025) demonstrates that the model is not able to replicate the observed drawdowns from the existing pumping tests.

It is not clear what the faults/dykes configuration is in the Rockwater (2025) model, making it difficult to completely compare both models.

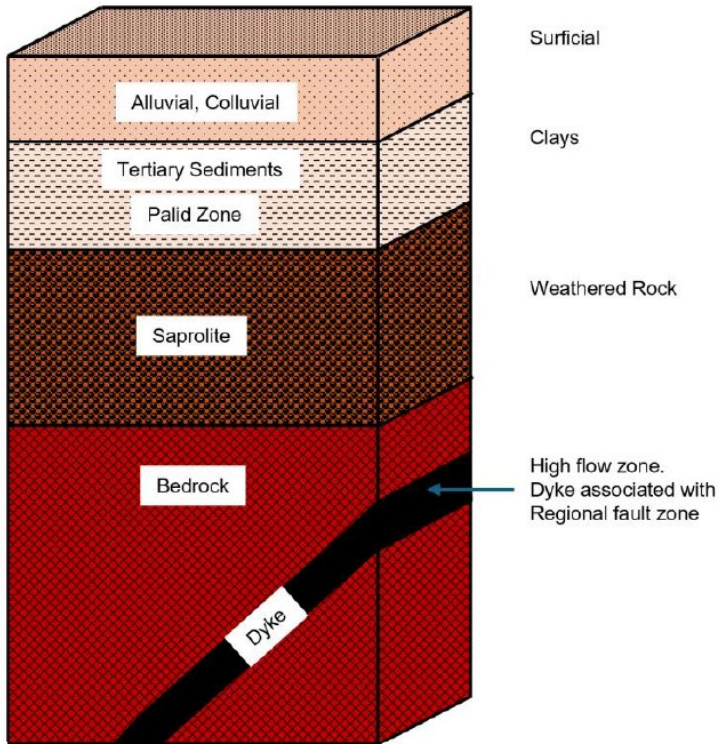

Figure 3.1 Hydrogeological column for the project (SRK, 2024b)

[1] It appears that SRK used the specific yield values derived from pumping test analysis of bore BSMB003 and BSMB010, reported as 0.11 and 0.15, respectively. Although it is beyond the scope of this work to review the pumping test analysis, it is very likely that the reported specific yield values are highly uncertain, as to obtain precise specific yield estimates from pumping tests in semiconfined systems such as fractured rock is uncommon.

[2] Although this is not always the case, from a water supply perspective it is a more conservative approach.

As the model files from the SRK (2025) model were available, the model was run for historical transient and predictive simulations for a Base Case (original hydraulic parameters) and for a case with reduced S_y value of 0.1% for the bedrock (country rock), called EMM Case[3]. The transient hydrographs with measured and modelled data are presented in Appendix B, and they show the following:

- Although there are a significant number of bores with hydraulic head data, each individual bore has a limited number of datapoints.
- Changing the S_y value of the bedrock from 10% to 0.1% does not significantly change the historical and predictive response of the model. Simply, the model with reduced S_y can be deemed as a valid model if the Base Case model is assumed to be valid.

The predictive pit inflows (dewatering) for the Base Case and EMM Case are presented in Figure 3.2. It is evident that the Base Case produce significantly higher flow rates than the EMM Case, with correspondingly higher peak values that dissipate slowly during each mine year. This is an indication of the excessively high S_y values used in the Base Case. Hence, SRK (2025) reported model-derived dewatering estimates with an average of 4.8 GL/yr and a maximum of 8.4 GL/yr for an 11 year mine life are unrealistic. In contrast, the EMM Case with reduced S_y values results in average of 1.5 GL/yr and a maximum value of 2.3 GL/yr, which are more reasonable values, when compared to average of 0.4 GL/yr with a maximum of 0.5 GL/yr for a 10 year mine life reported by Rockwater (2025).

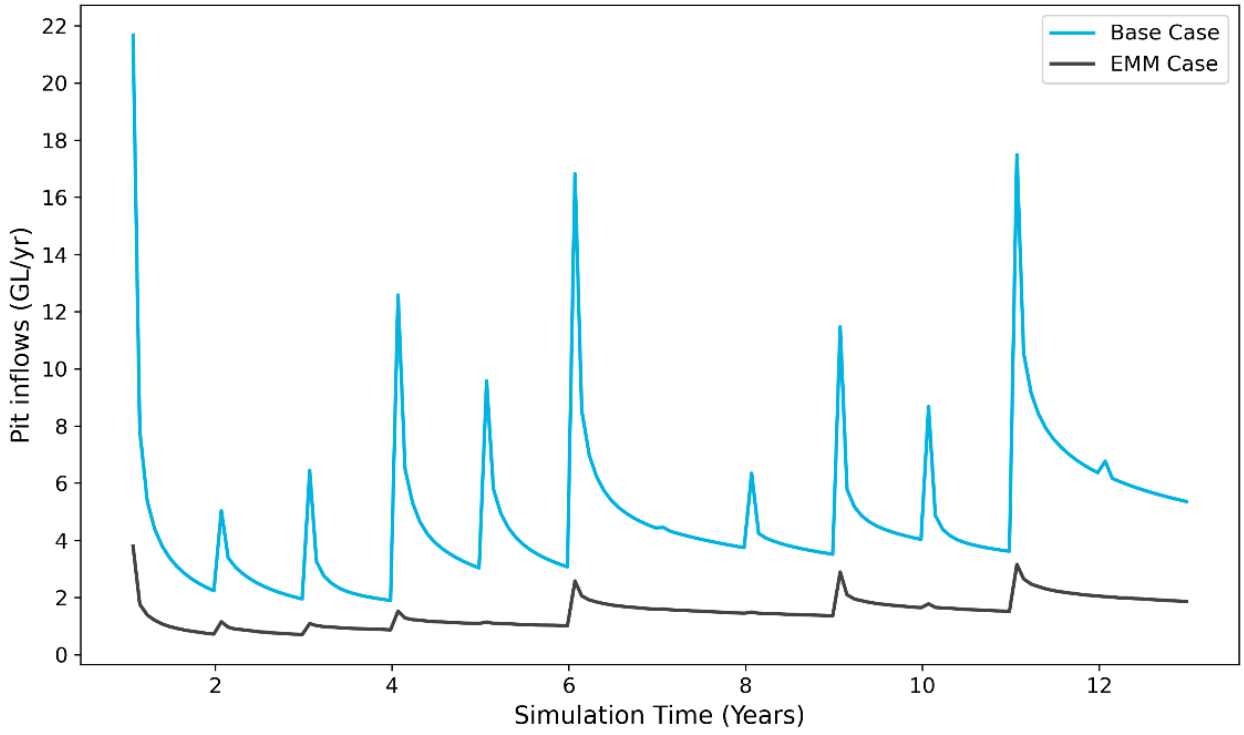

Figure 3.2 **Modelled pit inflows (passive dewatering) obtained from SRK (2015) model for: a) Base Case (Bedrock S_y = 10%) and b) EMM Case (Bedrock S_y = 0.1%)**

[3] It is important to clarify that the SRK (2025) model is used as is, and its use does not imply validation or endorsement by EMM.

4 Benchmarking

A comparison between the modelled dewatering flow rates (in GL/yr) and measured data from existing projects of similar type within Western Australia is presented in Figure 4.1. From the figure it is evident that the SRK (2025) model-derived dewatering estimates are significantly higher than the measured data, and that the Rockwater (2025) estimates along with the EMM Case of the SRK (2025) model (reduced S_y) are within the range of measured data, and therefore it is concluded that they are reasonable values.

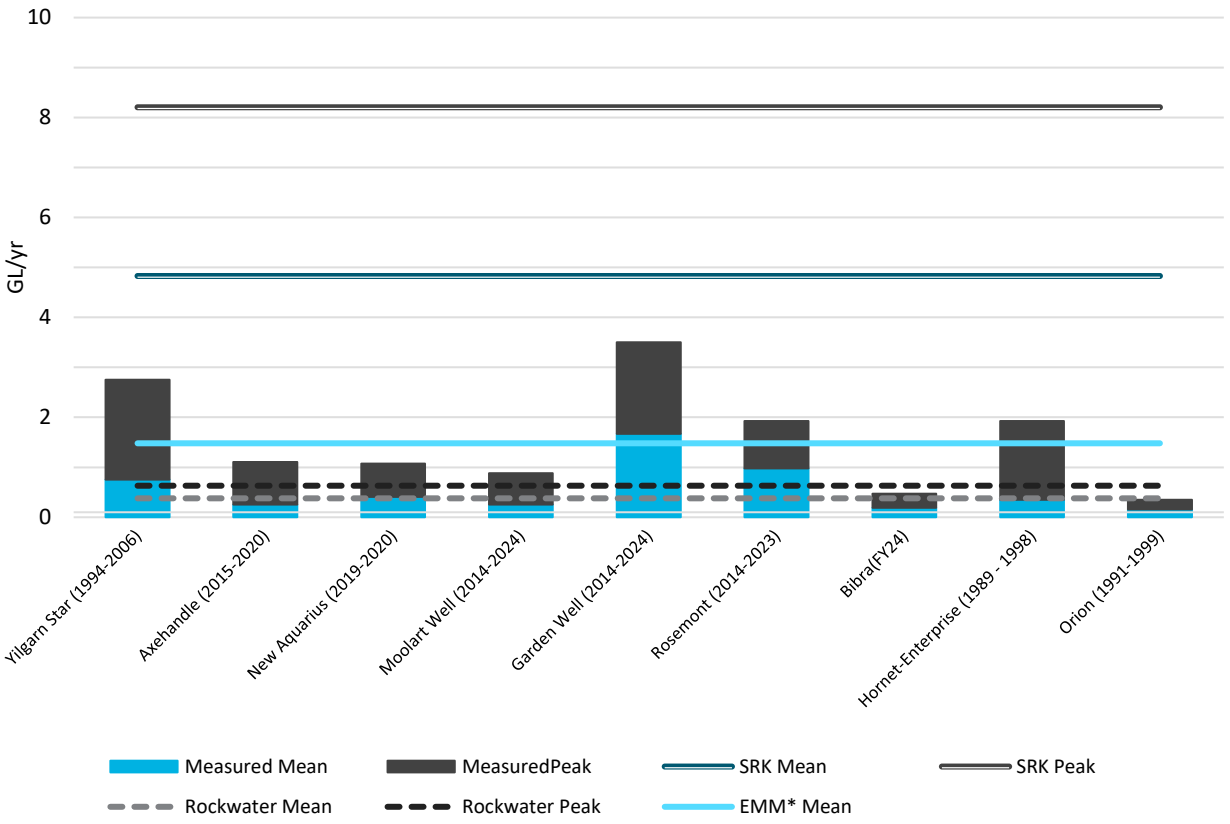

Figure 4.1 Benchmarking of pit dewatering rates (pit inflows) against existing projects

5 Risk analysis

A list of risks identified during the review process and sorted by importance are presented in Table 5.1.

Table 5.1 Risk analysis and proposed mitigation measures

Risk ID Number	Category	Description	Risk	Mitigation
1	Water supply sources	Groundwater inflows to pits are highly uncertain.	Heavy reliance on pit dewatering as a water source for the Project, within a low permeability area.	Secure water supply source through water supply borefield as a major source, with only 10–30% of the total required volumes sourced from the pits.
2	Pit dewatering	SRK (2025) mine plan numerical implementation is coarse assuming all pits advance at same rate, therefore annual sequence of dewatering estimates is not accurate.	Inaccurate water availability derived from the numerical model at the mine year scale may lead to misleading conclusions.	Re-implementation of mine plan and check sensitivity to results.
3	Hydrogeological data	There is limited groundwater level data or SRK used a limited dataset.	There is an incomplete understanding of the site hydrogeology, uncertain hydraulic parameters, and therefore uncertain pit dewatering and drawdown predictions.	Continue monitoring existing bores, and once sufficient data is available update conceptual model, recalibrate numerical model, and update predictions.
4	Hydrogeological data	There is no pumping test data at the centre of future pits.	If pit dewatering rates are required to ensure Project water supply, there high uncertainty in dewatering capacity.	Develop long-term (> 7 days of duration) and higher capacity pumping tests at the locations of the future pits.
5	Groundwater model	There is limited information on the Rockwater (2025) groundwater model design.	Not providing details on the model design make difficult to compare results with the SRK (2025) model and adds another source of uncertainty regarding pit dewatering estimates.	Update the SRK (2025) model and model report using more reasonable hydraulic parameter estimates, to further support the Project water supply strategy and investment decision.

6 Closing

There is a significant amount of uncertainty in the hydrogeological regime at the Project which has led to a large range in groundwater inflow estimates. To address this uncertainty, this memo has recommended the following:

- Begin development of a borefield with the capability to supply up to 90% of the Project water demand.
- Continue to monitor bores that have been constructed to provide data in a future updated conceptual and numerical groundwater model.
- Undertake pumping tests on existing bores at increased pumping rates and longer durations and at new locations within the proposed dewatering areas.

If you have any further questions on this work or how best to implement these recommendations, please feel free to contact EMM.

Yours sincerely

Signature:

Email: topazo@emmconsulting.com.au

Tomas Opazo
Senior Associate Hydrogeologist
topazo@emmconsulting.com.au

Appendix A

References and information reviewed

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A.1 References

De Silva, J, Smith, R A, Rutherford, J L and Ye, L, 2000. Hydrogeology of the Blackwood River Catchment, Western Australia, Water and Rivers Commission, Hydrogeological Record Series, Report HG 6, 58p.

Rockwater 2025. DEWATERING MODEL SUMMARY, KATANNING GOLD PROJECT.

SRK, 2024a. Technical memorandum; Katanning drilling operations strategy.

SRK, 2024b. AusGold project – Conceptual hydrogeological model development

SRK, 2025. H3 Hydrogeological Assessment; Katanning Gold Project.

A.2 Information reviewed

Table A.1 Information reviewed

Item	Description
AUG034_LogsCombined_RevA.pdf	SRK – monitoring borelogs 2022
Draft Logs - AUG035HydroDrilling.pdf	SRK – monitoring borelogs 2023
SteadyState_BaseCase.gwv	SRK(2025) Steady state groundwater model
Transient_BaseCase.gwv	SRK(2025) transient groundwater model
Pred_update_BaseCase.gwv	SRK(2025) predictive groundwater model

Appendix B

SRK (2025) Model hydrographs

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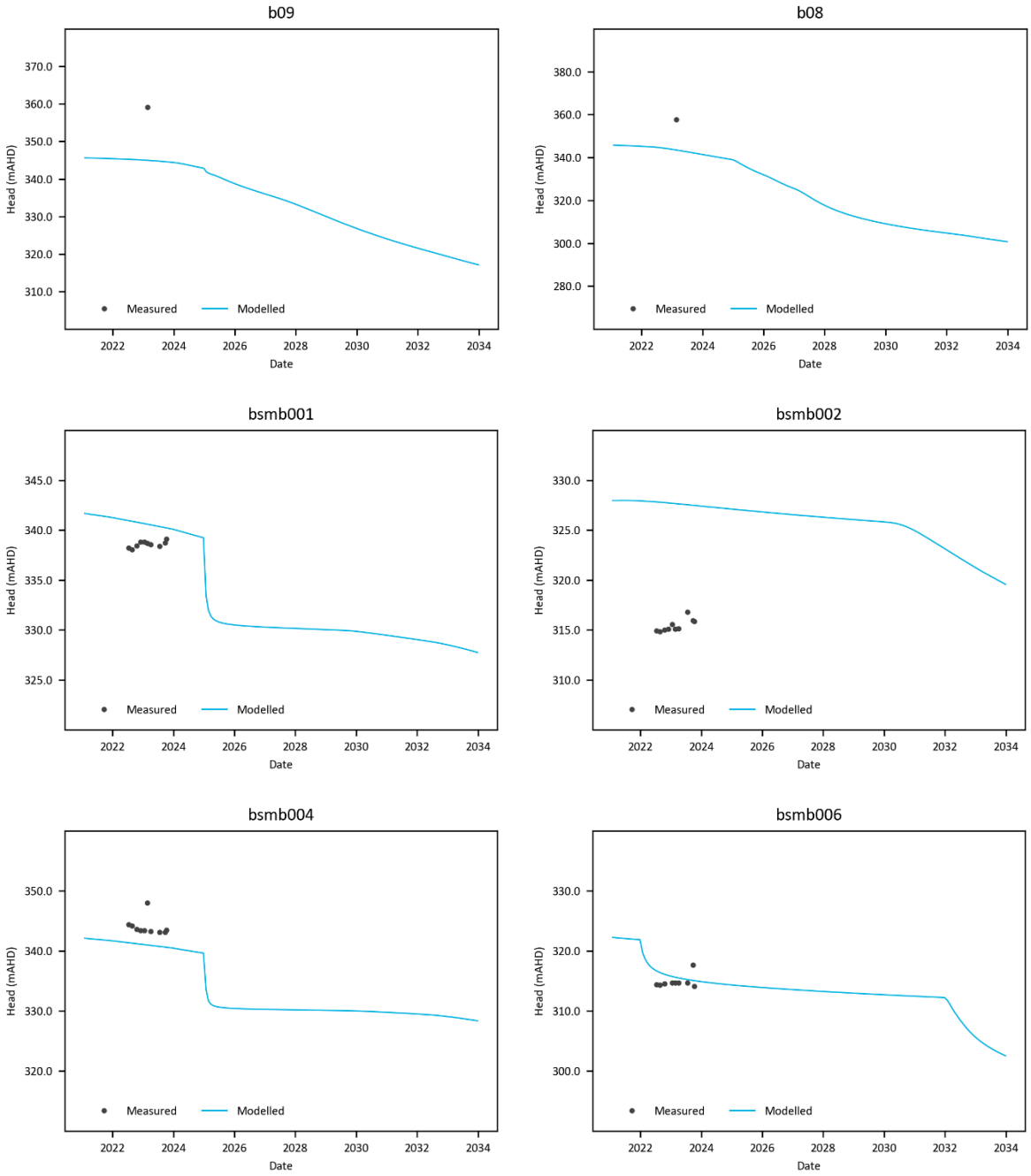
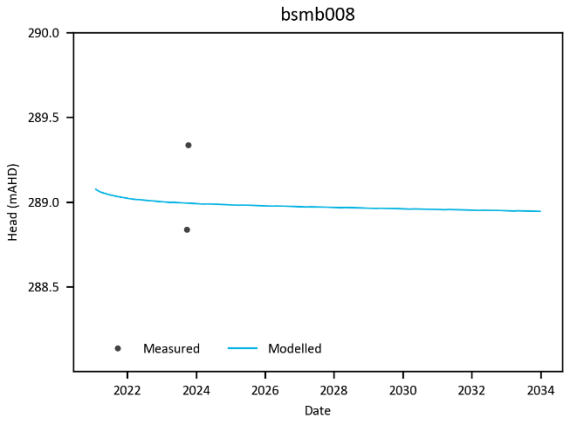
B.1 Hydraulic head hydrographs from SRK predictive model – base case

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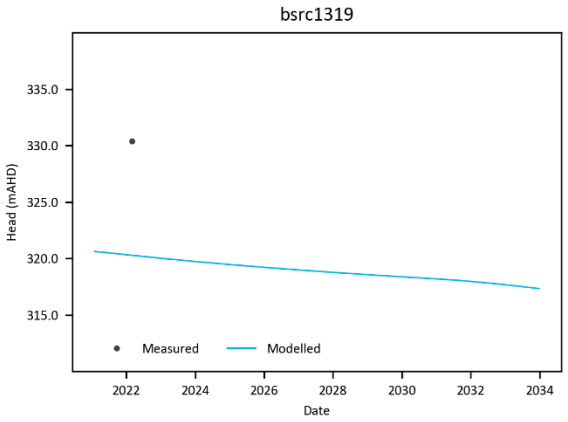
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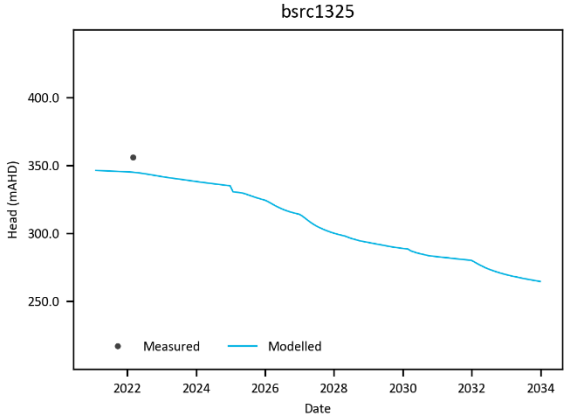
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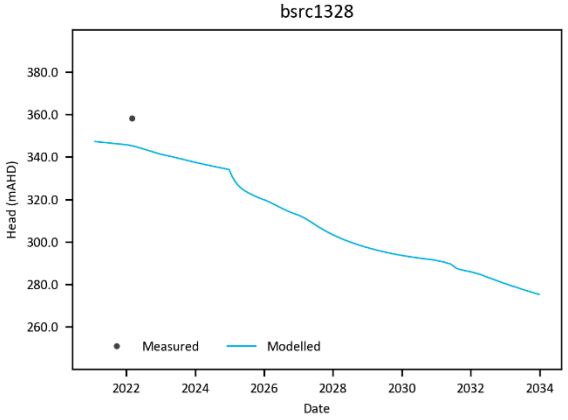
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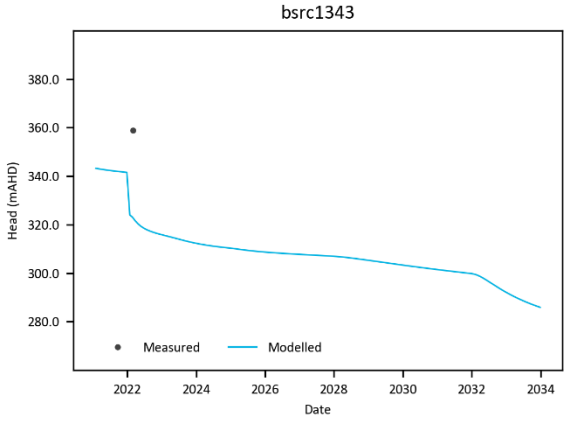
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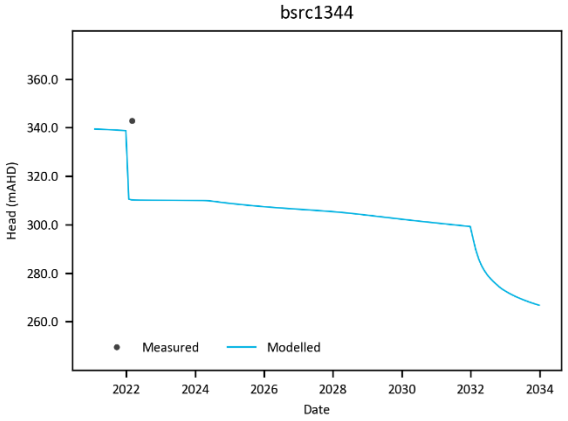
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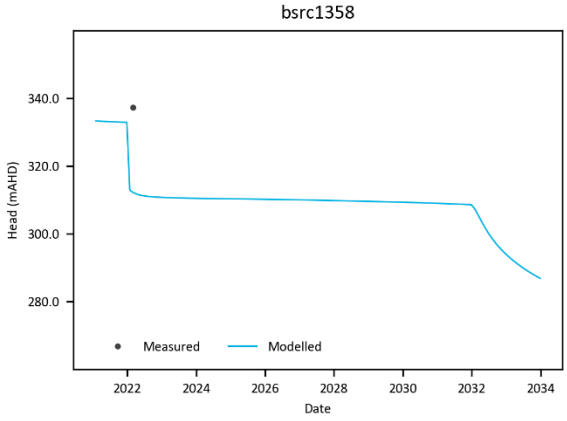
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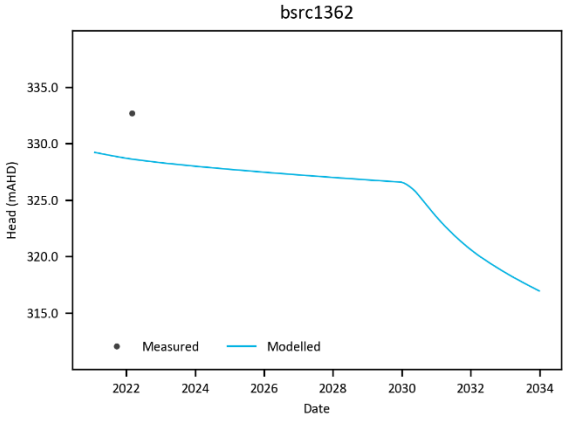
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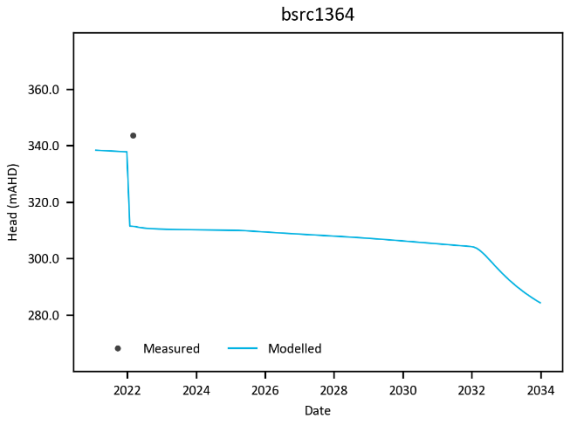
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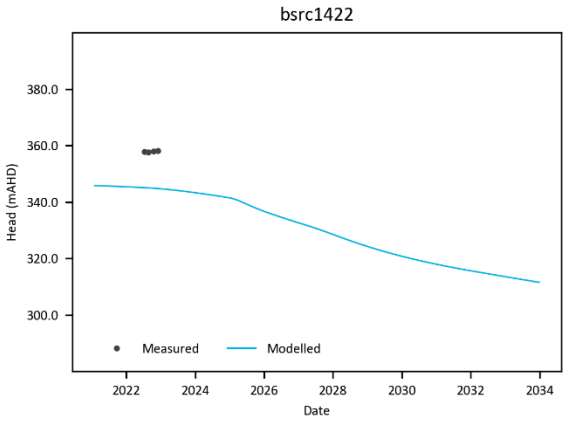
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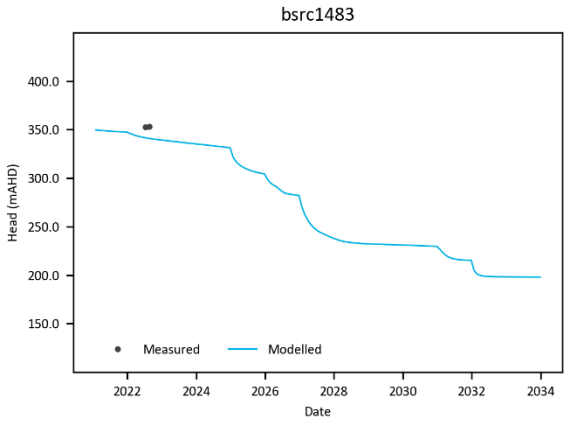
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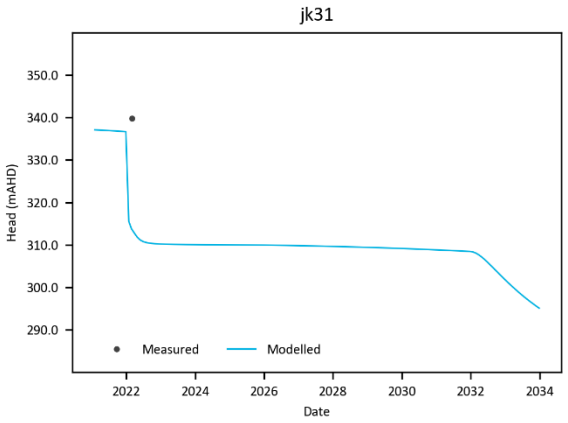
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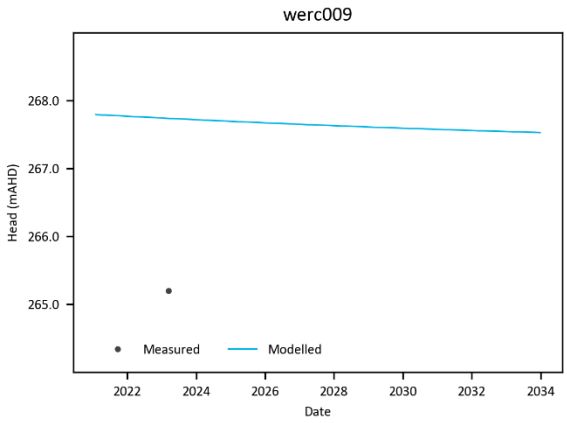
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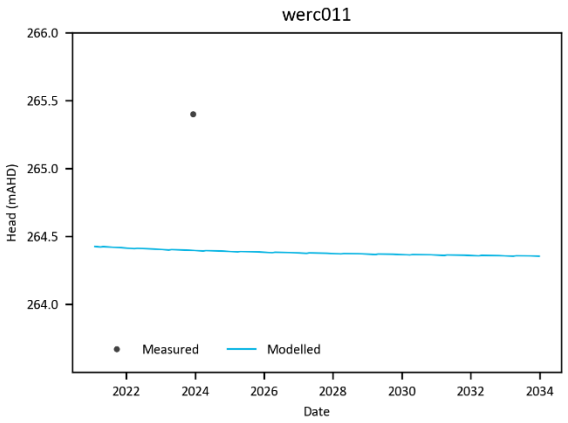
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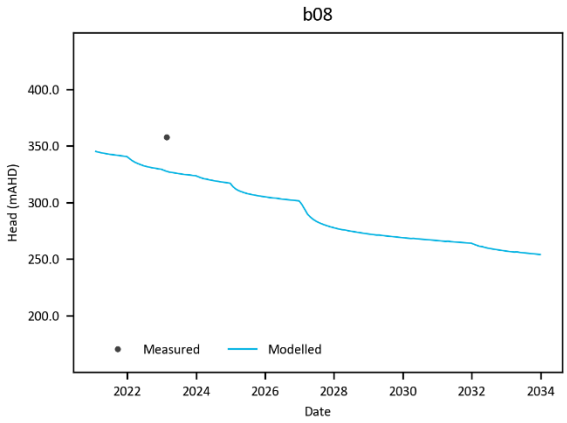
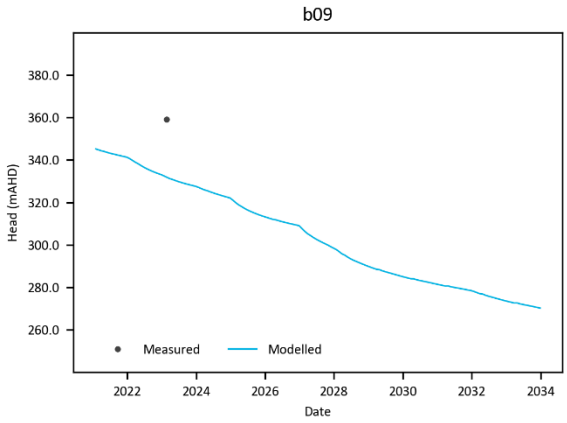
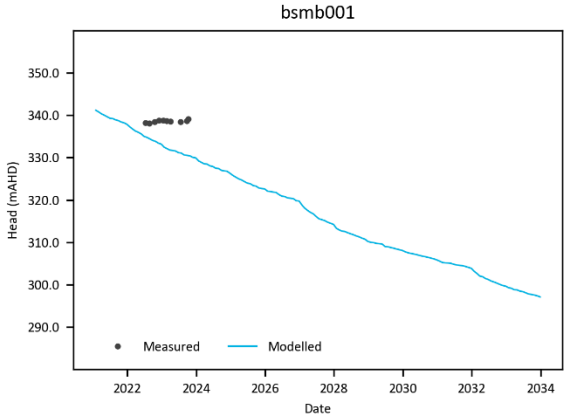
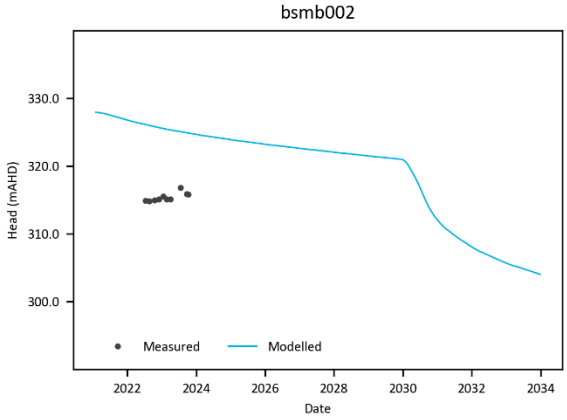
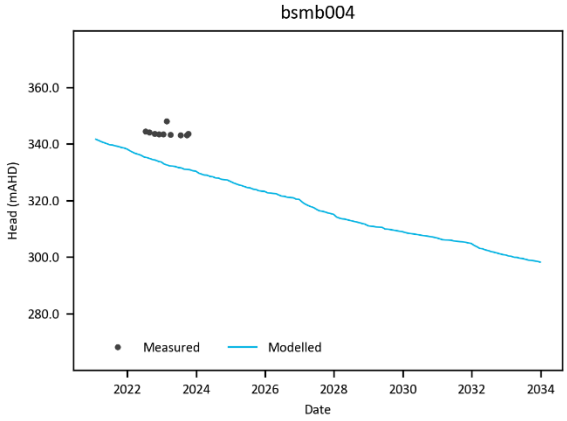
B.2 Hydraulic head hydrographs from SRK predictive model – low Sy sensitivity case

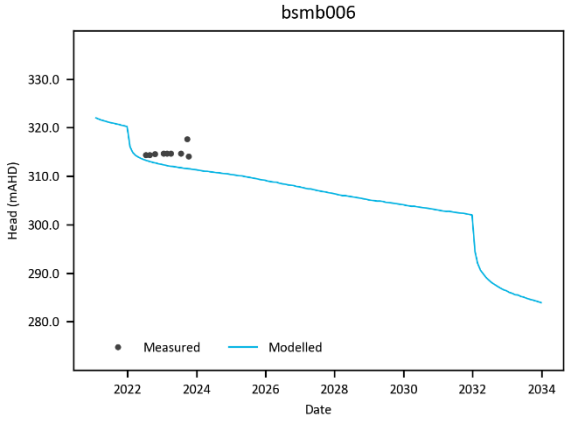


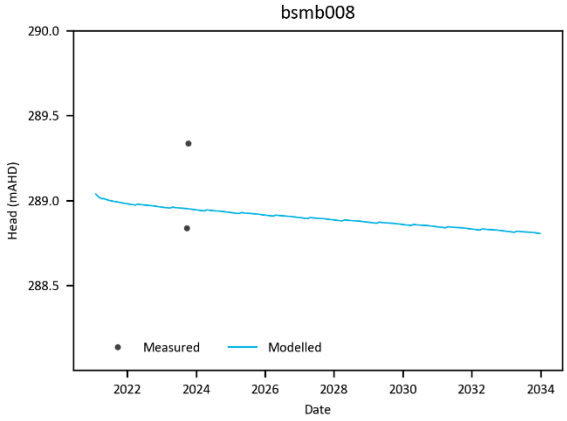


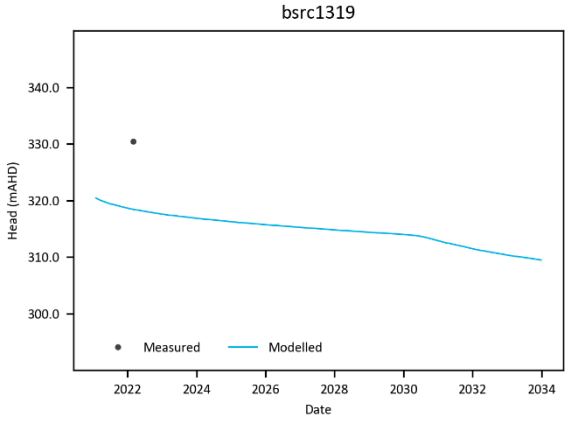


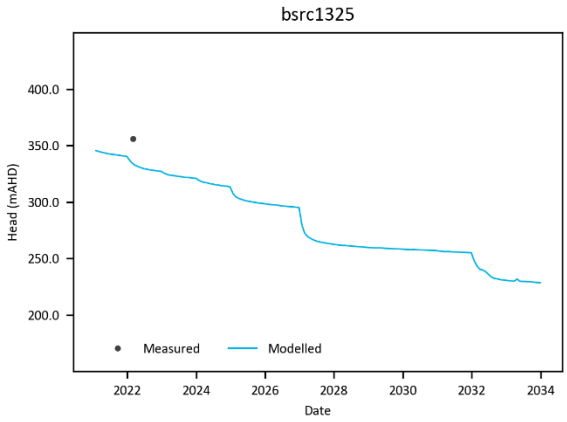








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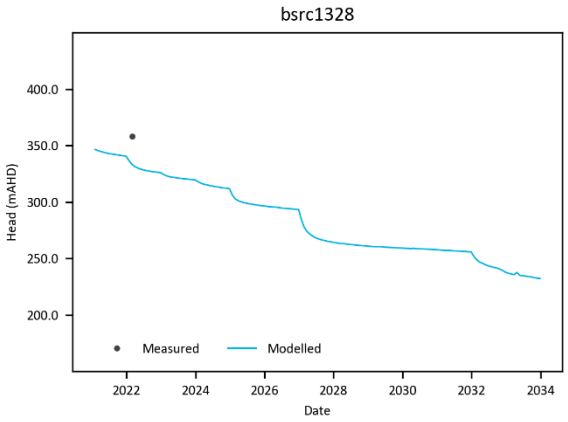
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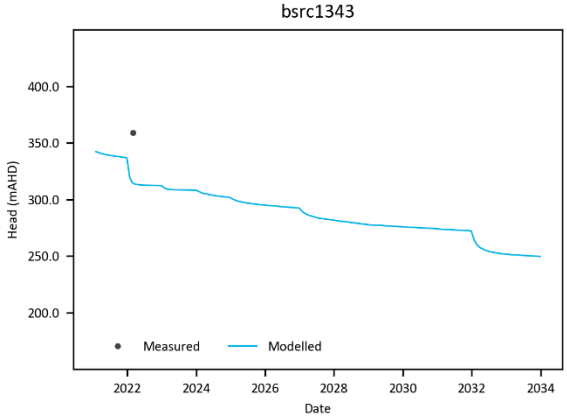
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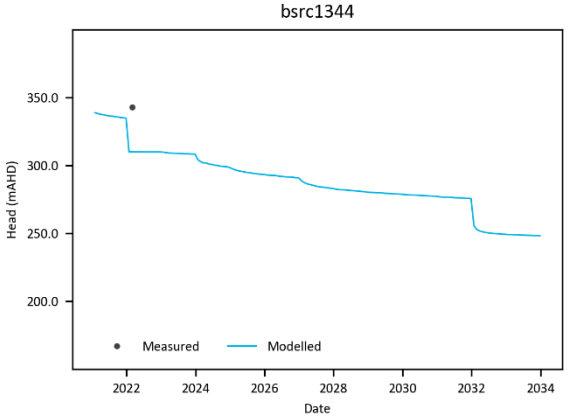
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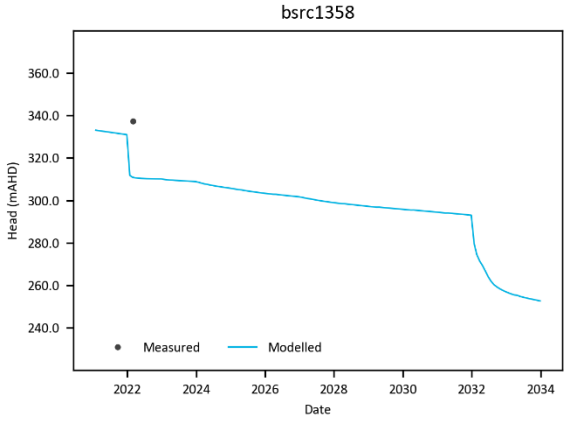
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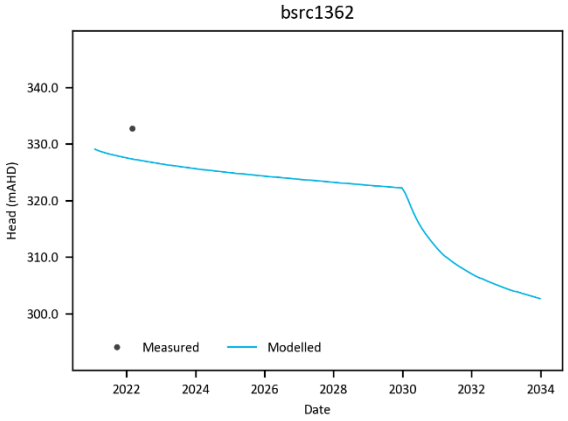
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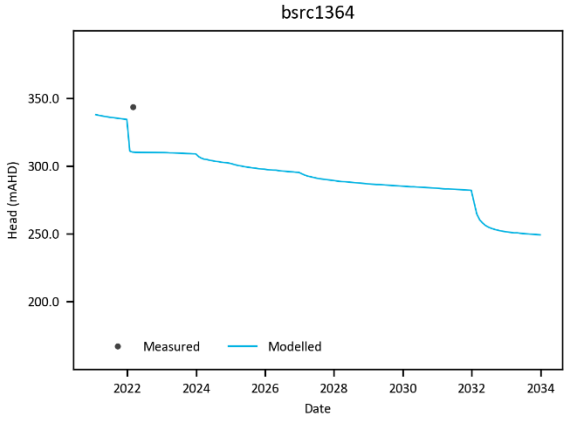
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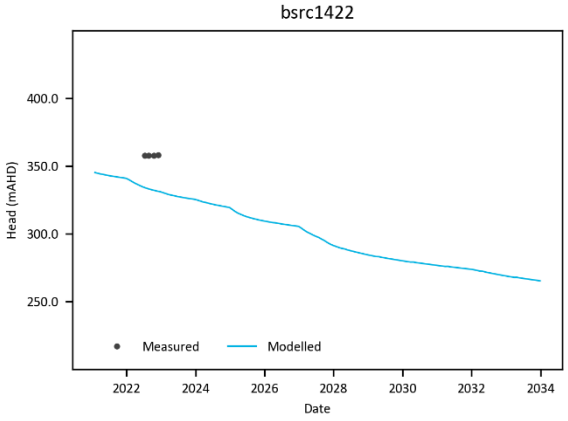
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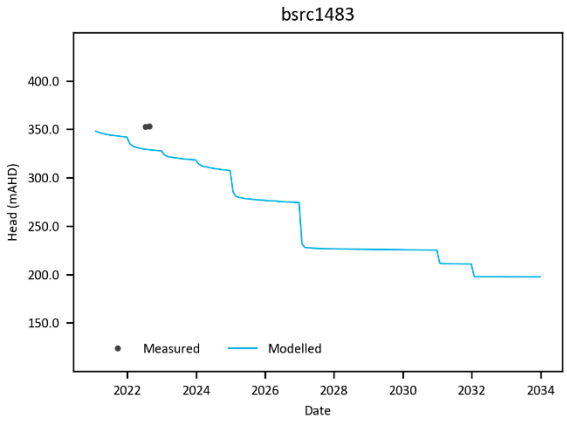
300.0
250.0
Measured
Modelled
2022
2024
2026
2028
2030
2032
2034
Date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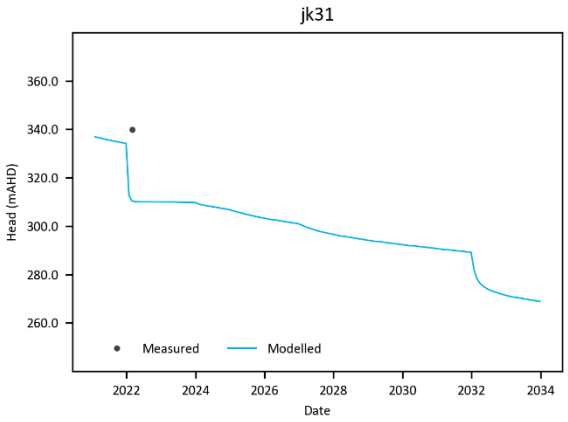
Date


jk31
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340.0
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280.0
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Measured
Modelled
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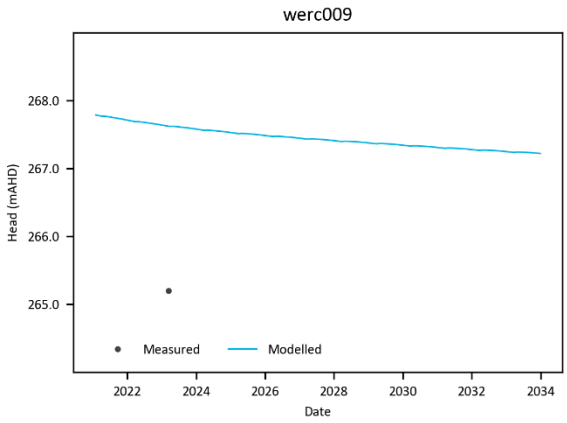
2032
2034
Date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266.0
265.0
Measured
Modelled
2022
2024
2026
2028
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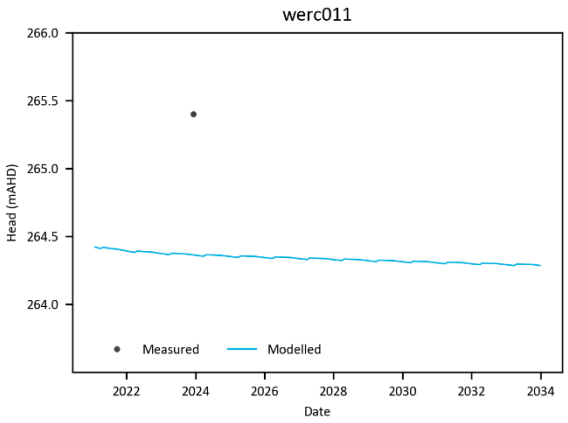
2032
2034
Date


werc011
Head (mAHD)
266.0
265.5
265.0
264.5
264.0
Measured
Modelled
2022
2024
2026
2028
2030
2032
2034
Date

Appendix 5: Site-Wide Water Balance (WSP, 2026a)

Design
for a better
future /

Ausgold Limited

Katanning Gold Project

Site-Wide Water Balance

May 2026

Question today
Imagine tomorrow
Create for the future

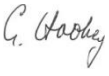
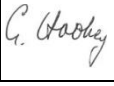
Katanning Gold Project
Site-Wide Water Balance

Ausgold Limited

WSP
Lvl 3, Mia Yellagonga Tower 2, 5 Spring St
Perth WA 6000
PO Box 7181
Cloisters Square WA 6850

Tel: +61 8 9489 9700
Fax: +61 8 9489 9777
wsp.com

Rev	Date	Details
A	13 June 2025	Draft Report
0	16 July 2025	Report
1	29 July 2025	Report
2	23 October 2025	Report with groundwater inflows updated
3	29 May 2026	Final report with updated mine layout

	Name	Date	Signature
Prepared by:	Andrea Garcia-Forero	29 May 2026	
Reviewed by:	Greg Hookey	29 May 2026	
Approved by:	Greg Hookey	29 May 2026	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Appendix B Water balance – Pits
Appendix C Water balance – Sediment ponds
Appendix D Water balance – Process plant

Abbreviations

Ausgold	Ausgold Limited
BO	Borefield
BoM	Bureau of Meteorology
CCiA	Climate Change in Australia
CR	Catchment Runoff
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DP	Direct Precipitation
EF	Evaporation Factor
EN	Entrained Water
FS	Feasibility study
GCMs	Global Climate Models
GG	Greenhouse Gas
GW	Groundwater
KGP	Katanning Gold project
MAR	Managed Aquifer Recharge
ME	Mechanical Evaporator
NRM	Natural Resource Management
OV	Overtopping
PE	Pond Evaporation
PS	Prefeasibility study
RCP	Representative Concentration Pathways
PWR	Pit Wall Runoff
RO	Runoff
ROM	Run of Mine
SILO	Queensland Department of Environment and Science's SILO Data Drill
SP	Seepage
SWMP	Surface Water Management Plan
TDS	Total Dissolved Solids
TE	Tailings Evaporation
T_P	Decanting Pumping

TR	Tailings Runoff
TS	Tailings Slurry
TSF	Tailings Storage Facility
WB	Water Balance
WSP	WSP Australia Pty Limited
WRD	Waste Rock Dump

1 Project background

1.1 Introduction

WSP Australia Pty Ltd (WSP) has been engaged by Ausgold Limited (Ausgold) to develop a site-wide Water Balance (WB) for the Katanning Gold project (KGP) based on the mine layout as at December 2025. The site is located approximately 40 km northeast of the town of Katanning in the southwest region of Western Australia. The project is undergoing definitive Feasibility studies (DFS) to provide an overarching strategy for future mining operations. This study aims to develop a site-wide WB model to provide a general understanding on the site water management requirements and to support the regulatory approval process.

The focus of the site-wide WB is on tracking the contact water and estimate the annual water surplus that will require management through systems such as mechanical evaporation. Non-contact water will be diverted and managed according to the site Surface Water Management Plan (SWMP), which was also developed by WSP in a parallel scope (WSP, 2026). This approach will prevent any mixing of contact and non-contact water.

This report summarises the methodology as presented in the Basis of Assessment (WSP, 2025a), outlines the conceptualisation of the model, and presents the findings of the water balance modelling.

1.2 Site overview

The site is situated approximately 40 km northeast of the town of Katanning in the southwest region of Western Australia. The tenements span more than 4,000 km^2 across the Katanning Greenstone Belt in the southwest corner of the Yilgarn Craton. The KGP represents a 17 km long mineralised trend with significant potential. The general site location is shown in Figure 1.1 and the site layout is shown in Figure 1.2.

Figure 1.1 KGP location

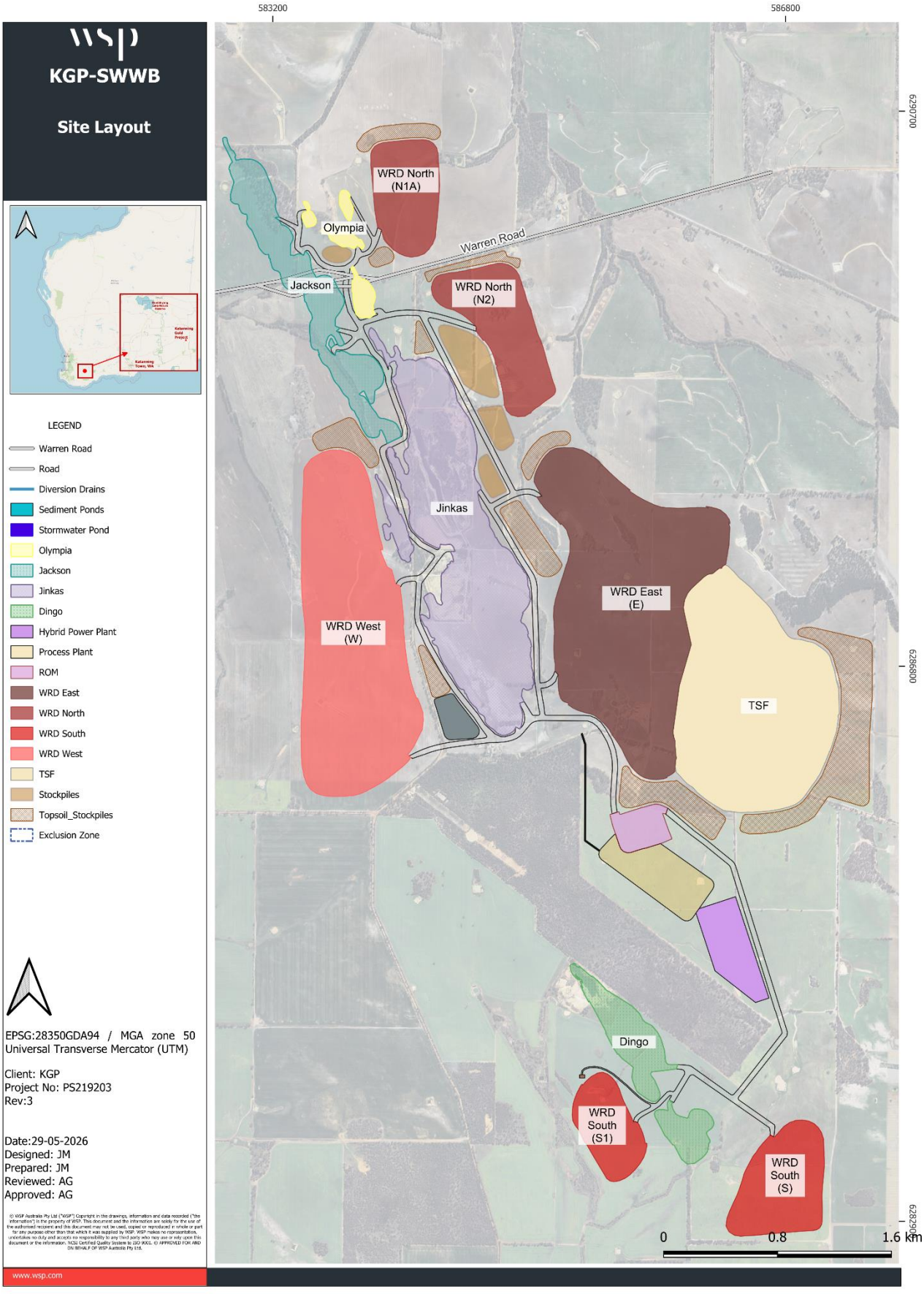


Figure 1.2 Site layout

2 Model overview

2.1 Objectives and considerations

The WB model was developed using the GoldSim software. The model operates on a daily time step to predict the water storage volumes for key structures. The predictive simulations incorporate a probabilistic (stochastic) climate generator to account for uncertainties related to future climatic conditions and variability in selected model inputs and parameters. This approach enables the prediction of the likely long-term interactive performance of the site's infrastructure under alternative climatic sequences.

The objective of the site-wide WB was to establish a base model to inform the strategic planning for the operational phase focusing on:

- Understanding fluxes: Analysing the inflows and outflows of the main infrastructure under stochastic climate time series.
- Quantifying the yearly water surplus that will require management through systems such as mechanical evaporation, adhering to the 'zero release' stipulation.

2.2 Software

The WB was developed in GoldSim (Version 15.0) (GoldSim Technology Group, 2021). GoldSim is used globally to simulate dynamic systems, to understand the factors which control the systems and to predict the future behaviour. Any system that can be quantitatively described using equations and/or rules can be modelled using GoldSim.

GoldSim models are composed of containers and functional elements such as inputs, expressions, stocks, events, delays, cell pathways and results. Each functional element forms part of the model structure which is developed specifically for a particular modelled system. The calculations within and relationship between functional elements are built by the modeller. Input data are stored within the model and can come in the form of a scalar value, a vector or a matrix.

Model simulations are run at a daily time-step over an identified simulation period with one or multiple model realisations. A realisation is defined as a single model run under one set of stochastic inputs (e.g., climate dataset). The purpose of using multiple realisations in this case is to test the system under multiple alternative rainfall/evaporation time series or other input patterns.

2.3 Conceptualisation

A simplified version of the process flow diagram for the WB is presented in Figure 2.1 showing the general interactions between the main storages. In general, the contact water flow during operations is as follows:

- **Pits:** There are four main pits on site (Jackson, Jinkas, Dingo, and Olympia), with each pit developed in stages (refer to Section 3.2 for details). Pits in general receive water from direct precipitation, catchment runoff, pit wall runoff and groundwater inflow, the latter as a result of the pit being mined below the regional groundwater level (except Olympia). Water ponding within a pit is mainly lost through dewatering pumping to the process plant.
- **Sediment Ponds and Stormwater Ponds:** Eleven sediment ponds are expected to collect runoff and seepage from the Waste Rock Dumps (WRDs) across the mine area, while two stormwater ponds are expected to collect runoff from the Run of Mine (ROM) pad and the power plant (refer to Section 3.3 for details). Operational rules governing pumping from the sediment ponds to the process plant are applied. The sediment ponds are expected to be clay lined, and therefore only minimal seepage is expected.

- **Tailings Storage Facility (TSF):** The TSF comprises two cells (Northern cell and Southern cell) (refer to Section 3.4 for details). The TSF cells receive water from direct precipitation, water released from the tailings slurry, and runoff from the tailings surface. The main outflow from the TSF cells is decanting pumping directed back to the process plant. A minimal seepage is expected to be captured via an underdrainage system or collection system returning the water to the processing plant. The model would consider this seepage as a loss in the water balance.
- **Process Plant:** The process plant receives water from the pits, sediment ponds, and TSF cells. It has an annual water demand of approximately 3700 ML and if the inflow is insufficient, borefields are used to supplement the water supply (refer to Section 3.4.3 for details).

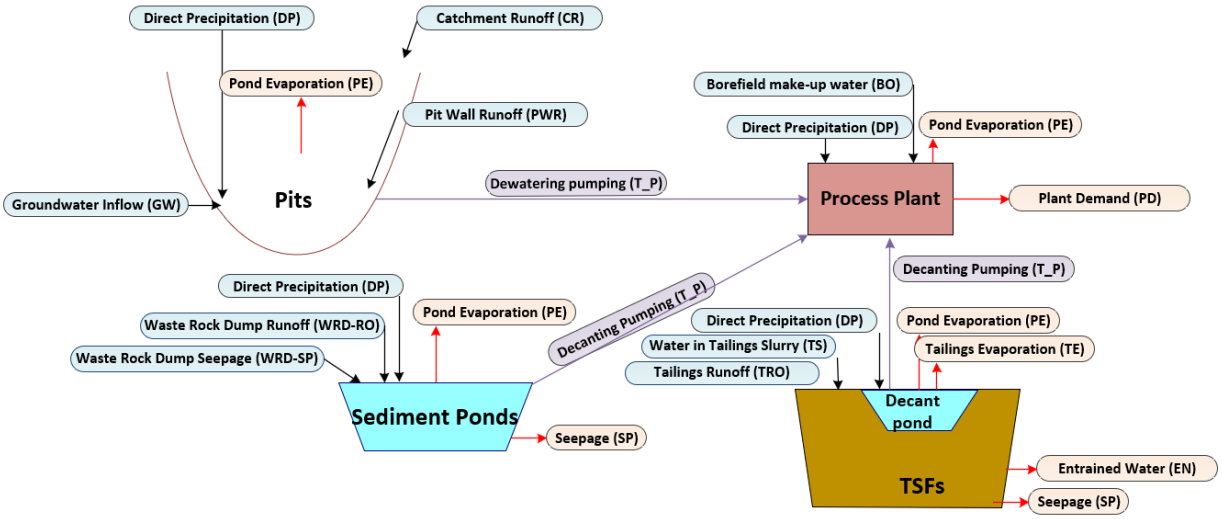


Figure 2.1 Simplified process flow diagram for KGP

2.4 Model inflows and outflows

Inflows, outflows, and water transfers for each storage are summarised in Table 2.1 to Table 2.7 for each storage type. Fluxes were assigned a FLOW ID based on the flow type.

Table 2.1 TSF inflows and outflows

Flow ID	Flow	Description	Rationale for calculation
Inflows			
DP	Direct precipitation	Direct precipitation over the ponding area	Water volumes generated by direct precipitation over the decant pond assuming a runoff coefficient of 1 (i.e., no losses). Area was considered variable depending on the pond volume at each time step.

<table>
<tr><th>Flow ID</th><th>Flow</th><th>Description</th><th>Rationale for calculation</th></tr>
<tr><td>TR</td><td>Tailings runoff</td><td>Run off from the tailings area</td><td>Runoff from the tailings was calculated based on the saturation level (beach condition) and runoff coefficient for each area. The values, presented in Table 2.2, are adopted from the TSF design report (WSP, 2025b).
Table 2.2 Area contributions and runoff coefficients for different areas of the tailings
<table>
<tr><th>Saturation level</th><th>% Area</th><th>Runoff coefficient</th></tr>
<tr><td>Wet beach</td><td>30%</td><td>90%</td></tr>
<tr><td>Drying beach</td><td>10%</td><td>80%</td></tr>
<tr><td>Dry beach</td><td>40%</td><td>60%</td></tr>
</table></td></tr>
<tr><td>TS</td><td>Water in tailings slurry</td><td>Water within the tailings</td><td>Tailings pumped into the TSF includes slurry water of which some is released from the tailings and eventually flows to the TSF pond. The water in slurry released from the tailings depends on the tailings characteristics, and in particular the tailings solids content, defined as follows:
$(eq1)\ Water\ in$ tailings $slurry = \frac{Production\ Rate}{\delta_w} \times \frac{1 - Tailings\ Solids\ Content}{Tailings\ Solids\ Content}$
δw = Density of water (1 t/m^3)</td></tr>
<tr><td colspan="4">Outflows</td></tr>
<tr><td>PE</td><td>Pond evaporation</td><td>Evaporation over the ponding area</td><td>Evaporation was estimated by applying pan evaporation rates scaled by a pan evaporation factor (EF=0.7) to the ponding surface area.</td></tr>
<tr><td>TE</td><td>Tailings evaporation</td><td>Tailings evaporation</td><td>To estimate the evaporation from the different beach areas within the TSF (as mentioned in Table 2.2), the parameters presented in Table 2.3 were considered.
Table 2.3 Factors to derive evaporation from different beach areas
<table>
<tr><th>Saturation levels</th><th>% Area</th><th>Evaporation factor</th></tr>
<tr><td>Wet Beach Factor</td><td>30%</td><td>60%</td></tr>
<tr><td>Drying beach</td><td>10%</td><td>30%</td></tr>
<tr><td>Dry beach</td><td>40%</td><td>10%</td></tr>
</table></td></tr>
<tr><td>T_P</td><td>Decanting pumping</td><td>Decanting pumping</td><td>TSF decant pond is designed to have a decant pond no larger than 20% of the tailings area, therefore excess water in the TSF pond was pumped out to the process plant, even if the process plant has no capacity to store any water in excess of process requirements.</td></tr>
</table>

Flow ID	Flow	Description	Rationale for calculation
EN	Entrained water	Entrained water	As tailings is pumped to the TSF some water is entrained as interstitial water. The proportion depends on the tailings characteristics, and in particular the initial settled dry density (δdi), specific gravity (SG) of tailings material and tailings solids content, defined as follows: $$(eq2)\ Entrained\ water = \frac{Production\ Rate\ \times w}{\delta_w}$$ $$(eq3)\ w = \frac{(SG\ \times\ \delta_w) - \delta_{di}}{SG\ \times\ \delta_{di}}$$ where: w = Moisture content of tailings (% w/w) SG = Specific gravity of tailings material (dimensionless) δw = Density of water (1 t/m^3) δdi = Initial settled dry density of pumped tailings (t/m^3).
SP	Seepage	Seepage	Seepage water from tailings is assumed to occur at a rate 0.044 L/s for the Southern Cell and 0.045 L/s for the Northern Cell based on the TSF Design report (WSP, 2025b). Although seepage is expected to be minimal and negligible in terms of its impact on the overall water balance, it is tracked as an outflow. This is to ensure that in case the seepage is not captured by the underdrainage system, the total volumes can be tracked for environmental checks. Seepage is considered a loss in the system.
OV	Overtopping	Overflow from the TSF	Overflow from the TSF.

Table 2.4 Pit inflows and outflows

Flow ID	Flow	Description	Rationale for calculation
Inflows			
DP	Direct precipitation	Direct precipitation over the ponding area	Water volumes generated by direct precipitation over the decant pond in a Pit assume a runoff coefficient of 1 (i.e., no losses). A constant pond area of 2240 m^2 was adopted considering the dewatering will aim to maintain the pond (sump) in a pit at a minimal water depth of 0.5 m.
CR	Catchment runoff	Catchment runoff	This inflow was estimated by the rainfall-runoff relationship established by McCullough, Marchand and Unseld (2013) and varies depending on the magnitude of the daily rainfall and the preceding day's rainfall to account for antecedent moisture conditions as summarised in Table 2.5.

Table 2.5 Runoff coefficients for pit walls

Current day rainfall	Previous day rainfall	Runoff coefficient for catchment area (CR)	Runoff coefficient for pit wall (PWR).
< 5 mm/d	N/A	0	0
< 40 mm/d	< 20 mm/d	0.15	0.30
< 40 mm/d	> 20 mm/d	0.40	0.65
≥ 40 mm/d	N/A	0.40	0.65

Flow ID	Flow	Description	Rationale for calculation
PWR	Pit wall runoff	Pit wall runoff	This inflow was estimated by the rainfall-runoff relationship established by McCullough, Marchand and Unseld (2013). See Table 2.5.
GW	Groundwater inflow	Groundwater inflow	Continuous groundwater (GW) inflow occurs due to the head difference between the regional GW level and the pit lake level. Ausgold has provided GW inflow data for each pit as a yearly inflow (see Section 3.2). It is assumed the GW inflow has a TDS concentration of (12,600 ppm=mg/L) (Pers comm, 2025a).
Outflows			
PE	Pond evaporation	Evaporation over the ponding area	Evaporation was estimated by applying two factors to the pan evaporation rates as follows: — **Pan evaporation factor** (EF): To convert pan evaporation to pond evaporation a factor of 0.7 adopted. — **Salinity factor (SF):** Leanny and Christen (Leaney, 2020) estimated the decrease in the evaporation rate due to the increase in pond salinity as per equation 1, where S corresponds to pond salinity in g/L: $eq4. SF = 1.025 - 0.0246\, e^{0.00879 * S}$
T_P	Dewatering pumping	Dewatering pumping	Excess water in the pit voids will be pumped out and directed to the process plant. The pump rate will be defined based on the requirement to maintain a constant water level of 0.5 m in the pond.
OV	Overtopping	Overflow from the pits	Overflow from the pit if pond surface elevation exceeds perimeter ground elevation.

Table 2.6 Sediment ponds inflows and outflows

Flow ID	Flow	Description	Rationale for calculation
Inflows			
DP	Direct precipitation	Direct precipitation over the ponding area	Water volumes generated by direct precipitation over the sediment ponds assume a runoff coefficient of 1 (i.e., no losses). The water surface area of the pond was considered for the calculation.
WRD_RO	Run off	Run off	A 10% runoff coefficient is applied to daily rainfall on the WRDs and 90% on the ROM pad.
WRD_SP	Seepage from the WRD	Seepage from the WRD	A 35% seepage coefficient is applied to daily rainfall to represent seepage from the WRDs.
Outflows			
PE	Pond Evaporation	Evaporation over the ponding area	Evaporation was estimated by applying pan evaporation rates scaled by a pan evaporation factor (EF=0.7) to the surface area of the pond.
T_P	Dewatering pumping	Dewatering pumping	A pump capacity of 200 m^3/hour was adopted with pumping assumed to be activated when the water level in the pond is within 1 m of the crest (using the crest as a reference due to variable pond depths) and deactivated when the water depth in the pond reduces below 0.5 m.

Flow ID	Flow	Description	Rationale for calculation
SP	Seepage	Seepage	Calculated considering a clay lined pond with a seepage rate of 10 mm/d over the ponded area.
OV	Overtopping	Overflow from the sediment ponds	Overflow from the sediment ponds.

Table 2.7 Process plant inflows and outflows

Flow ID	Flow	Description	Rationale for calculation
Inflows			
DP	Direct precipitation	Direct precipitation over the ponding area	Water volumes generated by direct precipitation over the process plant storage assuming a runoff coefficient of 1 (i.e., no losses). The water surface area of the process plant (90 m x 40 m=3600 m^2) was considered for the calculation.
T_P-TSF	Decanting from TSF	Decanting from pits and sediment ponds	See T_P in Table 2.1.
T_P-Pits	Transfer, decanting from TSF	Transfer, decanting from TSF	See T_P in Table 2.4.
T_P-SedPonds	Transfer, decanting from Sediment ponds	Transfer, decanting from Sediment ponds	See T_P in Table 2.6.
BO	Borefield make-up water	Borefield make-up water	In case of shortfall to meet water demand of the process plant, required make-up water will be sourced from the nearby borefield.
Outflows			
PE	Pond evaporation	Evaporation over the ponding area	Evaporation was estimated by applying pan evaporation rates scaled by a pan evaporation factor (EF=0.7) to the surface area of the pond.
PD	Plant demand	Plant demand	Plant demand provided by Ausgold in monthly timestep (Pers comm, 2025a).
ME	Mechanical evaporator loss	Losses required for the system to balance	Estimated as the overflow from the process plant pond, considering a storage capacity of 12 ML.

3 Model input data

3.1 Climate

This section provides a summary of the climate conditions at the site, as the WB simulates the system based on daily rainfall and evaporation data. KGP is located within a temperate climate zone with a hot dry summer and cold winter, typically featuring low but highly variable annual rainfall in which there is a significant surplus of evaporation over rainfall. Baseline climate conditions were derived from the Queensland Department of Environment and Science's SILO Data Drill (SILO) gridded data for the period 1986-2005 (see Section 3.1.1). Monthly climate change factors were derived from publicly available data from Climate Change in Australia (CCiA) for rainfall and evaporation based on future period 2020 to 2040 (centred in 2030) and are applicable to the adopted baseline data period form 1986-2005. Three climate change scenarios were considered (see Section 3.1.2):

- Wetter scenario
- Drier Scenario
- Max consensus scenario.

To assess climate variability, the model uses daily stochastically generated rainfall and evaporation data (see Section 3.1.3).

3.1.1 Baseline climate conditions

3.1.1.1 Baseline – Data comparison

The baseline climate condition for the project site was analysed based on five data sources (summarised below) including four Bureau of Meteorology (BoM) weather stations. The period 1973-2011 was selected for concurrent comparison as it includes the most consistent recorded climate data for all stations:

- Badgebup, located approximately 10 km south of the site (BoM ref: 010508; in operation since 1915)
- Dumbleyung, located 30 km north of the site (BoM ref: 010546; in operation since 1910)
- Kwobrup, located 10 km southeast of the site (BoM ref: 010589; in operation since 1915)
- Nairibin, located 20 km north of the site (BoM ref: 010657; in operation since 1915)
- SILO gridded data interpolated for the KGP site location (Lat: -33.55°; Long: 117.90°).

SILO accesses grids of data interpolated from point observations for stations operated by the BoM providing long-term estimates of continuous daily rainfall and evapotranspiration records (from 1889 to present) for any location in Australia. A comparison of the average monthly and annual rainfalls for the five sources is provided in Table 3.1. The comparison shows that the monthly SILO values follow a similar trend and are comparable to the BoM stations, although the BoM stations recorded slightly lower values for July.

Table 3.1 Average monthly rainfalls (mm) for Badgebup BoM station, Dumbleyung BoM station, Kwobrup BoM station, Nairibin BoM station, KGP SILO dataset 1973 to 2011

Station	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Badgebup	18.4	16.0	15.1	27.0	46.7	52.5	54.3	47.7	37.9	30.9	25.6	16.2	388.4
Dumbleyung	17.0	17.3	14.0	24.3	42.3	49.6	53.3	47.6	31.7	23.0	26.9	16.0	363.0
Kwobrup	17.4	13.9	15.3	27.1	45.7	50.2	54.4	47.8	34.4	26.2	28.6	16.1	377.0
Nairibin	15.5	15.9	11.7	20.8	37.7	44.7	46.3	42.1	27.7	21.0	22.9	13.1	319.4
SILO KGP site location	17.8	15.7	13.7	25.2	43.3	54.0	60.2	46.7	35.8	28.4	25.6	15.3	381.5

3.1.1.2 Baseline adopted

Daily pan evaporation data from SILO are available from 1970-2024 and daily rainfall data from 1889-2024. However, the period of rainfall data from 1986-2005 has been adopted for the water balance assessment for consistency with the baseline period used by CCiA to derive the monthly climate change factors. Table 3.2 summarises the mean monthly climate data adopted for the KGP site and compares it to the longer period from 1970-2024. The comparison shows similar seasonal trends and values for the respective monthly rainfalls and evaporation.

Table 3.2 Mean baseline climate for site (mm)

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Rainfall													
1970–2024	17.1	17.7	18.0	23.7	41.9	53.3	58.8	47.4	36.1	28.7	25.0	14.5	382.2
1986–2005 (adopted)	14.0	14.6	19.7	24.7	46.4	53.9	60.9	47.2	37.1	23.9	24.0	12.4	378.8
Evaporation													
1970–2024	248.5	202.7	170.1	103.8	66.3	46.8	48.4	62.2	88.0	134.6	180.1	235.6	1587.0
1986–2005 (adopted)	242.9	198.3	167.5	103.0	63.2	46.1	47.0	60.6	85.7	131.6	178.8	228.8	1553.4

In summary, for the adopted period:

- **Rainfall**: The average annual rainfall is 379 mm, with summer rainfall, i.e., November to April, averaging 109 mm and winter rainfall, i.e., May to October, averaging 269 mm. Further rainfall statistics based on SILO data are shown in Figure 3.1 and Figure 3.2.
- **Pan Evaporation:** The average annual Pan evaporation is 1553 mm, with summer evaporation, i.e., November to April, averaging 1019 mm and winter evaporation, i.e., May to October, averaging 434 mm. Pan evaporation statistics are shown in Figure 3.3 and Figure 3.4.

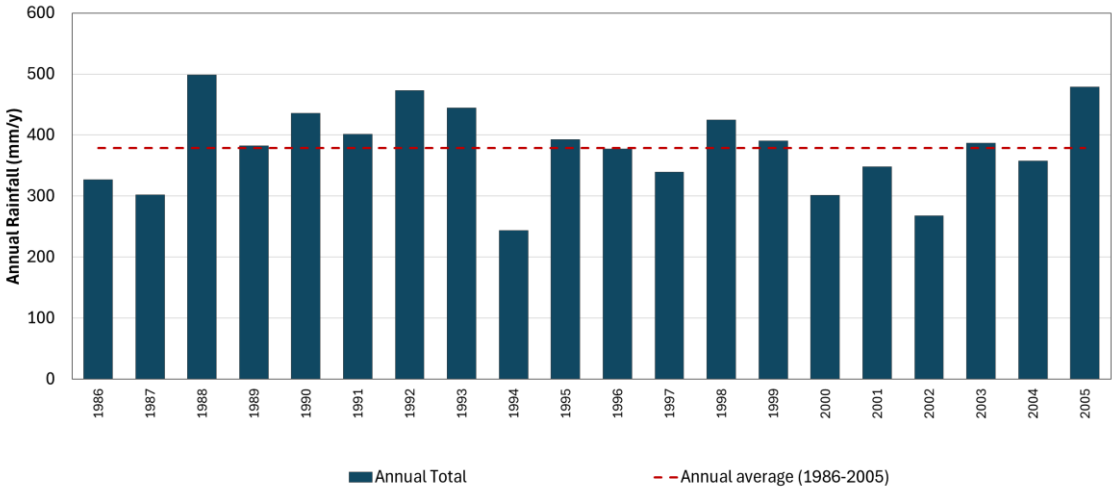


Figure 3.1 Annual rainfall at KGP from SILO (1986 to 2005)

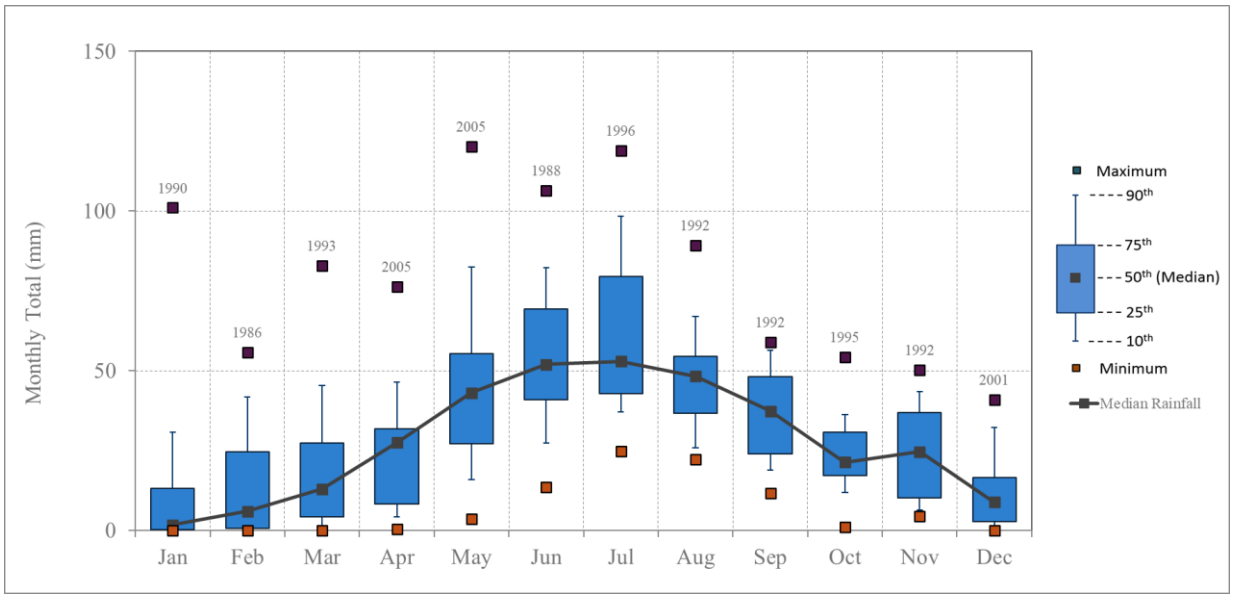


Figure 3.2 Monthly rainfall distribution at KGP from SILO (1986 to 2005)

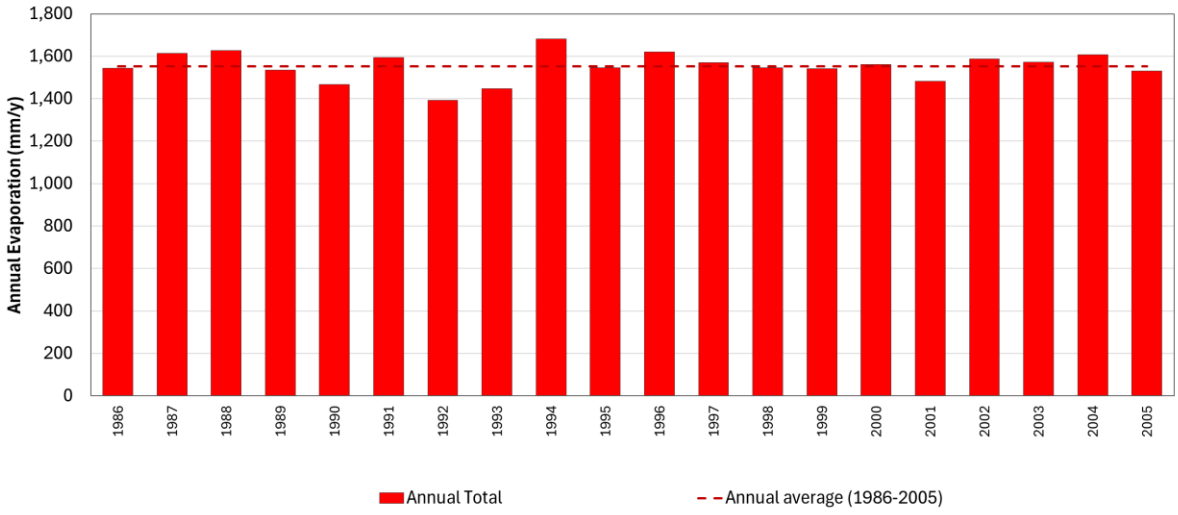


Figure 3.3 Annual pan evaporation at KGP from SILO (1986 to 2005)

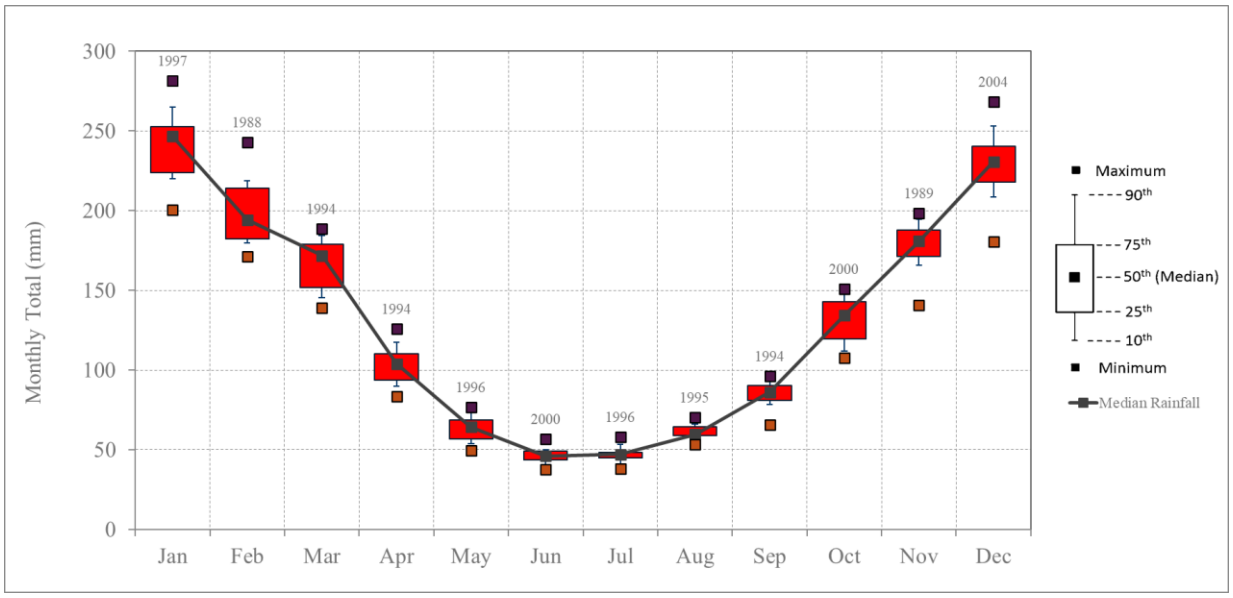


Figure 3.4 Monthly pan evaporation distribution at KGP from SILO (1986 to 2005)

3.1.2 Climate change

A climate change assessment was carried out to provide an understanding of the projected future climate conditions (i.e., rainfall and evaporation) at the project site based on a range of global Greenhouse Gas (GG) emission scenarios. The assessment was carried out for the near future (2020-2040) centred in 2030 (herein referred to as 2030) to estimate the possible climatic conditions for the operational period, considering a Life of Mine ending in 2035. The projected monthly changes for rainfall and evapotranspiration were incorporated into the water balance model as an additional scenario to assess the potential impacts of climate change on the water balance model.

3.1.2.1 Future climate methodology

To investigate and assess climate change impacts, researchers propose different future climate scenarios based on current human activities (e.g., burning fossil fuels). A measure of this is the Representative Concentration Pathways (RCPs), which are projected GG concentrations through to the end of this century dependent on different human behaviour scenarios. These scenarios range from RCP 8.5 (representing high emissions or the most pessimistic scenario), RCP 6.5 (representing intermediate emissions), RCP 4.5 (representing intermediate emissions), and RCP 2.6 (representing low emissions or the most optimistic scenario), as shown in Figure 3.5. The current global commitment for reducing GG emissions is closer to the RCP 4.5 trajectory, whereas the continuing historical pattern of GG emissions leads to RCP 8.5 (Commonwealth of Australia, 2018).

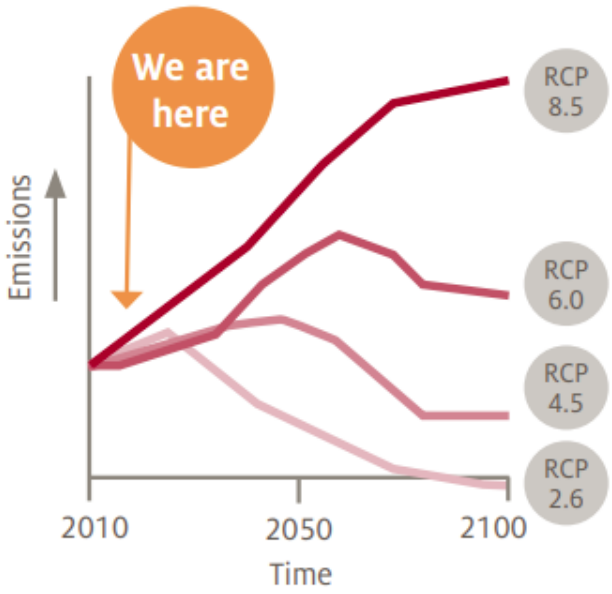


Figure 3.5 Greenhouse gas emission scenarios based on different representative concentration pathways

Global climate models (GCMs) are pivotal in the understanding of future climatic conditions, with their results accessible via the Coupled Model Intercomparison Project. Projections of Australia's future climate are based on the latest research informed by Australian government agencies and international research efforts. A key contributor is the collaborative research conducted by Commonwealth Scientific and Industrial Research Organisation (CSIRO) and BoM, as presented in the 'Climate Change in Australia (CCiA)' website (CSIRO & BoM, 2022). This source provides a comprehensive assessment of future climate for Australia.

The project site is located within the Southern and South-Western Flatlands Natural Resource Management (NRM) cluster (see Figure 3.6). For this region, CCiA predicts a rise in temperature between 0.7°C and 0.9°C for the period 2030, leading to scenarios where both substantially wetter conditions and markedly drier conditions are plausible. It is important to highlight that, irrespective of precipitation changes, a rise in temperature will invariably result in higher evaporation rates.

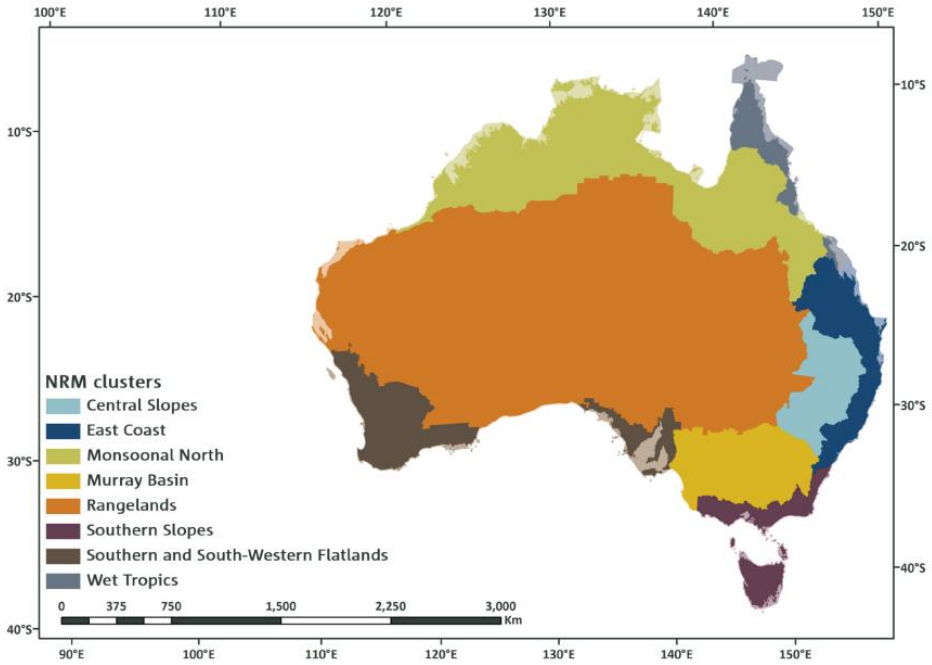


Figure 3.6 Australian natural resources management (NRM) clusters

3.1.2.2 Climate change model scenario selection

To account for a range of possible climate futures, this study assessed three climate change scenarios: Wetter, Drier, and Maximum Consensus.

Representative models were selected from the range of models for RCPs 4.5 and 8.5. The representative climate change model for each scenario was selected using the Climate Futures Projection Builder, based on the NRM cluster conditions from the CCiA website. To identify the representative models, the tool ranks all models using a multivariate statistical technique to find the best fit for the selected settings. Additionally, the tool identifies the maximum consensus climate future, which is the climate future projected by at least 33% of the models and includes at least 10% more models than any other scenario. Settings for the Drier and Wetter conditions were defined as follows:

- Drier conditions: Decrease in monthly and annual rainfall and increase in evapotranspiration.
- Wetter conditions: Increase in monthly and annual rainfall with little change in evapotranspiration.

Monthly percentual change factors for rainfall and evaporation of the assessed models and the adopted models are shown in Table 3.3 and Table 3.4 for the following scenarios:

- Drier scenario model: RCP 4.5 GFDL-ESM2M
- Wetter scenario model: RCP 8.5 CNRM-CM5
- Maximum consensus (Max Con) model: RCP 4.5 ACCESS1-0 (corresponding to the climate prediction with the highest degree of model agreement).

Table 3.3 Monthly percentage change factors for rainfall (%)

Models	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
RCP 4.5 GFDL-ESM2M **(Drier scenario)**	-35.90	-35.90	-44.80	-44.80	-44.80	-16.50	-16.50	-16.50	-46.10	-46.10	-46.10	-35.90
RCP 4.5 NorESM1-M	-5.00	-5.00	9.70	9.70	9.70	-8.20	-8.20	-8.20	-1.20	-1.20	-1.20	-5.00
RCP 4.5 ACCESS1-0 **(Max Con Scenario)**	-9.60	-9.60	-1.50	-1.50	-1.50	-16.60	-16.60	-16.60	3.40	3.40	3.40	-9.60
RCP 8.5 CanESM2	-2.90	-2.90	-24.90	-24.90	-24.90	-10.70	-10.70	-10.70	-23.20	-23.20	-23.20	-2.90
RCP 8.5 CNRM-CM5 **(Wetter Scenario)**	19.70	19.70	15.50	15.50	15.50	-3.70	-3.70	-3.70	3.20	3.20	3.20	19.70
RCP 8.5 CESM1-CAM5	-11.00	-11.00	3.50	3.50	3.50	-8.10	-8.10	-8.10	-4.90	-4.90	-4.90	-11.00

Table 3.4 Monthly percentagfe change factors for evaporation (%)

Models	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
RCP 4.5 GFDL-ESM2M **(Drier scenario)**	0.30	0.30	5.60	5.60	5.60	7.30	7.30	7.30	-0.70	-0.70	-0.70	0.30
RCP 4.5 NorESM1-M	3.70	3.70	1.10	1.10	1.10	4.30	4.30	4.30	2.20	2.20	2.20	3.70
RCP 4.5 ACCESS1-0 **(Max Con Scenario)**	3.20	3.20	2.30	2.30	2.30	4.40	4.40	4.40	2.00	2.00	2.00	3.20
RCP 8.5 CanESM2	1.70	1.70	7.80	7.80	7.80	7.40	7.40	7.40	7.00	7.00	7.00	1.70

Models	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
RCP 8.5 CNRM-CM5 **(Wetter Scenario)**	2.60	2.60	2.20	2.20	2.20	2.90	2.90	2.90	2.20	2.20	2.20	2.60
RCP 8.5 CESM1-CAM5	2.30	2.30	3.70	3.70	3.70	8.80	8.80	8.80	2.40	2.40	2.40	2.30

Table 3.5 and Table 3.6 summarise the monthly and total (annual) rainfalls and evaporation for the selected models applying the factors to the corresponding baseline period 1986-2005. Figure 3.7 and Figure 3.8 illustrate the changes for each scenario.

Table 3.5 Comparison of predicted monthly rainfalls for a range of climate models

Models	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Baseline Rainfall	14	15	20	25	46	54	61	47	37	24	24	12	379
RCP 4.5 GFDL-ESM2M **(Drier scenario)**	9	9	11	14	26	45	51	39	20	13	13	8	257
RCP 4.5 ACCESS1-0 **(Max Con Scenario)**	13	13	19	24	46	45	51	39	38	25	25	11	349
RCP 8.5 CNRM-CM5 **(Wetter Scenario)**	17	17	23	29	54	52	59	45	38	25	25	15	398

Table 3.6 Comparison of predicted monthly evaporations for a range of climate models

Models	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
Baseline Evaporation	243	198	167	103	63	46	47	61	86	132	179	229	1553
RCP 4.5 GFDL-ESM2M **(Drier scenario)**	244	199	177	109	67	49	50	65	85	131	178	229	1583
RCP 4.5 ACCESS1-0 **(Max Con Scenario)**	251	205	171	105	65	48	49	63	87	134	182	236	1597
RCP 8.5 CNRM-CM5 **(Wetter Scenario)**	249	203	171	105	65	47	48	62	88	134	183	235	1591

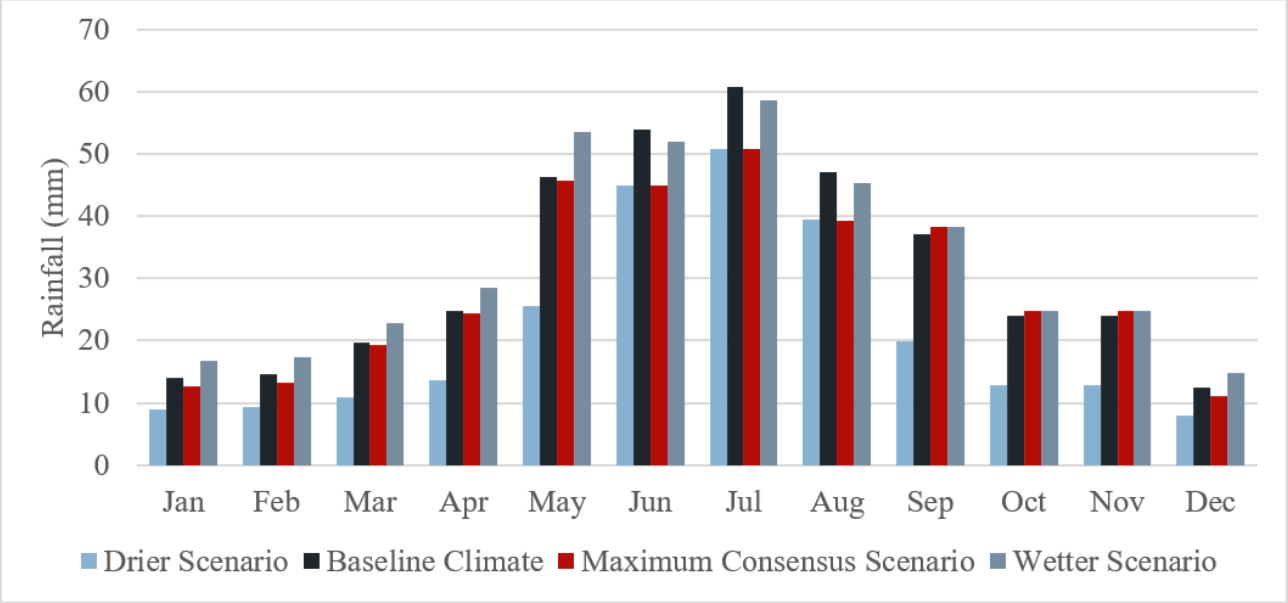


Figure 3.7 Average monthly rainfalls for the four climate scenarios

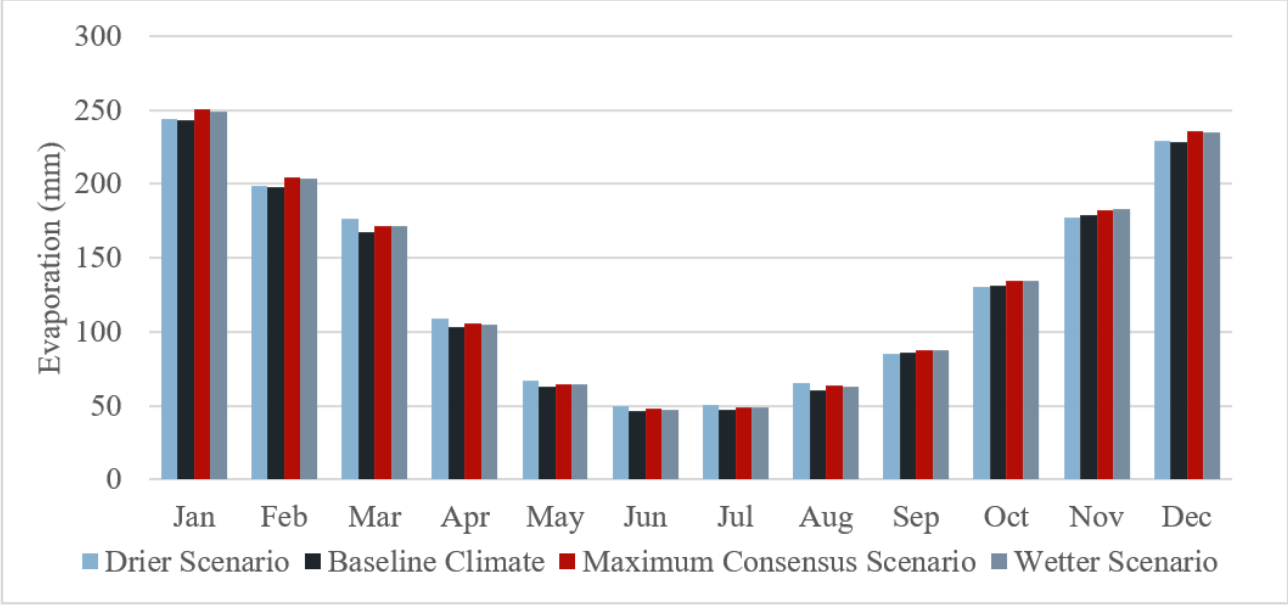


Figure 3.8 Average monthly evaporations for the four climate scenarios

3.1.3 Stochastic climate generation

Simulating the water balance using stochastic climate sequences provides alternative yet equally possible model climate sequences to indicate the range and variability in likely fluxes and stores within the water balance. The stochastic rainfall and evaporation modules, which are based on the approach developed by the Catchment Research Centre (CRC) for Catchment Hydrology (Boughton, 1999), generate synthetic sequences of daily precipitation and evaporation based on transitional probability matrices (TPMs) defined for each month from the respective historical sequences or projected future climate sequences. These matrices define the probability of occurrence of daily rainfall/evaporation rates occurring within various ranges also taking in account the previous day's value. By 'fitting' appropriate TPMs, the monthly and annual statistics of the SILO datasets can then be more accurately preserved in the stochastic sequences. On this basis the stochastic model can then be considered valid for the generation of alternative climatic data for application in the water balance model.

However, when a day of rainfall occurs evaporation generally reduces due to additional cloud cover and humidity. As the two generating modules for rainfall and evaporation would not explicitly preserve the daily interrelationship (cross-correlation) between these parameters (as they are modelled independently of each other), a variation to the approach for the concurrent generation of rainfall and evaporation datasets was therefore applied. The approach was based on the following:

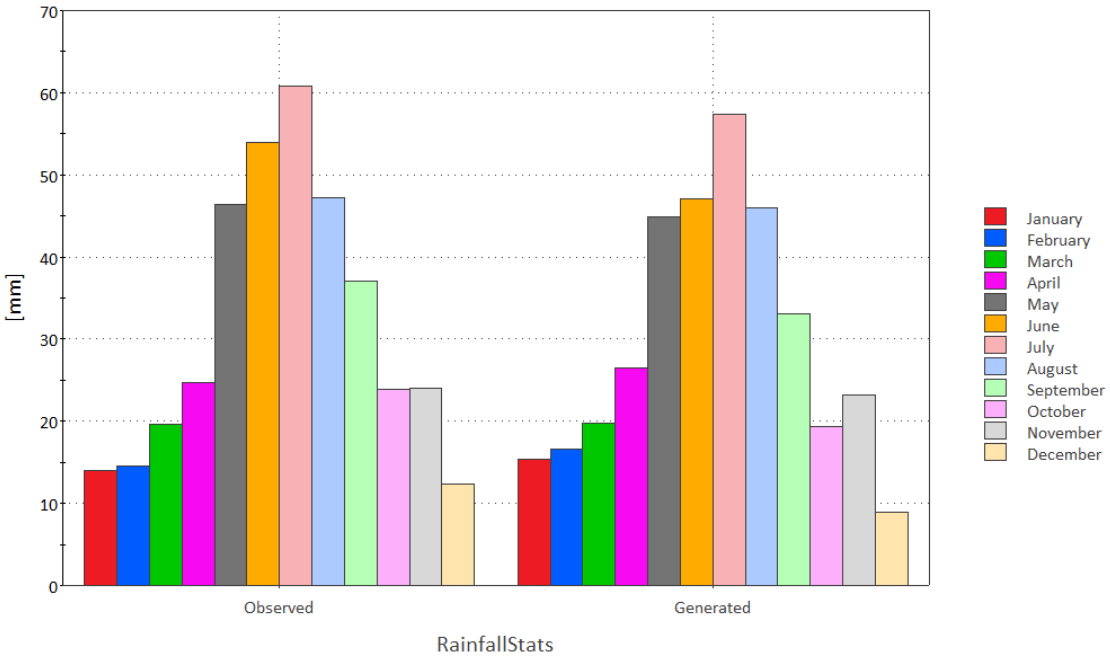
- For the rainfall generation module, a random number Ran_{RF} (between 0 and 1) is generated, which is integral in defining the magnitude of the rainfall estimate. Generally, the larger the random number the higher the rainfall estimate.
- For the evaporation module the random number for evaporation Ran_{Evap} for each concurrent day was therefore replaced by $1 – Ran_{RF}$ thereby generating a generally lower evaporation on days of higher rainfall.

This modification to the evaporation model better preserves the cross-correlations between the two climate datasets on a daily basis while still ensuring monthly and annual statistics of the stochastic evaporation datasets remain comparable to those of the historic data.

3.1.3.1 Calibrated generation results

Daily climate sequences for 500 years were generated and the associated statistics compared to those from the adopted datasets, that is the baseline climate data from SILO for the period 1986–2005. A comparison of the monthly observed and stochastically generated climate results for different scenarios are presented in Figure 3.9. The monthly distributions show agreement between generated and observed datasets, indicating the stochastic modules are capable of preserving the monthly patterns and the statistics of the historic climate data.

1



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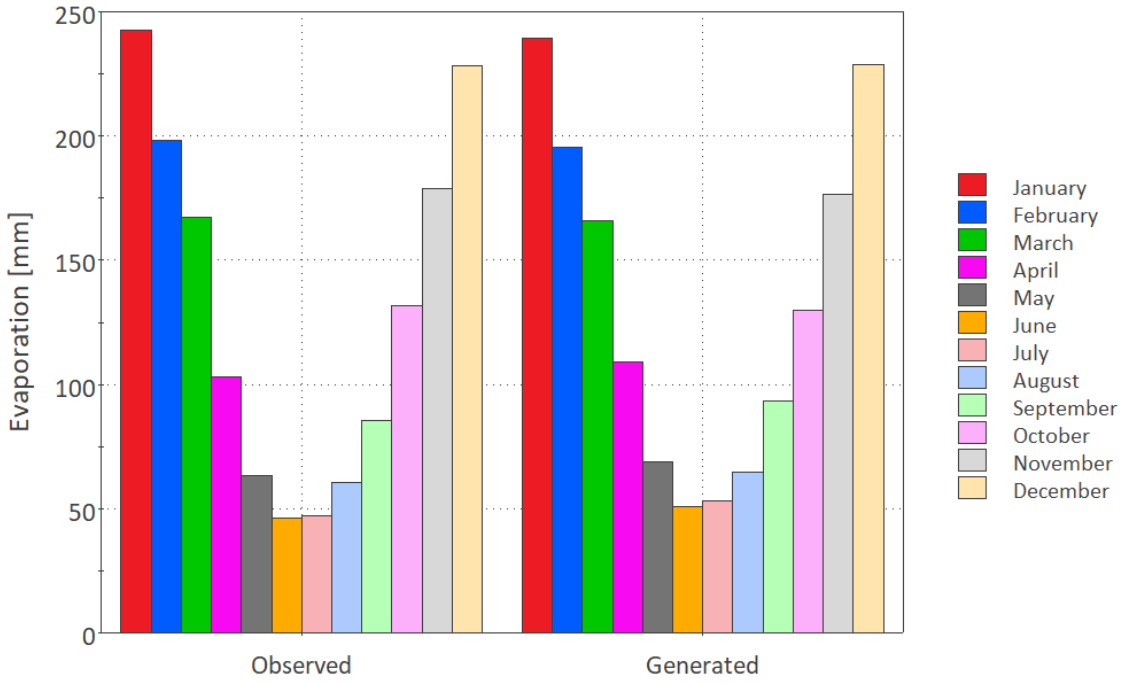

Figure 3.9 Comparison average monthly observed versus generated climate data (1) Rainfall (2) Evaporation

3.1.3.2 Adjustment of variance of annual rainfall and evaporation

Although the mean values (annual and monthly) for observed and generated data in the initial Boughton modelling approach were found to compare accurately, the annual standard deviations of the stochastically generated rainfall and evaporation were generally observed to be less than those of the actual rainfall and evaporation. This difference was subsequently reduced in the modelling approach by applying a factor to the standard deviation of the annual totals, referred to as the Boughton Correction Factor (BCF).

The difference between the generated annual total (GAT) and the mean of recorded annual totals ($\bar{x}_{Rain}$) is factored by the BCF in the stochastic climate generator adopted for this assessment, based on the following relationship to give an adjusted annual total (AAT):

$$AAT = \bar{x}_{Rain} + BCF(GAT - \bar{x}_{Rain})$$

$$Ratio = \frac{AAT}{GAT}$$

The ratio of AAT/GAT for each year is then used to multiply the associated generated daily rainfall, resulting in an improved estimate of the overall generated annual variance (when compared to the observed) whilst preserving the annual mean.

The Boughton model applied in the analyse incorporates this adjustment.

3.2 Pits

3.2.1 *Mine development plan*

Ausgold provided the mining plan for the pits (Pers comm, 2025a). The plan outlined the development of several stages for the four key pits, along with the pit designs for each stage as shown in Figure 3.10 over a 10 year plan. The direct pit areas and associated catchment areas were delineated based on the available survey data and the pit designs and are summarised in Table 3.7 and Table 3.8. Conceptual dates starting on 1 September 2025 were used to model the change of the catchments and pits over time. Area estimates were linearly interpolated between the data points in the tables, reflecting the progression of each pit stage according to the mine development schedule. Once a pit stage is mined, it is excluded from the model and its direct and catchment areas are set to zero. Similarly, after mining ceases, groundwater inflows are no longer considered in the model, even though inflows may still occur, since dewatering activities will not continue post-mining.

Forecasts of annual groundwater inflows per pit were provided by Ausgold, based on Rockwater's estimates (Oct 2025) (Pers comm., 2025c). A summary of the groundwater inflow is presented in Table 3.9.

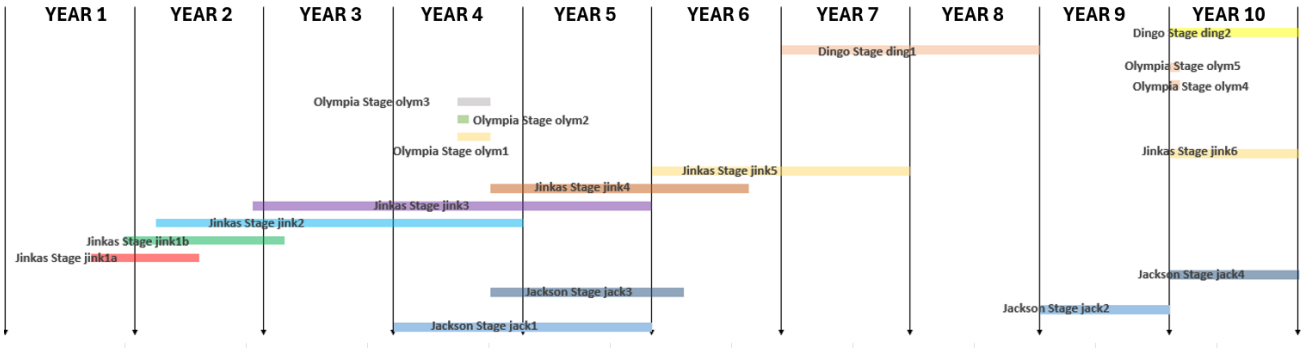

Figure 3.10 KGP Mine development plan

Table 3.7 Pit catchment areas

Date	Jinkas	Jackson	Olympia	Dingo
1/09/2025	719,004	0	0	0
1/12/2025	845,309	0	0	0
1/03/2026	909,558	0	0	0
1/07/2026	927,968	0	0	0

Date	Jinkas	Jackson	Olympia	Dingo
1/12/2026	951,056	0	0	0
1/03/2027	951,056	0	0	0
1/01/2028	951,056	270,598	0	0
30/06/2028	951,056	270,598	127,835	0
1/07/2028	951,056	270,598	127,835	0
1/10/2028	1,759,271	446,607	127,835	0
2/10/2028	1,759,368	446,607	0	0
1/01/2029	1,768,135	446,607	0	0
1/01/2030	1,803,299	446,607	0	0
1/04/2030	1,803,299	446,607	0	0
2/04/2030	1,803,299	0	0	0
1/10/2030	1,803,299	0	0	0
1/01/2031	1,803,299	0	0	440,620
1/01/2032	1,803,299	0	0	440,620
1/01/2033	1,836,498	795,802	0	440,620
2/01/2033	1,836,588	795,802	0	0
1/01/2034	1,869,605	795,802	63,625	252,012
2/01/2034	1,869,605	176,388	63,625	252,012
31/01/2034	1,869,605	176,388	63,625	252,012
1/02/2034	1,869,605	176,388	0	252,012
1/01/2035	1,869,605	176,388	0	252,012
2/01/2035	0	0	0	0
2/01/2035	0	0	0	0
1/01/2036	0	0	0	0

Table 3.8 Pit direct areas

Date	Jinkas	Jackson	Olympia	Dingo
1/09/2025	0	0	0	0
1/12/2025	69,793	0	0	0
1/03/2026	154,536	0	0	0
1/07/2026	269,410	0	0	0
1/12/2026	296,129	0	0	0
1/03/2027	344,362	0	0	0
1/01/2028	404,395	0	0	0

Date	Jinkas	Jackson	Olympia	Dingo
30/06/2028	439,905	41,820	0	0
1/07/2028	440,101	42,051	10,233	0
1/10/2028	458,150	63,307	48,541	0
2/10/2028	458,957	63,707	0	0
1/01/2029	532,349	100,037	0	0
1/01/2030	807,005	245,759	0	0
1/04/2030	885,236	260,897	0	0
2/04/2030	886,105	0	0	0
1/10/2030	1,044,305	0	0	0
1/01/2031	1,068,124	0	0	0
1/01/2032	1,162,624	0	0	125,178
1/01/2033	1,162,624	0	0	250,699
2/01/2033	1,162,624	534	0	0
1/01/2034	1,162,624	194,750	0	0
2/01/2034	1,162,903	0	1,285	361
31/01/2034	1,171,000	8,485	38,554	10,822
1/02/2034	1,171,279	8,777	0	11,183
1/01/2035	1,264,524	106,500	0	131,671
2/01/2035	0	0	0	0
2/01/2035	0	0	0	0
1/01/2036	0	0	0	0

Table 3.9 Total annual groundwater inflows and pit distribution

Mining Year	Total Annual kL/d	Jackson	Jinkas	Dingo	Olympia
		kL/d	kL/d	kL/d	kL/d
1	**323.7**	0.0	323.7	0.0	0.0
2	**255.5**	0.0	255.5	0.0	0.0
3	**199.6**	0.0	199.6	0.0	0.0
4	**310.6**	159.3	151.3	0.0	0.0
5	**409.5**	272.5	137.0	0.0	0.0
6	**566.4**	195.6	370.8	0.0	0.0
7	**786.7**	0.0	314.4	472.3	0.0
8	**881.8**	61.8	30.2	789.8	0.0
9	**383.4**	250.4	0.0	133.0	0.0

Mining Year	Total Annual kL/d	Jackson	Jinkas	Dingo	Olympia
		kL/d	kL/d	kL/d	kL/d
10	**158.2**	0.0	158.2	0.0	0.0

3.3 Sediment ponds

Sediment ponds were modelled in accordance with the SWMP for the KGP site (WSP, 2026). All WRD ponds feature a side slope of 1:2 (V:H), while for the stormwater ponds a side slope of 1:1 (V:H) was adopted. The sediment pond dimensions and year they come online are detailed in Table 3.10.

Table 3.10 Sediment pond dimensions

Area	Pond Name	Catchment Area (ha)	Top Width (m)	Top Length (m)	Depth (m)	Year to come online
WRD East	Pond E A	82	40	120	2.5	Year 4
	Pond E B	31	25	75	2.5	Year 4
	Pond E C	69	35	105	2.5	Year 4
	Pond E D	19	20	60	2.5	Year 4
WRD West	Pond W A	78	35	105	2.5	Year 1
	Pond W B	77	35	105	2.5	Year 1
WRD N1A	Pond N1 A	34	25	75	2.5	Year 3
WRD N	Pond N2 B	20	20	60	2.5	Year 7
	Pond N2 A	25	25	75	2.5	Year 7
WRD S	Pond S	41	30	90	2.5	Year 6
WRD S1	Pond S1	25	25	75	2.5	Year 8
ROM	Pond ROM	10	20	80	5	Year 1
Power Plant	Pond PP	42	50	130	5	Year 1

3.4 TSF Design data

3.4.1 Staged development

The TSF was designed to be developed over six construction phases excluding contingency storage (5 Mt) and closure. These are set out in Table 3.11. It is noted the start date for tailings deposition into the facility is a generic year (e.g., Year 0), consistent with the operation year considered in Ausgold's tailings production schedule. The Raise 2 – Northern Cell will be constructed immediately after Raise 2 – Southern Cell (i.e., under the same construction contract). This WB excludes the contingency storage as it has not been assigned a date in the mining plan.

Note: Ausgold is considering an alternative development of the Starter -Southern Cell, which involves staging the development of the Starter Southern Cell in two phases (Starter A and Starter B) each with 12-month storage capacity (WSP, 2025c). After these phases, the plan will follow the original staged development as outlined in Table 3.11. This change is not expected to impact the water balance and therefore was not modelled.

Table 3.11 TSF construction phase and tailings deposition staging plan

Construction Phase	Embankment Crest Elevation	Deposition Tonnage	Tailings Deposition	
			Estimated Commencement	Estimated Completion
Starter – Southern Cell	RL 383.4 m	~7.0 Mt	Q1 Year 1	Q4 Year 2
Starter – Northern Cell	RL 390.7 m	~7.5 Mt	Q1 Year 3	Q4 Year 4
Raise 1 – Southern Cell	RL 394.3 m	~7.4 Mt	Q1 Year 5	Q4 Year 6
Raise 1 – Northern Cell	RL 400.9 m	~7.3 Mt	Q1 Year 7	Q4 Year 8
Raise 2 – Southern Cell	RL 402.6 m	~5.3 Mt	Q1 Year 9	Q2 Year 10
Raise 2 – Northern Cell	RL 402.6 m	~1.3 Mt	Q2 Year 10	Q4 Year 10
Contingency storage				
Southern Cell	RL 405.7 m	~2.5 Mt	-	-
Northern Cell	RL 405.7 m	~2.5 Mt	-	-

3.4.2 Tailings properties

The following tailings parameters have been adopted based on the TSF design report:

- Slurry density (w/w): 45%
- Tailings specific gravity (SG): 2.97
- In situ tailings bulk density: Long-term settled tailings dry density of 1.5 t/m^3, which is used in defining the retained interstitial water volumes (WSP, 2025d).

3.4.3 Stage-storage curves

Stage-storage curves were derived based on the Northern and Southern TSF designs for the facility and are shown in Figure 3.11 and Figure 3.12.

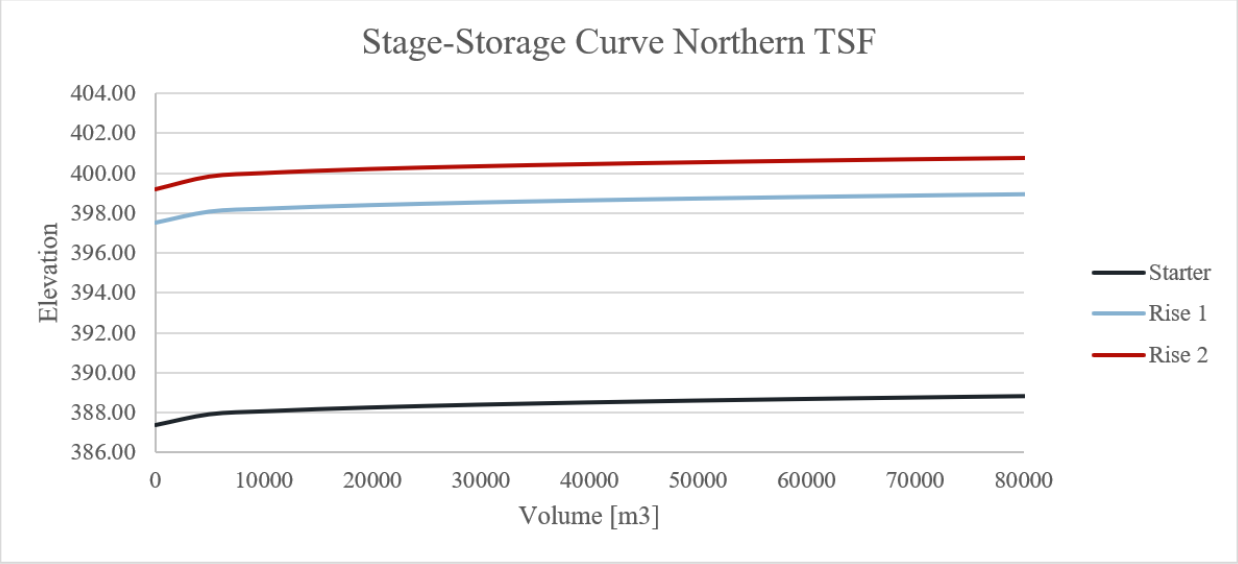

Figure 3.11 Stage-storage curves Northern cell of TSF

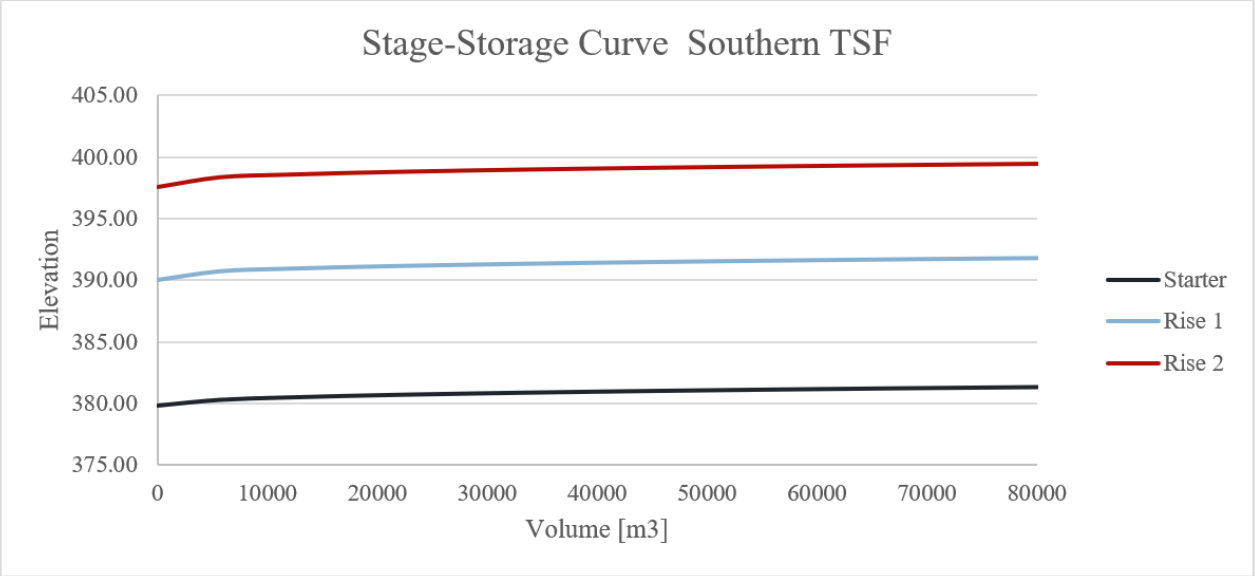

Figure 3.12 Stage-storage curves Southern cell of TSF

3.5 Process plant pond

The process plant pond has a footprint of 90 m x 40 m with an assumed maximum capacity of 12 ML using a rectangular geometry. The pond collects and store water from various sources, including dewatering from the pits, runoff from sediment ponds, and decant water from the TSF cells.

3.6 Mechanical evaporator system

Mechanical evaporation has been adopted as the primary control to manage excess water within the site water balance. Ausgold has provided a capacity assessment based on Minetek's evaluation, whereby the proposed system comprises modular 600/300 evaporator units, each with a nominal flow-through capacity of approximately 135 m³/h (3,240 m³/d).

Under average climatic conditions, the system is expected to achieve an annual evaporation efficiency of approximately 37%, corresponding to an evaporation capacity of approximately 1,200 m³/day per unit (considering 12 hr a day). Evaporation efficiency is, however, subject to seasonal variability, as summarised in Table 3.12.

Table 3.12 Monthly efficiency mechanical evaporator model 600/300 -Katanning (-33.683, 117.6) provided by Ausgold.

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Efficiency (%)	43%	45%	38%	40%	37%	29%	29%	29%	32%	37%	38%	42%

The water balance modelling assessed three mechanical evaporation configurations based on 2, 5, and 10 evaporator units, representing increasing levels of installed evaporation capacity. Results associated with the modelling are presented in Section 4.3.

4 Model results

This section provides a summary of the model results for each modelled facility under the different climate scenarios. The general outcome of the model regarding required mechanical losses is provided in Section 4.1 and the detailed results per facility in Section 4.2. Section 4.3 presents the results for the three mechanical evaporator configurations under baseline climate conditions.

In general, contact water comes from three main sources:

- Pits: Dewatering of surplus groundwater inflow in the pits contributes approximately~270 ML/year, ranging from 92 ML/year to 481 ML/year.
- Sediment Ponds: Runoff and seepage from the Waste Rock Dumps (WRDs) add about 470 ML/year, ranging from 220 ML/year to 630 ML/year.
- Tailings Storage Facility (TSF): Return water from the TSF is around 2,960 ML/year, ranging from 2300 ML/year to 3200 ML/year, which constitutes about ~70% of the total water inflow to the TSF from slurry water release, incident rainfall and surface runoff.

Based on the average results under baseline climate, the average annual Plant demand is approximately 3,700 ML/year, resulting in a balanced inflows-outflows over the 10 year modelling period. However, due to the year-to-year variations in climate there is no capacity to retain water surpluses during wet periods and water deficits can occur during dry periods. During dry periods Borefield make up of approximately 470 ML/year is therefore required while during wet periods annual surpluses of approximately 375 ML/year, ranging from 150 ML/year to 560 ML/year, are required to be processed via a mechanical loss system (i.e., mechanical evaporator).

4.1 General results – net total required mechanical losses

This section summarises the net total mechanical losses required under baseline climate and climate change conditions, including average and peak volumes, seasonal variability, and probabilistic exceedance metrics, based on the ensemble of 100 climate realisations.

4.1.1 Net total required mechanical losses – Baseline climate

As mentioned above, the system will require a mechanical loss system to achieve a water balance during wet periods, given there is no onsite storage availability (i.e., no evaporation pond). Table 4.1 summarises the average total volume (ML/month) required to be removed based on the mean of the 100 climate realisations. In general, peak mechanical evaporation is required from May to August, consistent with the dry season being from September to April.

Note: The results for the first three months consider a delay of 3 months in the commencement of TSF dewatering returns; this is a modelling assumption in the absence of detailed deposition modelling with dewatering starting in the fourth month.

Table 4.1 Average monthly total loss required though mechanical means – Baseline climate [ML/month]

Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Total
Y1	1	0	0	70	78	60	13	5	19	16	28	13	**302**
Y2	8	6	5	2	3	3	9	8	23	26	37	18	**148**
Y3	18	6	8	3	9	6	10	13	19	28	34	19	**176**
Y4	26	14	17	6	14	18	14	16	64	65	78	47	**381**
Y5	26	14	20	9	11	11	17	20	52	75	76	60	**392**

Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Total
Y6	31	16	16	11	32	9	16	26	75	77	95	61	**464**
Y7	55	20	26	11	22	13	34	24	73	82	107	66	**533**
Y8	49	23	27	14	18	14	24	33	81	92	112	71	**558**
Y9	33	22	21	9	22	10	20	36	61	79	107	67	**487**
Y10	32	16	18	7	8	6	22	23	34	48	58	39	**312**

Figure 4.1 and Table 4.2 present the daily probabilistic results, indicating the required maximum annual peak mechanical losses will occur in Years 7 and 8, each with a daily mean of 1.5 ML/d and 95% probability of exceedance of around 6.5 ML/d.

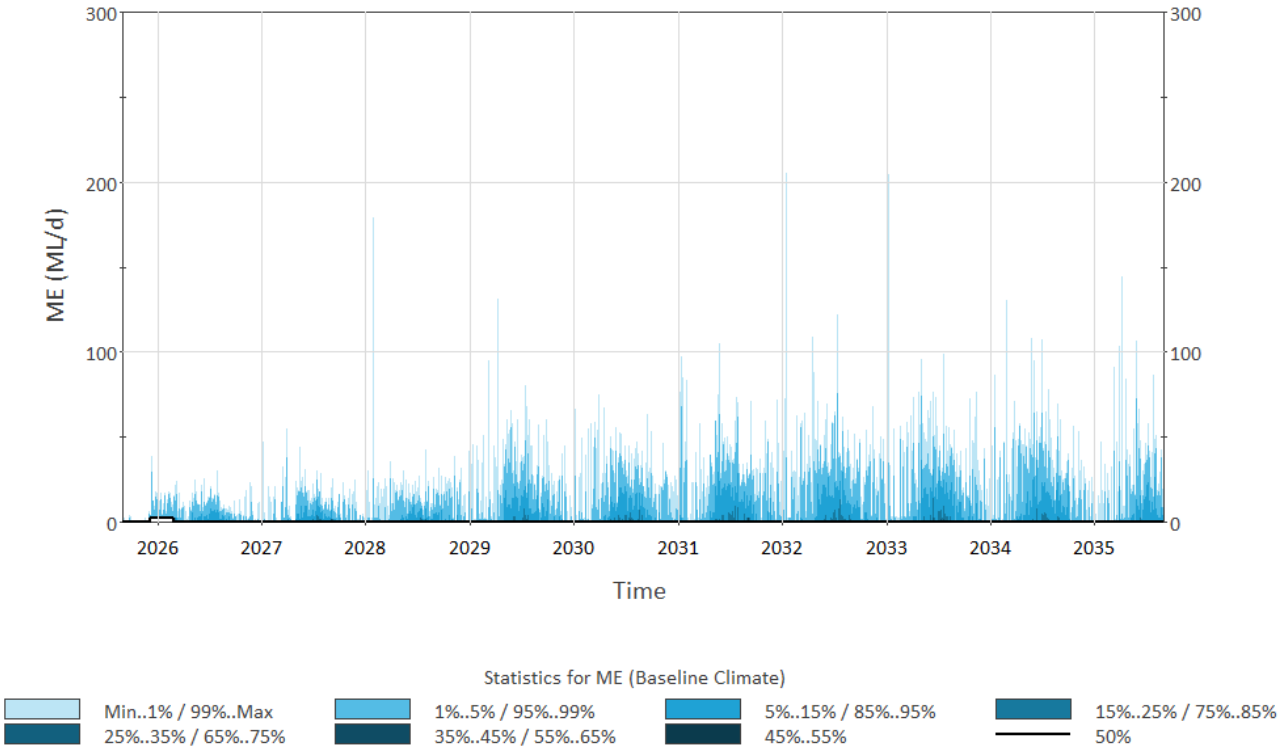

Figure 4.1 Probabilistic summary of required daily total loss though mechanical means – Baseline climate

Table 4.2 Probabilistic summary of required yearly and daily total losses though mechanical means – Baseline climate

Year	Total Volume Mec Evaporator [ML/year]			Average Daily Mec Evaporator (Total volume/365 days) [ML/d]		
	Mean	75%	95%	Mean	75%	95%
Y1	302	418	766	0.8	1.1	2.1
Y2	148	281	723	0.4	0.8	2.0
Y3	176	338	950	0.5	0.9	2.6
Y4	381	751	1729	1.0	2.1	4.7

Year	Total Volume Mec Evaporator [ML/year]			Average Daily Mec Evaporator (Total volume/365 days) [ML/d]		
	Mean	75%	95%	Mean	75%	95%
Y5	392	805	1810	1.1	2.2	5.0
Y6	464	914	2088	1.3	2.5	5.7
Y7	533	1023	2360	1.5	2.8	6.5
Y8	558	1118	2328	1.5	3.1	6.4
Y9	487	851	2017	1.3	2.3	5.5
Y10	312	875	1821	0.9	2.4	5.0

The required mechanical losses vary significantly on a daily basis. When analysing the probability of exceedance, Table 4.3 summarises the average required mechanical losses for a range of probabilities of exceedance. Using 2 ML/day as the assumed capacity of the mechanical loss system, the results indicate that over the 10-year simulation period, this has around an 8% probability of being exceeded.

Table 4.3 Daily exceedance probability [ML/d] – Baseline climate

Percentile	Average [ML/d]
50.0%	0
70.0%	0
80.0%	0
90.0%	0.5
91.7%	**2.0**
95.0%	4.2
99.0%	26.4

4.1.2 Net total required mechanical losses – Climate change

In general, the annual mechanical losses required increase under a wetter climate scenario and reduce under a drier climate scenario. Table 4.4 presents a comparison of the climate change results outlining the average annual losses (ML/year) and average daily losses `(ML/d) based on the mean of 100 climate realisations for the four climate change scenarios modelled. Based on the model results, on average the required maximum average daily mechanical losses will occur in Year 8, ranging from 0.9 ML/d (Drier climate) to 1.6 ML/d (Wetter climate).

Table 4.4 Required average yearly and daily total losses though mechanical means – climate change comparison

Year	Total Volume Mechanical Evaporator [ML/year]				Average Daily Mechanical Evaporator (Total volume/365 days) [ML/d]			
	Baseline	Drier	Wetter	Max Con	Baseline	Drier	Wetter	Max Con
Y1	302	242	309	276	0.8	0.7	0.8	0.8
Y2	148	74	157	121	0.4	0.2	0.4	0.3
Y3	176	83	195	145	0.5	0.2	0.5	0.4

Year	Total Volume Mechanical Evaporator [ML/year]				Average Daily Mechanical Evaporator (Total volume/365 days) [ML/d]			
	Baseline	Drier	Wetter	Max Con	Baseline	Drier	Wetter	Max Con
Y4	381	210	406	320	1.0	0.6	1.1	0.9
Y5	392	224	418	339	1.1	0.6	1.1	0.9
Y6	464	259	491	401	1.3	0.7	1.3	1.1
Y7	533	291	564	450	1.5	0.8	1.5	1.2
Y8	558	313	589	481	1.5	0.9	1.6	1.3
Y9	487	267	518	421	1.3	0.7	1.4	1.2
Y10	312	159	334	270	0.9	0.4	0.9	0.7

4.1.2.1 Drier climate

Table 4.5 summarises the required average monthly total losses (ML/month) based on the mean of the 100 drier climate realisations. Peak mechanical evaporation is required from May to August, reflecting the occurrence of the dry season from September to April. Figure 4.2 and Table 4.6 present the probabilistic results indicating the required maximum mechanical losses will occur in Year 8 with a daily mean of 0.9 ML/d and a 95% probability of exceedance of 3.8 ML/d.

Table 4.5 Average monthly total loss required though mechanical means – Drier climate [ML/month]

Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Total
Y1	0	0	0	67	75	55	4	1	4	10	19	8	**242**
Y2	1	1	1	0	2	2	2	3	6	17	27	12	**74**
Y3	2	1	2	1	5	3	3	5	5	19	24	13	**83**
Y4	8	4	4	2	7	8	6	6	22	48	60	36	**210**
Y5	7	4	5	4	6	5	6	6	19	59	57	46	**224**
Y6	9	5	6	4	14	5	6	9	26	55	77	45	**259**
Y7	14	6	8	3	9	6	14	8	28	62	84	48	**291**
Y8	14	8	9	7	9	7	6	13	32	68	88	52	**313**
Y9	8	5	6	3	11	5	7	12	22	57	81	51	**267**
Y10	7	4	4	1	4	4	6	8	12	36	44	30	**159**

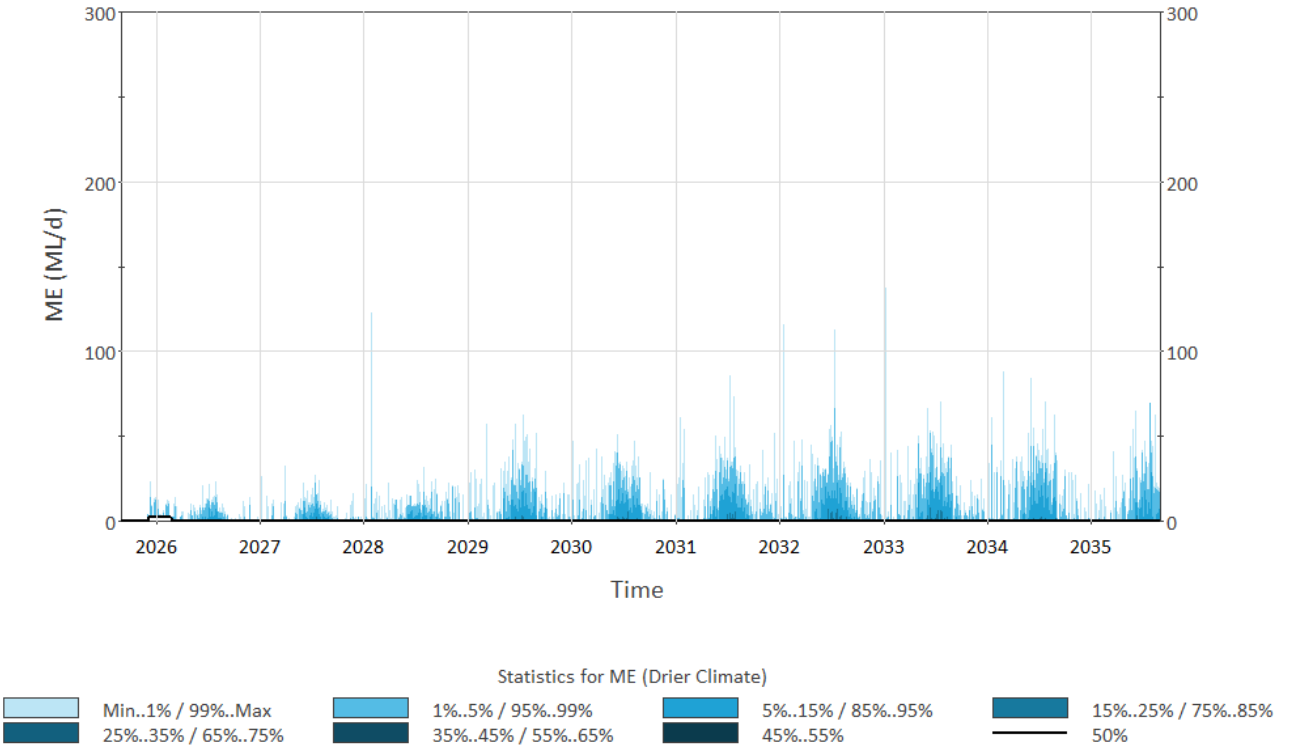

Figure 4.2 Probabilistic summary of required daily total loss though mechanical means – Drier climate

Table 4.6 Probabilistic summary of required yearly and daily total loss though mechanical means – Drier climate

Year	Total Volume Mechanical Evaporator [ML/year]			Average Daily Mechanical Evaporator (Total volume/365 days) [ML/d]		
	Mean	75%	95%	Mean	75%	95%
Y1	242	309	504	0.7	0.8	1.4
Y2	74	137	352	0.2	0.4	1.0
Y3	83	141	467	0.2	0.4	1.3
Y4	210	418	972	0.6	1.1	2.7
Y5	224	430	1032	0.6	1.2	2.8
Y6	259	511	1192	0.7	1.4	3.3
Y7	291	566	1302	0.8	1.6	3.6
Y8	313	626	1371	0.9	1.7	3.8
Y9	267	442	1103	0.7	1.2	3.0
Y10	159	471	1069	0.4	1.3	2.9

The required mechanical losses vary daily. When analysing the probability of exceedance, Table 4.7 summarises the average daily exceedance. Using 2 ML/day as the assumed capacity of the mechanical loss system, the results indicate that over the 10-year simulation period, this has around a 6% probability of being exceeded.

Table 4.7 Daily exceedance probability [ML/d] – Drier climate

Percentile	Average [ML/d]
50.0%	0
70.0%	0
80.0%	0
90.0%	0
94.0%	**2.0**
95.0%	2.2
99.0%	17.0

4.1.2.2 Wetter climate

Table 4.8 summarises the required average monthly total losses (ML/month) based on the mean of the 100 wetter climate realisations. Peak mechanical evaporation is required from May to August, reflecting the occurrence of the dry season from September to April. Figure 4.3 and Table 4.8 present the probabilistic results indicating the required maximum mechanical losses will occur in Year 8 with a daily mean of 1.6 ML/d and a 95% probability of exceedance of 6.9 ML/d.

Table 4.8 Average monthly total loss required though mechanical means – Wetter climate [ML/month]

Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Total
Y1	1	0	0	71	80	61	14	8	23	14	26	12	**309**
Y2	8	7	5	2	7	5	10	10	28	23	34	17	**157**
Y3	20	7	10	4	12	9	14	18	26	26	31	18	**195**
Y4	26	14	16	8	18	23	18	22	83	62	74	42	**406**
Y5	27	14	21	12	13	14	24	26	66	71	72	57	**418**
Y6	32	18	16	15	34	11	22	32	91	73	92	56	**491**
Y7	57	20	26	14	26	16	44	31	88	78	103	61	**564**
Y8	48	23	27	20	23	18	27	43	98	89	107	66	**589**
Y9	35	23	21	10	29	15	24	47	75	75	102	61	**518**
Y10	33	15	18	10	9	10	27	29	45	44	54	39	**334**

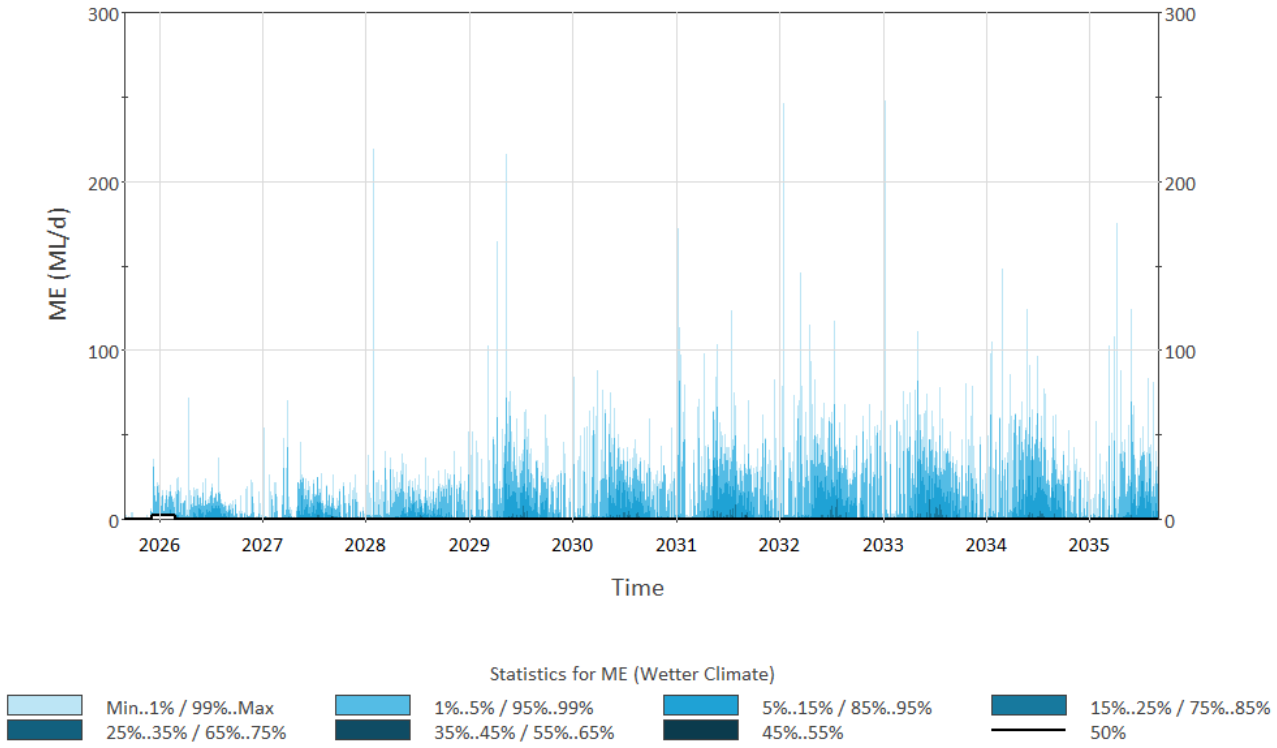

Figure 4.3 Probabilistic summary of required daily total loss though mechanical means – Wetter climate

Table 4.9 Probabilistic summary of required yearly and daily total losses though mechanical means – Wetter climate

Year	Total Volume Mechanical Evaporator [ML/year]			Average daily Mechanical Evaporator (Total volume/365 days) [ML/d]		
	Mean	75%	95%	Mean	75%	95%
Y1	309	435	812	0.8	1.2	2.2
Y2	157	296	786	0.4	0.8	2.2
Y3	195	365	1054	0.5	1.0	2.9
Y4	406	809	1916	1.1	2.2	5.3
Y5	418	857	1951	1.1	2.3	5.3
Y6	491	970	2231	1.3	2.7	6.1
Y7	564	1087	2519	1.5	3.0	6.9
Y8	589	1196	2520	1.6	3.3	6.9
Y9	518	949	2249	1.4	2.6	6.2
Y10	334	926	1932	0.9	2.5	5.3

The required mechanical losses vary daily. When analysing the probability of exceedance, Table 4.10 summarises the average daily exceedance. Using 2 ML/day as the assumed capacity of the mechanical loss system, the results indicate that over the 10-year simulation period, this has around a 9% probability of being exceeded.

Table 4.10 Daily exceedance probability [ML/d] – Wetter climate

Percentile	Average [ML/d]
50.0%	0
70.0%	0
80.0%	0
90.0%	0.8
91.4%	**2.0**
95.0%	4.5
99.0%	27.5

4.1.2.3 Max con climate

Table 4.11 summarises the required average monthly total losses (ML/month) based on the mean of the 100 Max con climate realisations. Peak mechanical evaporation is required from May to August, reflecting the occurrence of the dry season from September to April. Figure 4.4 and Table 4.12 present the probabilistic results indicating the required maximum mechanical losses will occur in Year 8 with a daily mean of 1.3 ML/d and a 95% probability of exceedance of 5.7 ML/d.

Table 4.11 Average monthly total loss required though mechanical means – Max Con climate [ML/month]

Year	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Total
Y1	1	0	0	69	77	59	11	5	18	10	18	8	**276**
Y2	8	7	5	1	3	3	8	8	22	17	26	12	**121**
Y3	14	7	10	2	10	5	10	13	19	19	23	13	**145**
Y4	27	14	16	4	12	14	15	16	62	47	59	34	**320**
Y5	25	13	22	8	9	10	17	21	52	58	57	47	**339**
Y6	33	16	17	10	27	8	15	27	73	55	75	44	**401**
Y7	46	19	25	8	18	10	33	24	74	63	83	46	**450**
Y8	46	24	28	13	15	12	21	34	78	69	87	53	**481**
Y9	33	21	22	6	20	10	21	37	60	60	81	50	**421**
Y10	33	16	18	6	7	5	21	23	35	33	43	29	**270**

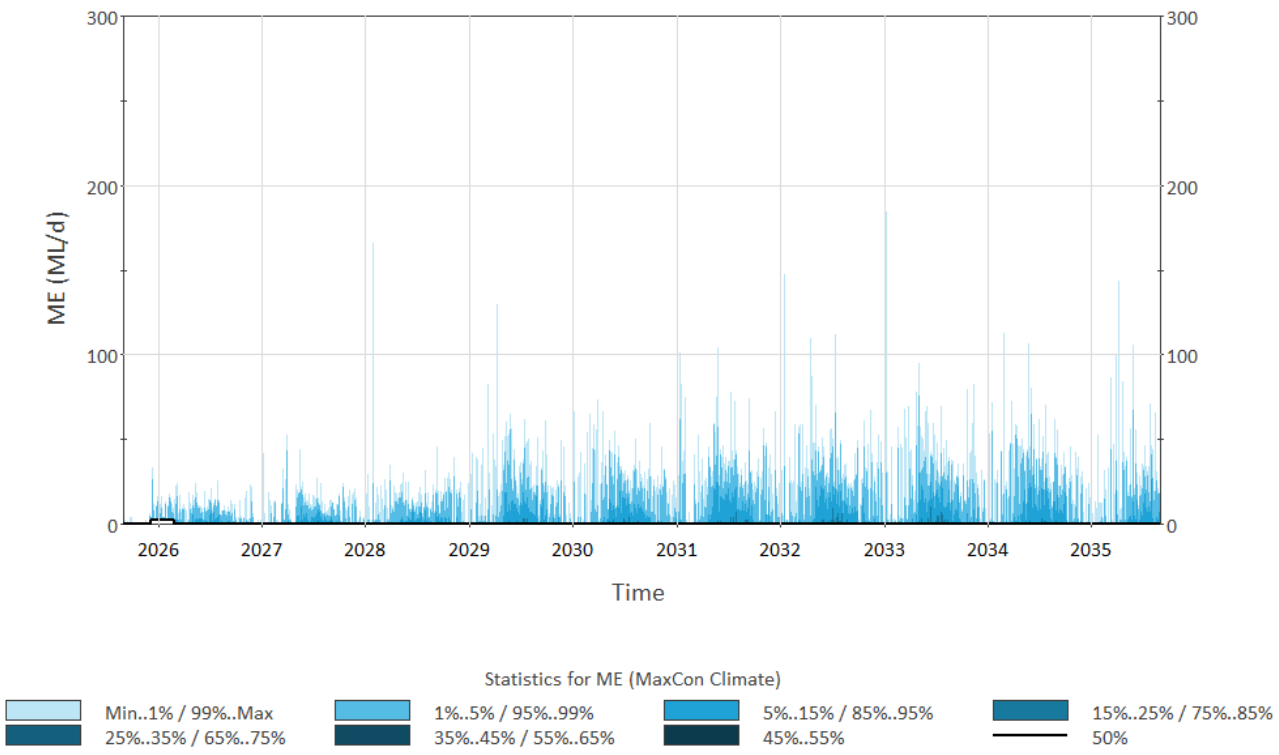

Figure 4.4 Probabilistic summary of dailytotal loss required though mechanical means – Max Con climate

Table 4.12 Probabilistic summary of results of yearly and daily losses required though mechanical means – Max Con climate

Year	Total Volume Mechanical Evaporator [ML/year]			Average Daily Mechanical Evaporator [ML/d]		
	Mean	75%	95%	Mean	75%	95%
Y1	276	375	683	0.8	1.0	1.9
Y2	121	227	632	0.3	0.6	1.7
Y3	145	277	836	0.4	0.8	2.3
Y4	320	657	1558	0.9	1.8	4.3
Y5	339	702	1627	0.9	1.9	4.5
Y6	401	803	1863	1.1	2.2	5.1
Y7	450	881	2097	1.2	2.4	5.7
Y8	481	1010	2092	1.3	2.8	5.7
Y9	421	773	1867	1.2	2.1	5.1
Y10	270	764	1634	0.7	2.1	4.5

The required mechanical losses vary daily. When analysing the probability of exceedance, Table 4.13 summarises the average daily exceedance. Using 2 ML/day as the assumed capacity of the mechanical loss system, the results indicate that over the 10-year simulation period, this has around an 8% probability of being exceeded.

Table 4.13 Daily exceedance probability [ML/d] – Max Con climate

Percentile	Average [ML/d]
50.0%	0
70.0%	0
80.0%	0
90.0%	0
92.4%	**2.0**
95.0%	3.0
99.0%	23.6

4.2 Detailed results per facility

A yearly WB summary for each facility is provided below under the baseline climate scenario with results for the alternative climate change results presented in the respective Appendix.

4.2.1 TSF

4.2.1.1 TSF Northern Cell

Water balance – baseline climate trends

A summary of the yearly WB results is presented in Table 4.14 and Figure 4.5 for the baseline climate conditions. As expected, Tailings Slurry (TS) is the main inflow driver of the system and the dewatering to the plant (T_P) represents the larger outflow from the TSF.

Table 4.14 TSF Northern cell – yearly water balance

Year	Inflows [ML/year]			Outflows [ML/year]						WB Totals	
	DP	TR	TS	PE	TE	T_P	EN	SP	OV	Total In	Total Out
Y1	19.7	106.3	0.0	23.8	40.6	0.0	0.0	1.1	0.0	**125.9**	**64.4**
Y2	28.3	97.2	0.0	66.2	49.4	0.0	0.0	1.3	0.0	**125.5**	**115.6**
Y3	40.3	95.3	4476.2	108.5	160.2	3131.3	1208.5	1.4	0.0	**4611.7**	**3400.0**
Y4	38.6	91.3	4588.1	109.8	161.8	3191.7	1238.8	1.4	0.0	**4718.0**	**3463.3**
Y5	26.7	99.6	0.0	56.4	48.7	0.0	0.0	1.3	0.0	**126.3**	**105.1**
Y6	29.8	100.5	0.0	67.8	49.3	0.0	0.0	1.3	0.0	**130.3**	**117.1**
Y7	102.3	50.8	4512.8	315.2	77.1	3045.2	1218.0	1.4	0.0	**4665.9**	**3437.5**
Y8	41.4	102.9	4376.3	157.1	161.1	2998.3	1181.5	1.4	0.0	**4520.7**	**3316.5**
Y9	25.2	118.5	0.0	57.2	59.5	0.0	0.0	1.3	0.0	**143.7**	**116.6**
Y10	46.2	105.0	1755.2	98.8	101.6	1227.5	473.8	1.4	0.0	**1906.3**	**1427.9**

Notes DP (Direct precipitation), TR (Tailings RO), TS (Tailings Water), PE (Evaporation), TE (Tailings evap), T_P (To Plant), EN (Entrained water), SP (Seepage), OV (Overtopping)

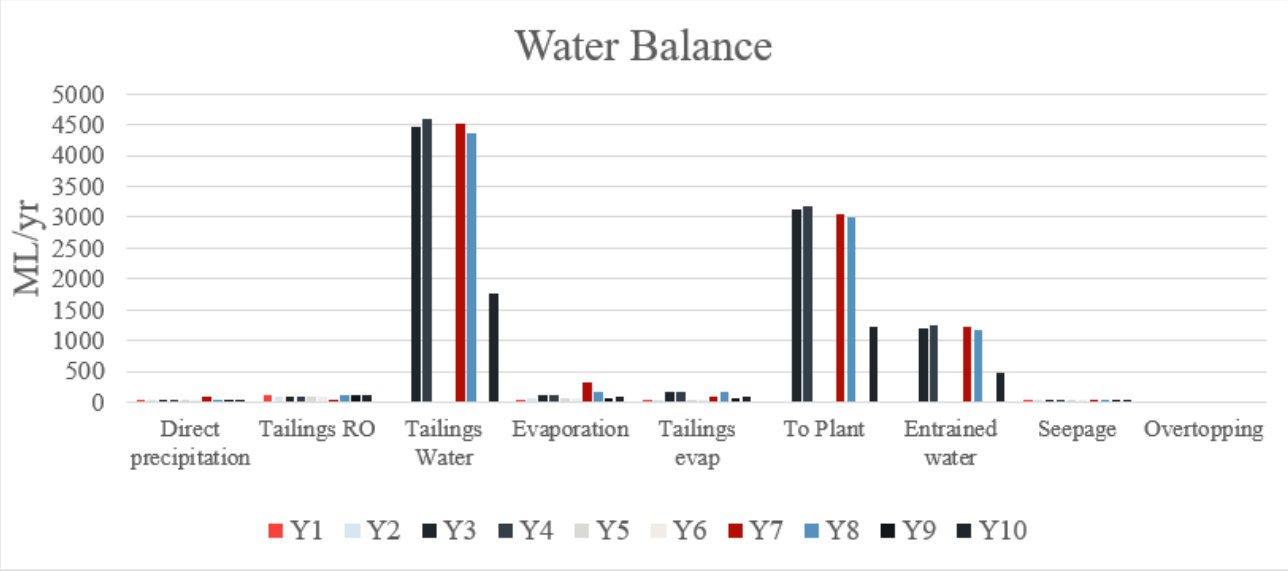

Figure 4.5 TSF Northern cell – summary of yearly water balance

Climate change impact

Table 4.15 summarises the average TSF Northern Cell fluxes under the four climate change scenarios. Climate change has a small impact on the total fluxes of the water balance ranging from -2.1% for a drier climate to +0.3% for a wetter climate. Detailed water balance results for each climate scenario are presented in Appendix A.

Table 4.15 TSF Northern cell – average water balance [ML/year]

	ID	Flow	Baseline Climate	Climate Change – Drier Climates	Climate Change – Wetter Climate	Climate Change – Max Con
Inflows	DP	Direct precipitation	39.9	24.3	42.3	35.4
	TR	Tailings RO	96.7	68.3	101.2	89.8
	TS	Tailings water	1970.9	1970.9	1970.9	1970.9
	Total		**2107.4**	**2063.5**	**2114.4**	**2096.1**
Outflows	PE	Evaporation	106.1	94.8	109.9	105.1
	TE	Tailings evap	90.9	89.1	93.3	92.7
	T_P	To Plant	1359.4	1335.6	1358.9	1349.0
	EN	Entrained water	532.1	532.1	532.1	532.1
	SP	Seepage	1.3	1.3	1.3	1.3
	OV	Overtopping	0.0	0.0	0.0	0.0
	Total		**2089.8**	**2052.9**	**2095.5**	**2080.2**

4.2.1.2 TSF Southern cell

Water balance- baseline climate trends

A summary of the yearly WB results is presented in Table 4.16 and Figure 4.6 for the baseline climate conditions. As expected, Tailings Slurry (TS) is the main inflow driver of the system and the dewatering to the plant (T_P) is the major outflow from the system.

Table 4.16 TSF Southern cell – yearly water balance

Year	Inflows [ML/year]			Outflows [ML/year]						WB Totals [ML/year]	
	DP	TR	TS	PE	TE	T_P	EN	SP	OV	Total In	Total Out
Y1	62.6	64.1	3979.1	233.7	85.4	2612.1	1074.2	1.4	0.0	**4105.7**	**2931.1**
Y2	53.2	68.5	4474.9	154.8	122.3	3096.2	1207.8	1.4	0.0	**4596.6**	**3373.3**
Y3	34.7	88.5	0.0	97.2	46.8	0.0	0.0	1.4	0.0	**123.2**	**144.0**
Y4	25.1	90.8	0.0	65.2	47.7	0.0	0.0	1.3	0.0	**116.0**	**112.9**
Y5	96.3	43.3	4613.6	305.0	61.2	3079.3	1245.4	1.4	0.0	**4753.3**	**3445.5**
Y6	44.6	93.9	4412.9	148.5	146.7	3041.7	1191.7	1.4	0.0	**4551.3**	**3336.8**
Y7	34.7	102.8	0.0	101.4	57.2	0.0	0.0	1.4	0.0	**137.5**	**158.6**
Y8	26.7	106.6	0.0	72.6	57.6	0.0	0.0	1.3	0.0	**133.3**	**130.2**
Y9	84.5	72.1	4544.2	294.5	100.5	3005.4	1226.8	1.4	0.0	**4700.8**	**3400.4**
Y10	52.6	107.0	1726.6	136.9	150.6	1085.4	466.1	1.4	0.0	**1886.2**	**1372.8**

Notes: DP (Direct precipitation), TR (Tailings RO), TS (Tailings Water), PE (Evaporation), TE (Tailings evap), T_P (To Plant), EN (Entrained water), SP (Seepage), OV (Overtopping)

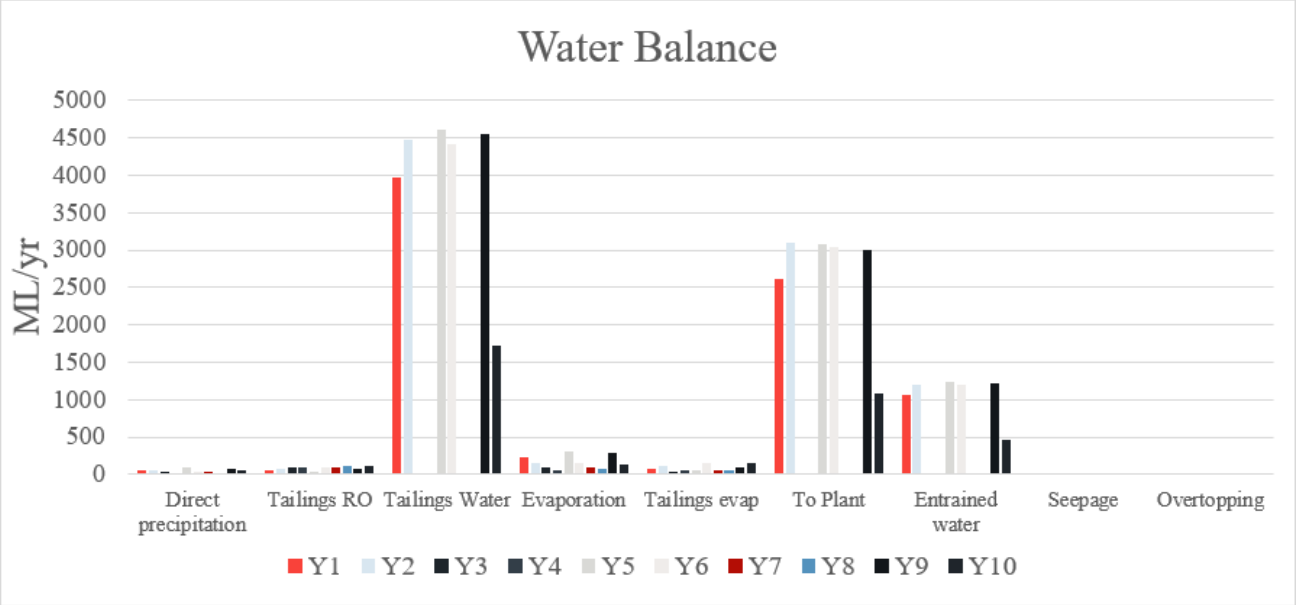

Figure 4.6 TSF Southern cell – yearly water balance

Climate change impact

Table 4.17 summarises the average TSF Southern Cell fluxes under the four climate change scenarios. Climate change has a small impact on the total fluxes of the balance ranging from -1.7% for a drier climate to +0.3% for a wetter climate. Detailed water balance results for each climate scenario are presented in Appendix A.

Table 4.17 TSF Southern cell – average water balance [ML/year]

	ID	Flow	Baseline Climate	Climate Change – Drier Climate	Climate Change – Wetter Climate	Climate Change – Max Con
Inflows	DP	Direct precipitation	51.5	32.1	54.7	46.4
	TR	Tailings RO	83.8	59.6	87.5	77.6
	TS	Tailings water	2375.1	2375.1	2375.1	2375.1
	Total		**2510.4**	**2466.9**	**2517.3**	**2499.2**
Outflows	PE	Evaporation	161.0	152.2	165.8	162.0
	TE	Tailings evap	87.6	88.1	89.8	89.8
	T_P	To Plant	1592.0	1566.7	1590.6	1580.5
	EN	Entrained water	641.2	641.2	641.2	641.2
	SP	Seepage	1.4	1.3	1.4	1.4
	OV	Overtopping	0.0	0.0	0.0	0.0
	Total		**2483.1**	**2449.6**	**2488.7**	**2474.9**

4.2.2 Pits

4.2.2.1 Jinkas

Water balance – baseline climate trends

A summary of the results of the yearly WB is presented in Table 4.18 and Figure 4.7 for the baseline climate conditions. As expected, Groundwater inflow (GW) is the main inflow driver of the system and the dewatering to the plant (T_P) is the major outflow from the pit.

Table 4.18 Pit Jinkas – yearly water balance

Year	Inflows [ML/year]				Outflows [ML/year]			WB Totals [ML/year]	
	DP	CR	PWR	GW	PE	T_P	OV	Total In	Total Out
Y1	0.9	36.5	18.8	118.2	2.4	162.8	0.0	**174.3**	**165.2**
Y2	0.8	31.2	34.4	93.3	2.4	148.8	0.0	**159.7**	**151.2**
Y3	0.9	30.1	45.7	73.1	2.4	136.0	0.0	**149.7**	**138.4**
Y4	0.8	58.8	61.5	55.2	2.4	155.0	0.0	**176.3**	**157.5**
Y5	0.8	47.7	90.1	50.0	2.4	164.8	0.0	**188.7**	**167.2**
Y6	0.9	38.9	114.6	135.3	2.4	263.1	0.0	**289.6**	**265.6**
Y7	0.9	35.3	119.8	115.1	2.4	241.7	0.0	**271.0**	**244.2**
Y8	0.8	35.5	116.3	11.0	2.4	137.2	0.0	**163.6**	**139.6**
Y9	0.8	35.1	119.2	0.0	0.2	129.0	0.0	**155.2**	**129.2**
Y10	0.8	7.0	27.3	57.7	2.4	84.5	0.0	**92.9**	**87.0**

Notes DP (Direct precipitation), CR (Catchment Runoff), PWR (Pit Wall Runoff), GW (Groundwater inflow), PE (Evaporation), T_P (Transfer to Plant), OV (Overtopping)

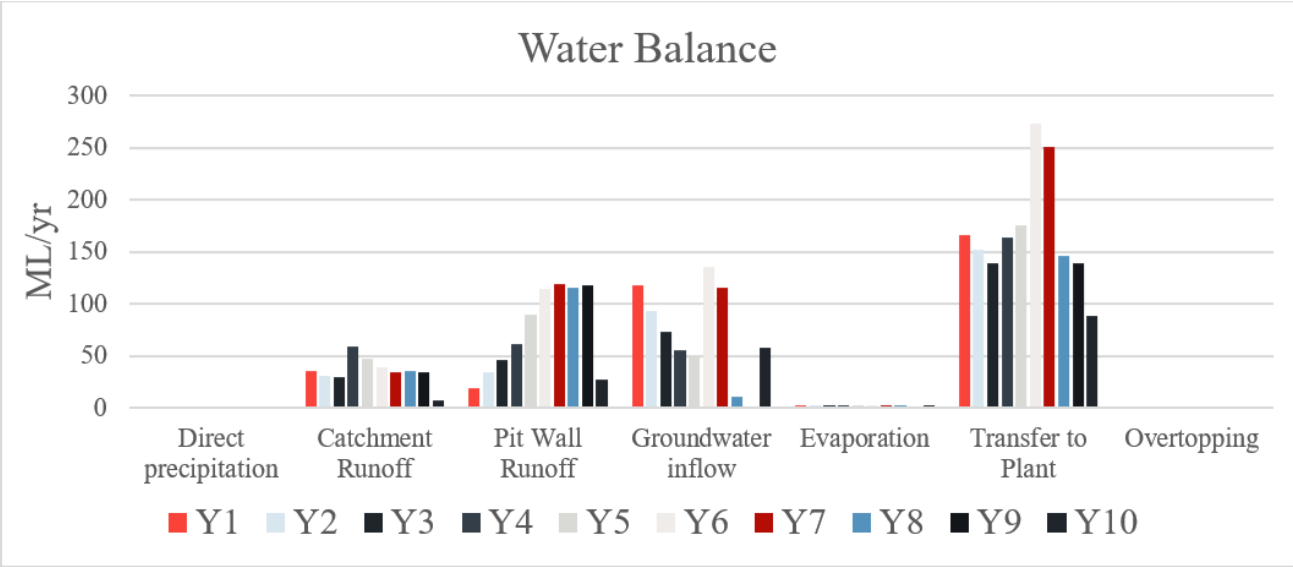

Figure 4.7 Pit Jinkas – yearly water balance

Climate change impact

Table 4.19 summarises the average Pit Jinka fluxes under the four climate change scenarios. Climate change has a small impact on the total fluxes of the balance ranging from -30% for a drier climate to +6.1% for a wetter climate. Detailed water balance results for each climate scenario are presented in Appendix B.

Table 4.19 Pit Jinkas – average water balance [ML/year]

	ID	Flow	Baseline Climate	Climate Change – Drier Climate	Climate Change – Wetter Climate	Climate Change – Max Con
Inflows	**DP**	**Direct precipitation**	0.8	0.6	0.9	0.8
	CR	**Catchment runoff**	35.6	17.5	39.5	31.0
	PWR	**Pit wall runoff**	74.8	38.1	81.7	64.9
	GW	**Groundwater inflow**	70.9	70.9	70.9	70.9
	Total		**182.1**	**127.0**	**193.0**	**167.6**
Outflows	**PE**	**Evaporation**	2.2	2.2	2.3	2.3
	T_P	**Transfer to Plant**	162.3	116.9	170.5	149.5
	OV	**Overtopping**	0.0	0.0	0.0	0.0
	Total		**164.5**	**119.1**	**172.8**	**151.8**

4.2.2.2 Jackson

Water balance – baseline climate trends

A summary of the results of the yearly WB is presented in Table 4.20 and Figure 4.8 for the baseline climate conditions. As expected, Groundwater inflow (GW) is the major inflow driver of the system and the dewatering to the plant (T_P) is the major outflow from the pit.

Table 4.20 Pit Jackson – yearly water balance

Year	Inflows [ML/year]				Outflows [ML/year]			WB Totals [ML/year]	
	DP	CR	PWR	GW	PE	T_P	OV	Total In	Total Out
Y1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	**0.9**	**0.0**
Y2	0.8	0.0	0.0	0.0	0.1	0.3	0.0	**0.8**	**0.4**
Y3	0.9	10.7	2.7	0.0	0.2	11.8	0.0	**14.2**	**12.0**
Y4	0.8	15.6	14.1	58.1	2.4	81.4	0.0	**88.7**	**83.8**
Y5	0.8	4.4	9.2	99.5	2.4	108.5	0.0	**113.9**	**110.9**
Y6	0.9	0.0	0.0	71.4	2.4	69.8	0.0	**72.3**	**72.2**
Y7	0.9	0.0	0.0	0.0	0.2	0.7	0.0	**0.9**	**0.9**
Y8	0.8	29.3	5.9	22.6	2.4	50.5	0.0	**58.6**	**52.9**
Y9	0.8	12.5	6.5	91.4	2.4	105.4	0.0	**111.2**	**107.8**
Y10	0.8	1.0	1.9	0.0	0.2	3.2	0.0	**3.7**	**3.4**

Notes DP (Direct precipitation), CR (Catchment Runoff), PWR (Pit Wall Runoff), GW (Groundwater inflow), PE (Evaporation), T_P (Transfer to Plant), OV (Overtopping)

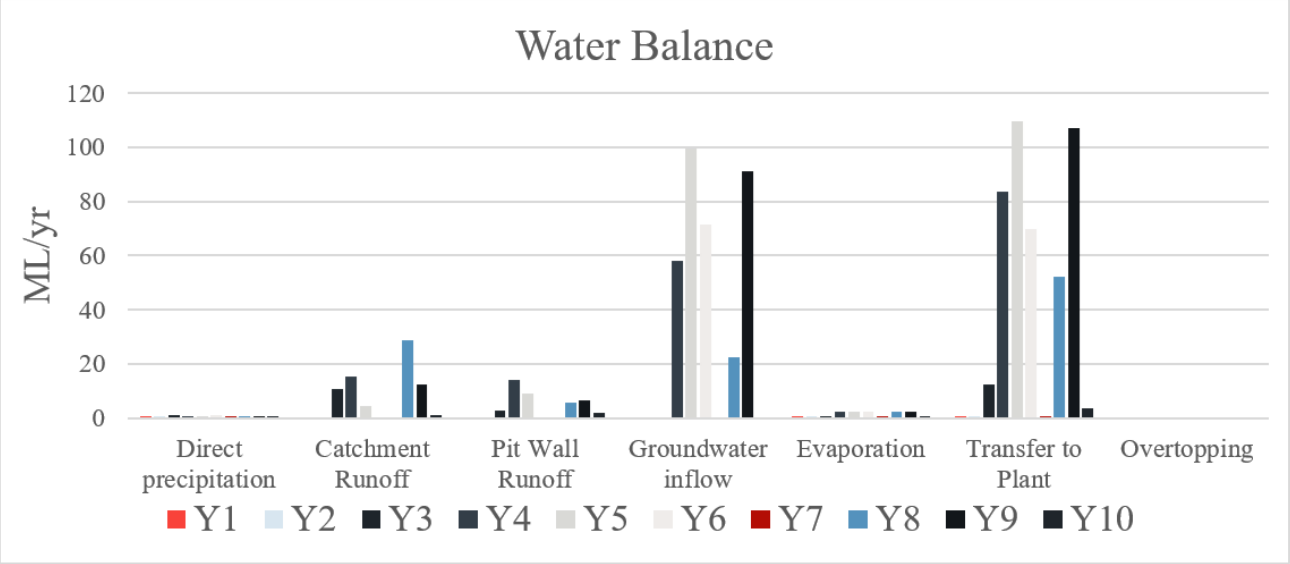

Figure 4.8 Pit Jackson – yearly water balance

Climate change impact

Table 4.21 summarises the averages Pit Jackson fluxes under the four climate change scenarios. Climate change has a small impact on the total fluxes of the balance ranging from -12.8% for a drier climate to +2.7% for a wetter climate. Detailed water balance results for each climate scenario are presented in Appendix B.

Table 4.21 Pit Jackson – average water balance [ML/year]

	ID	Flow	Baseline Climate	Climate Change – Drier Climate	Climate Change – Wetter Climate	Climate Change – Max Con
Inflows	**DP**	**Direct precipitation**	0.8	0.6	0.9	0.8
	CR	**Catchment runoff**	7.3	3.6	8.2	6.4
	PWR	**Pit wall runoff**	4.0	2.0	4.4	3.5
	GW	**Groundwater inflow**	34.3	34.3	34.3	34.3
	Total		**46.5**	**40.5**	**47.8**	**45.0**
Outflows	**PE**	**Evaporation**	1.3	1.3	1.3	1.3
	T_P	**Transfer to Plant**	43.2	38.3	44.1	41.8
	OV	**Overtopping**	0.0	0.0	0.0	0.0
	Total		**44.5**	**39.6**	**45.4**	**43.1**

4.2.2.3 Olympia

Water balance – baseline climate trends

The results of the yearly WB are presented in Table 4.23 and Figure 4.9 for the baseline climate conditions. As Olympia does not receive inflow from groundwater, the balance is smaller relative to the other pits.

Table 4.22 Pit Olympia – yearly water balance

Year	Inflows [ML/year]				Outflows [ML/year]			WB Total [ML/year]s	
	DP	CR	PWR	GW	PE	T_P	OV	Total In	Total Out
Y1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Y2	0.8	0.0	0.0	0.0	0.1	0.3	0.0	0.8	0.4
Y3	0.9	1.5	0.6	0.0	0.2	2.4	0.0	2.9	2.6
Y4	0.8	0.3	0.3	0.0	0.2	1.2	0.0	1.5	1.4
Y5	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y6	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8
Y7	0.9	0.0	0.0	0.0	0.2	0.5	0.0	0.9	0.7
Y8	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y9	0.8	0.2	0.1	0.0	0.2	0.7	0.0	1.2	0.9
Y10	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7

Notes DP (Direct precipitation), CR (Catchment Runoff), PWR (Pit Wall Runoff), GW (Groundwater inflow), PE (Evaporation), T_P (Transfer to Plant), OV (Overtopping)

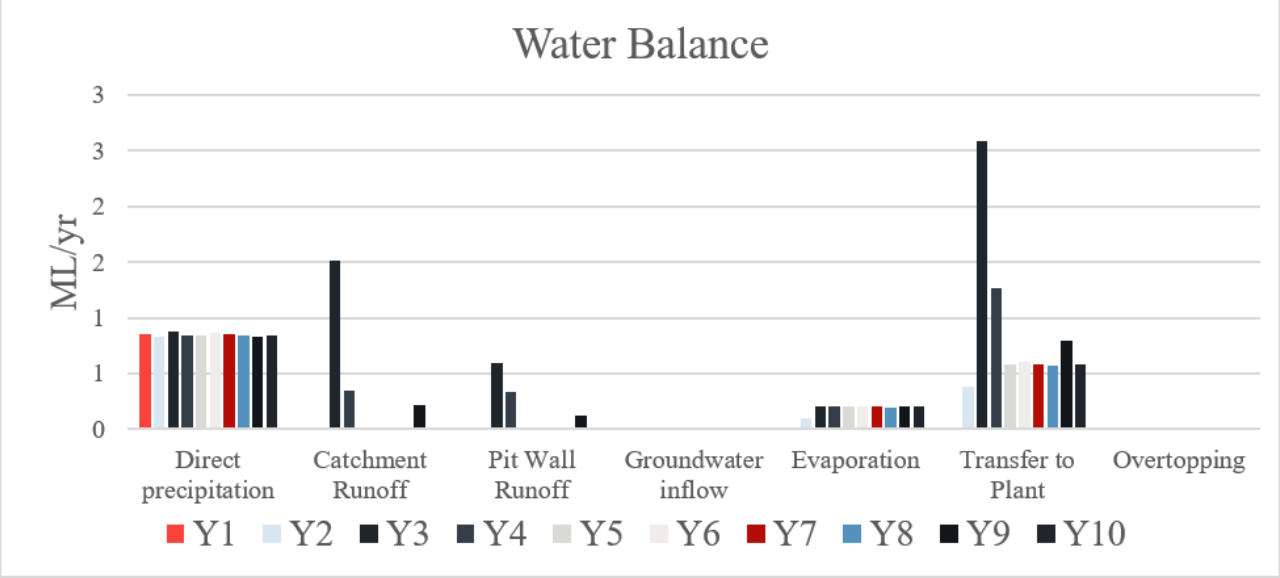

Figure 4.9 Pit Olympia – yearly water balance

Climate change impact

Table 4.23 summarises the average Olympia fluxes under the four climate change scenarios. Climate change has a moderate impact on the total fluxes of the balance ranging from -33.8% for a drier climate to +3.2% for a wetter climate. Detailed water balance results for each climate scenario are presented in Appendix B.

Table 4.23 Pit Olympia – average water balance [ML/year]

	ID	Flow	Baseline Climate	Climate change – Drier Climate	Climate change – Wetter Climate	Climate change – Max Con
Inflows	**DP**	**Direct precipitation**	0.8	0.6	0.9	0.8
	CR	**Catchment runoff**	0.2	0.1	0.2	0.2
	PWR	**Pit wall runoff**	0.1	0.1	0.1	0.1
	GW	**Groundwater inflow**	0.0	0.0	0.0	0.0
	Total		**1.2**	**0.8**	**1.2**	**1.0**
Outflows	**PE**	**Evaporation**	0.2	0.1	0.2	0.2
	T_P	**Transfer to Plant**	0.7	0.4	0.8	0.6
	OV	**Overtopping**	0.0	0.0	0.0	0.0
	Total		**0.9**	**0.6**	**0.9**	**0.8**

4.2.2.4 Dingo

Water balance – baseline climate trends

The results of the yearly WB are presented in Table 4.24 and Figure 4.10 for the baseline climate conditions. As expected, Groundwater inflow (GW) is the major inflow driver of the system and the dewatering to the plant (T_P) is the largest outflow from the pit.

Table 4.24 Pit Dingo – yearly water balance

Year	Inflows [ML/year]				Outflows [ML/year]			WB Totals [ML/year]	
	DP	CR	PWR	GW	PE	T_P	OV	Total In	Total Out
Y1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	**0.9**	**0.0**
Y2	0.8	0.0	0.0	0.0	0.1	0.3	0.0	**0.8**	**0.4**
Y3	0.9	0.0	0.0	0.0	0.2	0.6	0.0	**0.9**	**0.8**
Y4	0.8	0.0	0.0	0.0	0.2	0.5	0.0	**0.8**	**0.7**
Y5	0.8	0.0	0.0	0.0	0.2	0.5	0.0	**0.8**	**0.7**
Y6	0.9	17.3	4.1	0.0	0.2	18.7	0.0	**22.3**	**18.9**
Y7	0.9	15.3	16.2	172.9	2.4	196.8	0.0	**205.3**	**199.3**
Y8	0.8	2.5	5.3	288.3	2.4	292.9	0.0	**296.9**	**295.3**
Y9	0.8	8.3	4.0	48.5	2.4	57.9	0.0	**61.7**	**60.3**
Y10	0.8	1.6	2.3	0.0	0.2	4.0	0.0	**4.8**	**4.2**

Notes DP (Direct precipitation), CR (Catchment runoff), GW (Groundwater inflow), PE (Evaporation), T_P (Transfer to Plant), OV (Overtopping)

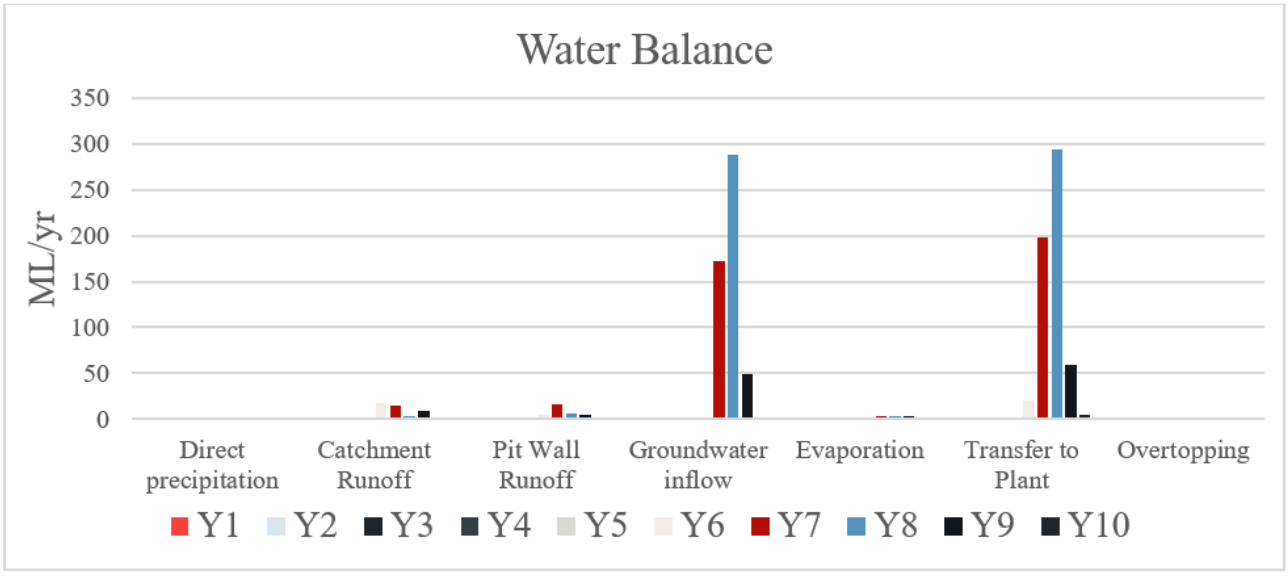

Figure 4.10 Pit Dingo – yearly water balance

Climate change impact

Table 4.25 summarises the average Dingo fluxes under the four climate change scenarios. Climate change has a small impact on the total fluxes of the balance ranging from -6.8% for a drier climate to +1.5% for a wetter climate. Detailed water balance results for each climate scenario are presented in Appendix B.

Table 4.25 Pit Dingo – average water balance

	ID	Flow	Baseline Climate	Climate change – Drier Climate	Climate change – Wetter Climate	Climate change – Max Con
Inflows	**DP**	**Direct precipitation**	0.8	0.6	0.9	0.8
	CR	**Catchment runoff**	4.5	2.2	5.1	3.9
	PWR	**Pit wall runoff**	3.2	1.6	3.4	2.8
	GW	**Groundwater inflow**	51.0	51.0	51.0	51.0
	Total		**59.5**	**55.4**	**60.4**	**58.5**
Outflows	**PE**	**Evaporation**	0.8	0.8	0.9	0.9
	T_P	**Transfer to Plant**	57.2	53.8	57.8	56.3
	OV	**Overtopping**	0.0	0.0	0.0	0.0
	Total		**58.1**	**54.7**	**58.7**	**57.1**

4.2.3 Sediment ponds

The 11 sediment ponds and the two stormwater ponds follow similar seasonal trends based on the results of the respective WBs, as the inflows and outflows are driven by rainfall-runoff and seepage. The results for Pond EA (at the WRD East) are presented below as an example of the results. Detailed water balance results for each climate scenario and sediment pond are presented in Appendix C.

Water balance – baseline climate trends

The results of the yearly WB for Pond E A are presented in Table 4.26 and

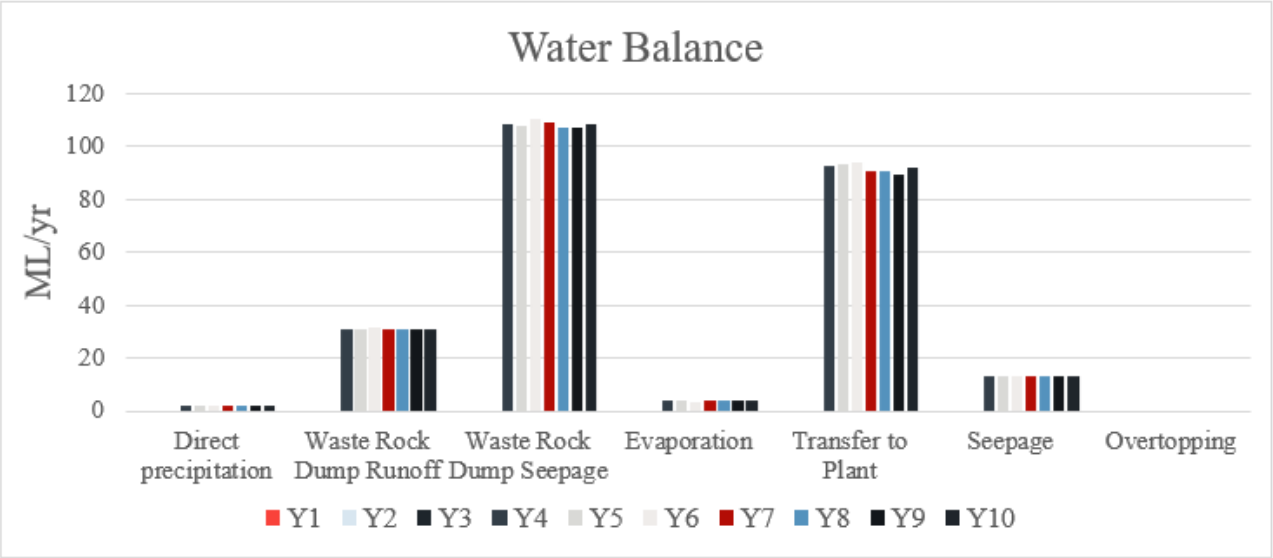

Figure 4.11 for the baseline climate conditions. As expected, rainfall dependant fluxes drive the inflows of the system and the dewatering to the plant (T_P) is the larger outflow from the sediment pond.

Table 4.26 Sediment Pond CT01 – yearly water balance

Year	Inflows [ML/year]			Outflows [ML/year]				WB Totals [ML/year]	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total In	Total Out
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	**0.0**	**0.0**
Y4	1.8	31.0	108.4	3.7	92.5	13.0	0.0	**141.2**	**109.2**
Y5	1.8	30.8	107.9	3.7	93.4	13.3	0.0	**140.6**	**110.4**
Y6	1.9	31.7	110.8	3.6	93.7	13.1	0.0	**144.3**	**110.4**
Y7	1.8	31.2	109.1	3.8	91.0	13.3	0.0	**142.1**	**108.1**
Y8	1.8	30.7	107.3	3.7	90.8	13.2	0.0	**139.8**	**107.6**
Y9	1.8	30.6	107.2	3.7	89.3	13.2	0.0	**139.7**	**106.1**
Y10	1.8	31.0	108.5	3.7	92.3	13.3	0.0	**141.3**	**109.3**

Notes DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

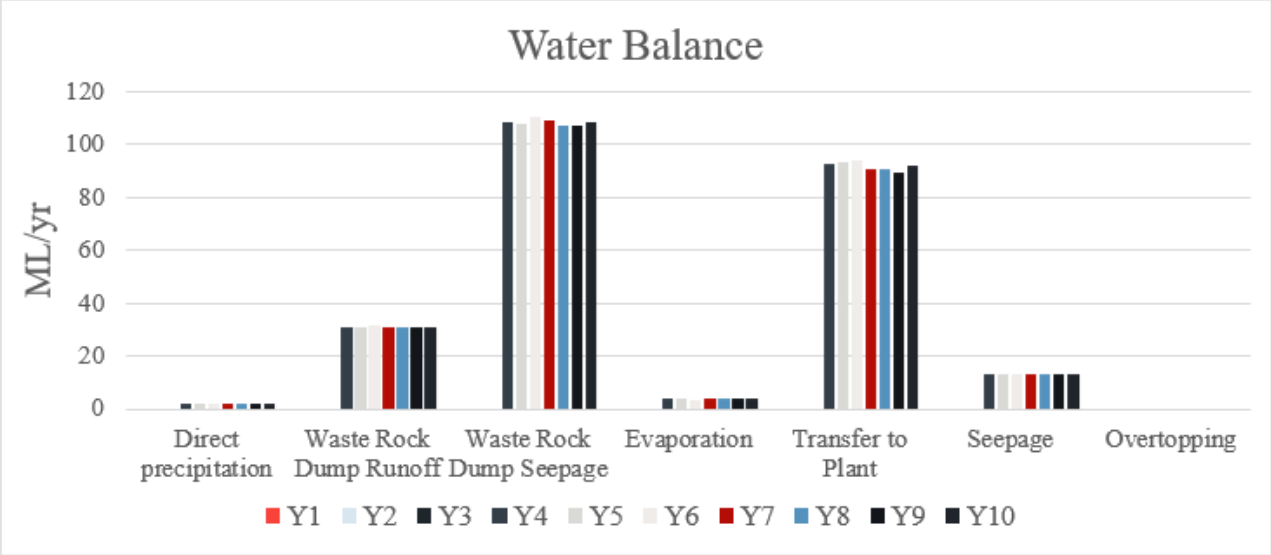

Figure 4.11 Ponde E A – yearly water balance

Climate change impact

Table 4.27 summarises the average Pond E A fluxes under the four climate change scenarios. Climate change has a moderate impact on the total fluxes in the balance ranging from -31.7% for a drier climate to +5.0% for a wetter climate.

Table 4.27 Main SRP POND 1– average water balance

	ID	Flow	Baseline Climate	Climate change – Drier Climate	Climate change – Wetter Climate	Climate change – Max Con
Inflows	DP	Direct precipitation	1.3	0.9	1.3	1.2
	WRD_RO	Waste Rock Dump runoff	21.7	14.8	22.8	19.9
	WRD_SP	Waste Rock Dump seepage	75.9	51.9	79.7	69.8
	Total		**98.9**	**67.6**	**103.8**	**90.9**
Outflows	PE	Evaporation	2.6	2.6	2.6	2.7
	T_P	Transfer to Plant	64.3	45.0	66.7	59.3
	SP	Seepage	9.2	9.3	9.2	9.2
	OV	Overtopping	0.0	0.0	0.0	0.0
	Total		**76.1**	**56.9**	**78.6**	**71.1**

4.2.4 *Process plant*

Water balance – baseline climate trends

The results of the yearly WB is presented in Table 4.28 and

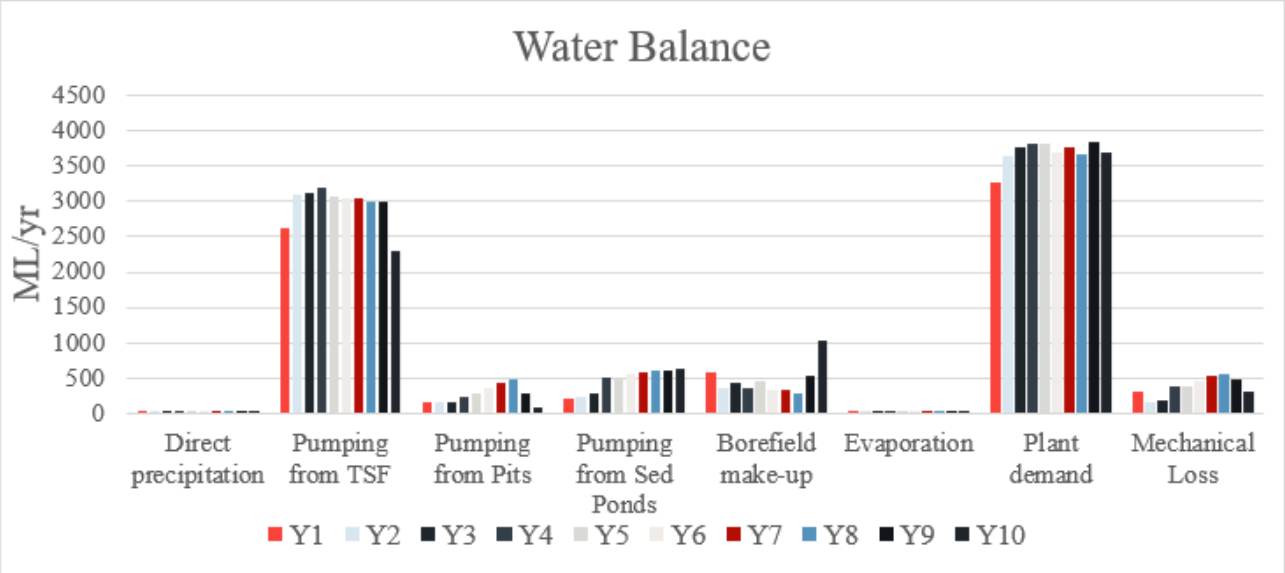

Figure 4.12 for the baseline climate conditions. As expected, pumping from the TSF, Sediment ponds and Pits drives the inflows to the Process Plant and the Plant demand (PD) is the larger outflow.

Note: This estimated demand assumes pit water from non-active pits is not utilised. However, it is likely that water will be available in the pits during at least the last two years, reducing or potentially eliminating the need for borefield makeup water during this period.

Table 4.28 Process plant – yearly water balance

Year	Inflows [ML/year]					Outflows [ML/year]			WB Totals [ML/year]	
	DP	TP_TSF	TP_Pits	TP_SedPon	BO	PE	PD	ME	Total In	Total Out
Y1	1.4	2612.1	162.9	220.6	576.7	3.9	3263.7	302.5	3573.5	3570.1
Y2	1.3	3096.2	149.8	222.3	359.1	3.9	3652.3	148.1	3828.7	3804.3
Y3	1.4	3131.3	150.8	276.6	428.1	3.9	3780.1	175.9	3988.3	3959.9
Y4	1.4	3191.7	238.1	505.2	369.4	3.9	3822.7	380.5	4305.8	4207.2
Y5	1.4	3079.3	274.4	500.7	450.5	3.9	3811.7	393.5	4306.2	4209.1
Y6	1.4	3041.7	352.2	551.4	334.0	3.9	3703.8	463.7	4280.6	4171.4
Y7	1.4	3045.2	439.9	591.8	343.3	3.9	3766.1	533.1	4421.5	4303.2
Y8	1.3	2998.3	481.2	616.3	275.0	3.9	3677.9	557.2	4372.2	4239.0
Y9	1.3	3005.3	293.0	611.1	525.4	3.9	3841.0	489.1	4436.2	4334.0
Y10	1.4	2312.8	92.2	626.2	1039.6	3.9	3687.5	309.2	4072.3	4000.5

Notes DP (Direct precipitation), TP_TSF (Pumping from TSF), TP_Pits (Pumping from Pits), TP_SedPon (Pumping from Sed Ponds), BO (Borefield make-up), PE (Evaporation), PD (Plant demand), ME (Mechanical Loss)

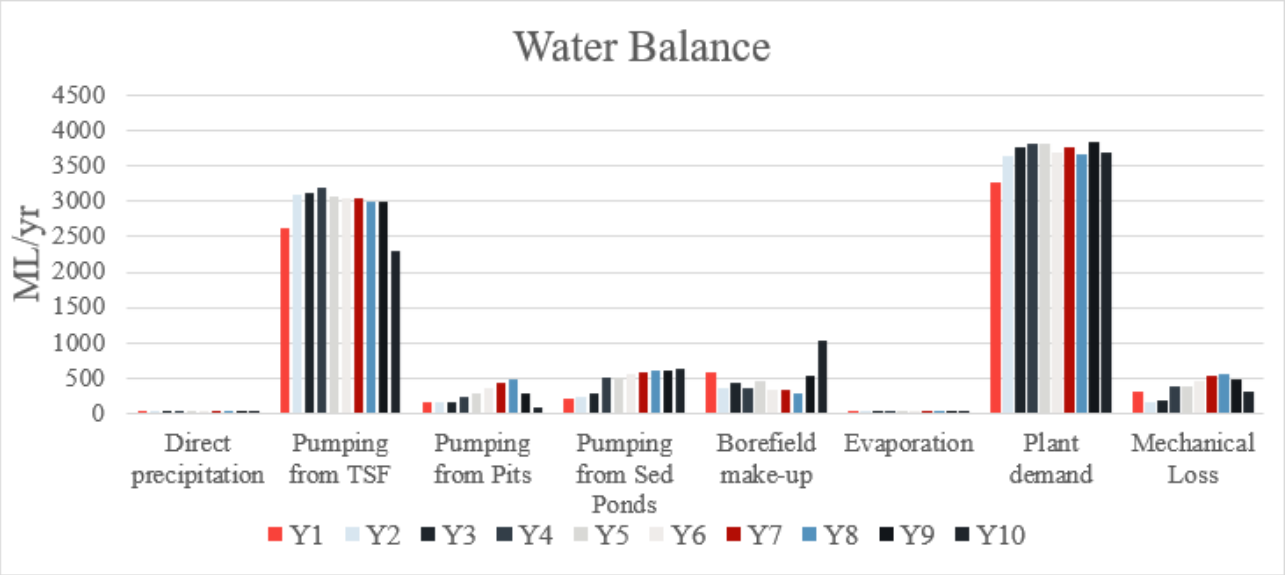

Figure 4.12 Process plant – yearly water balance

Climate change impact

Table 4.29 summarises the average Process Plant fluxes under the four climate change scenarios. Climate change has a small impact on the total fluxes of the water balance ranging from -6.6% for a drier climate to +0.7% for a wetter climate. Detailed water balance results for each climate scenario are presented in Appendix D.

Table 4.29 Process plant – average water balance

	ID	Flow	Baseline Climate	Climate change – Drier Climate	Climate change – Wetter Climate	Climate change – Max Con
Inflows	DP	Direct precipitation	1.4	0.9	1.4	1.3
	TP_TSF	Pumping from TSF	2951.4	2902.4	2949.5	2929.6
	TP_Pits	Pumping from Pits	263.4	209.5	273.1	248.2
	TP_SedPon	Pumping from Sed Ponds	472.2	331.1	489.9	435.8
	BO	Borefield make-up	470.1	531.4	468.7	485.2
	Total		**3688.4**	**3443.8**	**3714.0**	**3614.8**
Outflows	PE	Evaporation	3.9	4.0	4.0	4.0
	PD	Plant demand	3700.7	3700.5	3700.7	3700.7
	ME	Mechanical Loss	375.3	212.1	398.1	322.2
	Total		**4079.9**	**3916.6**	**4102.8**	**4026.9**

4.3 Mechanical evaporators scenarios

Results presented in Section 4.1 correspond to the net total mechanical losses required to maintain the site-wide water balance. This section presents the results for three mechanical evaporation scenarios (2, 5, and 10 units).

While the mechanical evaporation requirements are appropriately interpreted at a monthly scale, greater variability is observed at the daily scale, primarily driven by rainfall events. Short-duration, high-intensity rainfall events can generate significant inflow spikes that may exceed the evaporation capacity of the system. For example, a rainfall event of approximately 40 mm/day may result in a system-wide increase in stored water in the order of 100 ML/day. Removing this volume within a single day would theoretically require more than 80 evaporator units. However, such an approach is neither practical nor necessary, as these volumes can be temporarily stored within the system and managed progressively over time.

This behaviour reflects the climatic conditions at site, characterised by:

- Episodic, high-intensity rainfall events during summer (e.g. remnant cyclone-driven systems), and
- More persistent rainfall during winter, when evaporation efficiency is at its lowest (see Table 3.12).

Figure 4.13 shows the daily evaporation demand relative to installed capacity for the three scenarios for a single rainfall realisation. The results indicate that, although increasing the number of evaporator units improves the system's capacity to manage average and more elevated inflow conditions, mechanical evaporation alone is insufficient to manage the infrequent short-duration peak rainfall events. During such periods, inflows may exceed the maximum evaporation capacity unless a vewry large number of evaporators are installed. Accordingly, excess water is required to be temporarily stored within available system storage (e.g. sediment ponds, pits, and the TSF) and subsequently released for mechanical evaporation under controlled conditions over the next few days.

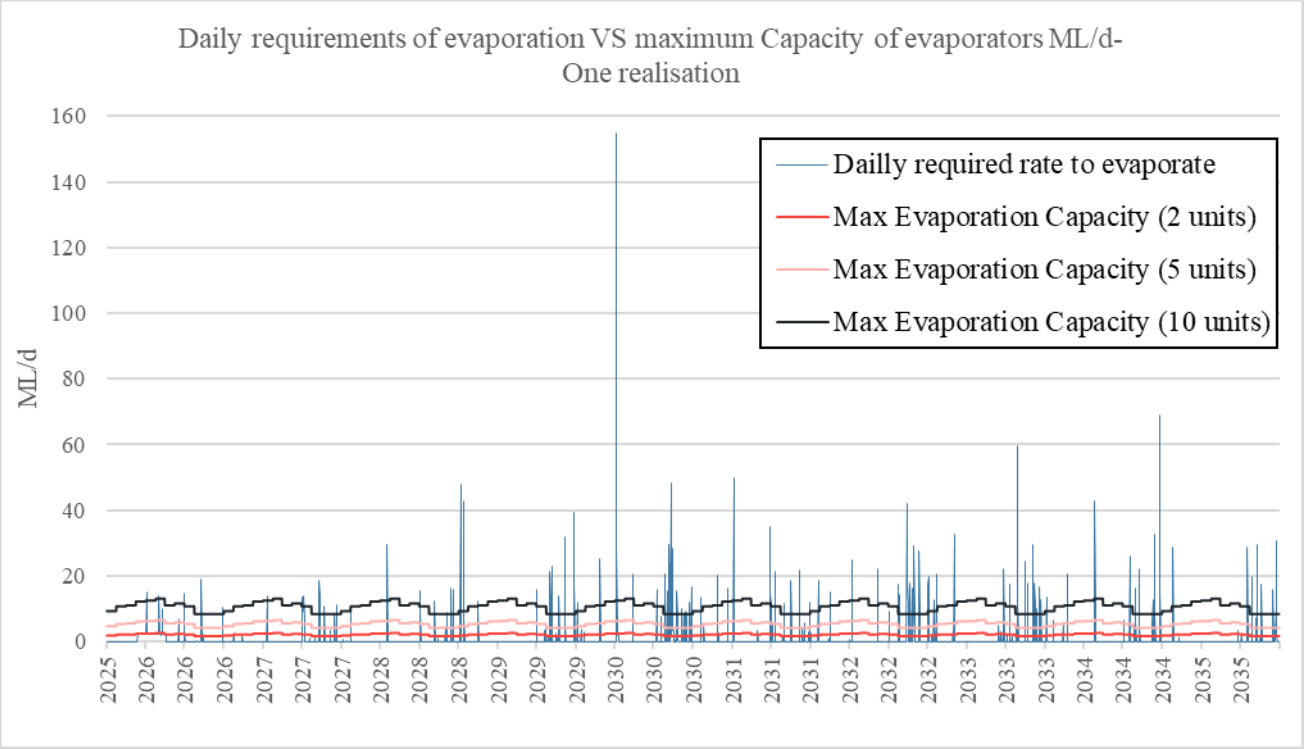

Figure 4.13 Daily requirements of evaporation VS maximum Capacity of evaporators ML/d - one rainfall realisation

Figure 4.14 to Figure 4.16 present the probabilistic upstream storage requirements under baseline climate conditions for the three evaporator scenarios, based on an ensemble of 100 climate realisations. These results illustrate the buffering capacity required to manage peak inflow events. Table 4.30 summarises the annual maximum upstream storage volumes for each scenario, reported for the mean, 75th, 90th, and 95th probabilities of exceedance. The results demonstrate that the installed evaporation capacity influences the cumulative accumulation of excess water over time.

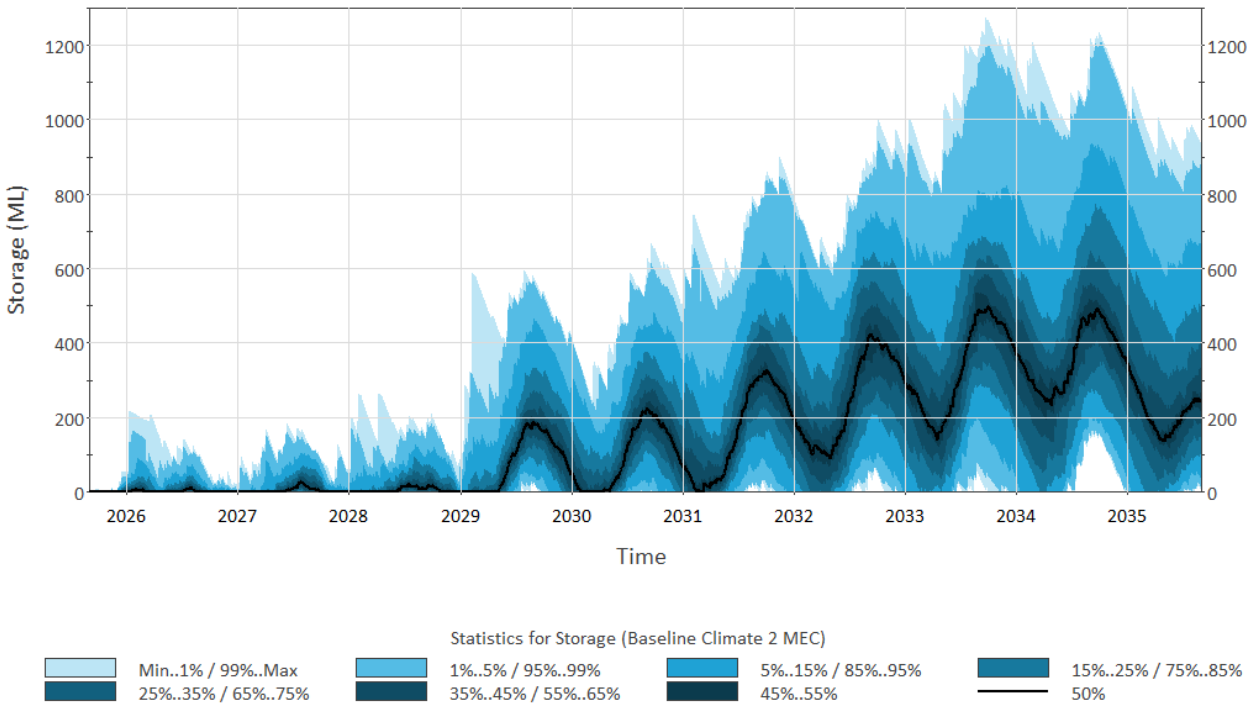

Figure 4.14 Probabilistic upstream storage requirements under baseline climate (2 Mechanical Evaporators)

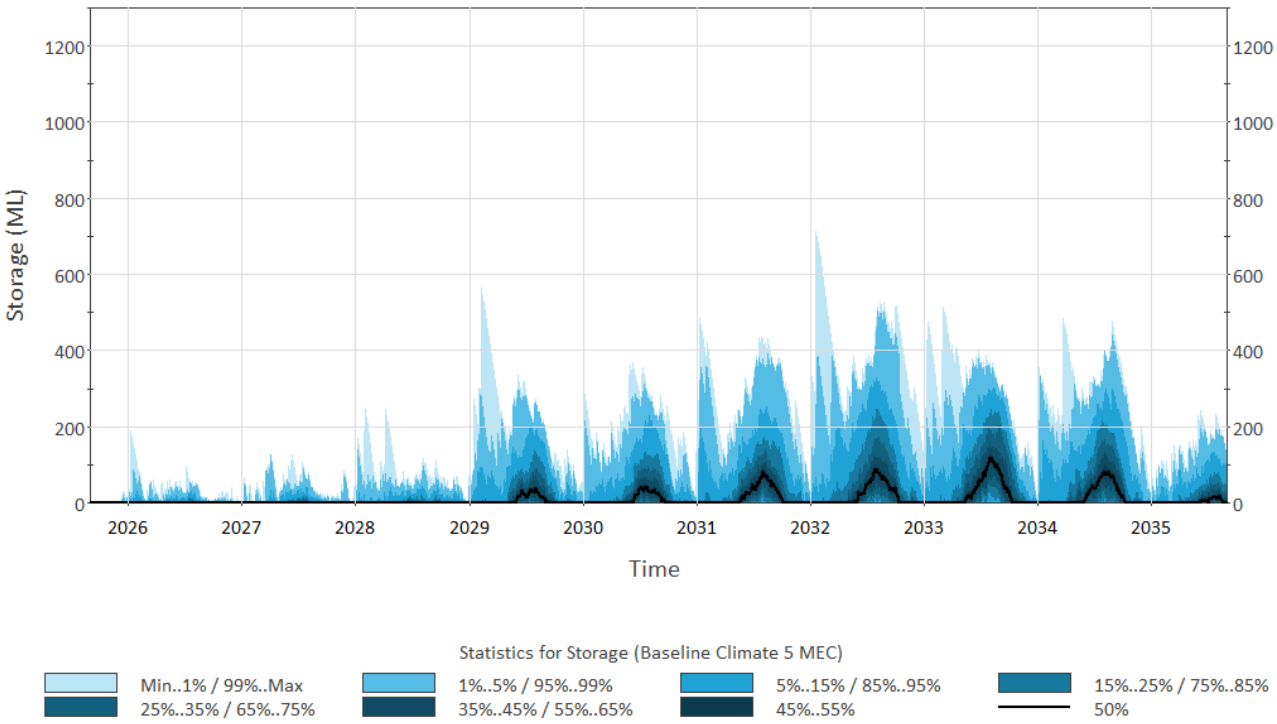

Figure 4.15 Probabilistic upstream storage requirements under baseline climate (5 Mechanical Evaporators)

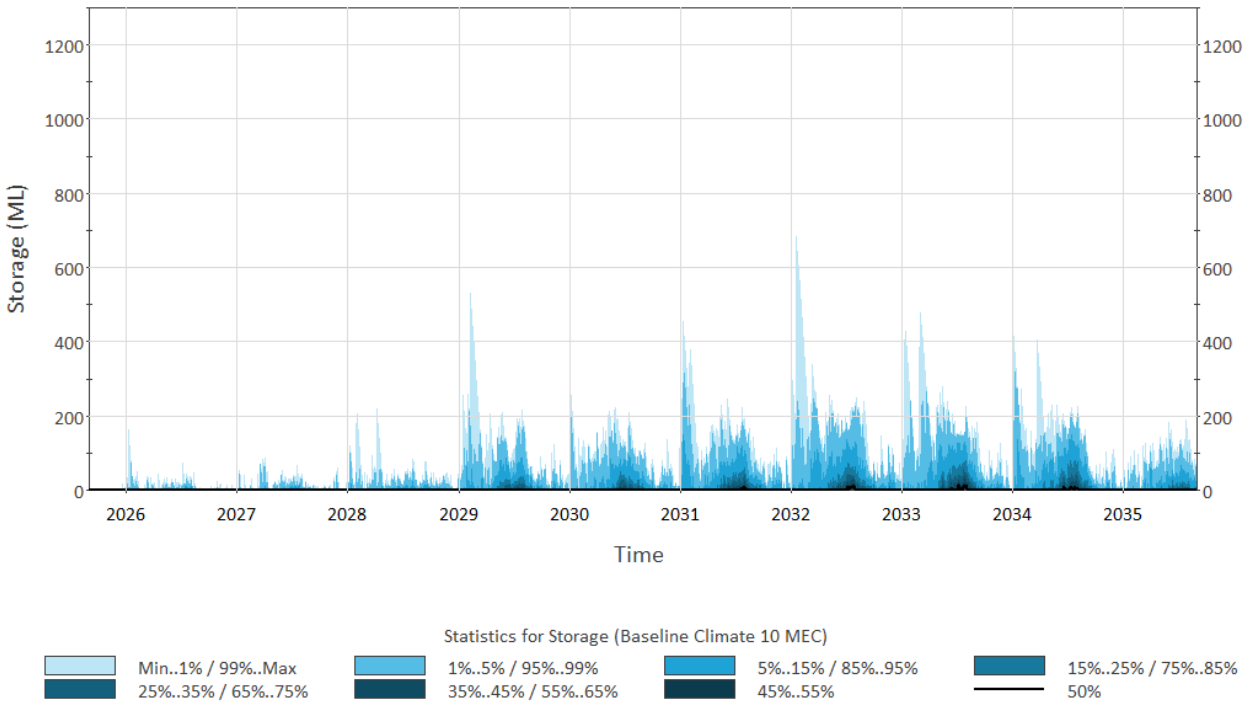

Figure 4.16 Probabilistic upstream storage requirements under baseline climate (10 Mechanical Evaporators)

Table 4.30 Probabilistic maximum upstream storage required per year for the three evaporator scenarios

	2 Mechanical Evaporators				5 Mechanical Evaporators				10 Mechanical Evaporators			
Year	Mean	75%	90%	95%	Mean	75%	90%	95%	Mean	75%	90%	95%
Y1	19	31	62	91	6	5	21	36	3	0	7	15
Y2	34	53	86	107	8	14	26	47	3	0	9	14
Y3	34	58	99	127	8	9	31	50	4	0	13	29
Y4	206	272	365	456	57	94	163	204	17	22	65	97
Y5	227	306	411	467	63	102	172	229	19	31	67	100
Y6	312	412	502	590	95	143	223	260	26	43	87	151
Y7	401	554	681	735	114	178	294	336	30	44	103	140
Y8	495	632	741	815	126	203	277	304	34	58	109	148
Y9	499	639	825	923	114	211	256	309	31	53	119	153
Y10	506	651	841	937	94	147	207	297	14	16	49	85

5 Assumptions and limitations

5.1 Model assumptions

The following assumptions were adopted in the model:

- Due to the variable nature of the WRDs, runoff coefficients for the WRD and seepage coefficient were assumed. These values can be further refined or calibrated when more information is available.
- For consistency, the pit voids were modelled as one individual pit for Jinkas, Jackson, Olympia, and Dingo, despite the pit stages, as the GW inflows were provided in this way. In further design stages, it is recommended that inflows are provided for each pit stage, so the tracking of volumes corresponds to the operations can be modelled in more detail.
- Mechanical evaporation is assumed as the primary water balance control, with modular 600/300 units (~1,200 m^3/day per unit under average conditions).

5.2 Model limitations

Water balance modelling as undertaken in the current assessment typically has the following known limitations:

- Since the water balance model can only approximate natural hydrological responses and dynamics, they inherently have limitations and are based on a range of assumptions.
- It is noted the groundwater inflow data used in this assessment corresponds to the revised version of the groundwater model conducted by a third party for Ausgold. The initial modelling, performed by SRK, predicted significantly larger groundwater inflows than those presented herein. Groundwater inflows are a significant inflow component to the pits and overall water balance and therefore directly affect the accuracy of the water balance modelling results.

5.3 Exclusions

The water balance model excludes the balance of the non-operational pit voids.

6 Conclusions and recommendations

6.1 Results summary

A WB model was developed for the KGP site to inform water planning for the mine's operational phase.

Based on the stochastic generation of climate data assuming the baseline data and climate change projections, the water balance indicated:

- Sources of Contact Water:
  - Pits: Dewatering of surplus groundwater inflow in the pits contributes approximately 270 ML/year, ranging from 92 ML/year to 481 ML/year.
  - Sediment Ponds: Runoff and seepage from the Waste Rock Dumps (WRDs) add about 470 ML/year, ranging from 220 ML/year to 630 ML/year.
  - Tailings Storage Facility (TSF): Return water from the TSF is around 2,960 ML/year, ranging from 2300 ML/year to 3200 ML/year, making up about 70% of the total water received by the TSF.
- Water Demand and Surplus:
  - The Process Plant water demand ranges from 3,260 ML/year to 3,840 ML/year.
  - Due to the year-to-year climate variations and as there is no capacity to retain the water surplus during wet periods (seasonal or short duration large storm events) annual surplus of water required to be processed via a mechanical loss system is estimated to be approximately 375 ML/year, ranging from 150 ML/year to 560 ML/year.
- Seasonal Water Management:
  - Due to insufficient storage to retain surplus water during the wet period, the system typically experiences a water deficit during the dry season (Sptember to April).
  - Consequently, borefield makeup water is estimated to be required typically in summer/autumn, ranging from 270 ML/year to 1040 ML/year. This estimated demand assumes pit water from non-active pits is not utilised. However, it is likely water will be available in the pits during at least the last two years, reducing or potentially eliminating the need for borefield makeup water during this period.

Figure 6.1 shows borefield make up and mechanical losses required per year, two of the key elements of the annual water budget.

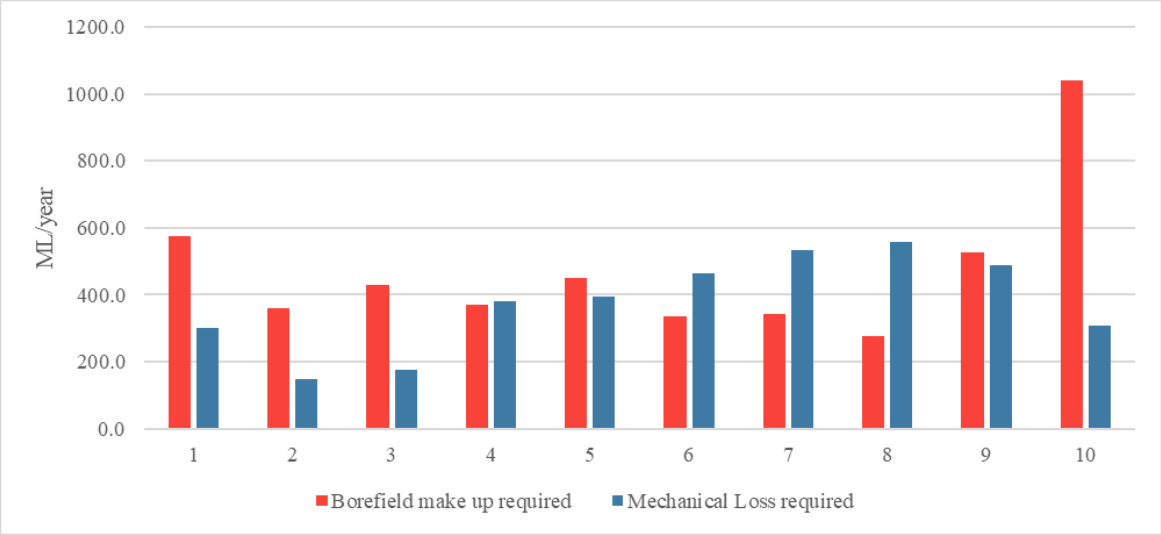

Figure 6.1 Mean annual borefield make up and Mechanical loss required

- Mechanical evaporator scenarios:

  The assessment of the three mechanical evaporation scenarios (2, 5, and 10 units) indicates that increasing evaporation capacity reduces the magnitude and persistence of excess water within the system, thereby lowering overall onsite storage requirements.

  - Under the 2-unit scenario, significant accumulation of water occurs over time, resulting in the highest upstream storage requirements and limited ability to recover during wet periods.
  - The 5-unit scenario provides a balanced outcome, substantially reducing storage accumulation while maintaining operational practicality.
  - The 10-unit scenario further decreases storage requirements and improves system responsiveness; however, it does not eliminate the need for temporary storage during the infrequent, but short-duration peak rainfall events that can occurr at the site.

  Overall, while higher evaporator capacity improves system performance at an annual and monthly scale, all scenarios require sufficient buffering storage to manage short-term inflow peaks, highlighting the complementary role of evaporation and storage in maintaining a stable water balance.

- Climate change:
  - A high-level climate change assessment was undertaken to provide likely variability in climate conditions and the impact on the range in WB model results. A more detailed assessment is recommended in further design stages to ensure resilience of the project under potential future climate change.
  - The selected ranged of climate change for the near future centred in 2030 is estimated to have minimal impact on the WB results for most of the facilities with the exception of the Sediment Ponds and Olympia Pit.

6.2 Recommendations

The model has been set up as directed by Ausgold to estimate the required mechanical losses for the system without using an evaporation pond on site. It is recommended that in future simulations the following options are considered, to improve the operational balance:

- Accumulation of water in non-operational Pits: To improve the daily water management, investigate the accumulation of water in non-operational pits. An initial understanding of the pit balance of individual non-operational pit voids should be established in future simulations. This could manage seasonal changes in surplus water and potentially minimise the need for borefield makeup water. An increased maturity level for the groundwater assessment should be undertaken to understand how this would affect the GW inflows into the pits.
- To reduce reliance on borefield water and minimize mechanical losses, evaporation ponds could be used to store excess water during the wet season for use in the dry season. This approach can help improve site operation relating to the water balance; however, some dependence on mechanical systems and the borefield will still be necessary.
- Refinement of current modelling approach: It is recommended to enhance the resolution of groundwater inflow data with a finer timeseries than annual totals provided for each pit stage according to the mine schedule.
- Consideration of mechanical evaporation: If mechanical evaporation is adopted, it is recommended that Ausgold implement a balanced, risk-based approach to determining evaporation capacity, supported by adequate upstream storage to manage peak inflows. Consideration should also be given to provision for additional storage if site conditions prove wetter than predicted.

7 Limitations

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Appendix A

Water balance – TSFs

TSF - Northern Cell

Baseline Climate

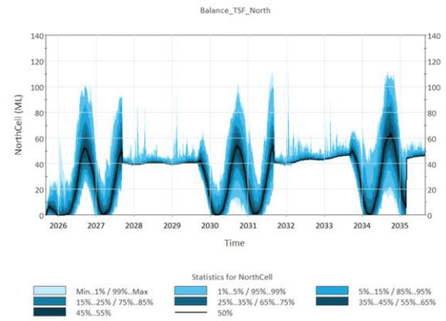
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]						WB Totals	
	DP	TR	TS	PE	TE	T_P	EN	SP	OV	Total in	Total Ou
Y1	19.7	106.3	0.0	23.8	40.6	0.0	0.0	1.1	0.0	125.9	64.4
Y2	28.3	97.2	0.0	66.2	49.4	0.0	0.0	1.3	0.0	125.5	115.6
Y3	40.3	95.3	4476.2	108.5	160.2	3131.3	1208.5	1.4	0.0	4611.7	3400.0
Y4	38.6	91.3	4588.1	109.8	161.8	3191.7	1238.8	1.4	0.0	4718.0	3463.3
Y5	26.7	99.6	0.0	56.4	48.7	0.0	0.0	1.3	0.0	126.3	105.1
Y6	29.8	100.5	0.0	67.8	49.3	0.0	0.0	1.3	0.0	130.3	117.1
Y7	102.3	50.8	4512.8	315.2	77.1	3045.2	1218.0	1.4	0.0	4665.9	3437.5
Y8	41.4	102.9	4376.3	157.1	161.1	2998.3	1181.5	1.4	0.0	4520.7	3316.5
Y9	25.2	118.5	0.0	57.2	59.5	0.0	0.0	1.3	0.0	143.7	116.6
Y10	46.2	105.0	1755.2	98.8	101.6	1227.5	473.8	1.4	0.0	1906.3	1427.9

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	50.9	61.9	97.2
Y2	Y2	52.3	66.4	100.9
Y3	Y3	51.5	66.2	93.2
Y4	Y4	41.0	42.8	80.3
Y5	Y5	51.0	65.2	86.0
Y6	Y6	54.4	66.9	101.3
Y7	Y7	53.9	65.9	101.0
Y8	Y8	46.8	48.3	73.1
Y9	Y9	59.6	75.3	109.6
Y10	Y10	63.8	80.6	109.9

Probabilistic Volume result [ML]



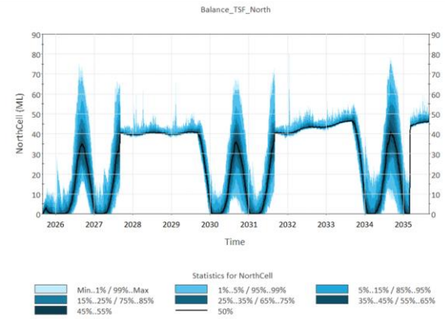
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]						WB Totals	
	DP	TR	TS	PE	TE	T_P	EN	SP	OV	Total in	Total Ou
Y1	10.1	75.3	0.0	12.3	33.2	0.0	0.0	0.9	0.0	85.4	45.6
Y2	13.5	71.0	0.0	37.1	43.2	0.0	0.0	1.1	0.0	84.5	80.4
Y3	27.1	64.9	4476.2	110.0	163.3	3073.6	1208.5	1.4	0.0	4568.2	3346.9
Y4	26.4	62.8	4588.1	111.5	164.8	3154.1	1238.8	1.4	0.0	4677.3	3430.5
Y5	14.0	71.5	0.0	41.2	44.7	0.0	0.0	1.2	0.0	85.4	86.0
Y6	13.9	73.7	0.0	37.6	43.5	0.0	0.0	1.1	0.0	87.6	81.1
Y7	69.7	34.7	4512.8	321.4	78.4	2980.3	1218.0	1.4	0.0	4617.2	3380.1
Y8	25.9	72.0	4376.3	158.4	164.9	2956.5	1181.5	1.4	0.0	4474.2	3279.8
Y9	13.0	84.3	0.0	41.9	54.8	0.0	0.0	1.2	0.0	97.2	96.7
Y10	29.5	73.1	1755.2	76.5	100.2	1191.7	473.8	1.3	0.0	1857.8	1368.5

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	34.1	42.8	68.9
Y2	Y2	35.5	45.1	68.8
Y3	Y3	40.7	45.7	63.1
Y4	Y4	41.0	42.6	59.9
Y5	Y5	40.8	44.0	62.4
Y6	Y6	37.1	44.7	70.1
Y7	Y7	43.8	45.4	69.3
Y8	Y8	46.8	48.1	57.9
Y9	Y9	46.8	50.8	75.7
Y10	Y10	46.3	51.2	75.7



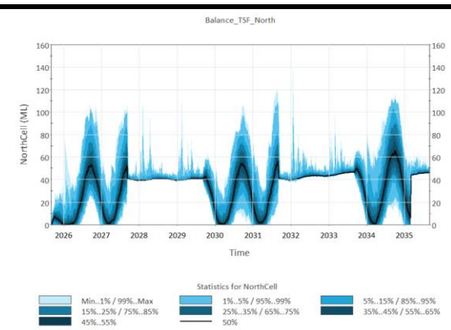
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]						WB Totals	
	DP	TR	TS	PE	TE	T_P	EN	SP	OV	Total in	Total Ou
Y1	20.9	111.3	0.0	26.7	42.4	0.0	0.0	1.1	0.0	132.2	69.0
Y2	30.2	101.5	0.0	70.0	50.8	0.0	0.0	1.3	0.0	131.6	120.8
Y3	42.5	100.2	4476.2	111.4	164.2	3131.2	1208.5	1.4	0.0	4618.9	3406.8
Y4	40.7	95.8	4588.1	112.6	165.8	3190.1	1238.8	1.4	0.0	4724.5	3468.5
Y5	28.2	104.2	0.0	59.3	50.1	0.0	0.0	1.3	0.0	132.3	109.4
Y6	31.9	105.2	0.0	71.9	50.5	0.0	0.0	1.3	0.0	137.2	122.4
Y7	108.8	52.5	4512.8	323.4	78.9	3042.7	1218.0	1.4	0.0	4674.1	3445.0
Y8	44.1	107.7	4376.3	160.9	165.2	2995.8	1181.5	1.4	0.0	4528.2	3321.9
Y9	27.0	123.9	0.0	60.3	60.9	0.0	0.0	1.3	0.0	150.9	121.2
Y10	48.4	110.3	1755.2	102.6	103.9	1229.5	473.8	1.4	0.0	1913.8	1436.0

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	51.7	62.7	97.4
Y2	Y2	53.2	66.5	102.9
Y3	Y3	53.6	65.5	101.3
Y4	Y4	41.0	42.9	89.0
Y5	Y5	52.1	65.9	88.0
Y6	Y6	55.9	67.5	108.9
Y7	Y7	56.5	66.4	108.2
Y8	Y8	46.8	48.3	80.2
Y9	Y9	61.2	78.9	110.9
Y10	Y10	65.4	82.4	112.6



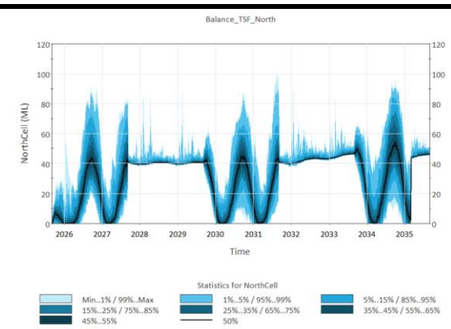
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]						WB Totals	
	DP	TR	TS	PE	TE	T_P	EN	SP	OV	Total in	Total Ou
Y1	15.9	99.2	0.0	23.0	41.1	0.0	0.0	1.1	0.0	115.1	64.0
Y2	23.0	91.4	0.0	57.0	49.1	0.0	0.0	1.2	0.0	114.4	106.1
Y3	37.0	87.9	4476.2	111.1	164.5	3106.9	1208.5	1.4	0.0	4601.1	3382.6
Y4	35.3	83.8	4588.1	112.6	166.1	3175.5	1238.8	1.4	0.0	4707.2	3454.1
Y5	22.9	92.7	0.0	55.5	49.1	0.0	0.0	1.2	0.0	115.6	104.6
Y6	24.1	94.6	0.0	58.4	49.1	0.0	0.0	1.3	0.0	118.7	107.5
Y7	93.7	47.1	4512.8	323.4	79.2	3014.8	1218.0	1.4	0.0	4653.6	3417.4
Y8	39.6	93.6	4376.3	161.0	165.5	2980.4	1181.5	1.4	0.0	4509.5	3306.9
Y9	21.6	110.0	0.0	56.1	60.2	0.0	0.0	1.3	0.0	131.6	116.3
Y10	40.8	97.8	1755.2	92.5	103.5	1212.5	473.8	1.4	0.0	1893.8	1408.6

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	42.2	52.0	81.6
Y2	Y2	43.9	55.8	87.5
Y3	Y3	43.8	54.7	82.2
Y4	Y4	41.0	42.4	74.7
Y5	Y5	43.4	53.6	73.0
Y6	Y6	44.7	55.7	89.5
Y7	Y7	44.4	54.1	88.7
Y8	Y8	46.8	48.0	69.6
Y9	Y9	50.1	65.1	90.6
Y10	Y10	54.2	69.8	92.0



DP (Direct precipitation), TR (Tailings RO), TS (Tailings Water), PE (Evaporation), TE (Tailings evap), T_P (To Plant), EN (Entrained water), SP (Seepage), OV (Overtopping)

TSF - Southern Cell

Baseline Climate

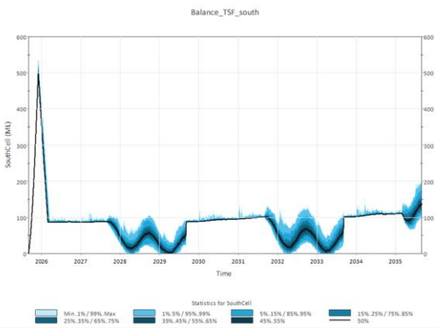
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]						WB Totals	
	DP	TR	TS	PE	TE	T_P	EN	SP	OV	Total in	Total Ou
Y1	62.6	64.1	3979.1	233.7	85.4	2612.1	1074.2	1.4	0.0	4105.7	2931.1
Y2	53.2	68.5	4474.9	154.8	122.3	3096.2	1207.8	1.4	0.0	4596.6	3373.3
Y3	34.7	88.5	0.0	97.2	46.8	0.0	0.0	1.4	0.0	123.2	144.0
Y4	25.1	90.8	0.0	65.2	47.7	0.0	0.0	1.3	0.0	116.0	112.9
Y5	96.3	43.3	4613.6	305.0	61.2	3079.3	1245.4	1.4	0.0	4753.3	3445.5
Y6	44.6	93.9	4412.9	148.5	146.7	3041.7	1191.7	1.4	0.0	4551.3	3336.8
Y7	34.7	102.8	0.0	101.4	57.2	0.0	0.0	1.4	0.0	137.5	158.6
Y8	26.7	106.6	0.0	72.6	57.6	0.0	0.0	1.3	0.0	133.3	130.2
Y9	84.5	72.1	4544.2	294.5	100.5	3005.4	1226.8	1.4	0.0	4700.8	3400.4
Y10	52.6	107.0	1726.6	136.9	150.6	1085.4	466.1	1.4	0.0	1886.2	1372.8

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	499.3	511.4	538.9
Y2	Y2	87.4	89.1	110.8
Y3	Y3	88.0	92.8	105.3
Y4	Y4	57.4	70.2	106.1
Y5	Y5	94.1	95.5	118.3
Y6	Y6	100.2	101.5	137.4
Y7	Y7	101.2	104.6	128.2
Y8	Y8	68.5	82.5	125.3
Y9	Y9	110.4	111.8	136.2
Y10	Y10	138.5	152.2	197.6

Probabilistic Volume result [ML]



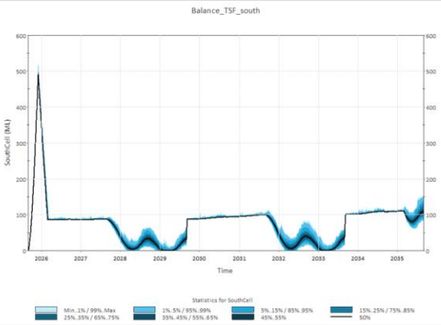
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]						WB Totals	
	DP	TR	TS	PE	TE	T_P	EN	SP	OV	Total in	Total Ou
Y1	41.8	44.7	3979.1	232.3	89.5	2576.1	1074.2	1.4	0.0	4065.6	2897.8
Y2	36.4	47.1	4474.9	157.6	124.5	3059.9	1207.8	1.4	0.0	4558.4	3342.0
Y3	17.4	64.6	0.0	80.5	49.0	0.0	0.0	1.4	0.0	82.0	129.5
Y4	11.4	66.7	0.0	33.7	40.9	0.0	0.0	1.1	0.0	78.1	74.6
Y5	65.8	30.2	4613.6	310.7	62.4	3021.3	1245.4	1.4	0.0	4709.6	3394.4
Y6	29.4	65.5	4412.9	150.0	150.0	3001.6	1191.7	1.4	0.0	4507.8	3301.6
Y7	17.3	74.4	0.0	84.9	59.7	0.0	0.0	1.4	0.0	91.8	144.6
Y8	11.1	77.7	0.0	36.5	50.8	0.0	0.0	1.2	0.0	88.8	87.3
Y9	56.4	50.9	4544.2	299.3	102.8	2937.8	1226.8	1.4	0.0	4651.5	3339.9
Y10	33.9	74.6	1726.6	136.5	151.8	1070.6	466.1	1.4	0.0	1835.1	1358.9

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	490.6	498.9	517.5
Y2	Y2	87.4	88.8	97.3
Y3	Y3	87.2	88.7	94.6
Y4	Y4	34.1	43.2	64.1
Y5	Y5	94.1	95.2	108.1
Y6	Y6	100.1	101.2	110.6
Y7	Y7	100.2	101.3	112.1
Y8	Y8	40.6	49.3	78.2
Y9	Y9	110.3	111.6	120.8
Y10	Y10	110.9	121.0	151.5



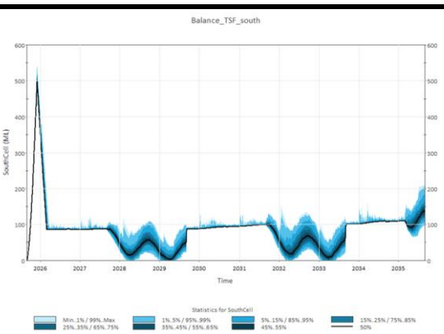
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]						WB Totals	
	DP	TR	TS	PE	TE	T_P	EN	SP	OV	Total in	Total Ou
Y1	66.4	66.7	3979.1	239.2	87.7	2609.4	1074.2	1.4	0.0	4112.1	2936.4
Y2	55.8	71.8	4474.9	158.7	125.3	3093.7	1207.8	1.4	0.0	4602.4	3377.7
Y3	37.1	92.7	0.0	100.6	47.8	0.0	0.0	1.4	0.0	129.8	148.4
Y4	27.1	94.8	0.0	69.4	48.8	0.0	0.0	1.3	0.0	121.9	118.3
Y5	101.9	44.5	4613.6	312.8	62.7	3077.0	1245.4	1.4	0.0	4760.0	3452.5
Y6	46.9	98.6	4412.9	152.2	150.4	3039.6	1191.7	1.4	0.0	4558.3	3342.1
Y7	37.0	107.8	0.0	104.6	58.5	0.0	0.0	1.4	0.0	144.8	163.1
Y8	28.9	111.5	0.0	77.1	58.9	0.0	0.0	1.3	0.0	140.3	136.0
Y9	90.3	74.3	4544.2	302.0	103.0	3004.0	1226.8	1.4	0.0	4708.8	3409.0
Y10	55.5	112.2	1726.6	140.8	154.4	1082.5	466.1	1.4	0.0	1894.2	1377.6

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	498.3	510.6	539.4
Y2	Y2	87.4	88.9	118.6
Y3	Y3	88.0	93.2	106.9
Y4	Y4	57.6	73.1	110.4
Y5	Y5	94.1	95.6	127.0
Y6	Y6	100.1	101.5	132.2
Y7	Y7	100.9	104.6	129.0
Y8	Y8	69.3	85.6	127.8
Y9	Y9	110.3	111.8	144.6
Y10	Y10	138.6	154.8	206.0



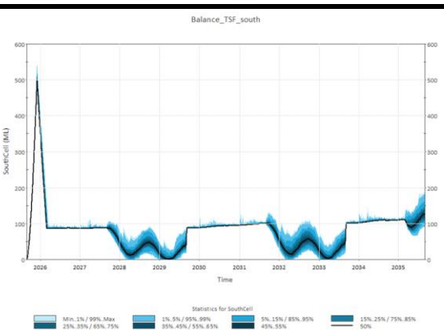
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]						WB Totals	
	DP	TR	TS	PE	TE	T_P	EN	SP	OV	Total in	Total Ou
Y1	57.6	58.7	3979.1	238.9	88.1	2596.3	1074.2	1.4	0.0	4095.4	2923.2
Y2	48.8	63.0	4474.9	158.9	125.5	3081.0	1207.8	1.4	0.0	4586.6	3365.4
Y3	30.8	82.5	0.0	96.9	48.2	0.0	0.0	1.4	0.0	113.2	145.1
Y4	20.2	85.4	0.0	55.7	47.4	0.0	0.0	1.3	0.0	105.6	103.0
Y5	88.2	39.8	4613.6	312.9	62.9	3051.5	1245.4	1.4	0.0	4741.6	3427.3
Y6	41.6	85.4	4412.9	152.3	150.6	3024.2	1191.7	1.4	0.0	4539.9	3327.0
Y7	30.6	95.8	0.0	100.8	59.0	0.0	0.0	1.4	0.0	126.4	159.8
Y8	21.3	100.6	0.0	62.3	58.1	0.0	0.0	1.3	0.0	121.9	120.4
Y9	78.0	65.6	4544.2	302.1	103.2	2973.4	1226.8	1.4	0.0	4687.9	3378.7
Y10	47.4	99.2	1726.6	139.8	154.6	1079.0	466.1	1.4	0.0	1873.1	1373.4

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	498.3	510.6	539.4
Y2	Y2	87.4	88.8	109.5
Y3	Y3	88.0	93.2	106.6
Y4	Y4	48.7	58.0	90.2
Y5	Y5	94.1	95.2	115.2
Y6	Y6	100.2	101.2	130.9
Y7	Y7	101.0	104.6	128.0
Y8	Y8	58.0	70.0	106.3
Y9	Y9	110.3	111.6	135.0
Y10	Y10	126.8	140.3	182.9



DP (Direct precipitation), TR (Tailings RO), TS (Tailings Water), PE (Evaporation), TE (Tailings evap), T_P (To Plant), EN (Entrained water), SP (Seepage), OV (Overtopping)

Appendix B

Water balance – Pits

Pit - Jinkas

Baseline Climate

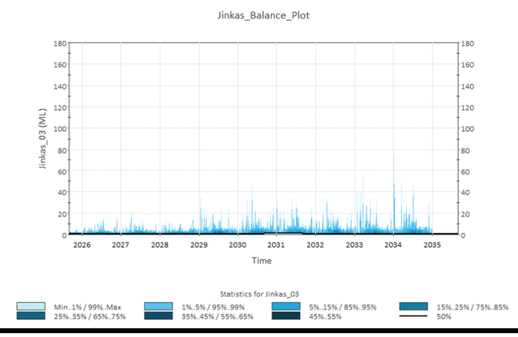
WATER BALANCE

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.9	36.5	18.8	118.2	2.4	162.8	0.0	174.3	165.2
Y2	0.8	31.2	34.4	93.3	2.4	148.8	0.0	159.7	151.2
Y3	0.9	30.1	45.7	73.1	2.4	136.0	0.0	149.7	138.4
Y4	0.8	58.8	61.5	55.2	2.4	155.0	0.0	176.3	157.5
Y5	0.8	47.7	90.1	50.0	2.4	164.8	0.0	188.7	167.2
Y6	0.9	38.9	114.6	135.3	2.4	263.1	0.0	289.6	265.6
Y7	0.9	35.3	119.8	115.1	2.4	241.7	0.0	271.0	244.2
Y8	0.8	35.5	116.3	11.0	2.4	137.2	0.0	163.6	139.6
Y9	0.8	35.1	119.2	0.0	0.2	129.0	0.0	155.2	129.2
Y10	0.8	7.0	27.3	57.7	2.4	84.5	0.0	92.9	87.0

Volume Results

Year	Maximum Volume [ML]		
	50th	75th	99th
Y1	1.4	2.4	25.3
Y2	1.4	2.0	25.5
Y3	1.4	1.8	31.9
Y4	1.3	2.0	60.6
Y5	1.3	1.8	36.5
Y6	1.5	2.2	79.5
Y7	1.5	3.7	89.1
Y8	1.4	1.9	49.2
Y9	1.1	3.6	48.0
Y10	1.3	1.5	21.7

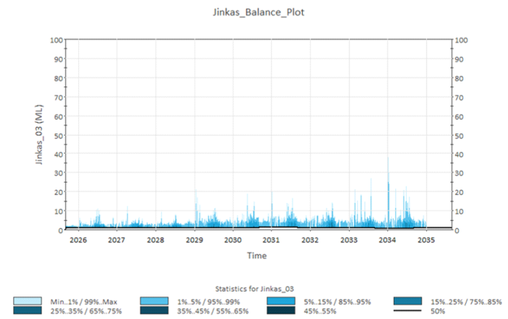
Probabilistic Volume result [ML]



Climate change - Drier Climate

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.6	18.3	11.0	118.2	2.4	140.5	0.0	148.0	142.9
Y2	0.6	15.3	17.9	93.3	2.5	121.2	0.0	127.0	123.7
Y3	0.6	14.9	23.7	73.1	2.5	104.9	0.0	112.2	107.4
Y4	0.6	30.1	33.0	55.2	2.5	108.1	0.0	118.9	110.6
Y5	0.6	23.1	47.1	50.0	2.5	109.4	0.0	120.8	111.9
Y6	0.6	19.0	58.6	135.3	2.5	199.5	0.0	213.5	202.0
Y7	0.6	17.3	60.5	115.1	2.5	178.6	0.0	193.5	181.1
Y8	0.6	17.4	58.3	11.0	2.5	74.2	0.0	87.4	76.6
Y9	0.6	17.7	61.9	0.0	0.2	67.4	0.0	80.2	67.6
Y10	0.6	2.1	8.5	57.7	2.5	65.0	0.0	69.0	67.4

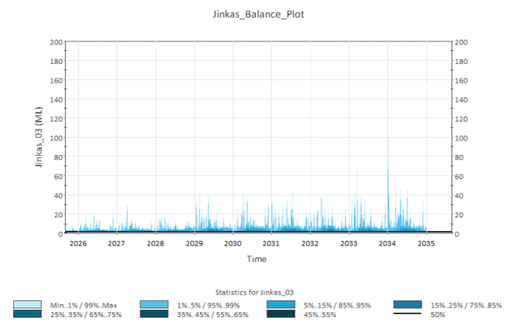
Year	Maximum Volume [ML]		
	50th	75th	99th
Y1	1.4	1.6	13.7
Y2	1.4	1.5	10.4
Y3	1.4	1.4	15.7
Y4	1.3	1.7	29.0
Y5	1.3	1.3	30.3
Y6	1.5	1.5	30.2
Y7	1.5	1.7	48.6
Y8	1.4	1.4	22.5
Y9	1.1	1.1	32.0
Y10	1.3	1.3	6.6



Climate change - Wetter Climate

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.9	40.5	19.9	118.2	2.5	166.7	0.0	179.4	169.1
Y2	0.9	34.9	37.7	93.3	2.5	154.2	0.0	166.7	156.7
Y3	0.9	33.4	50.1	73.1	2.5	142.4	0.0	157.4	144.9
Y4	0.9	65.5	66.9	55.2	2.5	164.5	0.0	188.6	167.0
Y5	0.9	51.9	96.3	50.0	2.5	173.3	0.0	199.1	175.8
Y6	0.9	43.4	126.2	135.3	2.5	273.6	0.0	305.8	276.1
Y7	0.9	39.2	131.9	115.1	2.5	254.1	0.0	287.0	256.6
Y8	0.9	39.1	127.3	11.0	2.5	147.8	0.0	178.3	150.3
Y9	0.9	39.5	131.8	0.0	0.2	142.0	0.0	172.1	142.2
Y10	0.9	7.5	29.3	57.7	2.5	86.3	0.0	95.4	88.8

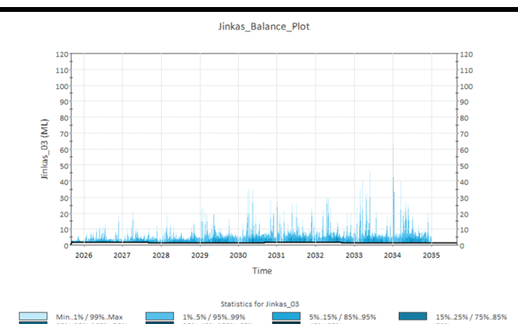
Year	Maximum Volume [ML]		
	50th	75th	99th
Y1	1.4	2.0	30.5
Y2	1.4	1.6	36.3
Y3	1.4	1.6	45.0
Y4	1.3	1.7	74.8
Y5	1.3	1.6	45.5
Y6	1.5	2.3	65.8
Y7	1.5	3.5	107.9
Y8	1.4	1.8	61.3
Y9	1.1	3.1	66.3
Y10	1.3	1.4	22.7



Climate change - Max Con

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.8	31.6	15.1	118.2	2.5	155.7	0.0	165.7	158.2
Y2	0.8	26.8	29.1	93.3	2.5	140.5	0.0	149.9	143.0
Y3	0.8	26.4	39.8	73.1	2.5	128.6	0.0	140.1	131.1
Y4	0.8	50.3	52.0	55.2	2.5	139.2	0.0	158.3	141.7
Y5	0.8	41.5	76.6	50.0	2.5	147.8	0.0	168.9	150.3
Y6	0.8	33.9	99.2	135.3	2.5	244.7	0.0	269.2	247.1
Y7	0.8	30.6	104.1	115.1	2.5	224.1	0.0	250.6	226.6
Y8	0.8	30.8	101.4	11.0	2.5	119.1	0.0	144.1	121.6
Y9	0.8	30.8	103.8	0.0	0.2	111.0	0.0	135.3	111.2
Y10	0.8	7.2	28.1	57.7	2.5	84.6	0.0	93.8	87.1

Year	Maximum Volume [ML]		
	50th	75th	99th
Y1	1.4	1.6	22.9
Y2	1.4	1.5	25.2
Y3	1.4	1.6	34.1
Y4	1.3	1.4	52.2
Y5	1.3	1.3	29.7
Y6	1.5	1.5	61.6
Y7	1.5	1.7	61.2
Y8	1.4	1.5	44.0
Y9	1.1	1.4	42.3
Y10	1.3	1.3	20.7



DP (Direct precipitation), CR (Catchment Runoff), PWR (Pit Wall Runoff), GW (Groundwater inflow), PE (Evaporation), T_P (Transfer to Plant), OV (Overtopping),

Pit - Jackson

Baseline Climate

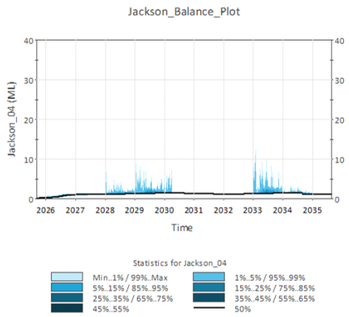
WATER BALANCE

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Y2	0.8	0.0	0.0	0.0	0.1	0.3	0.0	0.8	0.4
Y3	0.9	10.7	2.7	0.0	0.2	11.8	0.0	14.2	12.0
Y4	0.8	15.6	14.1	58.1	2.4	81.4	0.0	88.7	83.8
Y5	0.8	4.4	9.2	99.5	2.4	108.5	0.0	113.9	110.9
Y6	0.9	0.0	0.0	71.4	2.4	69.8	0.0	72.3	72.2
Y7	0.9	0.0	0.0	0.0	0.2	0.7	0.0	0.9	0.9
Y8	0.8	29.3	5.9	22.6	2.4	50.5	0.0	58.6	52.9
Y9	0.8	12.5	6.5	91.4	2.4	105.4	0.0	111.2	107.8
Y10	0.8	1.0	1.9	0.0	0.2	3.2	0.0	3.7	3.4

Volume Results

Year	50th	75th	99th
Y1	0.8	0.9	1.1
Y2	1.1	1.1	1.2
Y3	1.1	1.2	8.2
Y4	1.3	1.5	15.9
Y5	1.4	1.4	8.7
Y6	1.4	1.4	1.5
Y7	1.3	1.3	1.3
Y8	1.2	1.4	16.5
Y9	1.4	1.6	6.0
Y10	1.4	1.4	3.0

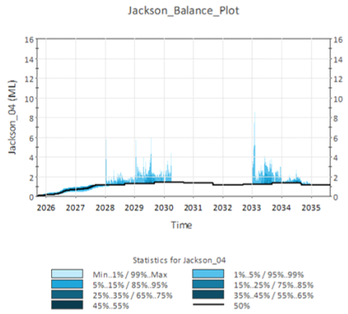
Probabilistic Volume result [ML]



Climate change - Drier Climate

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Y2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Y3	0.6	5.7	1.6	0.0	0.2	6.7	0.0	8.0	6.9
Y4	0.6	7.8	7.9	58.1	2.5	69.6	0.0	74.4	72.1
Y5	0.6	1.6	3.6	99.5	2.5	101.9	0.0	105.3	104.3
Y6	0.6	0.0	0.0	71.4	2.5	69.5	0.0	72.0	72.0
Y7	0.6	0.0	0.0	0.0	0.2	0.6	0.0	0.6	0.7
Y8	0.6	15.4	3.5	22.6	2.5	36.7	0.0	42.1	39.2
Y9	0.6	5.3	3.1	91.4	2.5	96.6	0.0	100.4	99.0
Y10	0.6	0.3	0.6	0.0	0.2	1.4	0.0	1.5	1.6

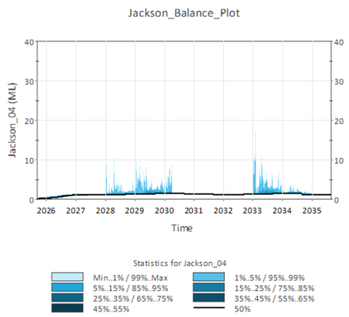
Year	50th	75th	99th
Y1	0.6	0.6	0.8
Y2	1.1	1.1	1.2
Y3	1.1	1.1	4.4
Y4	1.3	1.4	8.1
Y5	1.4	1.4	5.6
Y6	1.4	1.4	1.4
Y7	1.3	1.3	1.3
Y8	1.2	1.2	8.3
Y9	1.4	1.4	3.6
Y10	1.4	1.4	1.7



Climate change - Wetter Climate

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Y2	0.9	0.0	0.0	0.0	0.1	0.4	0.0	0.9	0.5
Y3	0.9	12.0	2.8	0.0	0.2	13.1	0.0	15.7	13.3
Y4	0.9	17.4	15.2	58.1	2.5	83.6	0.0	91.7	86.1
Y5	0.9	5.1	10.6	99.5	2.5	110.1	0.0	116.0	112.6
Y6	0.9	0.0	0.0	71.4	2.5	69.8	0.0	72.3	72.3
Y7	0.9	0.0	0.0	0.0	0.2	0.8	0.0	0.9	1.0
Y8	0.9	32.5	6.1	22.6	2.5	52.8	0.0	62.0	55.3
Y9	0.9	13.9	7.0	91.4	2.5	106.9	0.0	113.2	109.4
Y10	0.9	1.1	2.0	0.0	0.2	3.4	0.0	4.0	3.6

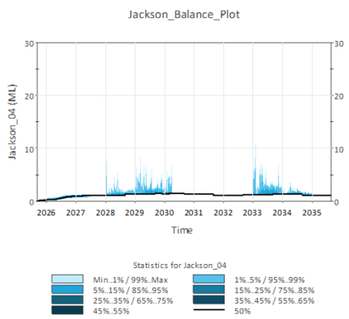
Year	50th	75th	99th
Y1	0.8	0.9	1.1
Y2	1.1	1.1	1.2
Y3	1.1	1.2	11.2
Y4	1.3	1.4	19.4
Y5	1.4	1.4	11.0
Y6	1.4	1.4	1.5
Y7	1.3	1.3	1.4
Y8	1.2	1.4	20.2
Y9	1.4	1.5	7.9
Y10	1.4	1.4	3.1



Climate change - Max Con

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Y2	0.8	0.0	0.0	0.0	0.1	0.3	0.0	0.8	0.3
Y3	0.8	8.9	2.1	0.0	0.2	10.0	0.0	11.9	10.2
Y4	0.8	13.5	11.7	58.1	2.5	77.3	0.0	84.1	79.8
Y5	0.8	4.3	8.8	99.5	2.5	108.1	0.0	113.4	110.6
Y6	0.8	0.0	0.0	71.4	2.5	69.7	0.0	72.2	72.2
Y7	0.8	0.0	0.0	0.0	0.2	0.7	0.0	0.8	0.9
Y8	0.8	24.3	4.6	22.6	2.5	44.7	0.0	52.3	47.1
Y9	0.8	11.8	5.9	91.4	2.5	104.0	0.0	109.9	106.5
Y10	0.8	1.1	1.9	0.0	0.2	3.1	0.0	3.7	3.4

Year	50th	75th	99th
Y1	0.7	0.8	1.1
Y2	1.1	1.1	1.2
Y3	1.1	1.1	8.7
Y4	1.3	1.3	13.8
Y5	1.4	1.4	8.6
Y6	1.4	1.4	1.4
Y7	1.3	1.3	1.3
Y8	1.2	1.2	14.8
Y9	1.4	1.4	6.4
Y10	1.4	1.4	2.9



DP (Direct precipitation), CR (Catchment Runoff), PWR (Pit Wall Runoff), GW (Groundwater inflow), PE (Evaporation), T_P (Transfer to Plant), OV (Overtopping),

Pit - Olympia

Baseline Climate

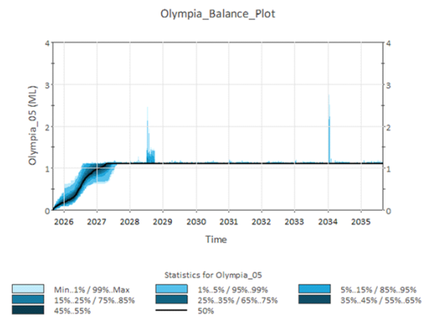
WATER BALANCE

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Y2	0.8	0.0	0.0	0.0	0.1	0.3	0.0	0.8	0.4
Y3	0.9	1.5	0.6	0.0	0.2	2.4	0.0	2.9	2.6
Y4	0.8	0.3	0.3	0.0	0.2	1.2	0.0	1.5	1.4
Y5	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y6	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8
Y7	0.9	0.0	0.0	0.0	0.2	0.5	0.0	0.9	0.7
Y8	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y9	0.8	0.2	0.1	0.0	0.2	0.7	0.0	1.2	0.9
Y10	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7

Volume Results

Year	50th	75th	99th
Y1	0.8	0.9	1.1
Y2	1.1	1.1	1.2
Y3	1.1	1.2	2.8
Y4	1.1	1.1	1.8
Y5	1.1	1.1	1.2
Y6	1.1	1.1	1.3
Y7	1.1	1.1	1.3
Y8	1.1	1.1	1.2
Y9	1.1	1.1	2.5
Y10	1.1	1.1	1.2

Probabilistic Volume result [ML]



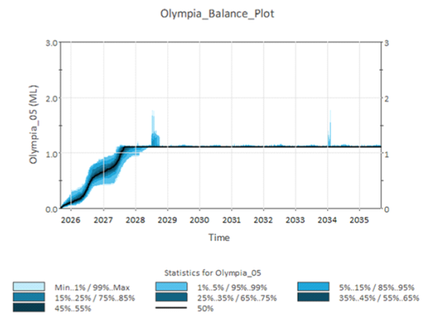
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Y2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Y3	0.6	1.1	0.4	0.0	0.2	1.7	0.0	2.1	1.8
Y4	0.6	0.1	0.1	0.0	0.2	0.5	0.0	0.8	0.7
Y5	0.6	0.0	0.0	0.0	0.2	0.4	0.0	0.6	0.5
Y6	0.6	0.0	0.0	0.0	0.2	0.4	0.0	0.6	0.5
Y7	0.6	0.0	0.0	0.0	0.2	0.3	0.0	0.6	0.5
Y8	0.6	0.0	0.0	0.0	0.2	0.3	0.0	0.6	0.5
Y9	0.6	0.1	0.1	0.0	0.2	0.5	0.0	0.8	0.6
Y10	0.6	0.0	0.0	0.0	0.2	0.3	0.0	0.6	0.5

Volume Results

Year	50th	75th	99th
Y1	0.6	0.6	0.8
Y2	1.1	1.1	1.2
Y3	1.1	1.1	2.3
Y4	1.1	1.1	1.4
Y5	1.1	1.1	1.2
Y6	1.1	1.1	1.2
Y7	1.1	1.1	1.2
Y8	1.1	1.1	1.2
Y9	1.1	1.1	2.1
Y10	1.1	1.1	1.2



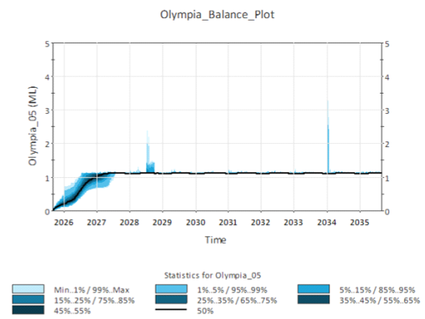
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Y2	0.9	0.0	0.0	0.0	0.1	0.4	0.0	0.9	0.5
Y3	0.9	1.4	0.6	0.0	0.2	2.3	0.0	2.9	2.5
Y4	0.9	0.4	0.3	0.0	0.2	1.2	0.0	1.6	1.4
Y5	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8
Y6	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8
Y7	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8
Y8	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8
Y9	0.9	0.3	0.2	0.0	0.2	0.9	0.0	1.3	1.1
Y10	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8

Volume Results

Year	50th	75th	99th
Y1	0.8	0.9	1.1
Y2	1.1	1.1	1.2
Y3	1.1	1.2	2.7
Y4	1.1	1.1	1.8
Y5	1.1	1.1	1.2
Y6	1.1	1.1	1.3
Y7	1.1	1.1	1.4
Y8	1.1	1.1	1.3
Y9	1.1	1.1	3.0
Y10	1.1	1.1	1.2



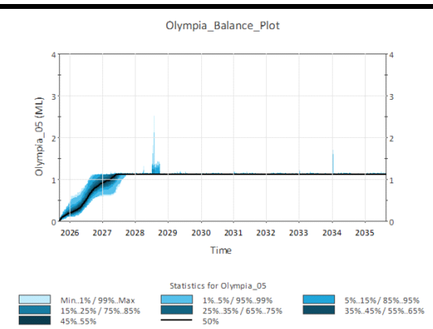
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Y2	0.8	0.0	0.0	0.0	0.1	0.3	0.0	0.8	0.3
Y3	0.8	1.0	0.4	0.0	0.2	1.8	0.0	2.3	2.0
Y4	0.8	0.4	0.3	0.0	0.2	1.1	0.0	1.5	1.3
Y5	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y6	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y7	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y8	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y9	0.8	0.2	0.1	0.0	0.2	0.7	0.0	1.1	0.9
Y10	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7

Volume Results

Year	50th	75th	99th
Y1	0.7	0.8	1.1
Y2	1.1	1.1	1.2
Y3	1.1	1.1	2.3
Y4	1.1	1.1	1.6
Y5	1.1	1.1	1.2
Y6	1.1	1.1	1.3
Y7	1.1	1.1	1.3
Y8	1.1	1.1	1.2
Y9	1.1	1.1	2.3
Y10	1.1	1.1	1.2



DP (Direct precipitation), CR (Catchment Runoff), PWR (Pit Wall Runoff), GW (Groundwater inflow), PE (Evaporation), T_P (Transfer to Plant), OV (Overtopping),

Pit - Dingo

Baseline Climate

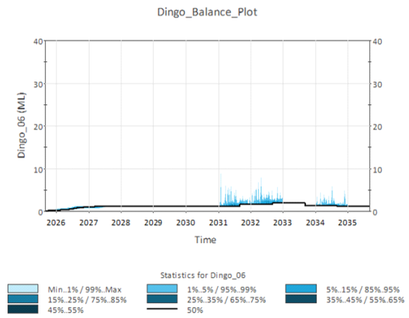
WATER BALANCE

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Y2	0.8	0.0	0.0	0.0	0.1	0.3	0.0	0.8	0.4
Y3	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8
Y4	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y5	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y6	0.9	17.3	4.1	0.0	0.2	18.7	0.0	22.3	18.9
Y7	0.9	15.3	16.2	172.9	2.4	196.8	0.0	205.3	199.3
Y8	0.8	2.5	5.3	288.3	2.4	292.9	0.0	296.9	295.3
Y9	0.8	8.3	4.0	48.5	2.4	57.9	0.0	61.7	60.3
Y10	0.8	1.6	2.3	0.0	0.2	4.0	0.0	4.8	4.2

Volume Results

Year	50th	75th	99th
Y1	0.8	0.9	1.1
Y2	1.1	1.1	1.2
Y3	1.1	1.1	1.3
Y4	1.1	1.1	1.3
Y5	1.1	1.1	1.2
Y6	1.1	1.2	15.2
Y7	1.6	2.1	19.8
Y8	1.9	2.0	7.9
Y9	1.9	1.9	5.9
Y10	1.3	1.3	3.6

Probabilistic Volume result [ML]



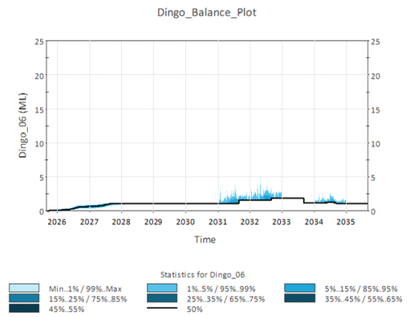
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Y2	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.0
Y3	0.6	0.0	0.0	0.0	0.2	0.3	0.0	0.6	0.5
Y4	0.6	0.0	0.0	0.0	0.2	0.4	0.0	0.6	0.5
Y5	0.6	0.0	0.0	0.0	0.2	0.4	0.0	0.6	0.5
Y6	0.6	9.2	2.5	0.0	0.2	10.3	0.0	12.2	10.5
Y7	0.6	7.2	8.7	172.9	2.5	183.8	0.0	189.4	186.3
Y8	0.6	0.8	1.8	288.3	2.5	288.4	0.0	291.5	290.9
Y9	0.6	4.5	2.5	48.5	2.5	53.1	0.0	56.1	55.6
Y10	0.6	0.5	0.7	0.0	0.2	1.5	0.0	1.8	1.7

Volume Results

Year	50th	75th	99th
Y1	0.6	0.6	0.8
Y2	1.1	1.1	1.2
Y3	1.1	1.1	1.2
Y4	1.1	1.1	1.2
Y5	1.1	1.1	1.2
Y6	1.1	1.1	6.3
Y7	1.6	1.6	11.4
Y8	1.9	1.9	4.8
Y9	1.9	1.9	4.3
Y10	1.3	1.3	1.8



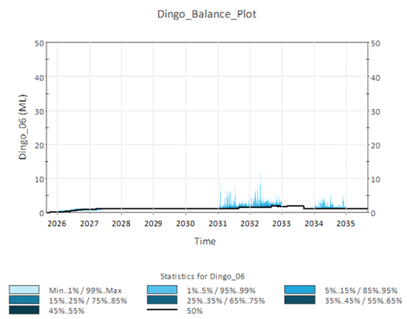
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.9	0.0
Y2	0.9	0.0	0.0	0.0	0.1	0.4	0.0	0.9	0.5
Y3	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8
Y4	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8
Y5	0.9	0.0	0.0	0.0	0.2	0.6	0.0	0.9	0.8
Y6	0.9	19.6	4.2	0.0	0.2	20.1	0.0	24.7	20.3
Y7	0.9	17.1	17.7	172.9	2.5	199.3	0.0	208.6	201.8
Y8	0.9	2.8	5.8	288.3	2.5	293.4	0.0	297.8	295.9
Y9	0.9	9.6	4.2	48.5	2.5	59.0	0.0	63.2	61.5
Y10	0.9	1.7	2.5	0.0	0.2	4.2	0.0	5.1	4.4

Volume Results

Year	50th	75th	99th
Y1	0.8	0.9	1.1
Y2	1.1	1.1	1.2
Y3	1.1	1.1	1.3
Y4	1.1	1.1	1.3
Y5	1.1	1.1	1.2
Y6	1.1	1.3	12.8
Y7	1.6	2.0	23.7
Y8	1.9	2.0	8.2
Y9	1.9	1.9	7.7
Y10	1.3	1.3	3.8



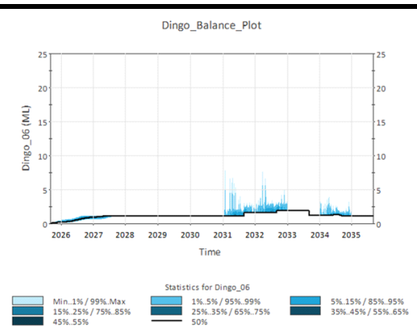
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]				Outflows [ML/yr]			WB Totals	
	DP	CR	PWR	GW	PE	T_P	OV	Total in	Total Ou
Y1	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0
Y2	0.8	0.0	0.0	0.0	0.1	0.3	0.0	0.8	0.3
Y3	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y4	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y5	0.8	0.0	0.0	0.0	0.2	0.5	0.0	0.8	0.7
Y6	0.8	14.5	3.2	0.0	0.2	15.2	0.0	18.5	15.4
Y7	0.8	13.5	13.7	172.9	2.5	193.0	0.0	200.9	195.5
Y8	0.8	2.6	5.4	288.3	2.5	292.8	0.0	297.0	295.3
Y9	0.8	7.0	3.2	48.5	2.5	55.9	0.0	59.5	58.4
Y10	0.8	1.7	2.4	0.0	0.2	3.9	0.0	4.8	4.1

Volume Results

Year	50th	75th	99th
Y1	0.7	0.8	1.1
Y2	1.1	1.1	1.2
Y3	1.1	1.1	1.3
Y4	1.1	1.1	1.3
Y5	1.1	1.1	1.2
Y6	1.1	1.1	12.0
Y7	1.6	1.6	14.0
Y8	1.9	2.0	7.3
Y9	1.9	1.9	5.4
Y10	1.3	1.3	3.5



DP (Direct precipitation), CR (Catchment Runoff), PWR (Pit Wall Runoff), GW (Groundwater inflow), PE (Evaporation), T_P (Transfer to Plant), OV (Overtopping),

Appendix C

Water balance – Sediment ponds

Sediment Ponds - Main SRP POND 1

Baseline Climate

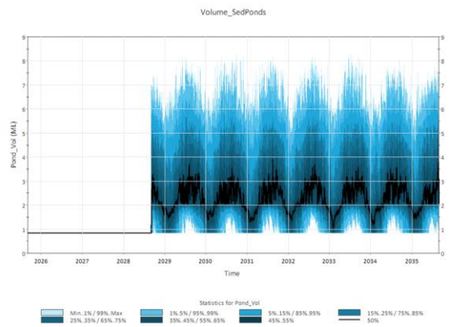
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	1.8	31.0	108.4	3.7	92.5	13.0	0.0	141.2	109.2
Y5	1.8	30.8	107.9	3.7	93.4	13.3	0.0	140.6	110.4
Y6	1.9	31.7	110.8	3.6	93.7	13.1	0.0	144.3	110.4
Y7	1.8	31.2	109.1	3.8	91.0	13.3	0.0	142.1	108.1
Y8	1.8	30.7	107.3	3.7	90.8	13.2	0.0	139.8	107.6
Y9	1.8	30.6	107.2	3.7	89.3	13.2	0.0	139.7	106.1
Y10	1.8	31.0	108.5	3.7	92.3	13.3	0.0	141.3	109.3

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.8	0.8	0.8
Y2	0.8	0.8	0.8
Y3	0.8	0.8	0.8
Y4	3.7	5.1	8.3
Y5	3.5	5.2	8.0
Y6	3.9	5.1	8.0
Y7	3.7	5.3	8.1
Y8	3.4	5.0	8.2
Y9	3.6	5.1	8.0
Y10	3.8	5.3	7.8

Probabilistic Volume result [ML]



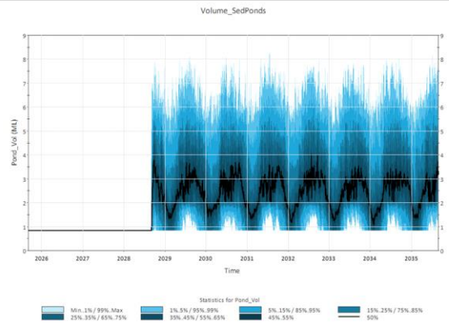
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	1.2	21.3	74.4	3.8	63.7	13.1	0.0	97.0	80.5
Y5	1.2	21.1	74.0	3.8	66.3	13.3	0.0	96.3	83.4
Y6	1.3	21.7	75.9	3.8	65.7	13.2	0.0	98.9	82.7
Y7	1.2	21.2	74.1	3.8	63.9	13.4	0.0	96.5	81.1
Y8	1.2	20.9	73.0	3.8	62.5	13.2	0.0	95.1	79.5
Y9	1.2	21.0	73.4	3.7	63.5	13.1	0.0	95.6	80.3
Y10	1.2	21.1	74.0	3.8	64.5	13.4	0.0	96.4	81.7

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.8	0.8	0.8
Y2	0.8	0.8	0.8
Y3	0.8	0.8	0.8
Y4	3.8	5.3	8.2
Y5	3.6	5.2	8.0
Y6	3.7	5.5	8.2
Y7	4.0	5.4	8.0
Y8	4.0	5.4	8.2
Y9	3.5	5.2	8.2
Y10	3.7	5.2	8.0



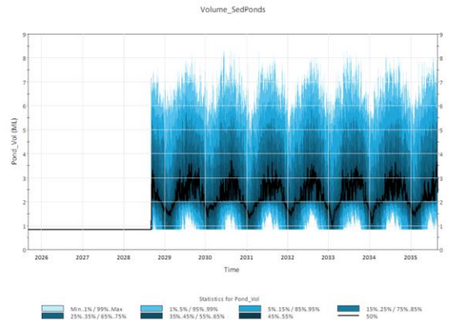
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	1.9	32.5	113.8	3.7	96.2	12.9	0.0	148.2	112.8
Y5	1.9	32.3	113.0	3.8	95.9	13.3	0.0	147.2	113.0
Y6	1.9	33.3	116.5	3.7	97.7	13.1	0.0	151.7	114.4
Y7	1.9	32.8	114.8	3.9	93.9	13.3	0.0	149.5	111.2
Y8	1.9	32.2	112.8	3.7	93.8	13.1	0.0	146.9	110.7
Y9	1.9	32.1	112.5	3.8	93.6	13.2	0.0	146.5	110.5
Y10	1.9	32.5	113.9	3.8	96.2	13.2	0.0	148.3	113.2

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.8	0.8	0.8
Y2	0.8	0.8	0.8
Y3	0.8	0.8	0.8
Y4	3.6	5.3	8.2
Y5	3.7	5.1	8.3
Y6	3.7	5.2	8.2
Y7	3.6	5.4	8.1
Y8	3.4	5.1	8.3
Y9	3.7	5.1	8.2
Y10	3.7	5.1	8.3



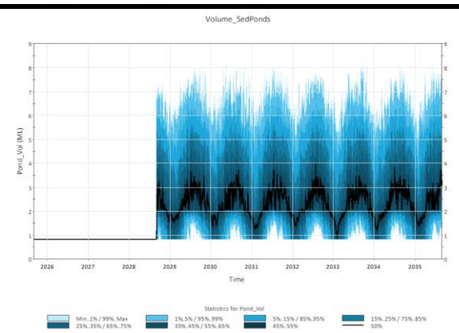
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	1.7	28.4	99.4	3.8	85.0	13.1	0.0	129.5	101.8
Y5	1.7	28.3	99.1	3.9	87.0	13.3	0.0	129.1	104.2
Y6	1.7	29.0	101.6	3.7	86.9	13.0	0.0	132.4	103.6
Y7	1.7	28.7	100.6	3.9	83.9	13.4	0.0	131.0	101.1
Y8	1.7	28.2	98.9	3.7	82.0	13.1	0.0	128.8	98.8
Y9	1.6	28.1	98.5	3.8	81.4	13.2	0.0	128.3	98.4
Y10	1.7	28.5	99.8	3.8	86.3	13.3	0.0	130.0	103.4

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.8	0.8	0.8
Y2	0.8	0.8	0.8
Y3	0.8	0.8	0.8
Y4	3.7	5.3	8.1
Y5	3.5	5.1	8.0
Y6	3.7	5.4	8.0
Y7	4.0	5.4	8.3
Y8	3.5	5.1	8.1
Y9	3.8	5.2	8.2
Y10	3.7	5.3	8.2



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Sediment Ponds - Main SRP POND 2

Baseline Climate

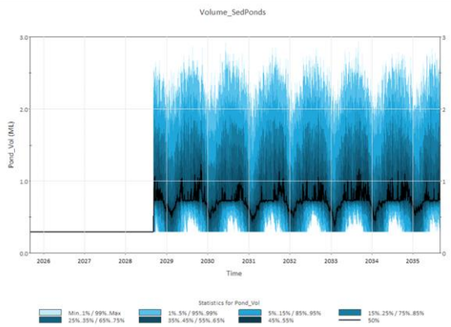
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.7	11.6	40.6	1.3	36.6	4.5	0.0	52.8	42.4
Y5	0.7	11.5	40.4	1.3	36.6	4.6	0.0	52.6	42.5
Y6	0.7	11.8	41.4	1.3	37.4	4.5	0.0	54.0	43.1
Y7	0.7	11.7	40.8	1.3	36.2	4.6	0.0	53.2	42.1
Y8	0.7	11.5	40.1	1.3	36.1	4.6	0.0	52.3	41.9
Y9	0.7	11.5	40.1	1.3	36.0	4.6	0.0	52.3	41.9
Y10	0.7	11.6	40.6	1.3	36.8	4.6	0.0	52.9	42.8

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	1.1	1.8	2.9
Y5	1.2	1.7	2.9
Y6	1.0	1.8	2.9
Y7	1.1	1.7	2.8
Y8	1.1	1.7	2.9
Y9	1.2	1.7	2.9
Y10	1.1	1.7	2.8

Probabilistic Volume result [ML]



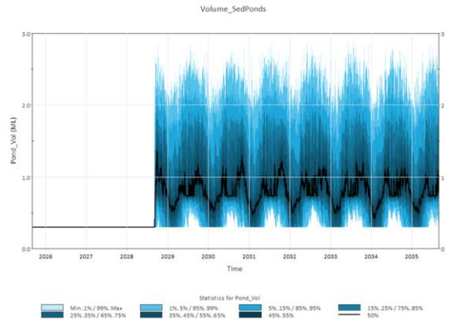
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.5	8.0	27.8	1.3	25.4	4.6	0.0	36.3	31.3
Y5	0.5	7.9	27.7	1.3	26.2	4.6	0.0	36.1	32.1
Y6	0.5	8.1	28.4	1.3	25.8	4.6	0.0	37.0	31.7
Y7	0.5	7.9	27.7	1.4	24.8	4.7	0.0	36.1	30.8
Y8	0.5	7.8	27.3	1.3	24.8	4.6	0.0	35.6	30.8
Y9	0.5	7.8	27.5	1.3	25.2	4.6	0.0	35.8	31.1
Y10	0.5	7.9	27.7	1.3	25.4	4.6	0.0	36.1	31.4

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	1.4	1.8	2.9
Y5	1.2	1.8	2.8
Y6	1.3	1.7	2.9
Y7	1.2	1.8	2.9
Y8	1.2	1.9	2.8
Y9	1.2	1.7	2.8
Y10	1.1	1.7	2.8



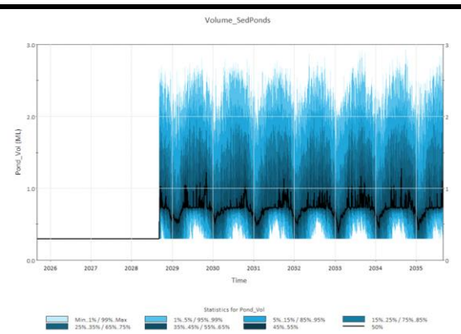
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.7	12.2	42.6	1.3	38.5	4.5	0.0	55.5	44.3
Y5	0.7	12.1	42.3	1.3	38.2	4.6	0.0	55.1	44.2
Y6	0.8	12.4	43.6	1.3	38.6	4.6	0.0	56.8	44.5
Y7	0.7	12.3	42.9	1.3	37.5	4.6	0.0	56.0	43.4
Y8	0.7	12.1	42.2	1.3	37.3	4.6	0.0	55.0	43.2
Y9	0.7	12.0	42.1	1.3	37.4	4.6	0.0	54.8	43.4
Y10	0.7	12.2	42.6	1.3	38.4	4.6	0.0	55.5	44.3

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	1.1	1.8	2.9
Y5	1.2	1.8	2.9
Y6	1.0	1.7	2.8
Y7	1.1	1.7	2.9
Y8	1.2	1.8	2.9
Y9	1.3	1.7	2.9
Y10	1.1	1.7	2.8



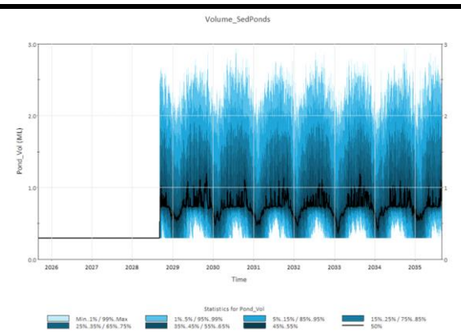
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.6	10.6	37.2	1.3	33.7	4.5	0.0	48.5	39.5
Y5	0.6	10.6	37.1	1.3	34.2	4.6	0.0	48.3	40.2
Y6	0.7	10.9	38.0	1.3	34.0	4.5	0.0	49.5	39.9
Y7	0.7	10.8	37.6	1.3	33.6	4.6	0.0	49.0	39.5
Y8	0.6	10.6	37.0	1.3	32.8	4.6	0.0	48.2	38.6
Y9	0.6	10.5	36.8	1.3	32.3	4.6	0.0	48.0	38.2
Y10	0.7	10.7	37.3	1.3	33.9	4.6	0.0	48.7	39.9

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	1.1	1.8	2.9
Y5	1.2	1.8	2.9
Y6	1.1	1.8	3.0
Y7	1.1	1.7	2.9
Y8	1.2	1.9	2.9
Y9	1.1	1.7	2.8
Y10	1.1	1.8	2.8



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Sediment Ponds - Main SRP POND 3

Baseline Climate

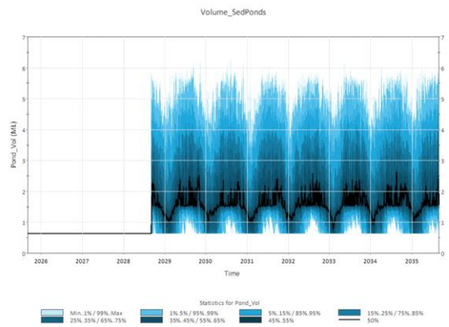
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	1.4	26.1	91.2	2.7	84.0	9.6	0.0	118.6	96.3
Y5	1.4	25.9	90.8	2.8	83.3	9.9	0.0	118.1	96.0
Y6	1.4	26.6	93.2	2.7	83.9	9.7	0.0	121.2	96.3
Y7	1.4	26.2	91.8	2.8	81.9	9.9	0.0	119.4	94.6
Y8	1.4	25.8	90.3	2.7	80.6	9.8	0.0	117.4	93.1
Y9	1.4	25.8	90.2	2.8	80.7	9.9	0.0	117.3	93.4
Y10	1.4	26.1	91.2	2.8	83.8	9.9	0.0	118.7	96.5

Volume Results

Year	50th	75th	99th
Y1	0.6	0.6	0.6
Y2	0.6	0.6	0.6
Y3	0.6	0.6	0.6
Y4	2.5	3.9	6.1
Y5	2.5	3.8	6.1
Y6	2.3	3.7	6.0
Y7	2.6	3.7	5.9
Y8	2.4	3.9	6.0
Y9	2.6	3.8	6.0
Y10	2.4	3.9	6.2

Probabilistic Volume result [ML]



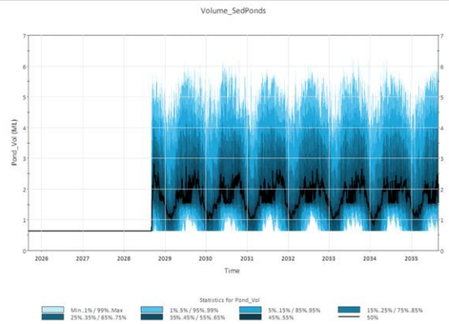
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	1.0	17.9	62.6	2.8	58.4	9.7	0.0	81.5	70.9
Y5	0.9	17.8	62.2	2.8	60.1	9.9	0.0	80.9	72.8
Y6	1.0	18.2	63.9	2.8	59.0	9.8	0.0	83.1	71.6
Y7	0.9	17.8	62.3	2.9	57.5	10.0	0.0	81.1	70.3
Y8	0.9	17.5	61.4	2.8	56.9	9.9	0.0	79.9	69.5
Y9	0.9	17.6	61.7	2.8	58.1	9.8	0.0	80.3	70.6
Y10	0.9	17.8	62.2	2.9	58.5	9.9	0.0	81.0	71.3

Volume Results

Year	50th	75th	99th
Y1	0.6	0.6	0.6
Y2	0.6	0.6	0.6
Y3	0.6	0.6	0.6
Y4	2.8	3.9	6.0
Y5	2.6	3.8	6.1
Y6	2.6	3.7	6.0
Y7	2.6	3.8	6.2
Y8	2.7	3.9	6.0
Y9	2.7	3.7	6.1
Y10	2.5	3.7	6.0



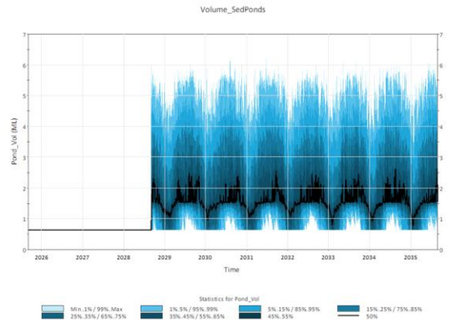
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	1.5	27.3	95.7	2.8	87.0	9.6	0.0	124.5	99.4
Y5	1.4	27.2	95.0	2.8	86.5	9.9	0.0	123.6	99.2
Y6	1.5	28.0	98.0	2.8	87.7	9.8	0.0	127.5	100.3
Y7	1.5	27.6	96.6	2.9	84.6	9.9	0.0	125.6	97.4
Y8	1.4	27.1	94.9	2.8	84.3	9.8	0.0	123.4	96.9
Y9	1.4	27.0	94.6	2.8	84.9	9.8	0.0	123.1	97.5
Y10	1.5	27.4	95.8	2.8	86.9	9.8	0.0	124.6	99.5

Volume Results

Year	50th	75th	99th
Y1	0.6	0.6	0.6
Y2	0.6	0.6	0.6
Y3	0.6	0.6	0.6
Y4	2.5	3.9	6.1
Y5	2.4	3.9	6.2
Y6	2.4	3.8	6.2
Y7	2.5	3.7	6.0
Y8	2.4	3.7	6.1
Y9	2.6	3.7	5.9
Y10	2.6	3.7	6.1



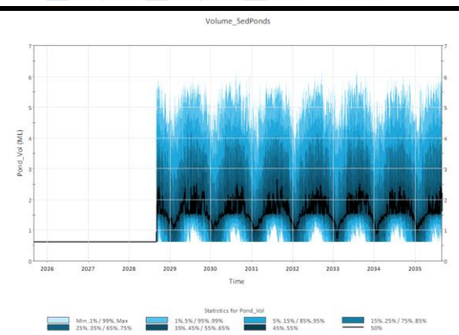
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	1.3	23.9	83.6	2.8	76.8	9.7	0.0	108.8	89.3
Y5	1.3	23.8	83.4	2.8	78.2	9.8	0.0	108.5	90.9
Y6	1.3	24.4	85.5	2.8	78.1	9.7	0.0	111.2	90.6
Y7	1.3	24.2	84.6	2.9	76.2	9.9	0.0	110.1	89.0
Y8	1.3	23.8	83.2	2.8	74.6	9.8	0.0	108.2	87.2
Y9	1.3	23.7	82.9	2.8	73.8	9.8	0.0	107.8	86.4
Y10	1.3	24.0	84.0	2.8	78.0	9.8	0.0	109.2	90.7

Volume Results

Year	50th	75th	99th
Y1	0.6	0.6	0.6
Y2	0.6	0.6	0.6
Y3	0.6	0.6	0.6
Y4	2.5	3.9	6.0
Y5	2.5	3.8	6.1
Y6	2.7	3.9	6.0
Y7	2.5	3.9	6.2
Y8	2.5	3.7	6.1
Y9	2.4	3.6	5.9
Y10	2.4	3.9	6.1



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Sediment Ponds - Main SRP POND 4

Baseline Climate

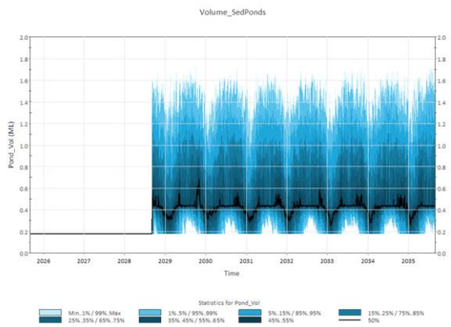
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.5	7.3	25.5	0.7	24.5	2.6	0.0	33.2	27.8
Y5	0.5	7.2	25.4	0.8	24.2	2.7	0.0	33.1	27.7
Y6	0.5	7.4	26.0	0.7	24.5	2.7	0.0	33.9	27.9
Y7	0.5	7.3	25.6	0.8	23.8	2.7	0.0	33.4	27.3
Y8	0.4	7.2	25.2	0.8	23.7	2.7	0.0	32.9	27.1
Y9	0.4	7.2	25.2	0.8	23.7	2.7	0.0	32.8	27.2
Y10	0.5	7.3	25.5	0.8	24.1	2.7	0.0	33.2	27.6

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.2	0.2	0.2
Y2	0.2	0.2	0.2
Y3	0.2	0.2	0.2
Y4	0.6	1.1	1.8
Y5	0.7	1.0	1.7
Y6	0.6	1.0	1.7
Y7	0.6	1.0	1.7
Y8	0.6	1.0	1.7
Y9	0.6	1.0	1.7
Y10	0.5	1.0	1.7

Probabilistic Volume result [ML]



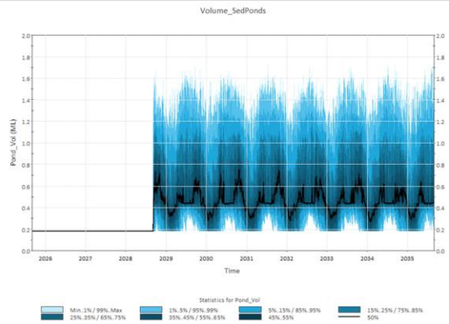
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.3	5.0	17.5	0.8	16.8	2.7	0.0	22.8	20.3
Y5	0.3	5.0	17.4	0.8	17.1	2.7	0.0	22.7	20.6
Y6	0.3	5.1	17.8	0.8	16.8	2.7	0.0	23.3	20.3
Y7	0.3	5.0	17.4	0.8	16.5	2.7	0.0	22.7	20.1
Y8	0.3	4.9	17.2	0.8	16.3	2.7	0.0	22.4	19.8
Y9	0.3	4.9	17.3	0.8	16.7	2.7	0.0	22.5	20.2
Y10	0.3	5.0	17.4	0.8	16.8	2.7	0.0	22.7	20.3

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.2	0.2	0.2
Y2	0.2	0.2	0.2
Y3	0.2	0.2	0.2
Y4	0.7	1.0	1.7
Y5	0.7	1.0	1.7
Y6	0.8	1.0	1.7
Y7	0.7	1.0	1.7
Y8	0.7	1.0	1.7
Y9	0.7	1.1	1.7
Y10	0.6	1.0	1.7



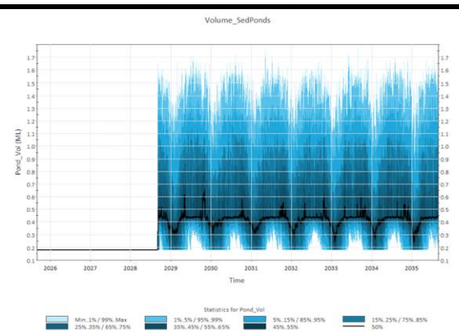
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.5	7.6	26.7	0.8	25.3	2.6	0.0	34.9	28.7
Y5	0.5	7.6	26.6	0.8	24.9	2.7	0.0	34.6	28.4
Y6	0.5	7.8	27.4	0.8	25.4	2.7	0.0	35.7	28.9
Y7	0.5	7.7	27.0	0.8	24.8	2.7	0.0	35.2	28.3
Y8	0.5	7.6	26.5	0.8	24.6	2.7	0.0	34.6	28.0
Y9	0.5	7.6	26.4	0.8	24.5	2.7	0.0	34.5	28.0
Y10	0.5	7.6	26.8	0.8	25.4	2.7	0.0	34.9	28.8

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.2	0.2	0.2
Y2	0.2	0.2	0.2
Y3	0.2	0.2	0.2
Y4	0.6	1.0	1.7
Y5	0.6	1.0	1.7
Y6	0.6	1.0	1.7
Y7	0.6	0.9	1.7
Y8	0.6	1.0	1.7
Y9	0.6	1.0	1.8
Y10	0.5	1.0	1.7



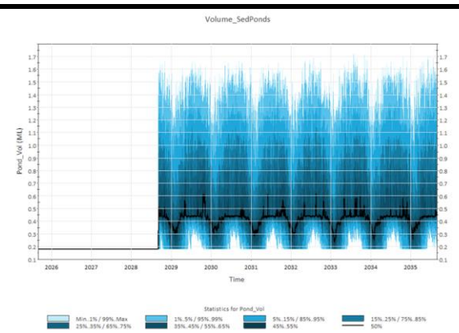
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.4	6.7	23.4	0.8	22.1	2.7	0.0	30.5	25.5
Y5	0.4	6.7	23.3	0.8	22.4	2.7	0.0	30.4	25.8
Y6	0.4	6.8	23.9	0.8	22.3	2.7	0.0	31.1	25.7
Y7	0.4	6.8	23.6	0.8	22.1	2.7	0.0	30.8	25.6
Y8	0.4	6.6	23.2	0.8	21.5	2.7	0.0	30.3	25.0
Y9	0.4	6.6	23.2	0.8	21.4	2.7	0.0	30.2	24.9
Y10	0.4	6.7	23.5	0.8	22.3	2.7	0.0	30.6	25.8

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.2	0.2	0.2
Y2	0.2	0.2	0.2
Y3	0.2	0.2	0.2
Y4	0.6	1.0	1.7
Y5	0.6	1.0	1.7
Y6	0.6	1.0	1.7
Y7	0.6	1.0	1.7
Y8	0.6	1.0	1.7
Y9	0.6	1.0	1.7
Y10	0.6	1.0	1.7



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Sediment Ponds - Main SRP POND 5

Baseline Climate

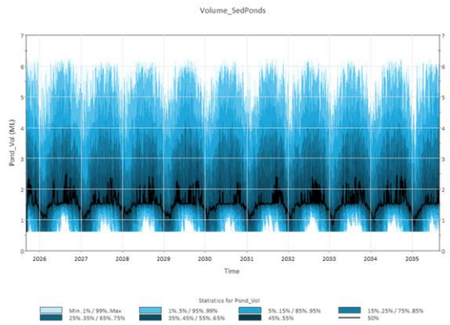
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	1.4	29.6	103.5	2.7	98.7	9.7	0.0	134.5	111.2
Y2	1.4	28.9	101.2	2.7	99.3	9.8	0.0	131.5	111.8
Y3	1.4	30.6	107.2	2.8	103.9	10.0	0.0	139.2	116.7
Y4	1.4	29.4	102.7	2.8	100.4	9.8	0.0	133.5	112.9
Y5	1.4	29.2	102.3	2.8	98.1	9.9	0.0	132.9	110.9
Y6	1.4	30.0	105.0	2.7	99.5	9.8	0.0	136.4	112.0
Y7	1.4	29.5	103.4	2.8	97.3	9.9	0.0	134.4	110.0
Y8	1.4	29.1	101.7	2.7	97.2	9.8	0.0	132.1	109.8
Y9	1.4	29.0	101.6	2.7	96.2	9.9	0.0	132.0	108.8
Y10	1.4	29.4	102.8	2.7	97.5	9.8	0.0	133.6	110.0

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.5	3.9	6.2
Y2	2.4	3.8	6.2
Y3	2.4	3.7	6.2
Y4	2.4	3.9	6.2
Y5	2.3	3.7	6.2
Y6	2.2	3.6	6.2
Y7	2.4	3.7	6.3
Y8	2.4	3.8	6.2
Y9	2.5	3.7	6.2
Y10	2.4	3.7	6.2

Probabilistic Volume result [ML]

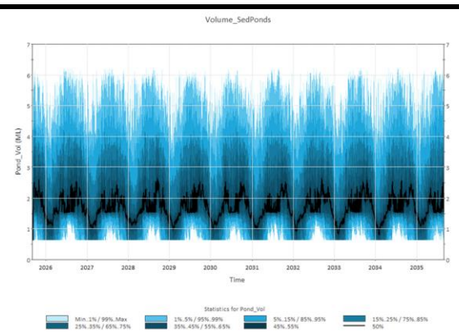


Climate change - Drier Climate

WATER BALANCE

Year	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	1.0	20.3	70.9	2.8	68.6	9.8	0.0	92.2	81.2
Y2	0.9	19.8	69.4	2.8	69.7	9.8	0.0	90.2	82.4
Y3	1.0	20.8	72.8	2.8	73.6	9.9	0.0	94.5	86.3
Y4	1.0	20.2	70.6	2.8	70.7	9.8	0.0	91.7	83.4
Y5	0.9	20.0	70.1	2.9	71.0	9.9	0.0	91.1	83.8
Y6	1.0	20.6	72.0	2.8	70.2	9.8	0.0	93.5	82.9
Y7	0.9	20.1	70.2	2.9	68.6	9.9	0.0	91.3	81.3
Y8	0.9	19.8	69.2	2.8	68.8	9.8	0.0	89.9	81.4
Y9	0.9	19.9	69.6	2.8	69.7	9.8	0.0	90.4	82.3
Y10	0.9	20.0	70.1	2.9	69.4	10.0	0.0	91.1	82.2

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.6	4.0	6.2
Y2	2.5	3.7	6.2
Y3	2.6	3.8	6.2
Y4	2.6	4.0	6.2
Y5	2.5	4.0	6.3
Y6	2.5	3.8	6.2
Y7	2.5	3.8	6.2
Y8	2.7	3.7	6.2
Y9	2.6	3.9	6.2
Y10	2.5	3.7	6.2

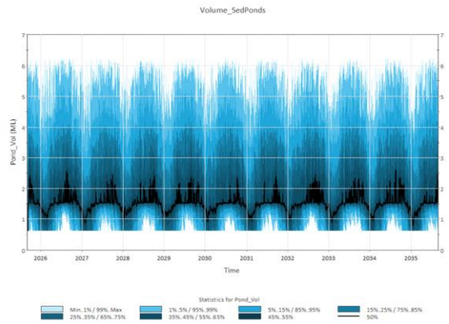


Climate change - Wetter Climate

WATER BALANCE

Year	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	1.5	31.0	108.6	2.8	102.2	9.8	0.0	141.1	114.7
Y2	1.4	30.3	106.1	2.8	102.8	9.7	0.0	137.8	115.3
Y3	1.5	32.2	112.8	2.9	108.1	10.0	0.0	146.5	121.0
Y4	1.5	30.8	107.8	2.8	104.9	9.8	0.0	140.1	117.5
Y5	1.4	30.6	107.1	2.8	101.6	9.8	0.0	139.1	114.2
Y6	1.5	31.5	110.4	2.8	104.0	9.7	0.0	143.4	116.5
Y7	1.5	31.1	108.8	2.9	100.5	9.9	0.0	141.3	113.3
Y8	1.4	30.6	106.9	2.8	100.3	9.9	0.0	138.9	112.9
Y9	1.4	30.5	106.6	2.8	101.3	9.8	0.0	138.5	113.9
Y10	1.5	30.8	107.9	2.8	101.2	9.8	0.0	140.2	113.7

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.6	3.9	6.2
Y2	2.2	3.9	6.2
Y3	2.5	3.9	6.2
Y4	2.4	3.9	6.2
Y5	2.3	3.6	6.3
Y6	2.4	3.8	6.2
Y7	2.4	3.8	6.2
Y8	2.5	3.9	6.2
Y9	2.6	3.7	6.2
Y10	2.5	3.6	6.3

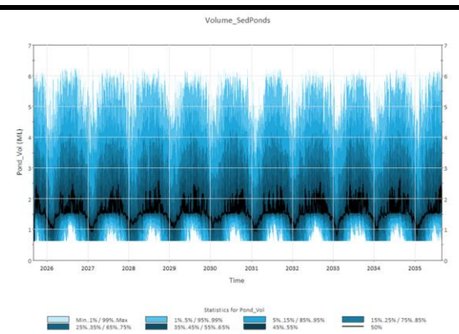


Climate change - Max Con

WATER BALANCE

Year	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	1.3	27.2	95.1	2.8	91.2	9.8	0.0	123.5	103.7
Y2	1.3	26.6	92.9	2.8	92.0	9.7	0.0	120.7	104.5
Y3	1.3	28.2	98.8	2.9	97.7	10.0	0.0	128.3	110.5
Y4	1.3	26.9	94.2	2.8	92.5	9.8	0.0	122.4	105.1
Y5	1.3	26.8	94.0	2.8	91.1	9.9	0.0	122.1	103.8
Y6	1.3	27.5	96.3	2.8	91.9	9.8	0.0	125.2	104.5
Y7	1.3	27.2	95.3	2.9	89.9	9.9	0.0	123.9	102.7
Y8	1.3	26.8	93.7	2.8	89.2	9.8	0.0	121.7	101.8
Y9	1.3	26.7	93.4	2.8	89.2	9.9	0.0	121.3	101.9
Y10	1.3	27.0	94.6	2.8	90.7	9.8	0.0	122.9	103.3

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.5	3.6	6.2
Y2	2.4	3.9	6.2
Y3	2.5	3.9	6.2
Y4	2.6	4.0	6.2
Y5	2.4	3.9	6.2
Y6	2.5	3.8	6.2
Y7	2.4	3.8	6.2
Y8	2.5	3.8	6.2
Y9	2.7	3.7	6.2
Y10	2.5	3.8	6.2



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Sediment Ponds - Main SRP POND 6

Baseline Climate

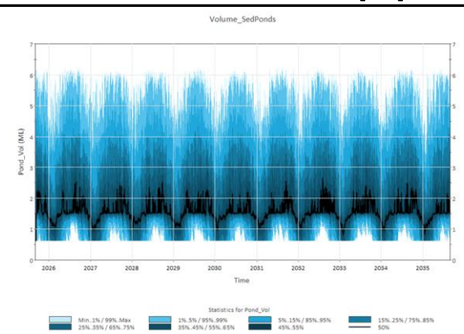
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	1.4	29.3	102.4	2.7	96.8	9.8	0.0	133.1	109.4
Y2	1.4	28.6	100.1	2.7	97.4	9.8	0.0	130.1	109.9
Y3	1.4	30.3	106.0	2.8	101.7	10.0	0.0	137.7	114.5
Y4	1.4	29.0	101.6	2.8	98.5	9.8	0.0	132.1	111.0
Y5	1.4	28.9	101.2	2.8	96.6	9.9	0.0	131.5	109.3
Y6	1.4	29.7	103.9	2.7	97.3	9.8	0.0	135.0	109.8
Y7	1.4	29.2	102.3	2.8	95.4	9.9	0.0	132.9	108.1
Y8	1.4	28.7	100.6	2.7	95.1	9.8	0.0	130.7	107.7
Y9	1.4	28.7	100.5	2.8	94.4	9.9	0.0	130.6	107.1
Y10	1.4	29.1	101.7	2.7	96.5	9.8	0.0	132.1	109.0

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.5	3.8	6.2
Y2	2.4	3.8	6.2
Y3	2.4	3.6	6.2
Y4	2.5	4.1	6.2
Y5	2.3	3.8	6.1
Y6	2.2	3.8	6.2
Y7	2.7	3.7	6.2
Y8	2.4	3.8	6.2
Y9	2.5	3.7	6.2
Y10	2.3	3.7	6.2

Probabilistic Volume result [ML]



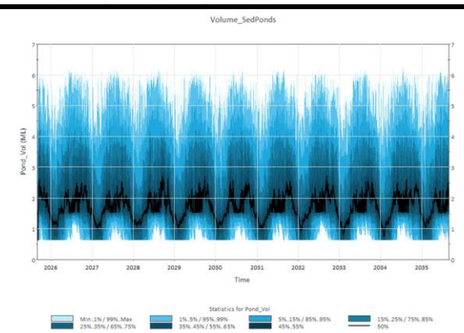
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	1.0	20.1	70.2	2.8	67.8	9.8	0.0	91.2	80.5
Y2	0.9	19.6	68.7	2.8	68.4	9.8	0.0	89.3	81.0
Y3	1.0	20.6	72.0	2.8	72.3	9.9	0.0	93.5	85.1
Y4	1.0	19.9	69.8	2.8	69.8	9.8	0.0	90.7	82.5
Y5	0.9	19.8	69.4	2.8	69.8	9.9	0.0	90.1	82.5
Y6	1.0	20.3	71.2	2.8	69.4	9.8	0.0	92.5	82.0
Y7	0.9	19.9	69.5	2.9	67.3	9.9	0.0	90.3	80.1
Y8	0.9	19.6	68.4	2.8	67.7	9.8	0.0	88.9	80.3
Y9	0.9	19.7	68.8	2.8	68.3	9.8	0.0	89.4	80.9
Y10	0.9	19.8	69.4	2.9	68.3	10.0	0.0	90.2	81.1

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.6	3.9	6.2
Y2	2.5	3.7	6.1
Y3	2.5	3.9	6.2
Y4	2.7	4.0	6.2
Y5	2.7	3.9	6.2
Y6	2.5	3.9	6.2
Y7	2.5	3.8	6.2
Y8	2.7	3.8	6.2
Y9	2.6	4.0	6.2
Y10	2.5	3.9	6.2



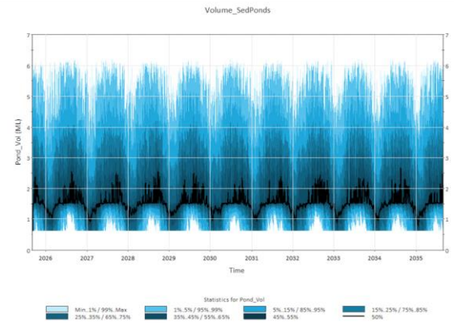
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	1.5	30.7	107.5	2.8	99.9	9.8	0.0	139.6	112.5
Y2	1.4	30.0	104.9	2.8	101.1	9.7	0.0	136.3	113.7
Y3	1.5	31.9	111.6	2.9	105.8	10.0	0.0	145.0	118.6
Y4	1.5	30.5	106.7	2.8	102.7	9.8	0.0	138.6	115.4
Y5	1.4	30.3	105.9	2.8	99.9	9.8	0.0	137.7	112.6
Y6	1.5	31.2	109.2	2.8	101.9	9.8	0.0	141.9	114.4
Y7	1.5	30.7	107.6	2.9	98.3	9.9	0.0	139.8	111.0
Y8	1.4	30.2	105.8	2.8	98.3	9.9	0.0	137.4	110.9
Y9	1.4	30.1	105.5	2.8	99.4	9.8	0.0	137.0	112.1
Y10	1.5	30.5	106.8	2.8	99.6	9.8	0.0	138.7	112.1

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.6	3.9	6.2
Y2	2.3	4.0	6.2
Y3	2.5	3.9	6.2
Y4	2.5	4.0	6.2
Y5	2.2	3.7	6.2
Y6	2.4	3.8	6.2
Y7	2.4	3.8	6.2
Y8	2.5	3.8	6.2
Y9	2.7	3.7	6.2
Y10	2.5	3.6	6.2



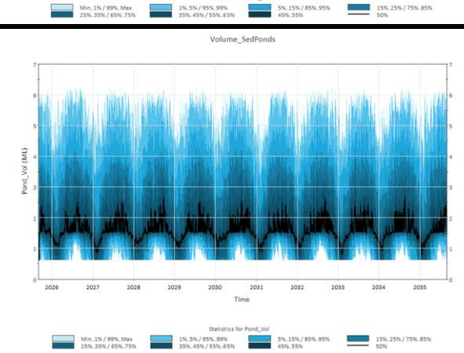
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	1.3	26.9	94.1	2.8	89.3	9.8	0.0	122.2	101.9
Y2	1.3	26.3	91.9	2.8	90.2	9.7	0.0	119.5	102.7
Y3	1.3	27.9	97.7	2.9	95.5	10.0	0.0	126.9	108.3
Y4	1.3	26.6	93.2	2.8	90.9	9.8	0.0	121.1	103.5
Y5	1.3	26.6	92.9	2.9	90.0	9.9	0.0	120.8	102.8
Y6	1.3	27.2	95.3	2.8	90.2	9.8	0.0	123.8	102.7
Y7	1.3	26.9	94.3	2.9	88.4	9.9	0.0	122.5	101.2
Y8	1.3	26.5	92.7	2.8	87.8	9.8	0.0	120.4	100.4
Y9	1.3	26.4	92.4	2.8	87.3	9.9	0.0	120.0	100.0
Y10	1.3	26.7	93.6	2.8	88.9	9.8	0.0	121.6	101.5

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.5	3.7	6.2
Y2	2.4	3.9	6.2
Y3	2.5	3.9	6.2
Y4	2.7	4.0	6.2
Y5	2.6	4.2	6.2
Y6	2.5	3.8	6.2
Y7	2.4	3.8	6.2
Y8	2.7	3.8	6.2
Y9	2.7	3.8	6.2
Y10	2.4	3.9	6.2



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Sediment Ponds - Main SRP POND 7

Baseline Climate

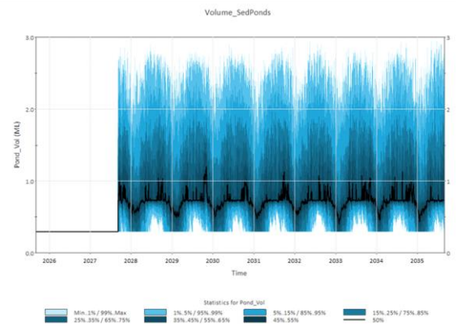
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.7	13.3	46.6	1.3	0.0	0.0	0.0	60.6	1.3
Y4	0.7	12.8	44.6	1.3	0.0	0.0	0.0	58.1	1.3
Y5	0.7	12.7	44.4	1.3	0.0	0.0	0.0	57.8	1.3
Y6	0.7	13.0	45.6	1.3	0.0	0.0	0.0	59.4	1.3
Y7	0.7	12.8	44.9	1.3	24.8	2.7	0.0	58.5	28.8
Y8	0.7	12.6	44.2	1.3	25.1	2.7	0.0	57.5	29.1
Y9	0.7	12.6	44.2	1.3	25.1	2.7	0.0	57.5	29.1
Y10	0.7	12.8	44.7	1.3	25.5	2.7	0.0	58.1	29.5

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	0.3	0.3	0.3
Y2	Y2	0.3	0.3	0.3
Y3	Y3	1.0	1.7	2.9
Y4	Y4	1.0	1.9	2.9
Y5	Y5	1.2	1.7	2.9
Y6	Y6	1.0	1.7	2.9
Y7	Y7	1.1	1.7	2.9
Y8	Y8	1.1	1.7	2.9
Y9	Y9	1.1	1.8	3.0
Y10	Y10	1.0	1.6	3.0

Probabilistic Volume result [ML]



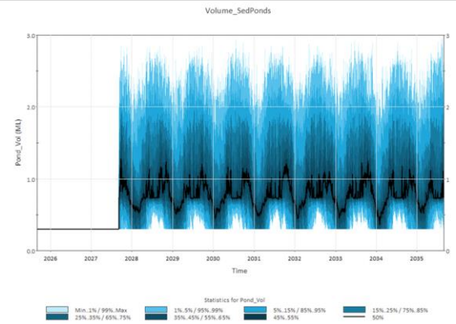
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.5	9.0	31.6	1.3	0.0	0.0	0.0	41.2	1.3
Y4	0.5	8.8	30.7	1.3	0.0	0.0	0.0	39.9	1.3
Y5	0.5	8.7	30.5	1.3	0.0	0.0	0.0	39.7	1.3
Y6	0.5	8.9	31.3	1.3	0.0	0.0	0.0	40.7	1.3
Y7	0.5	8.7	30.5	1.3	17.0	2.7	0.0	39.7	21.0
Y8	0.5	8.6	30.1	1.3	17.2	2.7	0.0	39.1	21.2
Y9	0.5	8.6	30.2	1.3	17.6	2.7	0.0	39.3	21.6
Y10	0.5	8.7	30.5	1.3	17.6	2.7	0.0	39.7	21.7

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	0.3	0.3	0.3
Y2	Y2	0.3	0.3	0.3
Y3	Y3	1.3	1.8	2.9
Y4	Y4	1.2	1.8	2.9
Y5	Y5	1.2	1.8	2.9
Y6	Y6	1.2	1.8	2.8
Y7	Y7	1.2	1.8	2.9
Y8	Y8	1.2	1.9	2.9
Y9	Y9	1.2	1.7	2.9
Y10	Y10	1.1	1.8	2.9



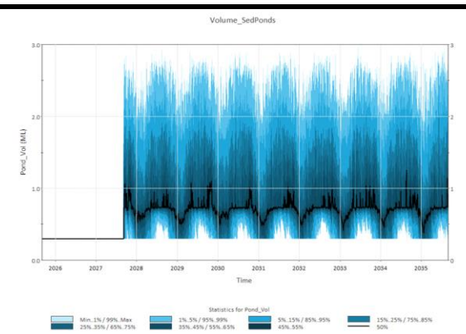
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.8	14.0	49.0	1.3	0.0	0.0	0.0	63.8	1.3
Y4	0.7	13.4	46.9	1.3	0.0	0.0	0.0	61.0	1.3
Y5	0.7	13.3	46.5	1.3	0.0	0.0	0.0	60.6	1.3
Y6	0.8	13.7	48.0	1.3	0.0	0.0	0.0	62.4	1.3
Y7	0.7	13.5	47.3	1.3	25.7	2.7	0.0	61.5	29.8
Y8	0.7	13.3	46.5	1.3	25.9	2.7	0.0	60.5	30.0
Y9	0.7	13.2	46.3	1.3	25.7	2.7	0.0	60.3	29.8
Y10	0.7	13.4	46.9	1.3	26.6	2.7	0.0	61.0	30.6

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	0.3	0.3	0.3
Y2	Y2	0.3	0.3	0.3
Y3	Y3	1.1	1.7	2.9
Y4	Y4	1.1	1.8	3.0
Y5	Y5	1.1	1.7	3.0
Y6	Y6	1.0	1.7	2.9
Y7	Y7	1.0	1.7	2.9
Y8	Y8	1.0	1.7	2.9
Y9	Y9	1.3	1.7	2.8
Y10	Y10	1.1	1.7	2.9



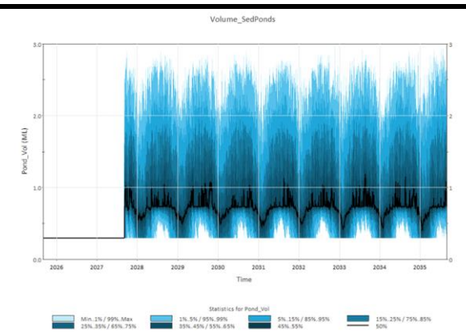
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.7	12.3	42.9	1.3	0.0	0.0	0.0	55.9	1.3
Y4	0.6	11.7	40.9	1.3	0.0	0.0	0.0	53.3	1.3
Y5	0.6	11.7	40.8	1.3	0.0	0.0	0.0	53.1	1.3
Y6	0.7	12.0	41.9	1.3	0.0	0.0	0.0	54.5	1.3
Y7	0.7	11.8	41.4	1.3	22.8	2.7	0.0	53.9	26.8
Y8	0.6	11.6	40.7	1.3	22.8	2.7	0.0	53.0	26.8
Y9	0.6	11.6	40.6	1.3	22.9	2.7	0.0	52.8	26.9
Y10	0.7	11.7	41.1	1.3	23.5	2.7	0.0	53.5	27.5

Volume Results

Year	Maximum Volume [ML]			
	Year	50th	75th	99th
Y1	Y1	0.3	0.3	0.3
Y2	Y2	0.3	0.3	0.3
Y3	Y3	1.0	1.7	2.9
Y4	Y4	1.0	1.8	2.9
Y5	Y5	1.1	1.8	2.9
Y6	Y6	1.1	1.7	2.9
Y7	Y7	1.0	1.7	2.9
Y8	Y8	1.2	1.8	2.9
Y9	Y9	1.2	1.7	3.0
Y10	Y10	1.1	1.7	2.9



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Sediment Ponds - Main SRP POND 8

Baseline Climate

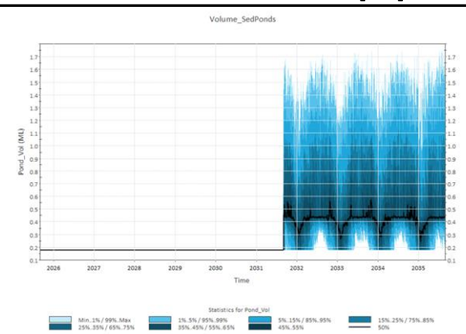
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	13.0	0.0	0.0	13.0
Y5	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	13.3
Y6	0.0	0.0	0.0	0.0	0.0	13.1	0.0	0.0	13.1
Y7	0.5	7.6	26.6	0.8	24.8	13.3	0.0	34.7	38.9
Y8	0.4	7.5	26.2	0.8	25.1	13.2	0.0	34.1	39.1
Y9	0.4	7.5	26.1	0.8	25.1	13.2	0.0	34.1	39.0
Y10	0.5	7.6	26.4	0.8	25.5	13.3	0.0	34.5	39.5

Volume Results

Year	50th	75th	99th
Y1	0.2	0.2	0.2
Y2	0.2	0.2	0.2
Y3	0.2	0.2	0.2
Y4	0.2	0.2	0.2
Y5	0.2	0.2	0.2
Y6	0.2	0.2	0.2
Y7	0.6	1.0	1.7
Y8	0.6	1.0	1.7
Y9	0.6	1.0	1.8
Y10	0.5	0.9	1.8

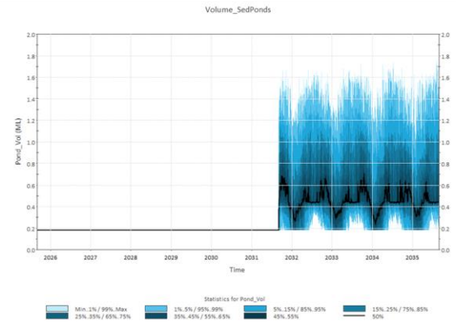
Probabilistic Volume result [ML]



Climate change - Drier Climate

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	13.1	0.0	0.0	13.1
Y5	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	13.3
Y6	0.0	0.0	0.0	0.0	0.0	13.2	0.0	0.0	13.2
Y7	0.3	5.2	18.1	0.8	17.0	13.4	0.0	23.5	31.1
Y8	0.3	5.1	17.8	0.8	17.2	13.2	0.0	23.2	31.2
Y9	0.3	5.1	17.9	0.8	17.6	13.1	0.0	23.3	31.5
Y10	0.3	5.2	18.0	0.8	17.6	13.4	0.0	23.5	31.8

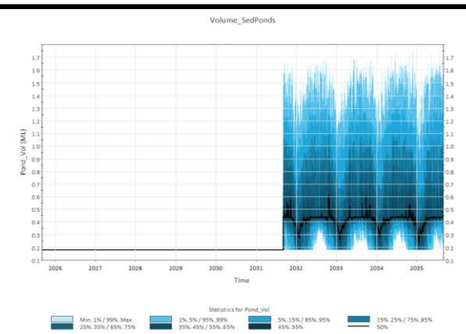
Year	50th	75th	99th
Y1	0.2	0.2	0.2
Y2	0.2	0.2	0.2
Y3	0.2	0.2	0.2
Y4	0.2	0.2	0.2
Y5	0.2	0.2	0.2
Y6	0.2	0.2	0.2
Y7	0.7	1.0	1.7
Y8	0.7	1.0	1.8
Y9	0.7	1.0	1.7
Y10	0.6	1.0	1.7



Climate change - Wetter Climate

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	12.9	0.0	0.0	12.9
Y5	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	13.3
Y6	0.0	0.0	0.0	0.0	0.0	13.1	0.0	0.0	13.1
Y7	0.5	8.0	28.0	0.8	25.7	13.3	0.0	36.5	39.9
Y8	0.5	7.9	27.5	0.8	25.9	13.1	0.0	35.8	39.8
Y9	0.5	7.8	27.4	0.8	25.7	13.2	0.0	35.7	39.7
Y10	0.5	7.9	27.8	0.8	26.6	13.2	0.0	36.2	40.6

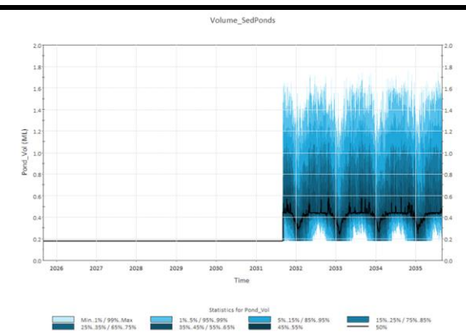
Year	50th	75th	99th
Y1	0.2	0.2	0.2
Y2	0.2	0.2	0.2
Y3	0.2	0.2	0.2
Y4	0.2	0.2	0.2
Y5	0.2	0.2	0.2
Y6	0.2	0.2	0.2
Y7	0.6	0.9	1.8
Y8	0.6	1.0	1.7
Y9	0.6	1.0	1.7
Y10	0.5	0.9	1.7



Climate change - Max Con

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	13.1	0.0	0.0	13.1
Y5	0.0	0.0	0.0	0.0	0.0	13.3	0.0	0.0	13.3
Y6	0.0	0.0	0.0	0.0	0.0	13.0	0.0	0.0	13.0
Y7	0.4	7.0	24.5	0.8	22.8	13.4	0.0	31.9	37.0
Y8	0.4	6.9	24.1	0.8	22.8	13.1	0.0	31.4	36.6
Y9	0.4	6.9	24.0	0.8	22.9	13.2	0.0	31.3	36.9
Y10	0.4	7.0	24.3	0.8	23.5	13.3	0.0	31.7	37.6

Year	50th	75th	99th
Y1	0.2	0.2	0.2
Y2	0.2	0.2	0.2
Y3	0.2	0.2	0.2
Y4	0.2	0.2	0.2
Y5	0.2	0.2	0.2
Y6	0.2	0.2	0.2
Y7	0.6	1.0	1.7
Y8	0.6	1.0	1.7
Y9	0.6	1.0	1.8
Y10	0.5	1.0	1.7



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Sediment Ponds - SRP N 1B POND 1

Baseline Climate

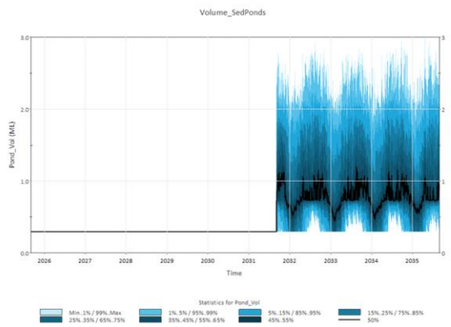
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y4	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	4.5
Y5	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y6	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y7	0.7	9.5	33.4	1.3	27.7	4.6	0.0	43.7	33.6
Y8	0.7	9.4	32.9	1.3	28.1	4.6	0.0	43.0	33.9
Y9	0.7	9.4	32.8	1.3	27.5	4.6	0.0	42.9	33.4
Y10	0.7	9.5	33.2	1.3	27.9	4.6	0.0	43.4	33.8

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	0.3	0.3	0.3
Y5	0.3	0.3	0.3
Y6	0.3	0.3	0.3
Y7	1.1	1.8	2.9
Y8	1.2	1.8	2.9
Y9	1.2	1.7	2.9
Y10	1.1	1.7	3.0

Probabilistic Volume result [ML]



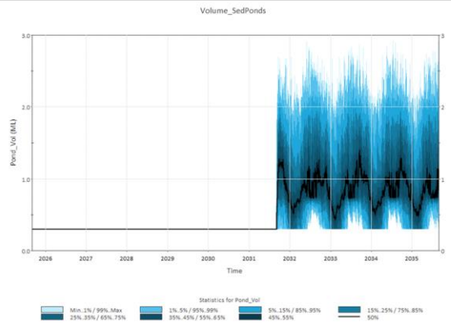
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y4	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y5	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y6	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y7	0.5	6.5	22.7	1.3	18.3	4.7	0.0	29.7	24.3
Y8	0.5	6.4	22.4	1.3	19.3	4.6	0.0	29.2	25.2
Y9	0.5	6.4	22.5	1.3	19.6	4.6	0.0	29.4	25.5
Y10	0.5	6.5	22.7	1.3	18.9	4.7	0.0	29.6	24.9

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	0.3	0.3	0.3
Y5	0.3	0.3	0.3
Y6	0.3	0.3	0.3
Y7	1.3	1.8	2.9
Y8	1.3	1.8	2.9
Y9	1.4	1.8	2.9
Y10	1.3	1.8	2.8



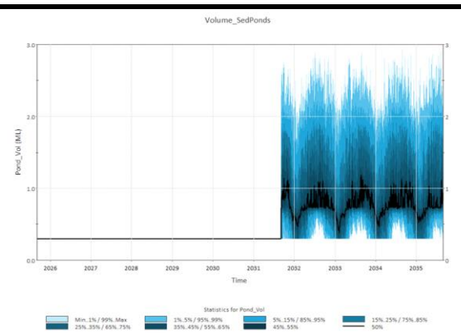
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y4	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	4.5
Y5	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y6	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	4.5
Y7	0.7	10.0	35.2	1.3	28.7	4.6	0.0	45.9	34.7
Y8	0.7	9.9	34.6	1.3	28.9	4.6	0.0	45.2	34.8
Y9	0.7	9.8	34.5	1.3	28.7	4.6	0.0	45.0	34.6
Y10	0.7	10.0	34.9	1.3	28.8	4.5	0.0	45.6	34.7

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	0.3	0.3	0.3
Y5	0.3	0.3	0.3
Y6	0.3	0.3	0.3
Y7	1.1	1.8	2.9
Y8	1.2	1.8	2.9
Y9	1.1	1.7	2.9
Y10	1.1	1.7	2.9



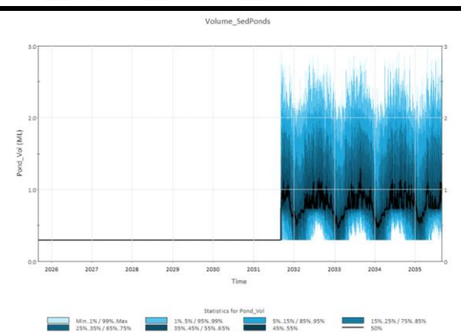
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y4	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y5	0.0	0.0	0.0	0.0	0.0	4.6	0.0	0.0	4.6
Y6	0.0	0.0	0.0	0.0	0.0	4.5	0.0	0.0	4.5
Y7	0.7	8.8	30.8	1.3	25.4	4.6	0.0	40.3	31.4
Y8	0.6	8.7	30.3	1.3	25.7	4.6	0.0	39.6	31.7
Y9	0.6	8.6	30.2	1.3	25.6	4.6	0.0	39.4	31.5
Y10	0.7	8.7	30.6	1.4	25.4	4.6	0.0	40.0	31.4

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	0.3	0.3	0.3
Y5	0.3	0.3	0.3
Y6	0.3	0.3	0.3
Y7	1.2	1.8	2.9
Y8	1.3	1.8	3.0
Y9	1.1	1.7	2.9
Y10	1.1	1.8	2.8



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Sediment Ponds - SRP N 1A POND 1

Baseline Climate

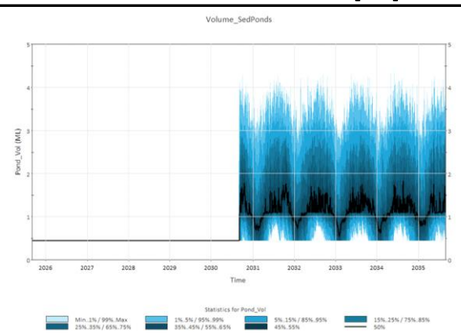
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y6	1.0	16.0	55.9	1.9	46.3	6.8	0.0	72.9	55.1
Y7	1.0	15.7	55.1	2.0	46.2	7.1	0.0	71.8	55.3
Y8	1.0	15.5	54.2	1.9	45.7	7.0	0.0	70.6	54.6
Y9	1.0	15.5	54.1	1.9	44.7	6.9	0.0	70.6	53.6
Y10	1.0	15.6	54.8	2.0	46.3	7.0	0.0	71.4	55.3

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.4	0.4	0.4
Y2	0.4	0.4	0.4
Y3	0.4	0.4	0.4
Y4	0.4	0.4	0.4
Y5	0.4	0.4	0.4
Y6	1.8	2.7	4.4
Y7	1.8	2.7	4.3
Y8	1.8	2.7	4.2
Y9	1.8	2.6	4.3
Y10	1.8	2.6	4.3

Probabilistic Volume result [ML]



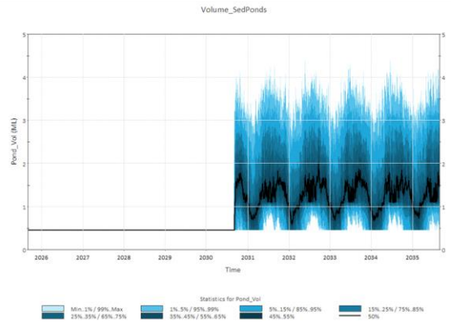
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y6	0.7	11.0	38.3	2.0	31.7	6.9	0.0	50.0	40.5
Y7	0.7	10.7	37.4	2.0	31.6	7.0	0.0	48.8	40.7
Y8	0.7	10.5	36.8	2.0	31.1	7.0	0.0	48.1	40.1
Y9	0.7	10.6	37.0	2.0	31.7	6.9	0.0	48.3	40.6
Y10	0.7	10.7	37.4	2.0	31.8	7.0	0.0	48.7	40.8

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.4	0.4	0.4
Y2	0.4	0.4	0.4
Y3	0.4	0.4	0.4
Y4	0.4	0.4	0.4
Y5	0.4	0.4	0.4
Y6	1.8	2.7	4.2
Y7	1.8	2.7	4.4
Y8	2.0	2.7	4.3
Y9	1.9	2.7	4.3
Y10	1.9	2.8	4.2



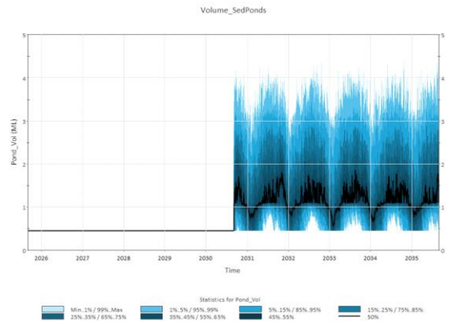
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y6	1.1	16.8	58.8	2.0	47.5	6.8	0.0	76.7	56.3
Y7	1.1	16.6	57.9	2.1	47.3	7.1	0.0	75.6	56.5
Y8	1.1	16.3	56.9	2.0	46.6	7.0	0.0	74.3	55.6
Y9	1.1	16.2	56.8	2.0	46.5	7.0	0.0	74.1	55.5
Y10	1.1	16.4	57.5	2.0	47.8	7.1	0.0	75.0	56.9

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.4	0.4	0.4
Y2	0.4	0.4	0.4
Y3	0.4	0.4	0.4
Y4	0.4	0.4	0.4
Y5	0.4	0.4	0.4
Y6	1.7	2.7	4.4
Y7	1.8	2.7	4.3
Y8	1.9	2.7	4.3
Y9	1.8	2.6	4.3
Y10	1.8	2.7	4.3



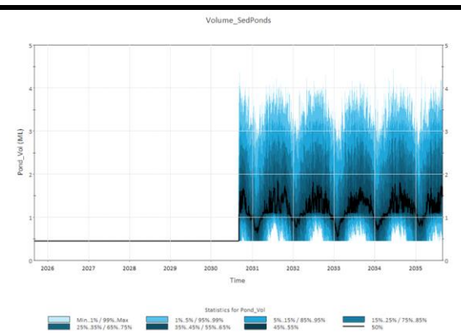
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y6	1.0	14.7	51.3	1.9	42.2	6.8	0.0	66.9	50.9
Y7	0.9	14.5	50.8	2.0	41.8	7.1	0.0	66.2	50.9
Y8	0.9	14.3	49.9	2.0	41.1	6.9	0.0	65.1	50.0
Y9	0.9	14.2	49.7	2.0	41.2	7.0	0.0	64.9	50.3
Y10	0.9	14.4	50.4	2.1	42.6	7.1	0.0	65.7	51.7

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.4	0.4	0.4
Y2	0.4	0.4	0.4
Y3	0.4	0.4	0.4
Y4	0.4	0.4	0.4
Y5	0.4	0.4	0.4
Y6	1.9	2.7	4.3
Y7	1.8	2.7	4.4
Y8	1.7	2.7	4.3
Y9	1.8	2.7	4.3
Y10	1.7	2.7	4.2



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Sediment Ponds - SRP N 1A POND 2

Baseline Climate

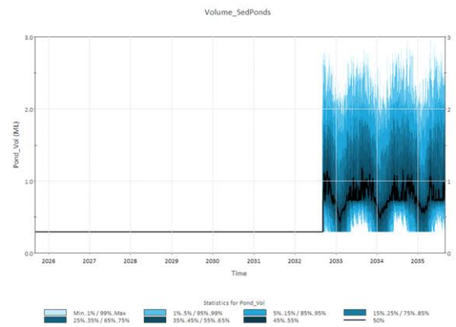
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y8	0.7	9.3	32.7	1.3	27.2	4.6	0.0	42.7	33.0
Y9	0.7	9.3	32.6	1.3	27.4	4.6	0.0	42.7	33.3
Y10	0.7	9.4	33.0	1.3	27.7	4.7	0.0	43.2	33.7

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	0.3	0.3	0.3
Y5	0.3	0.3	0.3
Y6	0.3	0.3	0.3
Y7	0.3	0.3	0.3
Y8	1.2	1.8	2.8
Y9	1.2	1.7	2.9
Y10	1.1	1.7	2.9

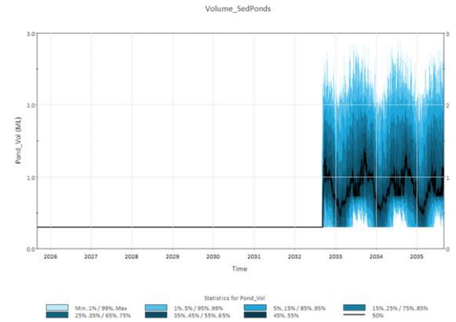
Probabilistic Volume result [ML]



Climate change - Drier Climate

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y8	0.5	6.3	22.2	1.3	18.5	4.5	0.0	29.0	24.3
Y9	0.5	6.4	22.3	1.3	19.3	4.7	0.0	29.2	25.3
Y10	0.5	6.4	22.5	1.3	18.8	4.6	0.0	29.5	24.7

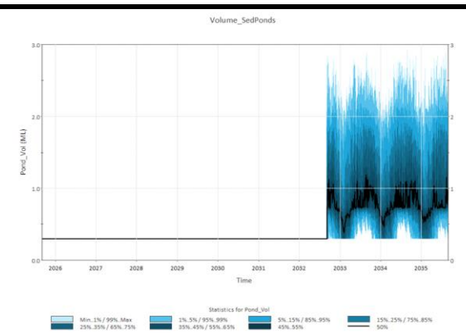
Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	0.3	0.3	0.3
Y5	0.3	0.3	0.3
Y6	0.3	0.3	0.3
Y7	0.3	0.3	0.3
Y8	1.3	1.8	2.9
Y9	1.4	1.8	2.9
Y10	1.3	1.8	2.8



Climate change - Wetter Climate

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y8	0.7	9.8	34.3	1.3	28.0	4.5	0.0	44.9	33.8
Y9	0.7	9.8	34.2	1.3	28.3	4.6	0.0	44.8	34.3
Y10	0.7	9.9	34.7	1.4	28.6	4.7	0.0	45.3	34.7

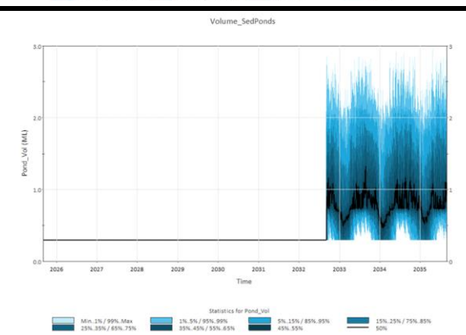
Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	0.3	0.3	0.3
Y5	0.3	0.3	0.3
Y6	0.3	0.3	0.3
Y7	0.3	0.3	0.3
Y8	1.2	1.8	2.9
Y9	1.1	1.8	2.9
Y10	1.2	1.7	2.9



Climate change - Max Con

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	WRD_RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Y8	0.6	8.6	30.1	1.3	24.8	4.6	0.0	39.3	30.6
Y9	0.6	8.6	30.0	1.3	25.4	4.6	0.0	39.2	31.3
Y10	0.7	8.7	30.4	1.4	25.3	4.7	0.0	39.7	31.3

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	0.3	0.3	0.3
Y2	0.3	0.3	0.3
Y3	0.3	0.3	0.3
Y4	0.3	0.3	0.3
Y5	0.3	0.3	0.3
Y6	0.3	0.3	0.3
Y7	0.3	0.3	0.3
Y8	1.3	1.9	2.9
Y9	1.2	1.8	2.9
Y10	1.1	1.8	2.8



DP (Direct precipitation), WRD_RO (Waste Rock Dump Runoff), WRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Process Plant

Baseline Climate

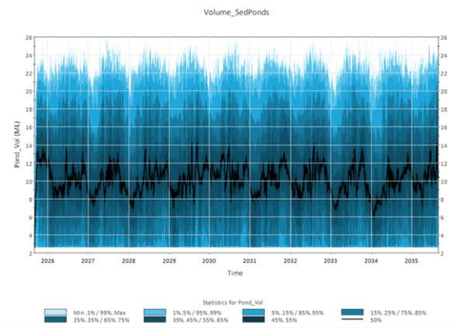
WATER BALANCE

Year	Inflows [ML/yr]					Outflows [ML/yr]			WB Totals	
	DP	TP_TSF	TP_Pits	P_SedPo	BO	PE	PD	ME	Total in	Total Ou
Y1	144.4	0.0	5.3	94.8	18.5	0.0	3263.7	302.5	263.0	3566.3
Y2	141.1	0.0	5.4	101.7	18.5	0.0	3652.3	148.1	266.6	3800.4
Y3	149.4	0.0	5.3	104.6	18.4	0.0	3780.1	175.9	277.7	3956.0
Y4	143.3	0.0	5.4	102.6	18.6	0.0	3822.7	380.5	269.9	4203.3
Y5	142.6	0.0	5.5	100.1	18.9	0.0	3811.7	393.5	267.1	4205.2
Y6	146.4	0.0	5.3	101.0	18.3	0.0	3703.8	463.7	271.1	4167.5
Y7	144.2	0.0	5.5	97.5	18.8	0.0	3766.1	533.1	266.0	4299.2
Y8	141.8	0.0	5.3	99.2	18.3	0.0	3677.9	557.2	264.6	4235.1
Y9	141.7	0.0	5.2	98.4	18.3	0.0	3841.0	489.1	263.6	4330.1
Y10	143.3	0.0	5.4	98.9	18.5	0.0	3687.5	309.2	266.1	3996.6

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	13.7	19.8	25.2
Y2	13.2	19.0	25.5
Y3	13.6	19.1	25.5
Y4	14.3	18.8	25.3
Y5	14.3	19.4	25.2
Y6	12.6	18.7	25.7
Y7	14.1	18.8	25.6
Y8	13.6	19.1	25.3
Y9	13.6	18.5	25.4
Y10	14.2	19.4	25.3

Probabilistic Volume result [ML]



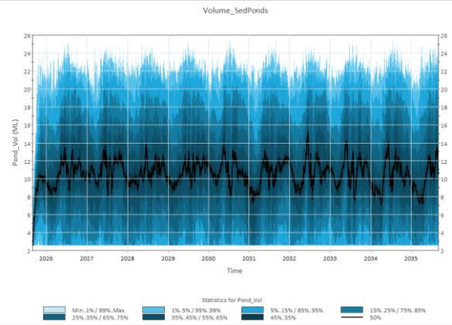
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]					Outflows [ML/yr]			WB Totals	
	DP	TP_TSF	TP_Pits	P_SedPo	BO	PE	PD	ME	Total in	Total Ou
Y1	98.5	0.0	5.7	59.2	19.1	0.0	3261.8	242.6	182.5	3504.5
Y2	96.8	0.0	5.7	65.3	19.2	0.0	3652.3	73.6	187.0	3726.0
Y3	101.4	0.0	5.6	71.1	19.0	0.0	3780.1	82.6	197.0	3862.7
Y4	98.4	0.0	5.7	66.7	19.0	0.0	3822.7	210.4	189.8	4033.1
Y5	97.8	0.0	5.7	65.3	19.2	0.0	3811.7	225.4	187.9	4037.1
Y6	100.3	0.0	5.4	70.5	18.6	0.0	3703.8	257.6	194.8	3961.4
Y7	97.9	0.0	5.7	62.9	19.2	0.0	3766.1	291.6	185.7	4057.8
Y8	96.4	0.0	5.8	63.2	19.3	0.0	3677.9	312.0	184.8	3989.9
Y9	97.0	0.0	5.6	62.7	19.0	0.0	3841.0	268.2	184.4	4109.2
Y10	97.8	0.0	5.6	65.0	18.9	0.0	3687.5	157.0	187.3	3844.5

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	13.6	18.7	25.3
Y2	13.7	19.0	24.7
Y3	13.8	18.8	25.4
Y4	13.0	19.2	25.5
Y5	13.7	19.1	25.1
Y6	13.2	19.0	25.1
Y7	15.2	19.1	25.2
Y8	14.2	19.0	25.2
Y9	14.1	18.9	24.8
Y10	13.5	18.9	25.2



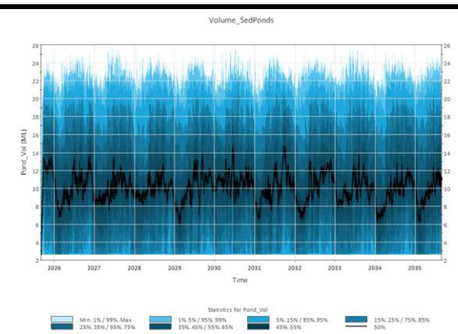
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]					Outflows [ML/yr]			WB Totals	
	DP	TP_TSF	TP_Pits	P_SedPo	BO	PE	PD	ME	Total in	Total Ou
Y1	151.5	0.0	5.4	98.3	18.2	0.0	3263.7	309.7	273.4	3573.4
Y2	147.9	0.0	5.5	104.6	18.4	0.0	3652.3	156.9	276.4	3809.2
Y3	157.3	0.0	5.4	112.4	18.4	0.0	3780.1	195.7	293.4	3975.8
Y4	150.4	0.0	5.5	107.3	18.4	0.0	3822.7	406.3	281.6	4229.0
Y5	149.3	0.0	5.6	104.3	18.7	0.0	3811.7	419.0	278.0	4230.7
Y6	153.9	0.0	5.4	108.1	18.2	0.0	3703.8	490.5	285.6	4194.3
Y7	151.7	0.0	5.5	104.7	18.6	0.0	3766.1	564.4	280.6	4330.5
Y8	149.1	0.0	5.4	100.4	18.4	0.0	3677.9	588.1	273.2	4266.0
Y9	148.7	0.0	5.5	102.9	18.4	0.0	3841.0	519.9	275.5	4360.8
Y10	150.5	0.0	5.4	103.4	18.2	0.0	3687.5	330.9	277.5	4018.4

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	13.6	18.4	25.7
Y2	13.6	18.9	25.4
Y3	12.5	18.9	25.3
Y4	13.3	18.9	25.2
Y5	14.7	18.6	25.5
Y6	13.0	18.5	25.5
Y7	14.7	19.3	25.6
Y8	13.7	19.1	25.5
Y9	12.9	18.7	24.9
Y10	12.6	18.9	25.5



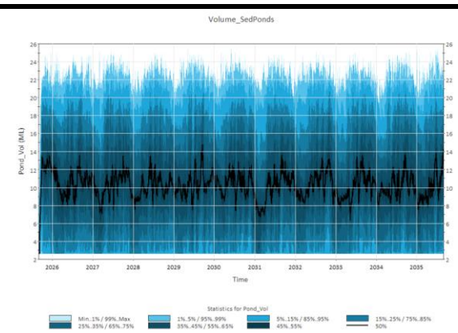
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]					Outflows [ML/yr]			WB Totals	
	DP	TP_TSF	TP_Pits	P_SedPo	BO	PE	PD	ME	Total in	Total Ou
Y1	132.6	0.0	5.5	84.6	18.6	0.0	3263.7	276.4	241.2	3540.2
Y2	129.6	0.0	5.5	93.3	18.5	0.0	3652.3	120.4	246.9	3772.8
Y3	137.7	0.0	5.5	98.1	18.6	0.0	3780.1	145.1	259.9	3925.2
Y4	131.4	0.0	5.6	91.2	18.7	0.0	3822.7	320.4	246.8	4143.1
Y5	131.0	0.0	5.6	93.5	18.7	0.0	3811.7	340.3	248.7	4152.0
Y6	134.3	0.0	5.3	91.5	18.3	0.0	3703.8	399.7	249.4	4103.5
Y7	132.9	0.0	5.6	92.4	18.8	0.0	3766.1	450.2	249.7	4216.3
Y8	130.6	0.0	5.4	88.8	18.4	0.0	3677.9	480.1	243.3	4158.0
Y9	130.2	0.0	5.6	88.8	18.7	0.0	3841.0	421.7	243.2	4262.7
Y10	131.9	0.0	5.5	89.5	18.5	0.0	3687.5	267.8	245.4	3955.3

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	13.6	18.5	25.4
Y2	13.6	19.3	25.1
Y3	13.6	19.2	25.0
Y4	13.2	18.7	25.2
Y5	14.8	19.4	25.4
Y6	13.7	18.4	25.1
Y7	13.5	18.9	25.2
Y8	13.6	19.1	25.2
Y9	12.5	19.2	25.1
Y10	14.3	19.3	25.4



DP (Direct precipitation), TP_TSF (Pumping from TSF), TP_Pits (Pumping from Pits), TP_SedPon (Pumping from Sed Ponds), BO (Borefield make-up), PE (Evaporation), PD (Plant demand), ME (Me

Sediment Ponds - Stormwater Pond

Baseline Climate

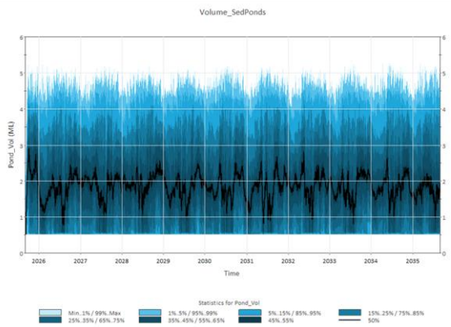
WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	ROM RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.6	34.9	0.0	1.0	25.0	3.5	0.0	35.5	29.5
Y2	0.6	34.1	0.0	1.1	25.6	3.6	0.0	34.7	30.3
Y3	0.6	36.1	0.0	1.0	27.3	3.6	0.0	36.7	31.9
Y4	0.6	34.6	0.0	1.1	25.5	3.6	0.0	35.2	30.2
Y5	0.6	34.5	0.0	1.0	26.2	3.6	0.0	35.1	30.8
Y6	0.6	35.4	0.0	1.0	25.8	3.6	0.0	36.0	30.4
Y7	0.6	34.9	0.0	1.1	25.5	3.6	0.0	35.5	30.2
Y8	0.6	34.3	0.0	1.0	25.0	3.6	0.0	34.9	29.6
Y9	0.6	34.2	0.0	1.1	24.6	3.6	0.0	34.8	29.3
Y10	0.6	34.6	0.0	1.0	25.1	3.6	0.0	35.3	29.7

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.9	3.8	5.2
Y2	2.4	3.6	5.3
Y3	2.4	3.7	5.2
Y4	2.6	3.7	5.3
Y5	2.5	3.7	5.2
Y6	2.6	3.9	5.2
Y7	2.8	3.8	5.3
Y8	2.5	3.7	5.2
Y9	2.6	3.7	5.2
Y10	2.4	3.6	5.2

Probabilistic Volume result [ML]



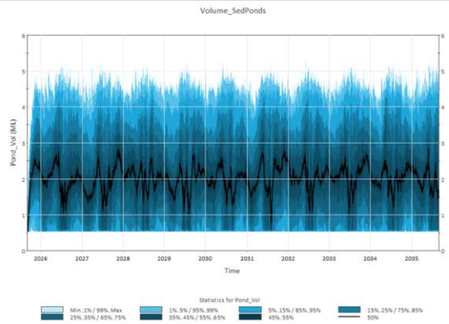
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	ROM RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.4	23.9	0.0	1.1	15.8	3.8	0.0	24.3	20.7
Y2	0.4	23.4	0.0	1.1	17.4	3.7	0.0	23.8	22.2
Y3	0.4	24.5	0.0	1.1	17.3	3.8	0.0	24.9	22.2
Y4	0.4	23.8	0.0	1.1	17.8	3.7	0.0	24.2	22.6
Y5	0.4	23.6	0.0	1.1	17.6	3.8	0.0	24.0	22.5
Y6	0.4	24.3	0.0	1.1	17.6	3.8	0.0	24.7	22.4
Y7	0.4	23.7	0.0	1.2	16.7	3.9	0.0	24.1	21.7
Y8	0.4	23.3	0.0	1.1	16.8	3.8	0.0	23.7	21.7
Y9	0.4	23.4	0.0	1.1	16.6	3.8	0.0	23.9	21.6
Y10	0.4	23.6	0.0	1.2	17.0	3.8	0.0	24.1	22.0

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.8	3.9	5.2
Y2	2.6	3.6	5.2
Y3	2.8	3.9	5.3
Y4	2.6	3.8	5.2
Y5	2.7	3.9	5.2
Y6	2.7	3.8	5.2
Y7	2.8	3.8	5.2
Y8	2.6	3.8	5.1
Y9	2.7	4.0	5.2
Y10	2.8	3.8	5.2



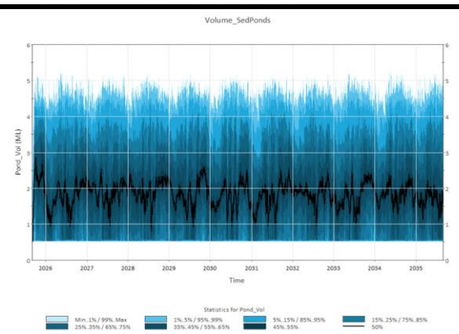
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	ROM RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.6	36.6	0.0	1.0	25.5	3.5	0.0	37.2	30.1
Y2	0.6	35.7	0.0	1.1	26.6	3.6	0.0	36.4	31.3
Y3	0.7	38.0	0.0	1.1	27.9	3.6	0.0	38.7	32.6
Y4	0.6	36.3	0.0	1.1	25.9	3.6	0.0	37.0	30.7
Y5	0.6	36.1	0.0	1.0	27.1	3.6	0.0	36.7	31.7
Y6	0.6	37.2	0.0	1.0	26.5	3.5	0.0	37.9	31.0
Y7	0.6	36.7	0.0	1.1	26.3	3.6	0.0	37.3	31.1
Y8	0.6	36.0	0.0	1.0	25.8	3.5	0.0	36.7	30.3
Y9	0.6	35.9	0.0	1.1	25.6	3.6	0.0	36.6	30.4
Y10	0.6	36.4	0.0	1.1	25.8	3.6	0.0	37.0	30.4

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.9	3.9	5.3
Y2	2.5	3.7	5.2
Y3	2.4	3.9	5.2
Y4	2.4	3.7	5.2
Y5	2.6	3.9	5.2
Y6	2.5	3.6	5.2
Y7	2.5	3.8	5.2
Y8	2.5	3.6	5.2
Y9	2.4	3.7	5.2
Y10	2.4	3.8	5.2



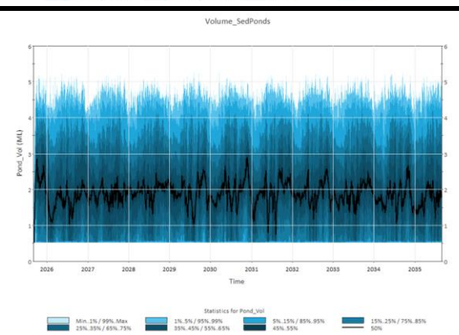
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]			Outflows [ML/yr]				WB Totals	
	DP	ROM RO	WRD_SP	PE	T_P	SP	OV	Total in	Total Ou
Y1	0.6	32.0	0.0	1.0	22.6	3.6	0.0	32.6	27.2
Y2	0.5	31.3	0.0	1.1	23.8	3.6	0.0	31.9	28.5
Y3	0.6	33.3	0.0	1.1	25.0	3.6	0.0	33.9	29.7
Y4	0.6	31.8	0.0	1.1	24.0	3.7	0.0	32.3	28.8
Y5	0.6	31.7	0.0	1.1	23.7	3.6	0.0	32.2	28.4
Y6	0.6	32.5	0.0	1.1	23.6	3.6	0.0	33.0	28.2
Y7	0.6	32.1	0.0	1.1	23.2	3.7	0.0	32.7	28.0
Y8	0.6	31.6	0.0	1.1	23.1	3.6	0.0	32.1	27.7
Y9	0.5	31.5	0.0	1.1	22.9	3.6	0.0	32.0	27.6
Y10	0.6	31.9	0.0	1.0	23.3	3.5	0.0	32.4	27.9

Volume Results

Maximum Volume [ML]			
Year	50th	75th	99th
Y1	2.9	3.9	5.2
Y2	2.3	3.7	5.2
Y3	2.5	3.7	5.2
Y4	2.4	3.9	5.2
Y5	2.6	3.9	5.2
Y6	2.9	3.8	5.3
Y7	2.6	3.8	5.2
Y8	2.6	3.8	5.3
Y9	2.5	3.9	5.2
Y10	2.7	3.8	5.2



DP (Direct precipitation), ROM Run offWRD_SP (Waste Rock Dump Seepage), PE (Evaporation), T_P (Transfer to Plant), SP (Seepage), OV (Overtopping)

Appendix D

Water balance – Process plant

Process Plant

Baseline Climate

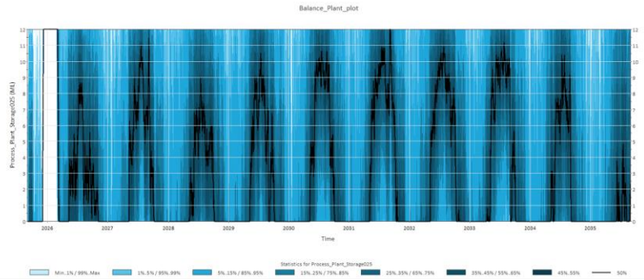
WATER BALANCE

Year	Inflows [ML/yr]					Outflows [ML/yr]			WB Totals	
	DP	TP_TSF	TP_Pits	P_SedPo	BO	PE	PD	ME	Total in	Total Ou
Y1	1.4	2612.1	162.9	220.6	576.7	3.9	3263.4	302.5	3573.5	3569.8
Y2	1.3	3096.2	149.8	222.3	359.1	3.9	3652.2	148.1	3828.7	3804.2
Y3	1.4	3131.3	150.8	276.6	428.1	3.9	3779.1	175.9	3988.3	3958.9
Y4	1.4	3191.7	238.1	505.2	369.4	3.9	3823.7	380.5	4305.8	4208.2
Y5	1.4	3079.3	274.4	500.7	450.5	3.9	3811.3	393.5	4306.2	4208.7
Y6	1.4	3041.7	352.2	551.4	333.9	3.9	3704.9	463.7	4280.5	4172.5
Y7	1.4	3045.2	439.9	591.8	343.3	3.9	3766.1	533.1	4421.5	4303.2
Y8	1.3	2998.3	481.2	616.3	275.0	3.9	3679.2	557.2	4372.2	4240.3
Y9	1.3	3005.4	293.0	611.1	525.4	3.9	3839.8	489.1	4436.2	4332.8
Y10	1.4	2312.8	92.2	626.2	1039.6	3.9	3686.5	309.2	4072.3	3999.6

Volume Results

Year	Maximum Volume [ML]			
		50th	75th	99th
Y1		12.0	12.0	12.0
Y2		11.0	12.0	12.0
Y3		11.5	12.0	12.0
Y4		10.5	12.0	12.0
Y5		10.7	12.0	12.0
Y6		10.9	12.0	12.0
Y7		12.0	12.0	12.0
Y8		11.2	12.0	12.0
Y9		10.4	12.0	12.0
Y10		8.2	12.0	12.0

Probabilistic Volume result [ML]



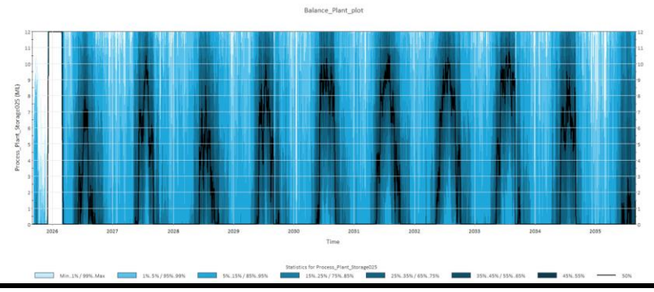
Climate change - Drier Climate

WATER BALANCE

Year	Inflows [ML/yr]					Outflows [ML/yr]			WB Totals	
	DP	TP_TSF	TP_Pits	P_SedPo	BO	PE	PD	ME	Total in	Total Ou
Y1	0.9	2576.1	140.5	152.2	643.7	3.9	3261.5	242.6	3513.5	3508.1
Y2	0.9	3059.9	121.3	155.5	408.4	4.0	3652.2	73.6	3746.1	3729.9
Y3	1.0	3073.6	113.7	193.4	498.2	4.0	3779.1	82.6	3879.8	3865.6
Y4	0.9	3154.1	178.6	353.1	421.9	4.0	3823.7	210.4	4108.7	4038.2
Y5	0.9	3021.3	212.0	358.3	522.2	4.0	3811.3	225.4	4114.8	4040.7
Y6	1.0	3001.6	279.7	386.0	379.8	4.0	3704.9	257.6	4048.1	3966.5
Y7	0.9	2980.3	363.3	411.2	395.2	4.0	3766.1	291.6	4151.0	4061.8
Y8	0.9	2956.5	399.6	428.7	312.2	4.0	3679.2	312.0	4098.0	3995.1
Y9	0.9	2937.8	217.5	435.9	606.3	4.0	3839.8	268.2	4198.5	4112.0
Y10	0.9	2262.4	68.2	436.6	1125.9	4.0	3686.5	157.0	3894.1	3847.5

Volume Results

Year	Maximum Volume [ML]			
		50th	75th	99th
Y1		12.0	12.0	12.0
Y2		10.5	12.0	12.0
Y3		8.7	12.0	12.0
Y4		10.0	12.0	12.0
Y5		10.4	12.0	12.0
Y6		10.6	12.0	12.0
Y7		10.4	12.0	12.0
Y8		10.8	12.0	12.0
Y9		9.5	12.0	12.0
Y10		7.1	12.0	12.0



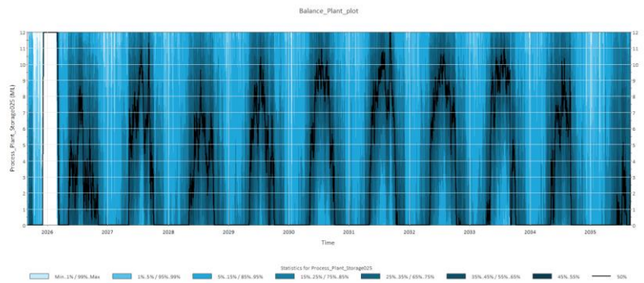
Climate change - Wetter Climate

WATER BALANCE

Year	Inflows [ML/yr]					Outflows [ML/yr]			WB Totals	
	DP	TP_TSF	TP_Pits	P_SedPo	BO	PE	PD	ME	Total in	Total Ou
Y1	1.4	2609.4	166.7	227.6	575.2	4.0	3263.4	309.7	3580.3	3577.0
Y2	1.4	3093.7	155.4	230.5	357.5	4.0	3652.2	156.8	3838.5	3813.1
Y3	1.5	3131.2	158.4	287.0	426.7	4.0	3779.1	195.7	4004.9	3978.8
Y4	1.4	3190.1	249.9	525.8	367.0	4.0	3823.7	406.3	4334.2	4234.1
Y5	1.4	3077.0	284.6	517.3	448.5	4.0	3811.3	419.0	4328.8	4234.3
Y6	1.5	3039.6	364.1	574.0	332.1	4.0	3704.9	490.5	4311.1	4199.4
Y7	1.4	3042.7	454.7	611.2	345.2	4.0	3766.1	564.4	4455.2	4334.6
Y8	1.4	2995.8	494.6	636.5	276.0	4.0	3679.2	588.1	4404.4	4271.3
Y9	1.4	3004.0	308.7	639.0	523.4	4.0	3839.8	519.9	4476.5	4363.7
Y10	1.4	2311.9	94.4	649.9	1035.0	4.0	3686.5	330.9	4092.7	4021.5

Volume Results

Year	Maximum Volume [ML]			
		50th	75th	99th
Y1		12.0	12.0	12.0
Y2		10.9	12.0	12.0
Y3		11.4	12.0	12.0
Y4		10.5	12.0	12.0
Y5		11.0	12.0	12.0
Y6		10.9	12.0	12.0
Y7		12.0	12.0	12.0
Y8		11.1	12.0	12.0
Y9		10.4	12.0	12.0
Y10		8.5	12.0	12.0



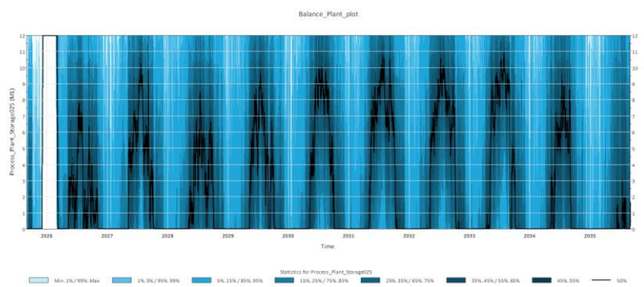
Climate change - Max Con

WATER BALANCE

Year	Inflows [ML/yr]					Outflows [ML/yr]			WB Totals	
	DP	TP_TSF	TP_Pits	P_SedPo	BO	PE	PD	ME	Total in	Total Ou
Y1	1.3	2596.3	155.7	203.1	587.6	4.0	3263.4	276.4	3544.0	3543.8
Y2	1.2	3081.0	141.3	206.0	369.9	4.0	3652.2	120.4	3799.5	3776.7
Y3	1.3	3106.9	140.9	258.8	445.4	4.0	3779.1	145.1	3953.3	3928.2
Y4	1.2	3175.5	218.1	464.5	382.4	4.0	3823.7	320.4	4241.7	4148.2
Y5	1.2	3051.5	256.9	466.0	468.5	4.0	3811.3	340.3	4244.2	4155.6
Y6	1.3	3024.2	330.0	508.5	343.2	4.0	3704.9	399.7	4207.2	4108.6
Y7	1.3	3014.8	418.2	546.4	358.6	4.0	3766.1	450.2	4339.3	4220.4
Y8	1.2	2980.4	457.1	563.5	285.0	4.0	3679.2	480.1	4287.2	4163.3
Y9	1.2	2973.4	271.6	561.4	550.3	4.0	3839.8	421.7	4357.9	4265.5
Y10	1.3	2291.6	92.1	579.8	1061.3	4.0	3686.5	267.8	4026.1	3958.3

Volume Results

Year	Maximum Volume [ML]			
		50th	75th	99th
Y1		12.0	12.0	12.0
Y2		10.3	12.0	12.0
Y3		9.9	12.0	12.0
Y4		9.8	12.0	12.0
Y5		10.1	12.0	12.0
Y6		10.8	12.0	12.0
Y7		10.6	12.0	12.0
Y8		10.9	12.0	12.0
Y9		9.6	12.0	12.0
Y10		7.9	12.0	12.0



DP (Direct precipitation), TP_TSF (Pumping from TSF), TP_Pits (Pumping from Pits), TP_SedPon (Pumping from Sed Ponds), BO (Borefield make-up), PE (Evaporation), PD (Plant demand), ME (Me

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Appendix 6: Surface Water Management Plan (WSP, 2026b)

Design
for a better
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Katanning Gold Surface Water Management Plan

Katanning Gold Project

May 2026

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WSP
Lvl 3, Mia Yellagonga Tower 2, 5 Spring St
Perth WA 6000
PO Box 7181
Cloisters Square WA 6850

Tel: +61 8 9489 9700
Fax: +61 8 9489 9777
wsp.com

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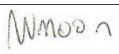
Prepared by:	Joyti Mabruk Sania Junejo	6 May 2026	
Reviewed by:	Ross Singleton Andrea Garcia-Forero	6 May 2026	
Approved by:	Nigel Moon	6 May 2026	

WSP acknowledges that every project we work on takes place on First Peoples lands.
We recognise Aboriginal and Torres Strait Islander Peoples as the first scientists and engineers and pay our respects to Elders past and present.

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Appendix A Flood maps

1 Project background

1.1 Introduction

Ausgold Limited (Ausgold) has engaged WSP Australia Pty Ltd (WSP) to support the surface water management plan (SWMP) for the Katanning Gold Project (KGP) based on the mine layout as at December 2025 DFS.

The aim of the SWMP is to identify any potential flood risks to the project based on the latest mine layout and associated infrastructure during the operational phase during the Life of Mine (LoM) and provide design peak flows and volume estimates to design appropriate surface water control infrastructure for mitigation. The critical mine areas that require flood protection include:

- Tailings Storage Facility (TSF)
- Pits (Jinkas, Dingo, Olympia, Jackson)
- Waste rock dumps (WRDs) across the mine area
- Process plant area
- Run of Mine (ROM) pad.

This report provides an overview of the hydrologic and hydraulic modelling to facilitate the development of the SWMP, results of the analysis, as well as hydraulic sizing of surface water control structures. Appendix A provides a summary of the flood mapping undertaken as part of this design. The scope of work undertaken by WSP is detailed further in Section 1.2 as well as in the subsequent sections.

1.2 Scope of work

The objective of the SWMP is to provide a management plan for the contact and non-contact surface water to be managed effectively throughout the LoM and to support the regulatory approvals process. In addition, the outcomes of the SWMP will inform any additional infrastructure required to store, convey or manage the surface water (i.e., water surplus storage, diversions, and/or sediment ponds). This work also used the outcomes of the site-wide water balance that was undertaken by WSP (WSP, 2025a).

WSP's scope of work for the SWMP includes the following:

- Assess the surface water flood impact for the ultimate mine layout and develop a SWMP to manage and minimise the risk of flooding of the mine pits and critical infrastructure within the project area for the operational phase only. Assessment of surface water management at various stages of the mine development was not part of the scope. In addition, ensure effective separation of contact and non-contact water thereby minimising volume of contact water requiring further management. The developed SWMP as part of this scope will facilitate regulatory approvals and planning for Ausgold.
- Develop feasibility level design for key infrastructure required for surface water management (i.e., storm event pond, sediment/seepage collection ponds for WRD's, drains and diversion bunds, etc.). The site will operate under a 'zero-discharge' regulatory requirement.

2 Site description

2.1 Site location

The KGP and the planned open-pit mining boundary is located 40 km northeast of the town of Katanning in the southwest region of Western Australia shown on Figure 2.1. The site is located within the Shire of Katanning.

Figure 2.1 Site location

2.2 Site layout and topography

The site is generally on top of the broader catchment with some low points to the northwest and southwest of the project area shown on Figure 2.2. The mine layout has also been illustrated on Figure 2.2. The critical mine areas such as Jinkas pit and WRD main are located at the peak of the topography at 393 m Australian height datum (mAHD) and 387 mAHD respectively. The site can be divided into distinct sub-catchments based on the direction of surface grading:

- The northern areas, including the Olympia Pit and WRD North 1 and North 2, are graded towards the northeast.
- The Jackson Pit and WRD West are located in areas that grade towards the northwest.
- The southern WRDs, Dingo Pit, ROM, and process plant area fall within the southwest-draining sub-catchment.
- The TSF area is graded towards the southeast.

The stockpile layout presented throughout this report is indicative and conceptual only. Stockpiles should not be located across any seasonal drainage pathways.

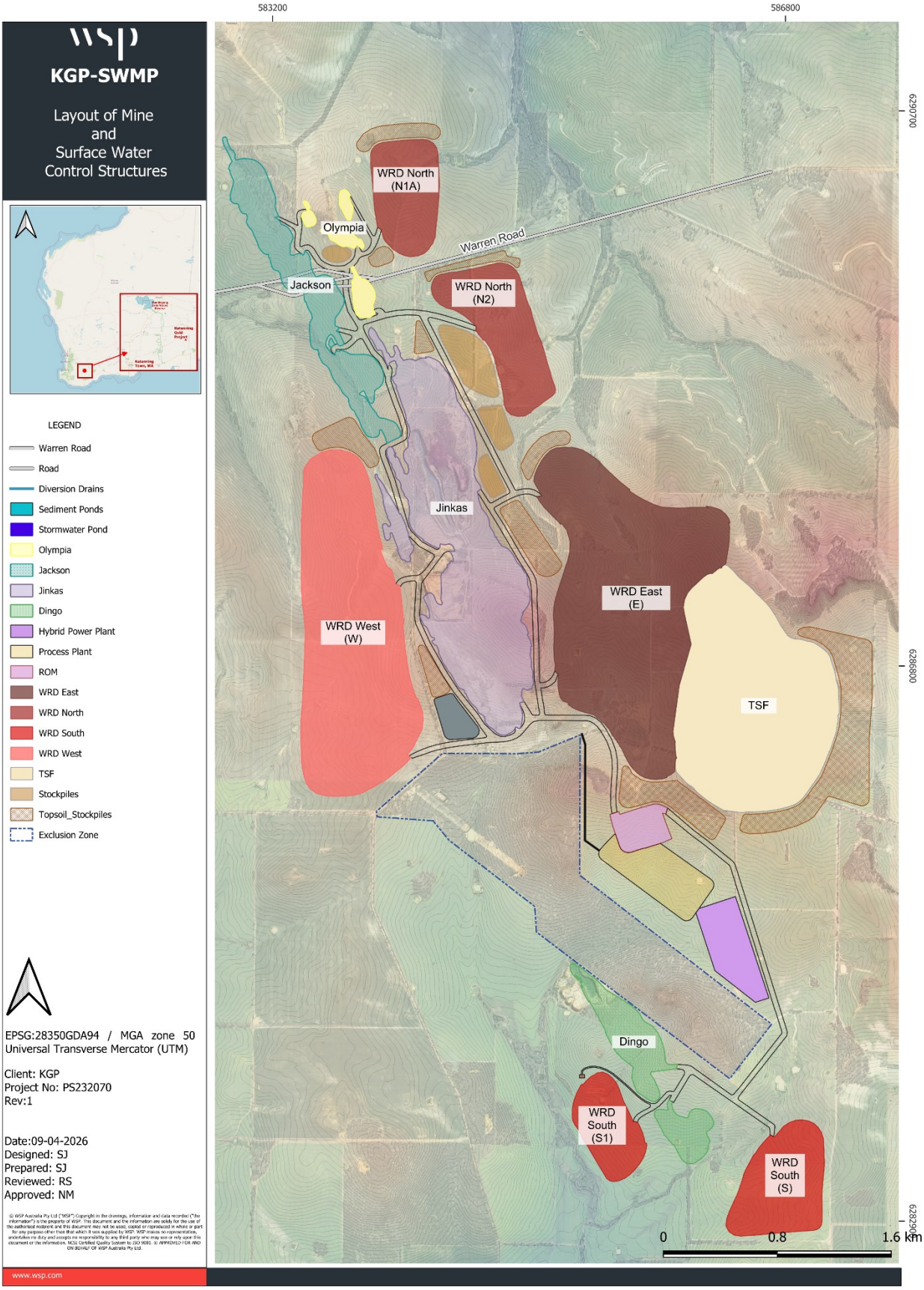


Figure 2.2 KGP site layout and topography

2.3 Existing watercourses

There are no existing natural major watercourses, or ponds located within the tenement boundary. Small farming dams are established variously across the site area, but do not impact the SWMP design.

An existing ore pit is located at the top of Dingo Pit and another existing pond/pit area across the Jinkas Pit are observed. The site is primarily affected by overland runoff within the internal catchments and open pits.

3 Climate setting

3.1 Historical climate statistics

Monthly statistics associated with the daily rainfalls and evaporation were sourced from the enhanced climate database hosted by Department of Environment, Tourism, Science and Innovation's SILO Data Drill (SILO). The SILO rainfall and evaporation datasets are based on interpolated gridded data (using an approximate 5 km × 5 km grid spacing) derived from records at over 6,000 weather stations in Australia (https://www.longpaddock.qld.gov.au/silo/).

The current climate condition for the project site was analysed based on five data sources (summarised below) including four Bureau of Meteorology (BoM) weather stations. The period 1973-2011 was selected for concurrent comparison as it includes the most consistent recorded climate data for all stations:

- Badgebup, located approximately 10 km south of the site (BoM ref: 010508; in operation since 1915),
- Dumbleyung, located 30 km north of the site (BoM ref: 010546; in operation since 1910),
- Kwobrup, located 10 km southeast of the site (BoM ref: 010589; in operation since 1915)
- Nairibin, located 20 km north of the site (BoM ref: 010657; in operation since 1915)
- The Department of Environment, Tourism, Science and Innovation's SILO Data Drill (SILO) gridded data interpolated for the KGP site location (Lat: -33.55°; Long: 117.90°).

SILO accesses grids of data interpolated from point observations made by stations operated by the BoM providing long-term estimates of continuous daily rainfall and evapotranspiration records (from 1889 to present) for any location in Australia. A comparison of the average monthly and annual rainfalls for the five sources is discussed in the water balance report (WSP, 2025a). The comparison shows that the monthly SILO values follow a similar trend and are comparable to the BoM stations, although the two BoM stations recorded slightly lower values for July.

The comparison shows that the monthly SILO values follow a similar trend and are comparable to the BoM stations, although the two BoM stations recorded slightly lower values for July. The SILO KGP site data are summarised in Table 3.1 and shown graphically in Figure 3.1. It should be noted that these rainfall and evaporation data are based on records from 1970 to 2024 (to include a complete year at the time of writing this report).

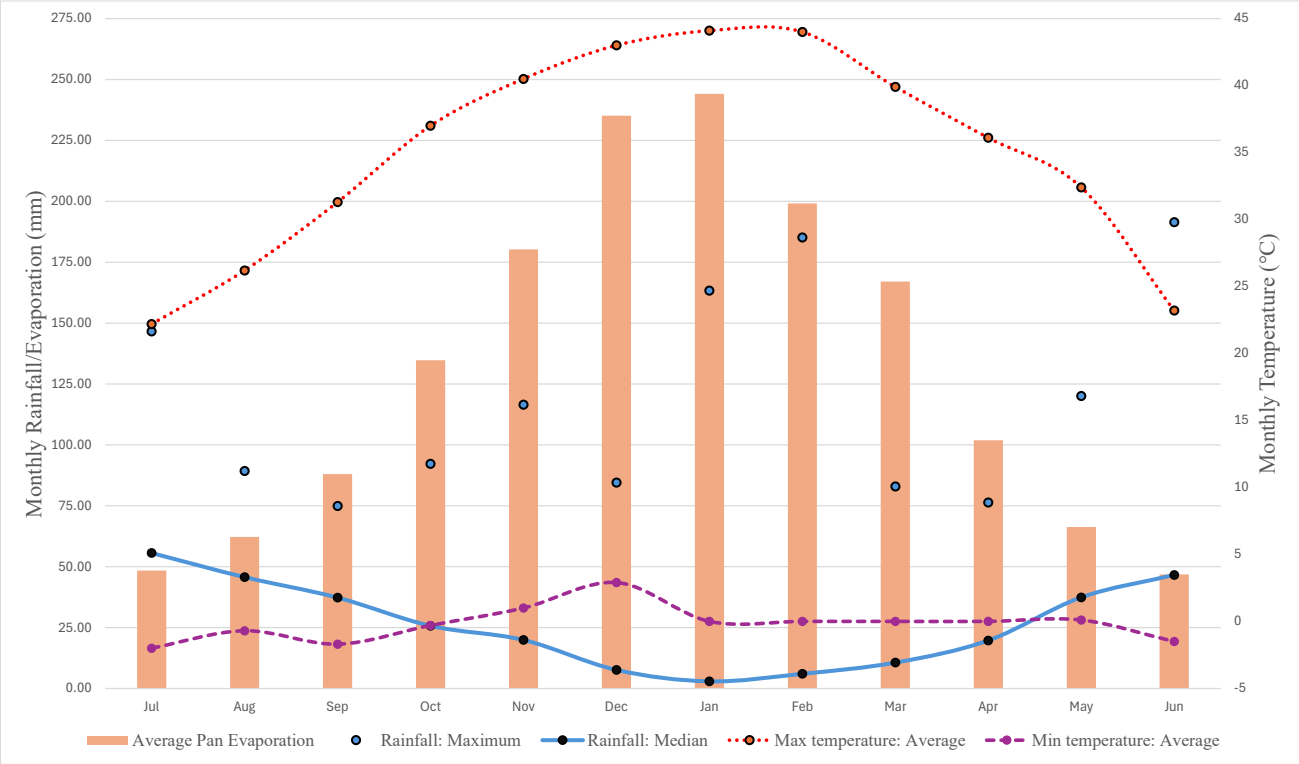
The climate data shows the Project location has cold winters with high rainfall expected. Monthly rainfall distributions show a distinct seasonal pattern with most of the rainfall occurring during the months of June through to August and more extreme monthly rainfall also occurring predominantly during this period. The highest recorded daily rainfall total in the SILO record within the defined period of record was 93.5 mm on 21 January 1982.

The average annual pan evaporation is around 1,587 mm. Median monthly pan evaporation exceeds median monthly rainfall in all months of the year except June and July (Figure 3.1).

Table 3.1 Monthly SILO climate statistics (mm) between years 1970 and 2024

Parameter	July	August	September	October	November	December	January	February	March	April	May	June	Annual
Average rainfall	58.8	47.4	36.1	28.7	25.0	14.5	17.1	17.7	18.0	23.7	41.9	53.3	382.2
Median rainfall	55.6	45.7	37.3	25.7	19.9	7.6	2.9	6.0	10.6	19.7	37.4	46.6	377.7
Maximum rainfall	146.6	89.3	74.9	92.2	116.5	84.5	163.3	185.1	82.9	76.3	120.1	191.4	617.1
Minimum rainfall	23.2	10.6	10.2	1.1	0.5	0.0	0.0	0.0	0.0	0.0	3.5	13.5	243.6
90th Percentile	87.3	67.5	58.9	54.3	48.6	37.4	58.0	46.8	49.1	45.8	78.0	81.9	496.0
75th Percentile	75.2	58.1	47.4	33.9	36.1	18.3	20.3	24.5	25.4	35.2	49.1	64.4	438.0
25th Percentile	40.6	38.5	23.5	13.4	9.8	2.2	0.4	1.0	2.4	6.5	24.4	33.2	330.8
10th Percentile	29.8	25.8	15.7	9.2	5.8	0.3	0.0	0.0	0.7	3.8	14.4	24.9	281.9
Median evaporation	47.3	60.8	87.5	134.3	180.6	231.8	250.3	200.0	170.8	104.0	65.4	46.4	1572.9

Notes Rainfall and evaporation data in mm/month

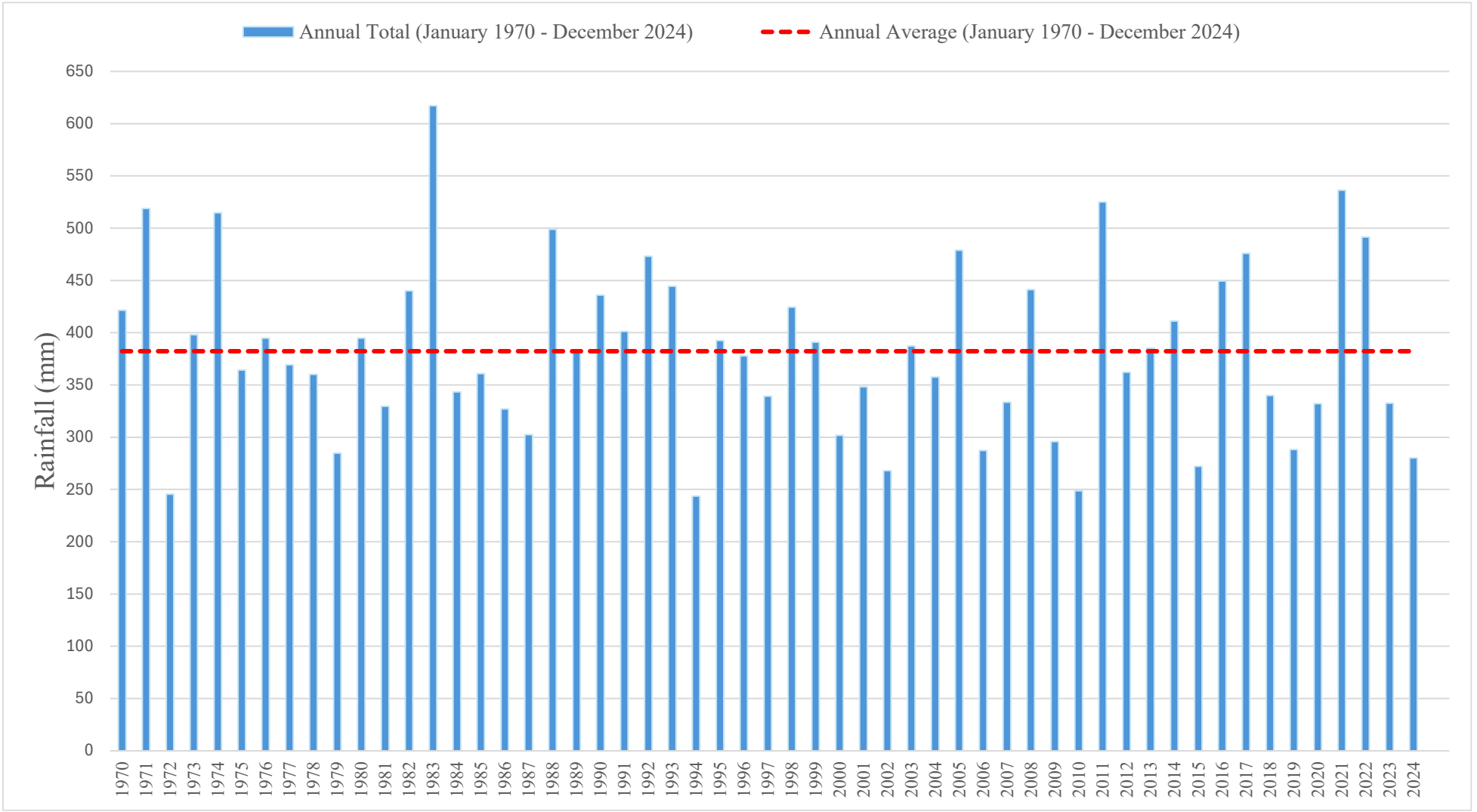


(1) All rainfall and temperature statistics derived from SILO data drill climate information (January 1970 to December 2024).

(2) Pan evaporation represents Class A pan evaporation equivalent (January 1970 to December 2024).

Figure 3.1 Monthly SILO rainfall and climate summary (January 1970 to December 2024)

Total annual rainfall for years 1970 to 2024 is presented in Figure 3.2. It also includes the mean annual rainfall over this period, which was around 382.2 mm.



Notes Annual rainfall data is derived from the water year (January 1970 to December 2024).

Figure 3.2 Annual Rainfall Summary (January 1970 to December 2024)

3.2 Baseline intensity-frequency-duration estimates

Baseline rainfall intensity-frequency-duration (IFD) estimates for the study area were derived using Australian Rainfall and Runoff (ARR) 2019 Datahub, which allows automatic estimation of a full set of IFD curves and associated data for any location in Australia. This approach is outlined in ARR 2019 guideline (ARR 2019).

Table 3.2 and Table 3.3 summarise rainfall intensities (mm/hr) associated with design storms with durations up to 72 hours' duration and Annual Exceedance Probability (AEP) up to 1 in 100 applied in the estimation of design flood discharges for a range of AEP events. Total rainfall depths are presented in Table 3.3.

Table 3.2 Baseline rainfall intensity (mm/hr) for standard durations and annual exceedance probability (AEPs)

Duration (mins)	Duration (Hrs)	Annual exceedance probability (AEP)						
		63.20% (1 in 1.58)	50% (1 in 2)	20% (1 in 5)	10% (1 in 10)	5% (1 in 20)	2% (1 in 50)	1% (1 in 100)
5	0.083	49.8	56.8	81.0	99.5	119	149	173
10	0.167	35.7	40.7	58.4	72.1	87.1	110	129
15	0.25	28.5	32.5	46.6	57.6	69.6	87.6	103
30	0.5	18.7	21.3	30.4	37.5	45.2	56.6	66.4
60	1	12	13.6	19.3	23.7	28.4	35.3	41.1
120	2	7.6	8.64	12.2	14.9	17.8	22	25.6
180	3	5.83	6.61	9.33	11.4	13.6	16.9	19.7
360	6	3.68	4.18	5.91	7.25	8.72	10.9	12.8
720	12	2.3	2.6	3.7	4.58	5.57	7.1	8.48
1440	24	1.39	1.58	2.26	2.82	3.46	4.5	5.45
1800	30	1.18	1.33	1.91	2.39	2.94	3.84	4.66
2880	48	0.816	0.922	1.32	1.65	2.04	2.67	3.26
4320	72	0.589	0.664	0.944	1.18	1.45	1.89	2.31

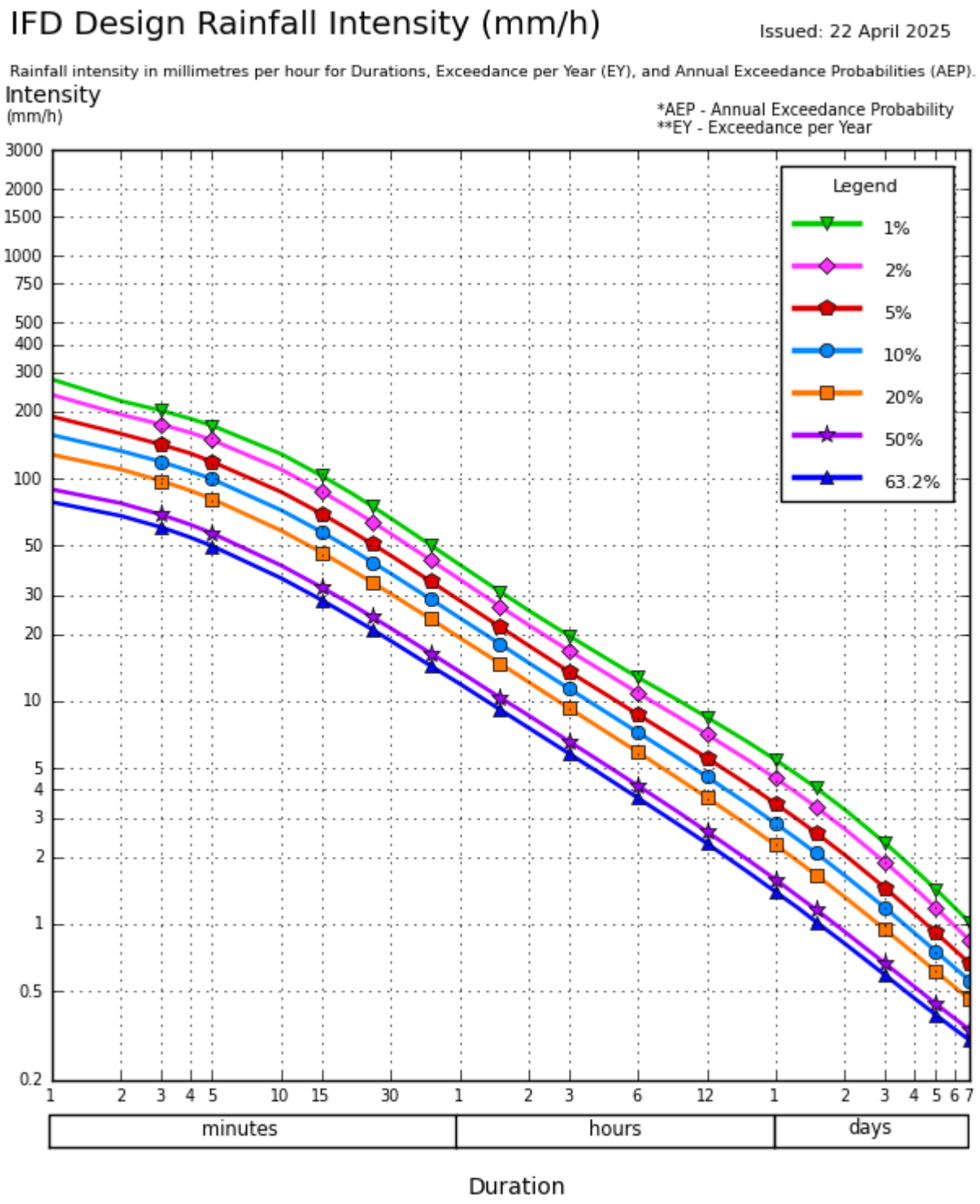


Figure 3.3 IFD Curves for KGP area (BOM 2016)

Table 3.3 Total rainfall depth (mm) for standard durations and annual exceedance probability (AEPs)

Duration (mins)	Duration (Hrs)	Annual exceedance probability (AEP)						
		63.20% (1 in 1.58)	50% (1 in 2)	20% (1 in 5)	10% (1 in 10)	5% (1 in 20)	2% (1 in 50)	1% (1 in 100)
5	0.083	4.15	4.74	6.75	8.29	9.95	12.4	14.4
10	0.167	5.95	6.79	9.73	12	14.5	18.3	21.5
15	0.25	7.13	8.13	11.6	14.4	17.4	21.9	25.8
30	0.5	9.35	10.7	15.2	18.7	22.6	28.3	33.2
60	1	12	13.6	19.3	23.7	28.4	35.3	41.1
120	2	15.2	17.3	24.4	29.8	35.6	44.1	51.2
180	3	17.5	19.8	28	34.2	40.9	50.7	59
360	6	22.1	25.1	35.4	43.5	52.3	65.5	77
720	12	27.6	31.2	44.4	55	66.8	85.2	102
1440	24	33.4	37.9	54.2	67.7	83.1	108	131
1800	30	35.3	40	57.3	71.7	88.2	115	140
2880	48	39.2	44.3	63.3	79.3	97.7	128	156
4320	72	42.4	47.8	67.9	84.7	104	136	166

4 Basis of design summary

The basis of design (BoD) summarising the adopted design criteria and design basis is provided in WSP technical memorandum document number PS222221-WSP-PER-MNG-MEM-001 Rev0 dated 18 July 2025 (WSP, 2025b), issued separately as part of this study. The key items from the summary include the following:

- **Design life:** the SWMP assumes a 10-year operational period considering mining operations commencing in year 2027. SWMP for closure and post-closure periods are not part of this assessment.
- **Site topography data:** The site topography data summarised in Table 4.1 was used for the assessment.

Table 4.1 Site topography data

Type	Extent	Source	Date	Comments
LiDAR and Photogrammetry	Site area only	Aerial Survey Imagery Source: Outline Imagery	31 October 2023	As an output 50 cm DSM, 50 cm DTM and 1 m interval contour and 10 cm resolution imagery data have been generated.

- **Surface water control structures protecting critical mine infrastructure:** Structures (including non-contact diversion channels) are sized to withstand the 1 in 100 AEP event which is typically selected for open drains/bunds to protect critical infrastructure on other mine sites. The selected AEP storm event is estimated to withstand an event with a probability of exceedance of 10% over the 10-year life of the current proposed operation. This means that the likelihood to experience at least one event exceeding the design event over a given Project life of 'n = 10' years is 10%. This is based on recommendations in Austroads (1994), and risk management approaches used widely in other mining operations in WA that are independent (or external) to tailings storage facilities noting the latter has more prescriptive requirements for extreme flood events.
- The probability (P) of a flood event being exceeded during the LoM can be calculated according to the following formula:

$$P = 1\text{-}\exp(-L/y)$$

  Where:
  - L = Life of operation (years)
  - Y = Flood AEP (years)
- A summary of the probabilities of exceedance for various AEPs and LoM (years) is presented in Table 4.2.

Table 4.2 Probability of exceedance for various AEP and Life of Mine

LoM	Probability of exceedance (%) for various AEPs					
Years	50% AEP (1 in 2)	20% AEP (1 in 5)	10% AEP (1 in 10)	5% AEP (1 in 20)	2% AEP (1 in 50)	1% AEP (1 in 100)
1	39%	18%	10%	5%	2%	1%
3	78%	45%	26%	14%	6%	3%
5	92%	63%	39%	22%	10%	5%
10	99%	86%	63%	39%	18%	10%
15	100%	95%	78%	53%	26%	14%
20	100%	98%	86%	63%	33%	18%
25	100%	99%	92%	71%	39%	22%
30	100%	100%	95%	78%	45%	26%

Based on Table 4.2, the 1 in 100 AEP event is selected as the design event for the sizing of the surface water control structures such as diversion channels protecting critical mine infrastructure, which has an 10% probability of exceedance for a design life of 10 years.

- Surface water control structures for local catchments are sized to the 1 in 20 AEP 24-hour event for storage, or critical duration for conveyance. The design intent of the structures is not to protect critical mine infrastructure, rather provide management of more frequent storm events. Freeboard for all structures has been adopted as 0.3 m.
- **Design peak flows:** Design peak flows used to design the surface water control structures is based on the hydrological and hydraulic (TUFLOW) model, further detailed in Section 5. Details on the estimation of design peak flows for local catchments is provided in Section 5.
- **Climate change considerations:** Climate change considerations have been applied to the baseline IFD (presented in Section 3.2) according to the 10-year operational period and follows the procedure developed by ARR (Ball, et al. 2019) found in Book 1 and Chapter 6. Table 4.3 provides the scaling factors that are applied to the IFDs shown in Table 3.3. Time horizon 2030, shared-socioeconomic (SSP) scenario SSP3-7.0 has been adopted by Ausgold to be applied to the BOM (2016) IFD to reflect the ‘current and near-term' climate scenario (Ausgold Pers.Comm , 2025).

Table 4.3 ARR data hub climate change factors

	Climate change factors									
	<1 hour	**1.5 Hours**	**2 Hours**	**3 Hours**	**4.5 Hours**	**6 Hours**	**9 Hours**	**12 Hours**	**18 Hours**	**>24 Hours**
2030 SSP2-4.5	1.18	1.17	1.16	1.14	1.13	1.12	1.12	1.11	1.10	1.10
2040 SSP2-4.5	1.22	1.20	1.19	1.17	1.16	1.15	1.14	1.13	1.12	1.12
2030 SSP3-7.0	**1.18**	**1.17**	**1.16**	**1.14**	**1.13**	**1.12**	**1.12**	**1.11**	**1.10**	**1.10**
2040 SSP3-7.0	1.23	1.21	1.20	1.18	1.17	1.16	1.15	1.14	1.13	1.12
2030 SSP5-8.5	1.20	1.18	1.17	1.16	1.14	1.13	1.13	1.12	1.11	1.11
2040 SSP5-8.5	1.26	1.24	1.22	1.20	1.18	1.17	1.16	1.15	1.14	1.14

- **Sediment retention ponds for the WRDs**: Minimum required volume, pond dimensions (i.e., length by width ratio 1:3) and sediment storage volume has been calculated using RUSLE equation (K.G. Renard, 1997) and detailed in Section 6.4.
- **Stormwater pond**: Minimum required volume to store the 1 in 20 AEP, 24-hour storm event runoff volume but to also provide settling capacity for sediment laden runoff from the adjacent ROM pad. Perimeter drains capturing runoff from the catchment is also recommended to be sized to the 1 in 20 AEP design peak flow.
- **Pond emergency spillways**: Sized to convey the peak flow resulting from the 1 in 50 AEP storm event with a minimum freeboard of 0.3 m, and a maximum flow depth of 0.2 m.
- **Perimeter drains reporting to ponds**: Perimeters drains capturing runoff from the pond catchment areas are recommended to be sized to the 1 in 20 AEP design peak flow.

5 Hydrologic and hydraulic modelling

Flood estimation (including flood levels, depths, and velocities) was completed using the TUFLOW hydraulic modelling software version 2025.0.2. TUFLOW is a two-dimensional hydraulic modelling software whereby a rainfall depth is applied to every active cell within a digitised polygon based on an input rainfall hyetograph which provides simulated flood depths, flows, and velocities. The input rainfall hyetograph was developed in accordance with ARR (Ball, et al. 2019), in which web-based design rainfall information specific to the Project location has been retrieved (refer to Section 4).

A direct rainfall approach enables reliable representation of the physiographic characteristics of the mine site, and its upstream catchment. This is due to several factors including greater consideration of the storage effects of depressions, better representation of sheet flow conditions associated with surrounding topography, and the ability to vary coefficients of roughness with increasing flow depths.

The hydrologic and hydraulic modelling was completed adopting the two scenarios provided in Table 5.1.

Table 5.1 Summary of TUFLOW model scenarios

Scenario number		Description
1	Baseline	Pre-development condition to understand the local flooding without considering any mine and surface water control structure.
2	Ultimate site development – without mitigation	Post-development condition considering the proposed mine layout and without surface water control structures.

The sections below provide further detail on the model inputs and results.

5.1 Model basis

In conjunction with the BoD developed by WSP (2025b), the following items form part of the TUFLOW model development:

- **Model extent**: The model covers all the catchments contributing to the site and the mine layout.
- **Grid information**: Comprising 0.5 m LiDAR data simulated as a 4 m cell size with 0.5 m Sub Grid Samples (SGS).
- **Storm event durations simulated**: Several durations ranged from 30 min to 96 hours were assessed for the 1 in 100 AEP flood event.
- **Hydrological parameters**: Catchment loss parameters were extracted from the ARR datahub (ARR 2019) for the project location.
- **Manning's roughness**: Digitising the natural ground using the google satellite imagery the following roughness values has been adopted.
  - Floodplain/grass: 0.05
  - Medium vegetation: 0.08
  - Heavy vegetation: 0.12
  - Track: 0.025
- **Climate change**: The upscale factor 2030 SSP3-7.0 was selected for TUFLOW modelling and was applied to the rainfall data as part of the model inputs (refer to Section 4).
- **Surface water controls**: Open channel diversions have been proposed as detailed in Section 6.2.

5.2 Model results

Model results for both scenarios and runs are presented in figures in the subsequent sections. Flood mapping and results including the mine structures and the proposed surface water control structures are discussed in Section 6 and the high resolution maps are provided in Appendix A.

Note, a cut-off depth of 3 cm has been applied to model results meaning that any predicted flood depths less than this are not presented. Likewise, any predicted velocity less than 3 cm/s is not shown on the velocity results.

5.2.1 Scenario 1 – Baseline conditions

5.2.1.1 Scenario 1 – Baseline flood depths

Figure 5.1 presents the baseline condition flood depths around the site for the 1 in 100 AEP flood event. The results show that surface water flow is predominantly confined to the defined drainage network, with shallow flow depths (generally <0.3 m) across most upstream and minor tributaries. Localised areas of greater depth occur along the main drainage lines, where flow convergence results in deeper channelised flow, reaching up to approximately 1–2 m in isolated sections.

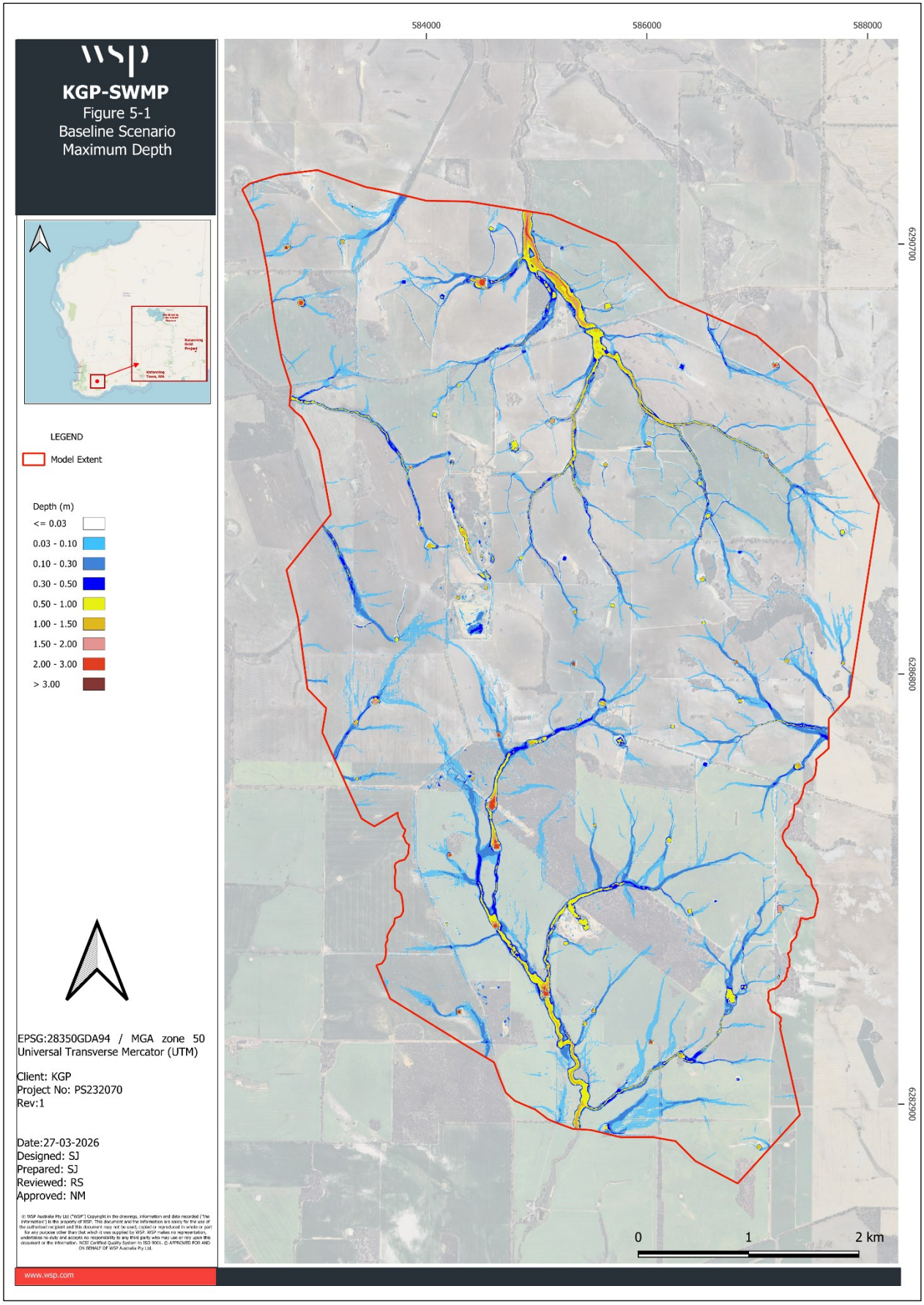


Figure 5.1 Baseline flood depths

5.2.1.2 Scenario 1 – Baseline flood velocity

Figure 5.2 presents the baseline condition flood velocity around the site for the 1 in 100 AEP flood event. The flow velocity is generally 0.5 m/s to 2 m/s site wide. Higher flow velocities are localised along the main drainage lines and downstream reaches, where flow convergence and channelisation occur. In these areas, velocities increase to approximately 1–2 m/s, with isolated sections exceeding this range along steeper or more confined channels.

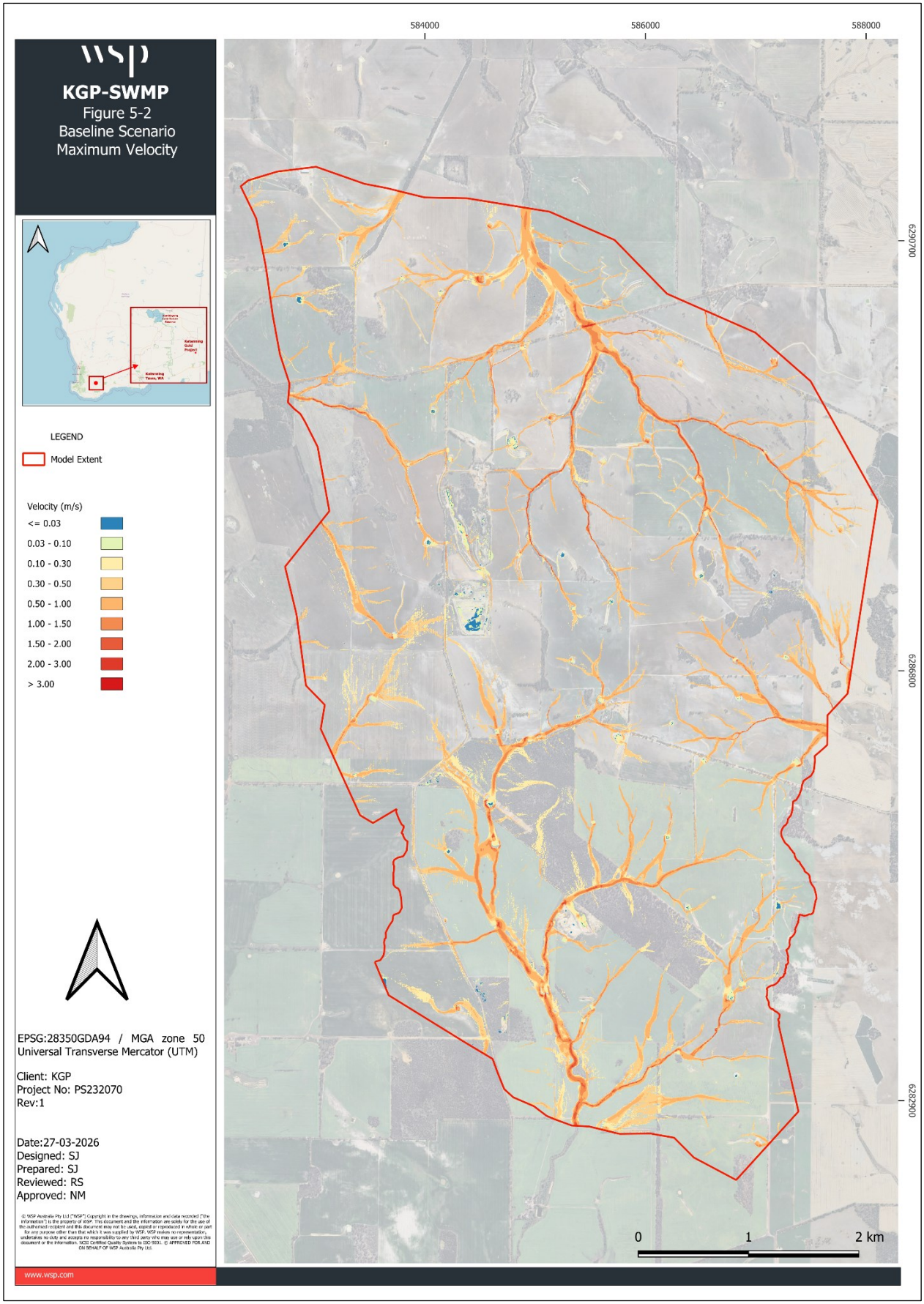


Figure 5.2 Baseline flood velocity

5.2.2 Scenario 2 – Post-development without mitigations

Outcomes of Scenario 2 TUFLOW modelling are used to size open channel diversions, further described in Section 6.2.

5.2.2.1 Scenario 2 – Flood depths

presents the flood depths across the site under post-development conditions for the 1 in 100 AEP flood event. Localised ponding is evident around mine infrastructure, with flood depths reaching up to approximately 3 m in some areas. These results highlight the influence of site structures on flood behaviour and the need for dedicated surface water control measures.

The callout areas identify locations where mine infrastructure significantly alters flow patterns, including redirection of flows into adjacent areas and increased flood extents downstream of WRDs and haul roads. Under the no-mitigation scenario, parts of the proposed mining layout are exposed to flooding, and infrastructure has the potential to exacerbate local flood depths by constraining natural drainage pathways.

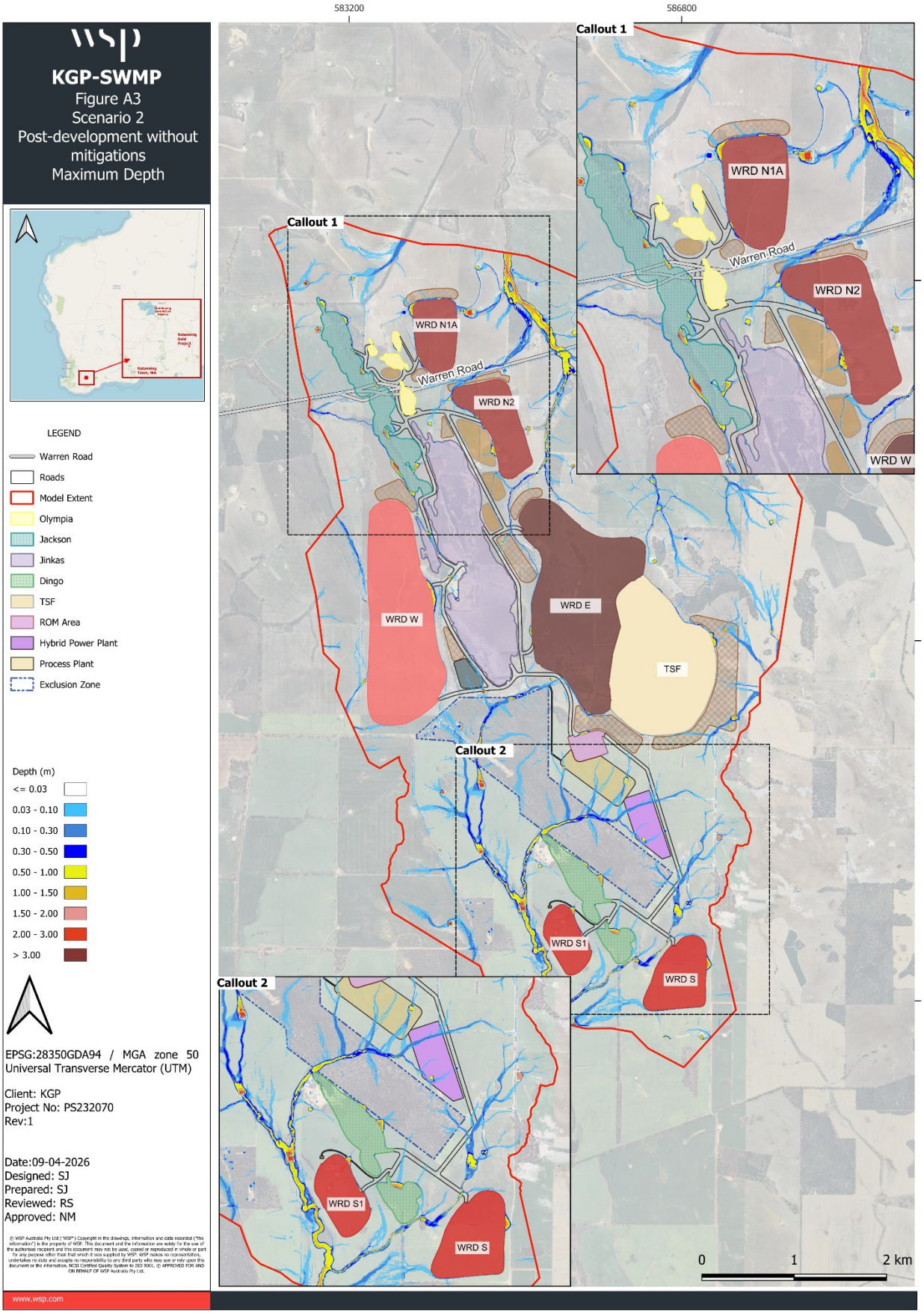


Figure 5.3 Scenario 2 flood depths

5.2.2.2 Scenario 2 – Flood velocity

Figure 5.4 presents the flow velocities results for the post-development scenario under the 1 in 100 AEP flood event. Overall, site-wide velocities remain within 0.5 m/s to 2 m/s, consistent with baseline conditions except in the ponding areas that occur under post-development conditions, where flow velocities slightly decrease due to the infrastructure.

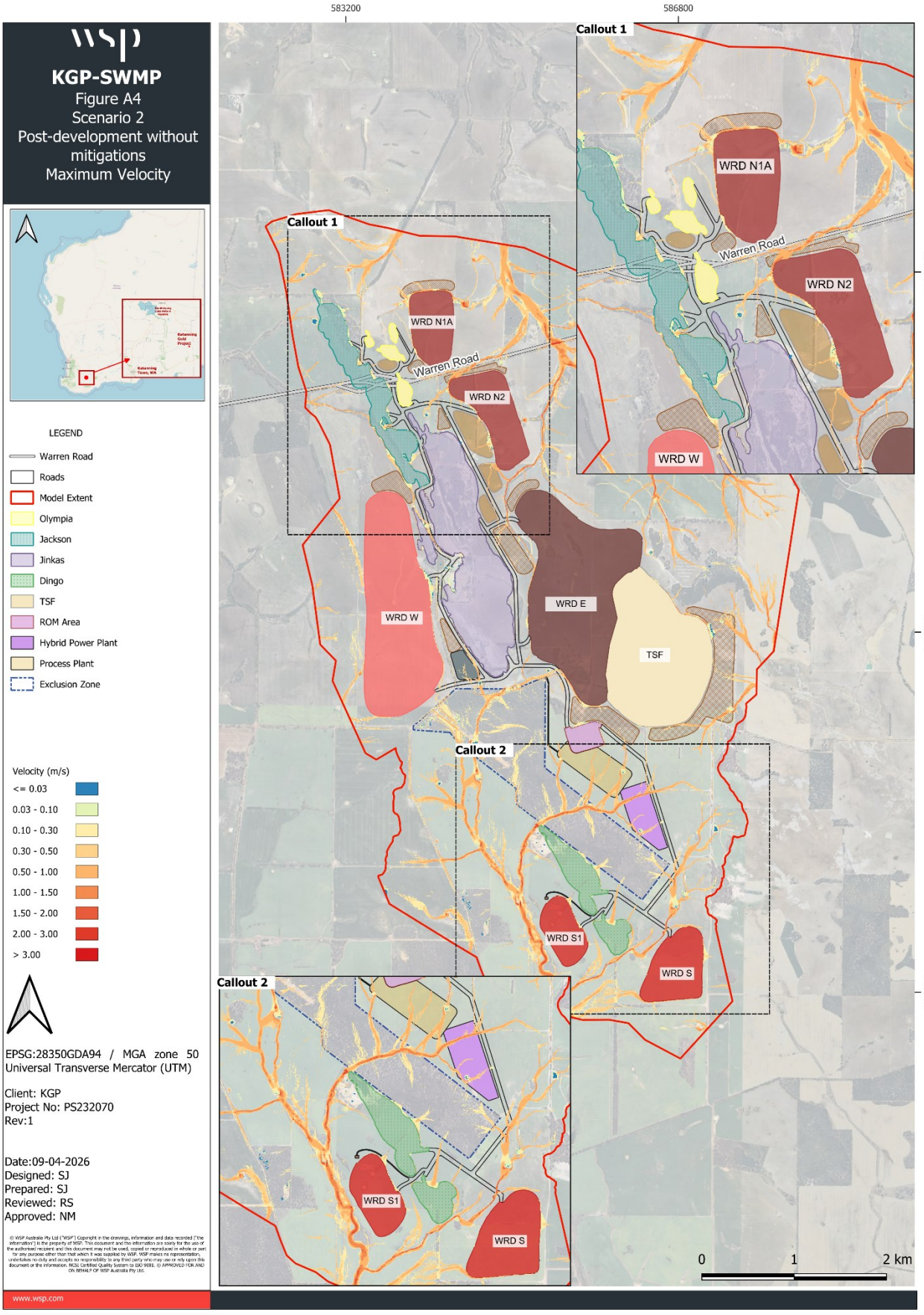


Figure 5.4 Scenario 2 flood velocities

6 Surface water management plan

During operations, the control and management of surface runoff and discharges in and immediately downstream of the mine area are essential to provide:

- Protection to mine personnel and infrastructure during larger storm events.
- Diversion of non-contact surface runoff around mine infrastructure to be discharged to the downstream environment following the existing hydrology.
- Retain sediment and clean out at a prescribed frequency generated from the WRDs and TSF embankments onsite to maintain zero discharge of the sediment material to the downstream environment.

In adopting appropriate design criteria for the sizing of the surface water control structures, several factors were considered:

- Compliance criteria of regulatory authorities.
- Separation of contact and non-contact water as reasonably practicable.
- Zero discharge for frequent storm events.
- Risk to infrastructure in the event of inundation during more extreme storm durations of the mining operation.
- Magnitude of design discharges, flow velocities and associated critical durations of flows in the mine area locations of mine infrastructure in relation to the existing hydrology.

Ausgold therefore requested that the integrated SWMP be sized to meet the requirements of the current proposed mine plan and associated infrastructure for a 10-year operational period commencing in year 2027.

6.1 Proposed surface water control structures

A summary of the key surface water control structures and the intent as part of the SWMP is provided in Table 6.1. A site plan of the SWMP general layout is provided in .

Table 6.1 Surface water control structures summary

Critical mine infrastructure	Surface water control structure	Design intent description
Pits (Jinkas, Dingo, Olympia, Jackson)	Based on the location of the ultimate pit layouts relative to the surrounding topography, minimal flood impacts from extreme storm are expected as the pits are not adjacent/downstream to major drainage lines, and do not have large reporting catchment areas.	Non-contact water upstream of the pits require a localised diversion system for the surrounding relatively small catchments to reduce water volumes needing further management.
Waste rock dumps (WRDs)	Similar to the pits, minimal flood impacts from extreme storm are expected as the WRDs are not adjacent/downstream to major drainage lines, and do not have large reporting catchment areas. Control structures for the WRDs are anticipated to include the following:	— Perimeter drains around the footprint of the WRDs (where practicable) to capture sediment laden runoff from the landforms and conveyed to sediment retention ponds (SRPs) for containment and further management (settling of particles). — Seepage collection ponds downstream of the WRDs (potentially acid forming or low

Critical mine infrastructure	Surface water control structure	Design intent description
	— Sediment laden runoff will need to be captured and contained for further management. — Seepage collection and storage.	water quality) to store seepage volumes from the landform for containment and further management.
Tailings storage facility (TSF)	Similar to the pits, minimal flood impacts from extreme storm are expected as the TSF is not adjacent/downstream to major drainage lines, and do not have large reporting catchment areas. Control structures for the TSF are anticipated to include the following: — Sediment laden runoff from the TSF embankment dam may need capturing and containment for further management. — Seepage collection and storage.	— Perimeter drains around the footprint of the TSF (where practicable) to capture sediment laden runoff from the TSF embankment and conveyed to a sediment retention pond (SRP) for containment and further management (settling of particles). — Seepage collection pond downstream of the TSF to store seepage volumes from the landform for containment and further management (as part of the TSF design scope of work, excluded from this scope).
Site plant area	Local drainage system conveying pad runoff to a stormwater pond.	Localised runoff from the site plant area to be captured and conveyed to a storm water pond (developed by others, excluded from this scope).
Run of Mine (ROM) pad	Local drainage system conveying pad runoff to a stormwater pond.	ROM pad is located to the north (upslope) of the site plant layout. Impacted runoff from the pad is captured by perimeter drains which conveys potentially sediment laden runoff to the stormwater pond for settlement of coarser particles. Additionally, ponded water can be reused in the process plant (if required).

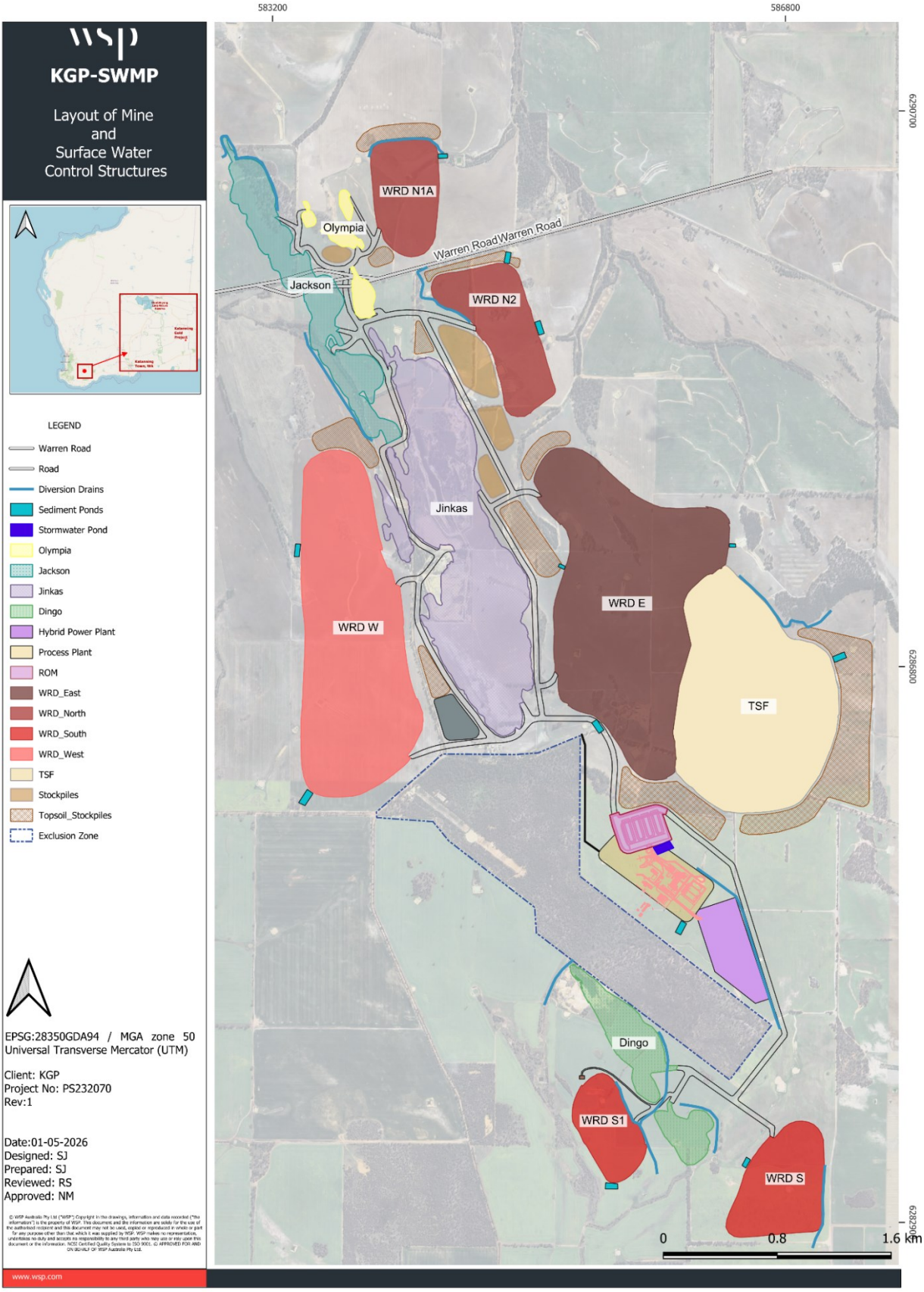


Figure 6.1 Layout of mine structures and surface water control structures

6.2 Open channel diversions

Hydraulic sizing of the proposed open channel diversions was undertaken based on the results of hydrologic modelling for the post-development scenario without any mitigation measures. The design intent of the diversion channels is to capture non-contact overland drainage from undisturbed upslope catchments and convey it downstream away from the site. The open channel diversions were located at key ponding locations around the site infrastructures to manage surface runoff.

The 1 in 100 AEP peak discharges obtained from the Scenario 2 results (refer to Section 5.2.2) were used to complete the hydraulic design for most of the diversion channels. For WRD S1 and Jackson Pit West, peak flows could not be accurately estimated using Scenario 2 results due to localised ponding and complex topography. Therefore, peak flows for these areas were calculated using the Rational Method in accordance with the Queensland Urban Drainage Manual (Institute of Public Works Engineering Australasia, 2008).

The diversion channels have been sized directly using hydrological peak flow estimates derived for the post-development scenario. The channel dimensions presented represent preliminary hydraulic sizing and may be further refined or optimised through detailed hydraulic modelling of the proposed diversion drains within the TUFLOW model, where required to confirm hydraulic performance and conveyance capacity.

The hydraulic sizing adopted the following approach:

- Using provided LiDAR survey, the diversion channels were vertically aligned to intersect existing drainage lines upslope of the mine structure. Along these alignments, channel sections were defined based on changes in longitudinal slope. A minimum longitudinal slope of 0.3% was adopted for the channels.
- Trapezoidal cross-section has been adopted with side slopes of 2H:1V.
- A recommended freeboard of 0.3 m above the peak flow depth was considered in the channel depth design.
- Peak flow depths within the channel were estimated using Manning's equation using a Manning's roughness coefficient of 0.035, which is considered to be appropriate for channels lined with riprap.
- Riprap D50 sizing was carried out for each channel section according to the respective longitudinal slope, following the methodology presented in HEC-15 (Kilgore & Cotton, 2005). This method considers hydraulic parameters such as shear stress, flow velocity, and channel slope to determine the median size required to ensure stability.

Table 6.2 summarises the channels design parameters for each identified slope section along the channel alignment, including the estimated peak flow rates, maximum flow velocities and recommended dimensions of the proposed diversion channels.

Table 6.2 Summary of open channel design and dimensions

Diversion channel ID	Section	Section length (m)	Minimum longitudinal slope	Design peak flow (m^3/s)	Minimum base width (m)	Minimum channel depth (m)[a]	Riprap D50 (mm)
WRD N1 A	S1	330	1.4%	5.9[b]	4.0	1.0	150
	S2	220	2.0%				200
	S3	65	2.3%				200
WRD N2	S1	160	1.3%	4.9[b]	6.0	1.0	150
	S2	150	2.0%				150
	S3	190	0.3%				50
	S4	144	2.0%				150
WRD S	S1	880	0.4%	1.7[b]	2.0	1.0	50
	S2	120	1.7%				150
	S3	295	3.1%				150
WRD S1	S1	480	0.3%	1.9[c]	2.0	1.0	50
	S2	127	3.0%				450
Dingo 1 pit and WRD S1 Junction	S1	400	0.3%	3.1[c]	4.0	1.0	50
	S2	175	4.1%				450
	S3	158	3.7%				450
Dingo 2 Pit	S1	200	0.7%	3.4 [b]	4.0	1.0	50
	S2	100	3.3%				250
	S3	218	5.1%				200
Jackson Pit West	S1	400	0.3%	6.3[c]	4.0	1.5	50
	S2	200	1.0%				150
	S3	291	3.3%				450
Jackson Pit East	S1	250	0.8%	1.1[b]	1.0	1.0	50
	S2	320	1.6%				150
	S3	3336	0.6%				50
Dingo 1 pit North	S1	28	4.1%	29[b]	7.0	2.0	450
	S2	330	0.3%				150
TSF	S1	300	2.8%	1.9[b]	2.0	1.0	150
	S2	70	2.1%				150
	S3	492	0.3%				50
HPP	S1	200	0.6%	3.9[b]	2.0	1.5	150

Diversion channel ID	Section	Section length (m)	Minimum longitudinal slope	Design peak flow (m^3/s)	Minimum base width (m)	Minimum channel depth (m)[a]	Riprap D50 (mm)
	S2	260	0.2%	3.9[b]	2.0	1.5	50
	S3	844	0.7%	3.9[b]	2.0	1.5	150

Notes a) Minimum channel depth accounting for 0.3 m freeboard above peak flow depth estimated.
b) Design peak flow as estimated by TUFLOW modelling and presented in Scenario 2 results (refer to Section 5.2.2).
c) Design peak flow as estimated by Rational Method (refer to Section 6.2).

For certain diversion channels with steep longitudinal slopes resulting in high flow velocities, stilling basins were designed to dissipate hydraulic energy and mitigate erosion risks at the outlet. These basins were dimensioned to accommodate the full length and height of the hydraulic jump, based on the USBR Method (Basin Type I) (Peterka, 1984). Table 6.3 presents the channels for which stilling basins were incorporated, along with the corresponding height and length requirements defined for each structure.

Table 6.3 Summary of energy dissipation structures design

Structure	Minimum depth (m)	Minimum Length (m)
WRD N1 A	1.0	2.5
Dingo 1 pit and WRD S1 Junction	1.0	2.0
Dingo 2 Pit	1.0	2.5
Jackson Pit West	1.5	3.0

The approximate diversion channel alignment for each structure is shown below in Figure 6.2 and Figure 6.3.

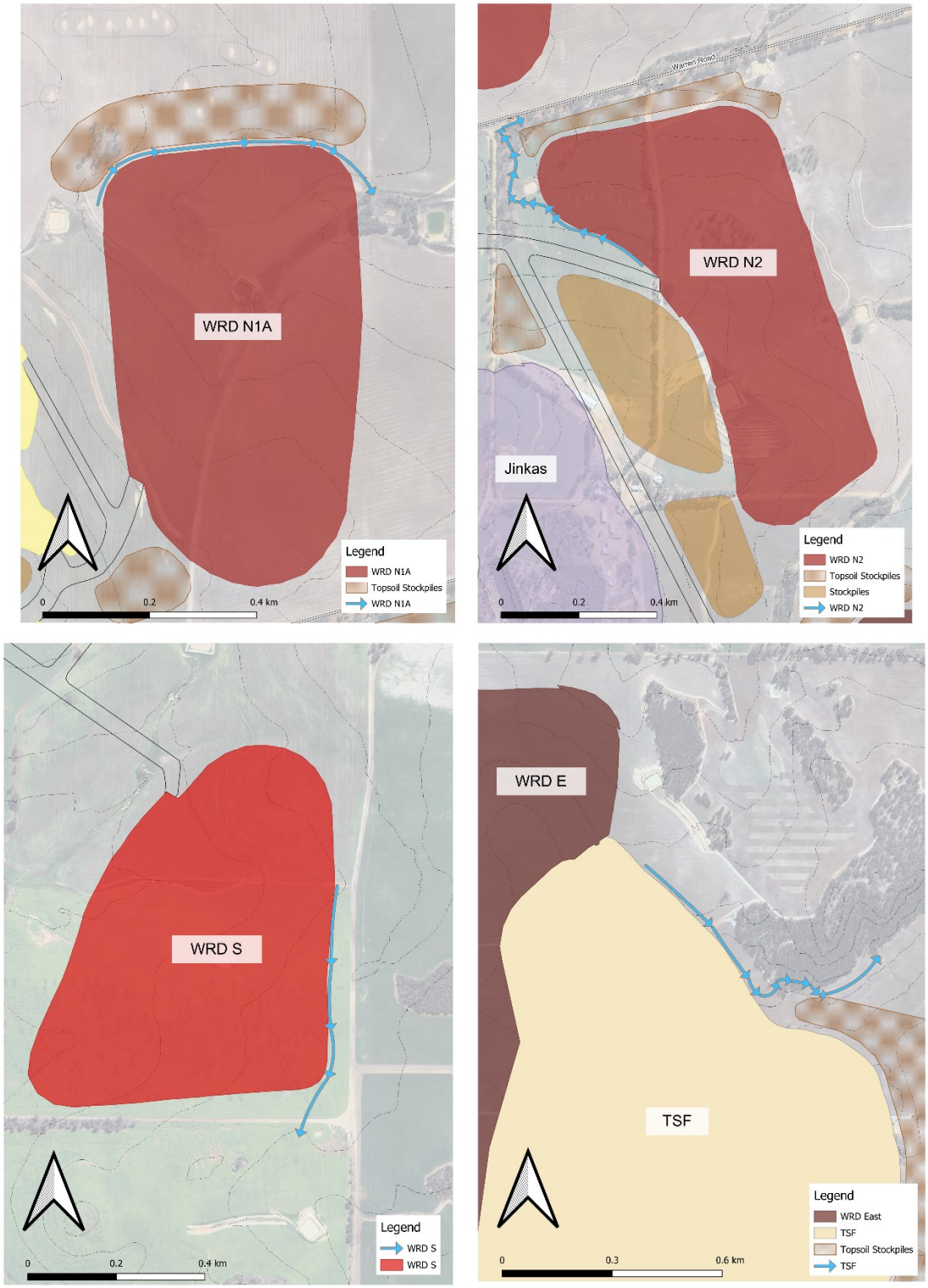


Figure 6.2 Diversion channel alignment northern area

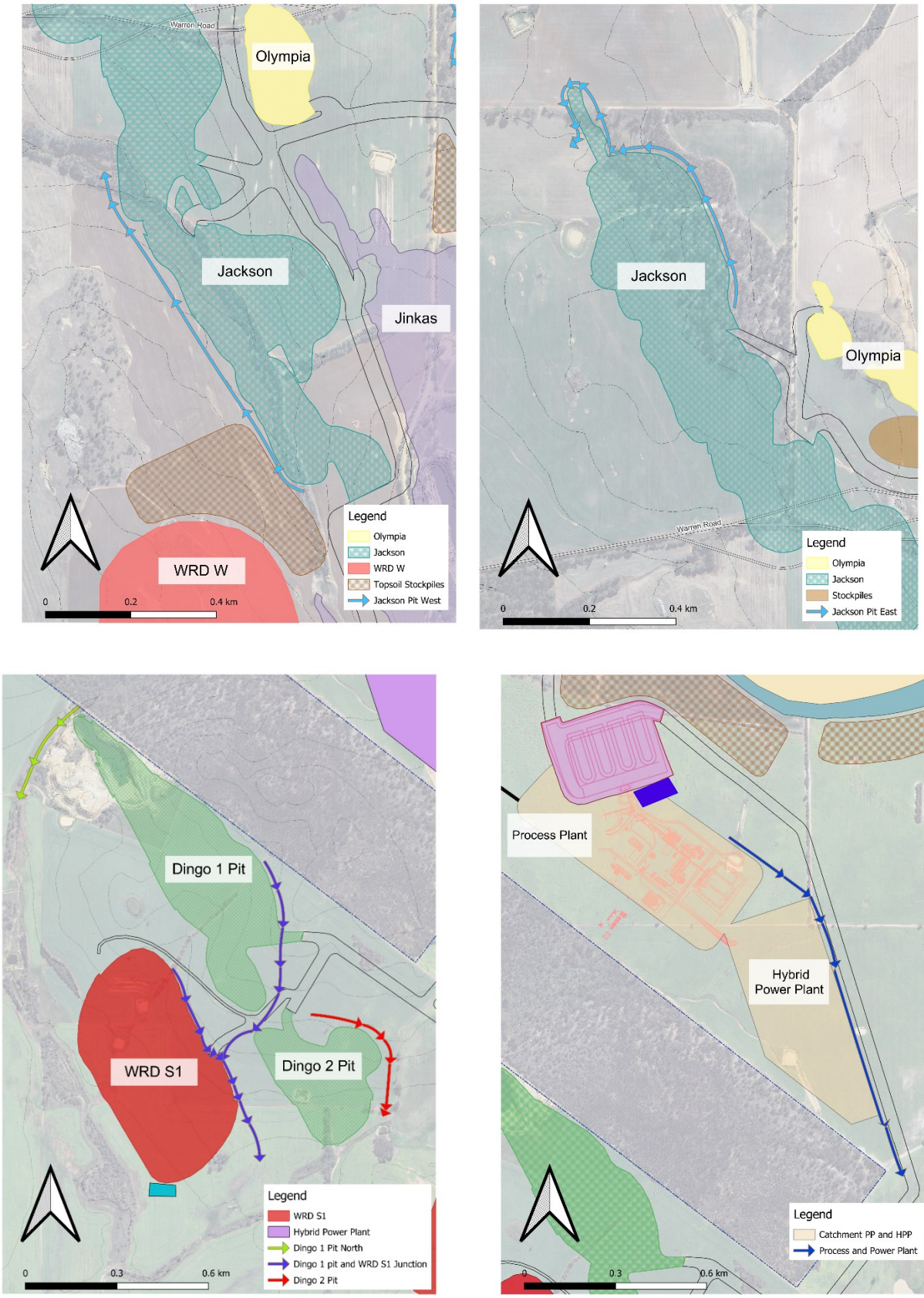


Figure 6.3 Diversion channel alignment southern area

6.3 ROM Pad and process and power plant stormwater ponds

Stormwater ponds were designed for a 1 in 20 AEP, 24-hour storm event, assuming a runoff coefficient of 0.9 representative of compacted, well-trafficked and capped surfaces, with catchment extents defined in Figure 6.4. Under these assumptions, the ROM Pad stormwater pond, draining a 10.2 ha catchment, requires a minimum storage volume of 7,700 m³, while the process plant and hybrid power plant stormwater pond, draining a 42.2 ha catchment, requires a minimum storage volume of 31,600 m³.

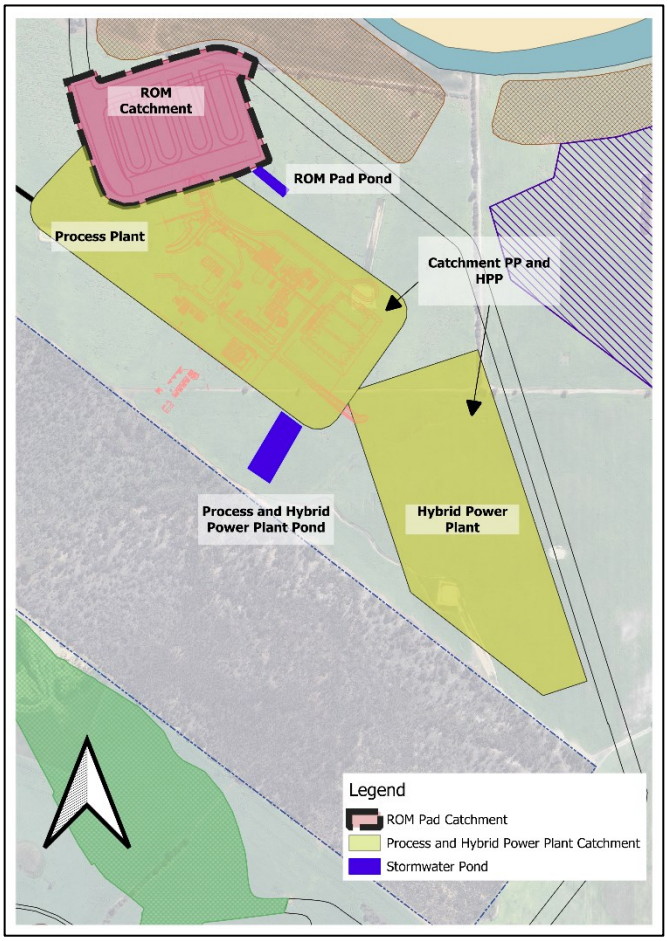


Figure 6.4 Stormwater Pond catchment areas and layout

A summary of the dimensions of the Stormwater Ponds are presented in Table 6.4.

Table 6.4 Stormwater Pond dimensions

Parameter	ROM Pad SWP	Process and Power Plant Pond
Pond base width (m)	20	50
Pond base length (m)	80	130
Total pond depth (m)	5.0	5.0
Internal embankment slopes	1H:1V	1H:1V
Total volume to crest (m^3)	8,000	32,500

A dead storage of 0.5 m depth at the base of the pond is provided as an allowance for sediment storage from the ROM pad and plant areas (i.e., sediment-laden surface runoff). The pond will be lined with a minimum thickness of 300 mm of clay to minimise seepage outflows from the pond.

The pond will be equipped with a pumping system to maintain the water levels within an optimal range to minimise uncontrolled spills during frequent events as per the zero-discharge license agreement, refer to Section 6.5 for further detail. In addition, the pond will include an emergency spillway designed to the 1 in 50 AEP storm event. Details on the spillway is included in Section 6.6.

Runoff from the ROM pad, and process and power plant surface resulting from the 1 in 20 AEP storm event containing sediment laden contact water will report to a perimeter drain aligned on the downstream crest perimeter of the pad and conveyed to the Stormwater Ponds. The perimeter drain will entail a trapezoidal cross-section with minimum hydraulic dimensions of 2 m base width, 0.8 m depth including freeboard with 2H:1V side slopes. A minimum longitudinal slope of 0.5% is recommended conveying accumulated runoff to the pond. It is recommended the perimeter drains be armoured with rock protection.

6.4 Sediment retention ponds

6.4.1 General

The intent of a sediment retention pond (SRP) is to collect and settle sediment-laden surface runoff expected from the WRDs and TSF. The intent is to also store volumes of seepage outflows from the WRD and TSF.

Similar to the Stormwater Pond, all SRPs are sized to contain the runoff volume from the 1 in 20 AEP storm event from the delineated upstream catchments. A dead storage of 10% of total pond volume for the SRPs is provided as an allowance for sediment storage from the WRD and TSF areas. The cleanout frequency of the accumulated sediment for each SRP is summarised in Section 7. All SRPs will be lined with clay placed to a minimum thickness of 300 mm to minimise seepage outflows.

The SRPs will be equipped with a pumping system to maintain the water levels within an optimal range to minimise uncontrolled spills during frequent events as per the zero-discharge license agreement. This was determined through a water balance assessment summarised in Section 6.5. In addition, the pond will include an emergency spillway designed to convey the peak flow resulting from the 1 in 50 AEP storm event. Details on the spillways are included in Section 6.6.

6.4.2 Design methodology

Estimating the composition of WRDs is inherently challenging due to the heterogeneous and often unpredictable nature of the materials involved. WRDs significantly vary in both the lateral and vertical direction of the landform and will comprise a mixture of mineralogy, grain size, moisture content, and degree of weathering. At this stage of design, there is limited data and information on what the KGP WRDs will be composed of without field tests and/or accurate site data. Therefore, an empirical approach has been adopted at this stage of design to estimate the volume of sediment yield that would be generated from the final landform of the WRDs. WSP is not the designer of record for the WRDs; therefore, the proposed methodology herein can be improved upon in future design stages when more site-specific information is available through laboratory testing (such as erodibility testing, suspended sediment yield testing, hydraulic wash testing, etc.).

Sediment management requirements, specifications and designs are based on the recommended Revised Universal Soil Loss Equation (RUSLE) method (K.G. Renard, 1997) approach and similar projects conducted by WSP. RUSLE is an empirically derived model based on extensive field data and statistical analysis to estimate average annual soil loss caused by sheet and rill erosion. For the approach herein, this annual soil loss represents the fines content present on the WRD landform surface that would be mobilised and conveyed downstream to the SRPs through rainfall-runoff. The RUSLE equation computes the average annual erosion expected on field slopes as:

$$A = R. K. L. S. C. P$$

Where:

- A = Average annual soil loss – *tons/ha/yr* or, *m^3/ha/yr*
- R = Rainfall-runoff erosivity factor – *MJ mm/(ha.h.yr)*
- K = Soil erodibility factor – *tons.h/(MJ.mm)* or, *m^3 h/(MJ.mm)*
- L.S = Slope length and steepness factor – unitless
- C = Cover management factor – unitless
- P = Support practice factor – unitless

The units are empirical and for the KGP, metric units have been used for consistency. Further description of the coefficients includes the following:

- **Rainfall-runoff erosivity**: The R factor is a measure of raindrops and intensity, which is defined by the mean annual sum of all individual storm erosion kinetic energy and the rainfall intensity (Yu, 2002).

  The unit of R factor is MJ.mm/(ha.h.yr),

  where:

  - MJ: the energy imparted by rainfall, which contributes to soil particle detachment
  - mm: the depth of rainfall
  - ha: the catchment area
  - h: duration of the rainfall event
  - yr: the annual period

- **Soil erodibility factor**: The K factor presents the effect of soil properties and soil profile characteristics on soil loss (K.G. Renard, 1997). This is the parameter which represents how easily the soil can be eroded based on the site soil type. The unit of K factor is tons.ha.h/(MJ.ha.mm) or tons.h/(MJ.mm). For calculations, metric unit (i.e., m^3. h/(MJ.mm)) has been used.

- **Slope Length factor**: The L.S is a dimensionless factor derived from topographic data. The erosion potential increases with the longer and steeper slopes.

- **Cover factor**: The C factor reflects the impact of cropping and management practices on erosion rates. This is a dimensionless factor
- **Support practice factor**: The P factor is a ratio of soil loss with a support practice i.e., contouring, strip cropping or terracing to soil loss with straight row farming up and down the slope (K.G. Renard, 1997).
- The volume of sediment has been calculated using the specific density of 2.65 tonnes/m^3 of the soil material type (silt and clay) and the catchment area.

The RUSLE equation was applied to delineated catchment areas for each WRD and the TSF. Delineated catchments are presented in Figure 6.5 for WRD North N1A and WRD North N2, Figure 6.6 for WRD West , Figure 6.7 for WRD East and TSF, and Figure 6.8 for WRD South S1 and WRD South S. Table 6.5 summarises the selected factors considered to be typical for the KGP WRDs based on the information available at this stage of design.

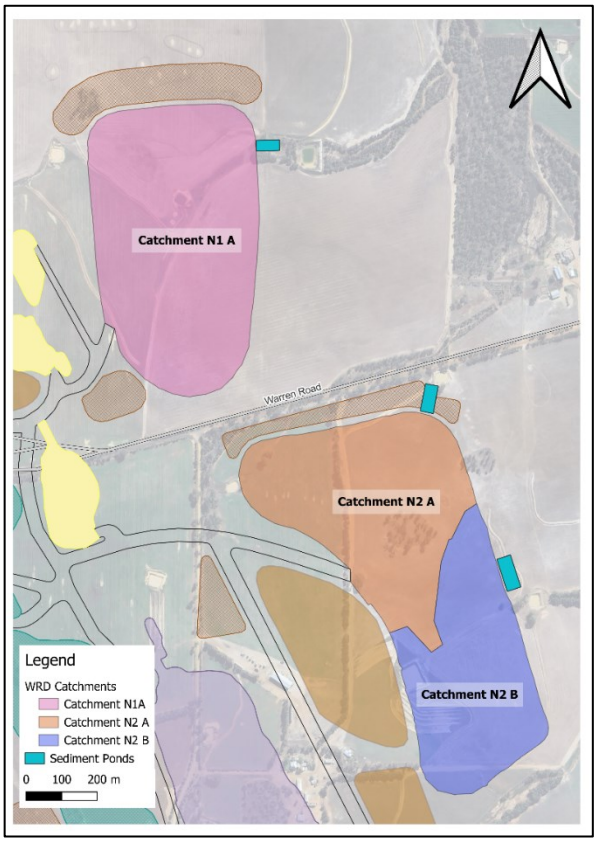


Figure 6.5 WRD North catchments

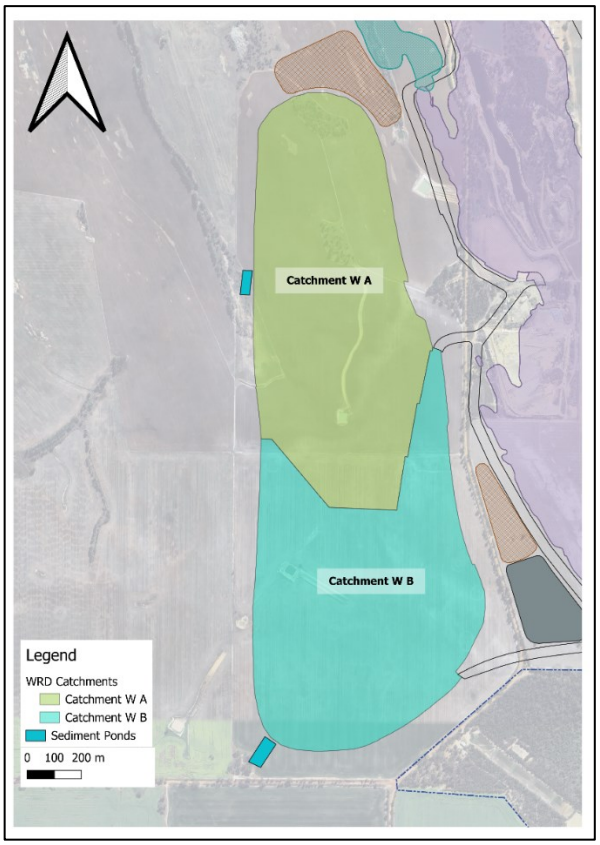


Figure 6.6 WRD West catchment

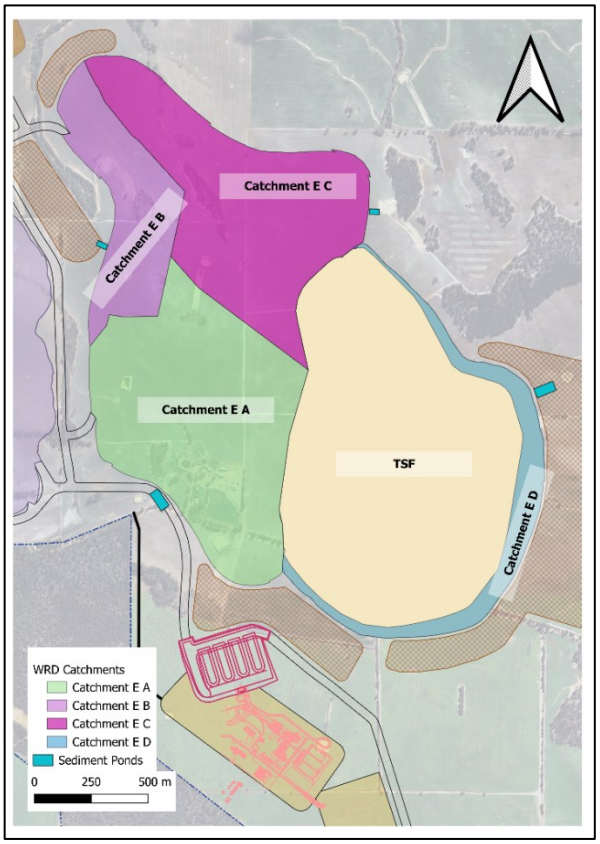


Figure 6.7 WRD East catchments and TSF

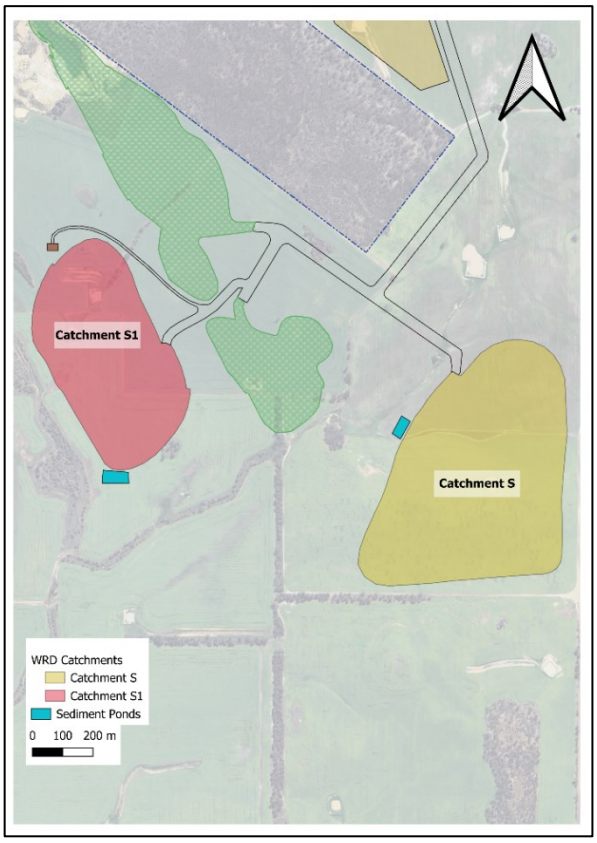


Figure 6.8 WRD South catchments

Table 6.5 Factors considered to be typical for the KGP WRDs

WRD Name	Catchment name	Pond name	R factor	K factor	LS factor	C factor	P factor
WRD East	Catchment E A	Pond E A	696	0.035	5.74	0.05	1
	Catchment E B	Pond E B	696	0.035	7.14	0.05	1
	Catchment E C	Pond E C	696	0.035	6.63	0.05	1
	Catchment E D	Pond E D	696	0.035	1.69	0.05	1
WRD West	Catchment W A	Pond W A	696	0.035	4.73	0.05	1
	Catchment W B	Pond W B	696	0.035	5.84	0.05	1
WRD N1A	Catchment N1 A	Pond N1 A	696	0.035	7.14	0.05	1
WRD N	Catchment N2 B	Pond N2 B	696	0.035	4.73	0.05	1
	Catchment N2 A	Pond N2 A	696	0.035	5.84	0.05	1
WRD S	Catchment S	Pond S	696	0.035	2.84	0.05	1
WRD S1	Catchment S1	Pond S1	696	0.035	4.73	0.05	1

A SRP is designed for each reporting catchment area delineated for the WRD and TSF. SRPs are located at local topographic lows surrounding the WRD footprint to encourage passive drainage of runoff upstream. Table 6.6 provides a summary of the WRD delineated catchment areas and the estimated average annual soil loss for reach SRP.

Table 6.6 WRD catchment area and estimated average annual soil loss

WRD ID	Catchment ID	Catchment area (km^2)	SRP ID	Width (m)	Length (m)	Depth including Spillway flow depth and Freeboard (m)	Estimate average annual soil loss (m^3/ha/yr)	Estimated sediment volume per year (m^3)
WRD East	Catchment E A	0.8	Pond E A	40	120	2.5	3	217
	Catchment E B	0.3	Pond E B	25	75	2.5	3	101
	Catchment E C	0.7	Pond E C	35	105	2.5	3	210
	Catchment E D	0.2	Pond E D	20	60	2.5	1	15
WRD West	Catchment W A	0.8	Pond W A	35	105	2.5	2	169
	Catchment W B	0.8	Pond W B	35	105	2.5	3	207
WRD N1A	Catchment N1A	0.3	Pond N1A	25	75	2.5	3	111
WRD N	Catchment N2 B	0.2	Pond N2 A	20	60	2.5	2	44
	Catchment N2 A	0.3	Pond N2 B	25	75	2.5	3	68
WRD S	Catchment S	0.4	Pond S	30	90	2.5	1	54
WRD S1	Catchment S1	0.2	Pond S1	25	75	2.5	2	54

A WRD perimeter drain, and separation bund conveyance system will be established along the outer toe of the WRD footprint. Runoff from the WRD resulting from the 1 in 20 AEP storm event containing sediment laden contact water will report to the perimeter drain and conveyed to the SRPs. The perimeter drain will entail a trapezoidal cross-section with minimum hydraulic dimensions of 2 m base width, 0.8 m depth with 2H:1V side slopes. A minimum longitudinal slope of 0.5% is recommended conveying accumulated runoff to the SRPs. It is recommended the perimeter drains be armoured with rock protection.

A separation berm will be established downstream of the perimeter drain (between the perimeter drain and the outer natural catchments) and along the same perimeter drain alignment towards the SRPs. The intent of the separation berm is to prevent contact water from the WRD and non-contact water from the natural catchment (or from adjacent diversion channels) from crossing. The separation berm will be sized to contain the peak runoff flows generated from the WRD during the 1 in 100 AEP design storm event; the perimeter drain will be used as part of the hydraulic capacity for this event as well. The minimum dimensions of the separation bund include a trapezoidal cross-section with a minimum 1 m crest width, 1 m height, and 2H:1V side slopes.

The final rehabilitated WRD design surfaces in closure were provided by Ausgold for this assessment which include shallower batter slopes than that during operations. With that, more area is available for the SRPs, and the perimeter drain and separation bund conveyance systems than that shown in the design figures.

6.5 Pond operating water levels and pumping rates

To maintain all pond operating water levels to avoid uncontrolled spills as per the zero-discharge permit for frequent rainfall events, the pond will be equipped with a pumping system. To determine the optimum pump rate and operating range to avoid uncontrolled spills due to climatic variation accounting for large storm events, a water balance model was developed.

The water balance model was developed using the GoldSim software (version 15.0.0257), developed by GoldSim Technology Group LLC (www.goldsim.com). GoldSim is a probabilistic simulation and modelling software package and is well suited to the development of graphically oriented models and with developed logic for networks, such as water balances. The model operates as a daily timestep and predicts the water storage volume of the SRPs and its associated variabilities driven by the simulation of paired annual rainfall and evaporation data derived from long term historical records.

The SRPs water balance concept and associated water fluxes into and out of the pond are represented in Figure 6.9.

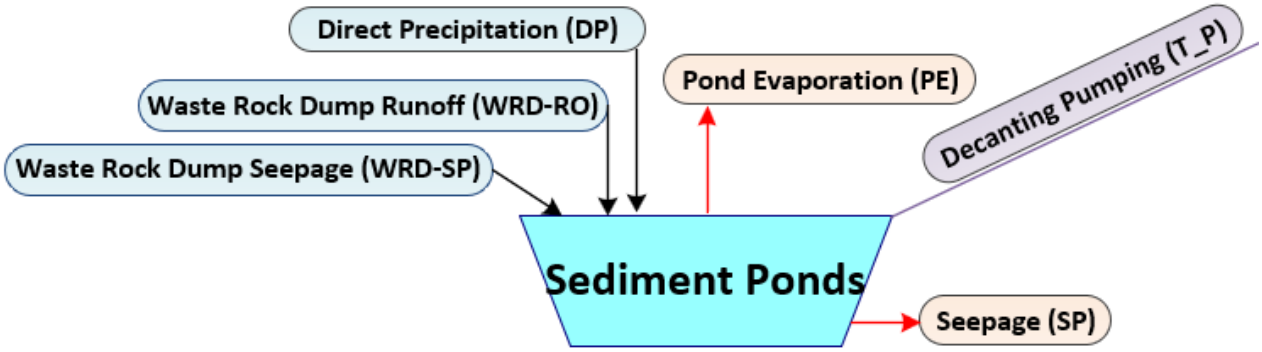


Figure 6.9 Pond water balance concept

The development of the stochastic climate generator that allows for probabilistic simulations for a range of outcomes based on climate variability is further described in the site-wide water balance model report (WSP, 2025a).

The basis and criteria (WSP, 2025c) adopted to determine the optimal operating water levels within the KGP ponds include the following:

- A 10% of total pond volume allowance was assumed for sediment storage.
- A 10% runoff coefficient is applied to the WRDs and 90% to the ROM pad for daily rainfall.
- A 35% coefficient for daily rainfall is assumed to represent seepage from the WRDs.
- A pump capacity of 200 m^3/hour was adopted with one pump for each sediment pond; however, to avoid any uncontrolled spills, additional (or back up) pumps were included in the model. The model will determine the number of pumps required in any given day. Pumping was assumed to be activated when the water level in the pond is within 1 metre of the crest (using the crest as a reference due to variable pond depths).
- A clay lined pond with a seepage rate of 10 mm/d over the ponded area.

Table 6.7 summarises general variations in pumping to avoid uncontrolled spills from the SRPs and Stormwater Pond under different climatic scenarios (baseline, wetter, and drier). In general, for baseline climate, average pumping frequencies range from 36 to 42 events per year for all the ponds, with the highest activity in Pond E D, Pond W A, Pond N1 A and Pond N2 B(up to 43 events per year). The Stormwater Pond is anticipated to have a pumping frequency of 9 days per year. Volumes pumped away from the ponds vary widely from as low as 28 ML/year in smaller or low-activity ponds (e.g., Pond E D) to over 111 ML/year in the Pond W A. In subsequent stages of the SWMP design, the fate of pumped volumes from SRPs and Stormwater Pond can be further assessed and managed by mechanical evaporators or an evaporation pond (or suitable alternative storage area).

For baseline climate, most SRPs can handle the required pumping to avoid uncontrolled spills using a single 200 m^3/hour pump for 98% of the time modelled with additional (or back up) pumps the remaining 2% of the time. However, the SRP Pond E A requires one additional pump 14.9% of the time and two additional pumps 1.6% of the time. The SRP Pond E C requires one additional pump 9.1% of the time and two additional pumps 0.8% of the time. Likewise, the SRP Pond W A and Pond W B require one additional pump 11% of the time and two additional pumps 1.2% of the time. Similarly, the Stormwater Pond needs one additional pump 64.4% of the time and two additional pumps 3.9% of the time. Events larger than those modelled in the water balance model may still result in uncontrolled spills; however, these are expected to be rare.

Figure 6.10 and Figure 6.11 represents the volume and water level, respectively, of WRD East Pond E A over a 10-year operational trend as an example of the probabilistic water balance modelling results. Overall, the data indicates that wetter conditions typically lead to slightly increased pumping rates, while drier conditions reduce both frequency and volume.

Table 6.7 Summary of frequency of pumping, pumped volume under different climatic scenarios

Mine Structure	SRP Name	Year to come online	Average Frequency of Pumping (per year)			Average Pumped Outflow Volumes (ML/year)		
			Baseline	Wetter	Drier	Baseline	Wetter	Drier
WRD East	Pond E A	Year 1	37	37	29	110	114	76
	Pond E B	Year 1	41	42	33	43	45	30
	Pond E C	Year 1	40	33	37	97	100	67
	Pond E D	Year 1	42	43	35	28	29	19
WRD West	Pond W A	Year 1	42	43	34	111	115	77
	Pond W B	Year 1	42	42	34	110	114	76
WRD N1A	Pond N1A	Year 1	42	43	35	49	50	34
WRD N	Pond N2 B	Year 1	42	43	35	49	50	34
	Pond N2 A	Year 1	36	37	29	33	34	23
WRD S	Pond S	Year 1	37	38	30	55	57	38
WRD S1	Pond S1	Year 1	36	37	29	33	34	22
Stormwater Pond	Stormwater Pond	Year 1	9	9	6	52	54	36
Process Plant and Power Plant	Pond Plants	Year 1	47	47	45	70	73	46

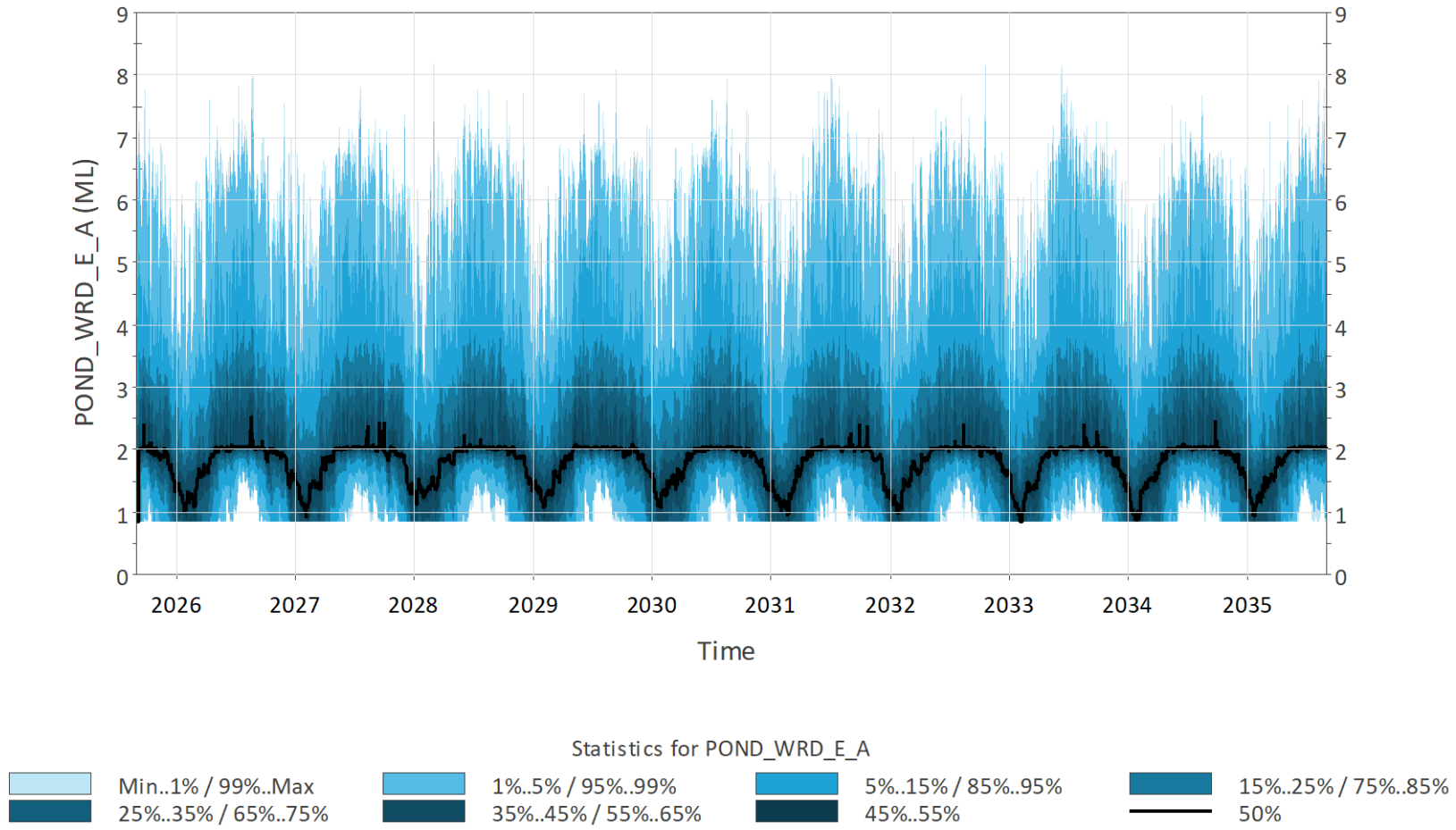


Figure 6.10 WRD East Pond E A volume statistics over 10-year operational period

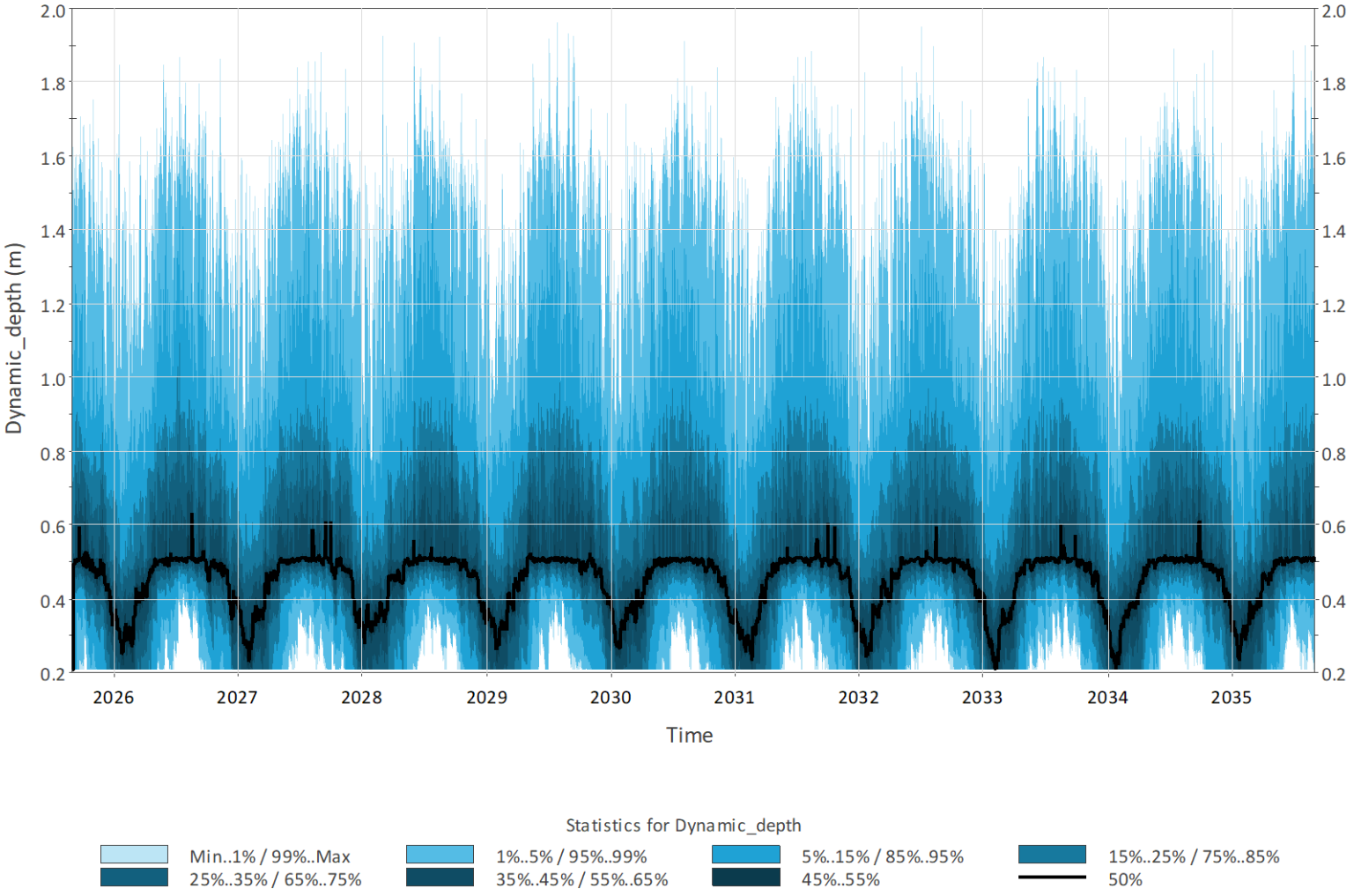


Figure 6.11 WRD East Pond E A water level statistics over 10-year operational period

6.6 Pond emergency spillways

All ponds must have emergency spillways to safely convey discharges associated with extreme storm events that exceed the design capacity of the ponds or multiple storms occurring within a short period. All pond spillways have been designed to convey the peak flow resulting from the 1 in 50 years AEP storm event.

The estimation of design peak flows for the upstream catchments of the ponds were based on application of the DRAINS runoff-routing model, Watercom Drains x64 (Version 2025.01) software package. This software is capable of simulating watershed systems and flood routing events using the Australian Rainfall and Runoff (ARR) recommended procedures (Ball J, 2019). A summary of the DRAINS model input parameters used to size the spillway crest width is presented in Table 6.8 and the dimensions are provided in Table 6.9 for each spillway.

Assuming a broad-crested weir with a discharge coefficient of 1.6, the required spillway crest widths and depths were estimated. Rock riprap will also be placed on the spillway and downstream of the embankment to provide protection against the higher flow velocities and increased risk of erosion during periods of spillway discharge.

Table 6.8 Summary of spillway hydraulic modelling parameters

Parameter	Value
Hydrologic model	Storage routing model (Runoff Analysis and Flow Training Simulation; RAFTS)
Initial and continuous losses (IL/CL)	See Table 6.9
Initial water level	At spillway crest invert elevation
Design storm event	1 in 50 AEP
Spillway geometry	Broad-crested trapezoidal weir with 2H:1V side slopes
Target spillway depth including 0.3 m freeboard	0.5 m
Spillway lining	Minimum D50 = 100 mm placed to a minimum thickness of 150 mm (1.5 x D50) following the methodology presented in HEC-15 (Kilgore & Cotton, 2005).

Table 6.9 Emergency spillway dimensions summary

Mine Structures	Pond Name	Critical Duration (hour)	Initial Losses (IL) (mm)	Continuing Losses (CL) (mm/hour)	Peak Spillway Outflow (m^3/s)	Spillway crest base width (m)
WRD East	Pond E A	20 min	2	30	3.5	21
	Pond E B	20 min	2	30	1.1	5
	Pond E C	20 min	2	30	2.9	17
	Pond E D	15 min	2	30	0.2	2
WRD West	Pond W A	20 min	2	30	2.5	15
	Pond W B	20 min	2	30	2.0	11
WRD N1A	Pond N1A	20 min	2	30	1.1	5
WRD N	Pond N2 B	20 min	2	30	0.8	3
	Pond N2 A	20 min	2	30	1.2	6
WRD S	Pond S	20 min	2	30	1.7	9
WRD S1	Pond S1	15 min	2	30	1.5	8
ROM Pad	STORMWATER POND	10 min	3	45	0.4	2
Process Plant and Power Plant	Pond Plants	10 min	3	45	0.7	5

6.7 Considerations for future design stages

The following considerations can be further assessed in subsequent design stages of the SWMP:

- At this stage of design, there is limited data and information on what the KGP WRDs will be composed of without field tests and/or accurate site data. Therefore, the RUSLE equation (an empirical approach) has been adopted to estimate the volume of sediment yield that would be generated from the final landform of the WRDs to size the SRPs. WSP is not the designer of record for the WRDs; therefore, the proposed methodology herein can be improved upon in future design stages when more site-specific information is available through laboratory testing (such as erodibility testing, suspended sediment yield testing, hydraulic wash testing, etc.).
- The diversion channels have been sized directly using hydrological peak flow estimates derived for the post-development scenario. Further review of the channel dimensions through detailed hydraulic modelling of the proposed diversion drains in TUFLOW may be undertaken during future design development to confirm hydraulic performance and conveyance capacity, if required.
- The cross-sectional side slopes of the drains, diversion channels and ponds can be further assessed through geotechnical stability analyses using parameters obtained from a site investigation along the alignments and locations. Stability analyses were excluded from the assessment herein.
- Based on the flood mapping results for Scenario 2 (refer to Section 5.2.2), floodways sized to the 1 in 100 AEP storm event are recommended to be subsequently designed at certain locations along the site access roads. Sizing of floodways were excluded from the assessment herein. Figure 6.12 presents the access road locations for the recommended floodways. Should site access roads be amended in the next stage of design, floodway locations should be revisited.
- Topographic depressions near critical infrastructure have been identified. To reduce ponding in these areas, infilling the low-lying zones with inert waste rock or bulk fill, and grading away from the critical infrastructure is recommended over constructing large diversion channels. Examples of such areas are shown in Figure 6.13.
- The fate of pumped volumes from ponds should be assessed in later design stages considering the site-wide water balance (WSP, 2025a). The next design phase should also evaluate the feasibility and efficiency of mechanical evaporators versus an evaporation pond. The efficiency use of mechanical evaporators declines during high rainfall events, which is when pumped volumes from ponds increase.
- Location of SRPs and alignments of non-contact water diversion channels should be confirmed using the operation landform of the WRDs, not the rehabilitated surface as used herein.

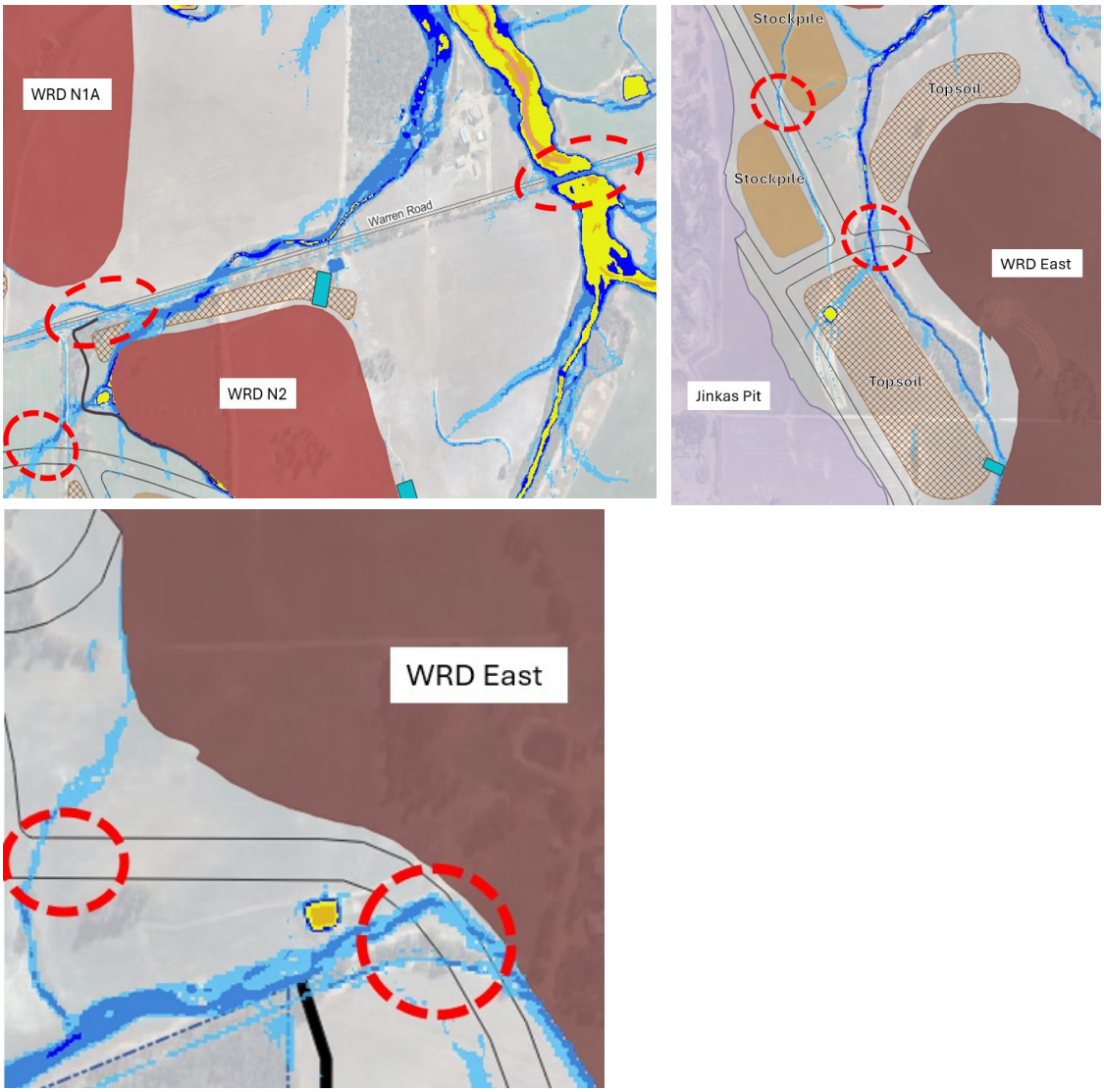


Figure 6.12 Proposed locations of recommended floodways on site access roads

Figure 6.13 Example of locations where localised ponding occurs against critical infrastructure that can be managed through backfilling of topographic lows

7 Monitoring and maintenance

A monitoring and maintenance plan should be developed and implemented for the site-wide SWMP considering the following as a minimum:

- All pond locations, localised drains, and diversion channels should be inspected on an annual basis, as a minimum, particularly prior to the onset of the wet season.
- The SWMP structure inspections should also be undertaken after large rainfall events to document signs of erosion and scour, or worsened erosion and scour, along critical components of the SWMP structures and downstream outlet areas due to the large rainfall event.
- Restoration of any failed areas to reinstate conveyance capacity of the design peak flow and containment of peak water depths should be undertaken immediately after a rainfall event.
- Monitoring of sediment accumulation along localised drains, diversion channels, spillway channels, and energy dissipation basins should also be undertaken on annual basis, as a minimum, to ensure the minimum depths are still achieved prior to the onset of any large rainfall event. Should sediment accumulation cause a reduction in available storage, removal of silt/sediment from the spillway structures may be required.
- Monitoring and regular clean-out of accumulated sediment in ponds should be undertaken at the minimum recommended frequency as per Table 7.1 estimated from the average sediment yield estimated in Section 6.4.
- Monitor the minimum thickness of clay liner in the ponds, notably during clean out activity and inspect whether surface desiccation occurs within the clay layer which prevents performing as intended.
- Removal of established vegetation that may impact conveyance capacity in drains and channels or displace operational volumes in storage ponds.
- Monitor for animal activity such as established nesting, or dead animals, within the SWMP structures that may potentially obstruct flow or displace volume. These should be removed immediately upon identification.
- Infrastructure downstream of any discharge locations should be monitored for progressive erosion or flooding. Erosion protection or localised surface water management should be implemented if erosion or flooding occurs during frequent rainfall events.
- KGP environmental monitoring regime should be combined, where relevant, with the monitoring and maintenance plan for the SWMP.
- Maintain logs of inspections, maintenance actions, sediment removal volumes, and any repair work done.
- Access for continued monitoring and maintenance of these structures per the above items should remain until final closure and rehabilitation of the facility. If inspections confirm unacceptable conditions, corrective repairs or modifications should be implemented, so the structure’s performance becomes acceptable again.

Table 7.1 Estimated frequency of sediment clean out for SRPs per year

Mine structure	SRP Name	Maximum allowance for sediment storage (m^3)	Estimated sediment volume per year (m^3)	Minimum frequency of Clean out per year
WRD East	Pond E A	947	217	4
	Pond E B	367	101	4
	Pond E C	724	210	3
	Pond E D	234	15	16
WRD West	Pond W A	724	169	4
	Pond W B	724	207	4
WRD N1A	Pond N1A	367	111	3
WRD N	Pond N2 B	234	44	5
	Pond N2 A	367	68	5
WRD S	Pond S	530	54	10
WRD S1	Pond S1	367	54	7

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Appendix A

Flood maps

KGP-SWMP

Figure A1
Baseline Scenario
Maximum Depth

LEGEND

Model Extent

Depth (m)

<= 0.03	
0.03 - 0.10	
0.10 - 0.30	
0.30 - 0.50	
0.50 - 1.00	
1.00 - 1.50	
1.50 - 2.00	
2.00 - 3.00	
> 3.00	

EPSG:28350GDA94 / MGA zone 50
Universal Transverse Mercator (UTM)

Client: KGP
Project No: PS232070
Rev:1

Date:27-03-2026
Designed: SJ
Prepared: SJ
Reviewed: RS
Approved: NM

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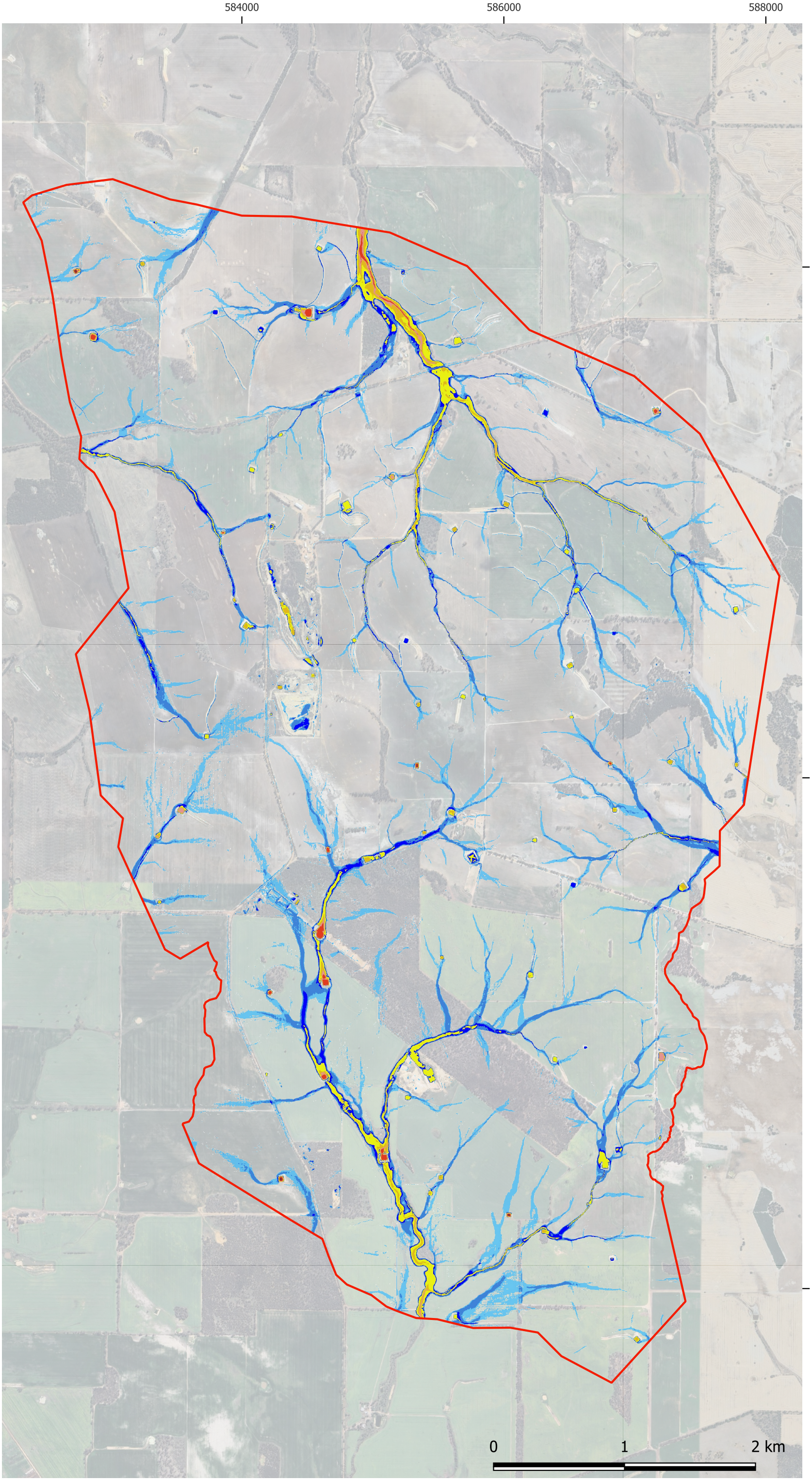

KGP-SWMP

Figure A2
Baseline Scenario
Maximum Velocity

LEGEND

Model Extent

Velocity (m/s)

<= 0.03	
0.03 - 0.10	
0.10 - 0.30	
0.30 - 0.50	
0.50 - 1.00	
1.00 - 1.50	
1.50 - 2.00	
2.00 - 3.00	
> 3.00	

EPSG:28350GDA94 / MGA zone 50
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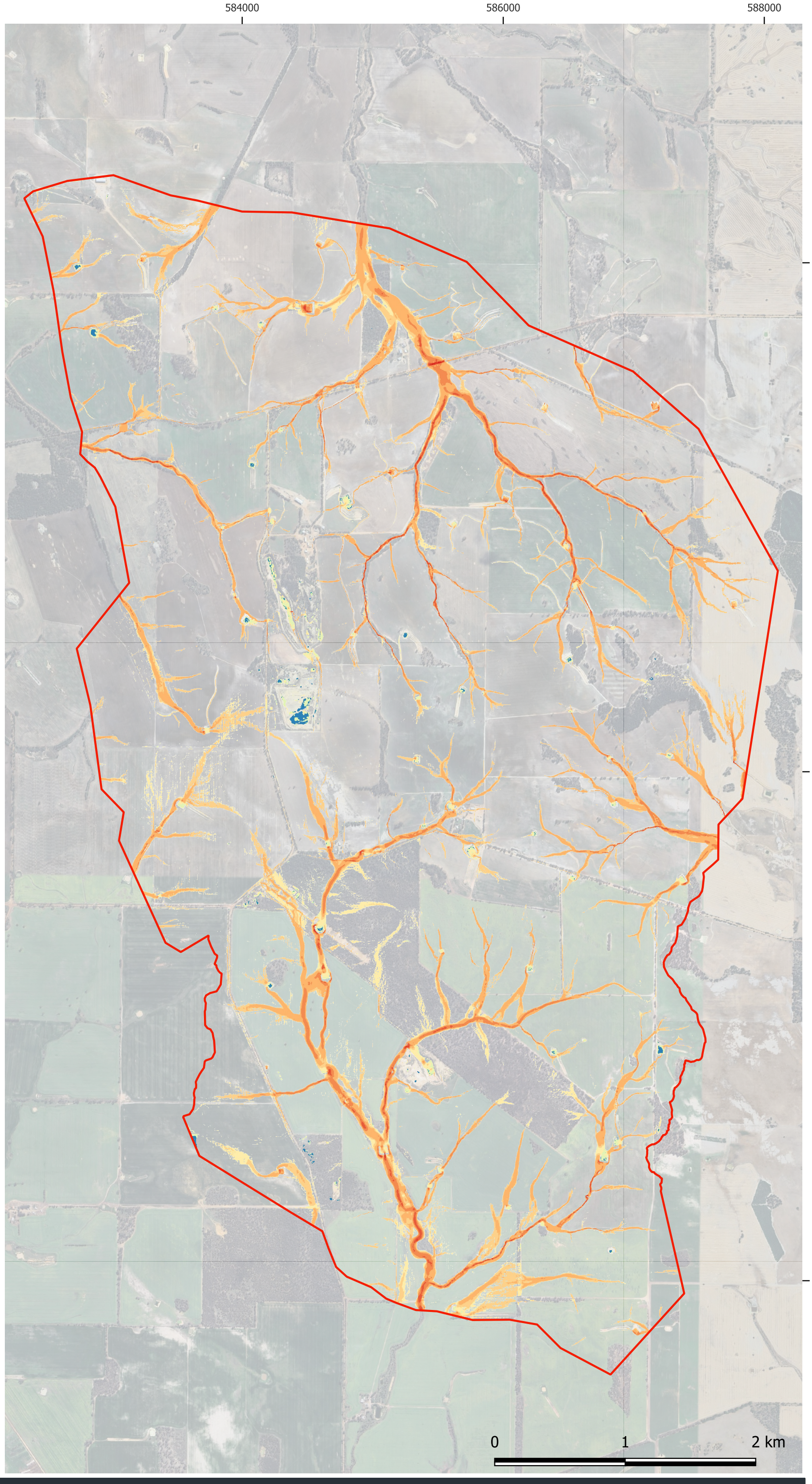

KGP-SWMP

Figure A3
Scenario 2
Post-development without mitigations
Maximum Depth

LEGEND

- Warren Road
- Roads
- Model Extent
- Olympia
- Jackson
- Jinkas
- Dingo
- TSF
- ROM Area
- Hybrid Power Plant
- Process Plant
- Exclusion Zone

Depth (m)

- <= 0.03
- 0.03 - 0.10
- 0.10 - 0.30
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 3.00
- > 3.00

EPSG:28350GDA94 / MGA zone 50
Universal Transverse Mercator (UTM)

Client: KGP
Project No: PS232070
Rev:1

Date:09-04-2026
Designed: SJ
Prepared: SJ
Reviewed: RS
Approved: NM

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583200
586800
6290700
6286800
6282900

Callout 1
WRD N1A
Warren Road
WRD N2
WRD W
WRD E
TSF
Callout 2
WRD S1
WRD S

0 1 2 km

KGP-SWMP

Figure A4
Scenario 2
Post-development without mitigations
Maximum Velocity

LEGEND

- Warren Road
- Roads
- Model Extent
- Olympia
- Jackson
- Jinkas
- Dingo
- TSF
- ROM Area
- Hybrid Power Plant
- Process Plant
- Exclusion Zone

Velocity (m/s)

- <= 0.03
- 0.03 - 0.10
- 0.10 - 0.30
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- 2.00 - 3.00
- > 3.00

EPSG:28350GDA94 / MGA zone 50
Universal Transverse Mercator (UTM)

Client: KGP
Project No: PS232070
Rev:1

Date:09-04-2026
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583200
586800
6290700
6286800
6282900

Callout 1
WRD N1A
Warren Road
WRD N2
WRD W
WRD E
TSF
Callout 2
WRD S1
WRD S

0 1 2 km

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Appendix 7: Surface Water Management Plan - Stormwater Design extract (WSP, 2025)

6 Surface water management plan

During operations, the control and management of surface runoff and discharges in and immediately downstream of the mine area are essential to provide:

- Protection to mine personnel and infrastructure during larger storm events.
- Diversion of non-contact surface runoff around mine infrastructure to be discharged to the downstream environment following the existing hydrology.
- Retain sediment and clean out at a prescribed frequency generated from the WRDs and TSF embankments onsite to maintain zero discharge of the sediment material to the downstream environment.

In adopting appropriate design criteria for the sizing of the surface water control structures, several factors were considered:

- compliance criteria of regulatory authorities.
- separation of contact and non-contact water as reasonably practicable.
- zero discharge for frequent storm events.
- risk to infrastructure in the event of inundation during more extreme storm durations of the mining operation.
- magnitude of design discharges, flow velocities and associated critical durations of flows in the mine area locations of mine infrastructure in relation to the existing hydrology.

Ausgold therefore requested that the integrated SWMP be sized to meet the requirements of the current proposed mine plan and associated infrastructure for a 10-year operational period commencing in year 2027.

6.1 Proposed surface water control structures

A summary of the key surface water control structures and the intent as part of the SWMP is provided in Table 6.1. A site plan of the SWMP general layout is provided in Figure 6.1.

Table 6.1 Surface water control structures summary

Critical mine infrastructure	Surface water control structure	Design intent description
Pits (Jinkas, Dingo, Olympia, Jackson)	Based on the location of the ultimate pit layouts relative to the surrounding topography, minimal flood impacts from extreme storm are expected as the pits are not adjacent/downstream to major drainage lines, and do not have large reporting catchment areas.	Non-contact water upstream of the pits require a localised diversion system for the surrounding relatively small catchments to reduce water volumes needing further management.

Critical mine infrastructure	Surface water control structure	Design intent description
Waste rock dumps (WRDs)	Similar to the pits, minimal flood impacts from extreme storm are expected as the WRDs are not adjacent/downstream to major drainage lines, and do not have large reporting catchment areas. Control structures for the WRDs are anticipated to include the following: — Sediment laden runoff will need to be captured and contained for further management. — Seepage collection and storage.	— Perimeter drains around the footprint of the WRDs (where practicable) to capture sediment laden runoff from the landforms and conveyed to sediment retention ponds (SRPs) for containment and further management (settling of particles). — Seepage collection ponds downstream of the WRDs (potentially acid forming or low water quality) to store seepage volumes from the landform for containment and further management.
Tailings storage facility (TSF)	Similar to the pits, minimal flood impacts from extreme storm are expected as the TSF is not adjacent/downstream to major drainage lines, and do not have large reporting catchment areas. Control structures for the TSF are anticipated to include the following: — Sediment laden runoff from the TSF embankment dam may need capturing and containment for further management. — Seepage collection and storage.	— Perimeter drains around the footprint of the TSF (where practicable) to capture sediment laden runoff from the TSF embankment and conveyed to a sediment retention pond (SRP) for containment and further management (settling of particles). — Seepage collection pond downstream of the TSF to store seepage volumes from the landform for containment and further management (as part of the TSF design scope of work, excluded from this scope).
Site plant area	Local drainage system conveying pad runoff to a stormwater pond.	Localised runoff from the site plant area to be captured and conveyed to a storm water pond (developed by others, excluded from this scope).
Run of Mine (ROM) pad	Local drainage system conveying pad runoff to a stormwater pond.	ROM pad is located to the north (upslope) of the site plant layout. Impacted runoff from the pad is captured by perimeter drains which conveys potentially sediment laden runoff to the stormwater pond for settlement of coarser particles. Additionally, ponded water can be reused in the process plant (if required).

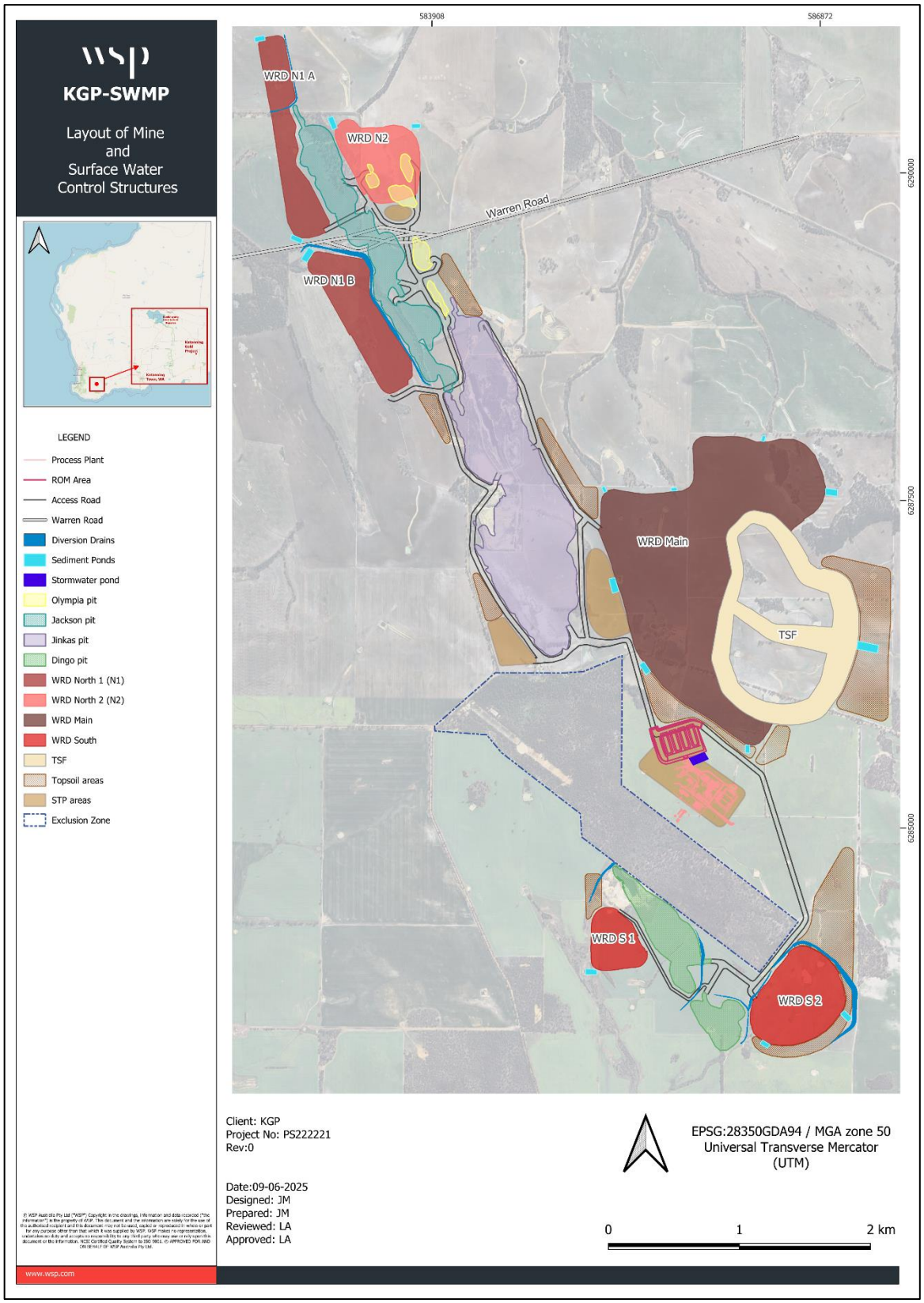

Figure 6.1 Layout of mine structures and surface water control structures

6.2 Open channel diversions

Hydraulic sizing of the proposed open channel diversions was undertaken based on the hydrologic and hydraulic modelling outputs of the contributing upslope catchments as discussed in Section 5. The design intent of the diversion channels is to capture non-contact overland drainage from undisturbed upslope catchments and convey it downstream away from the site. The 1 in 100 AEP peak discharges obtained from the Scenario 2 results (refer to Section 5.2.2) were used to hydraulically dimension the diversion channels. Once dimensioned, the channels were modelled in Civil 3D and the diversion design surfaces were incorporated into the TUFLOW hydrologic model to verify the commensurate hydraulic performance and ensure adequate conveyance under design conditions. The result of this exercise is presented in Scenario 3 (refer to Section 5.2.3).

The hydraulic sizing adopted the following approach:

- Using provided LiDAR survey, the diversion channels were vertically aligned to intersect existing drainage lines upslope of the mine structure. Along these alignments, channel sections were defined based on changes in longitudinal slope. A minimum longitudinal slope of 0.3% was adopted for the channels.
- Trapezoidal cross-section has been adopted with side slopes of 2H:1V.
- A recommended freeboard of 0.3 m above the peak flow depth was considered in the channel depth design.
- Peak flow depths within the channel were estimated using Manning's equation using a Manning's roughness coefficient of 0.035, which is considered to be appropriate for channels lined with riprap.
- Riprap D50 sizing was carried out for each channel section according to the respective longitudinal slope, following the methodology presented in HEC-15 (Kilgore & Cotton, 2005). This method considers hydraulic parameters such as shear stress, flow velocity, and channel slope to determine the median size required to ensure stability.

Table 6.2 summarises the channels design parameters for each identified slope section along the channel alignment, including the estimated peak flow rates, maximum flow velocities and recommended dimensions of the proposed diversion channels.

Table 6.2 Summary of Open Channel Design and Dimensions

Diversion channel ID	Section	Section length (m)	Minimum longitudinal slope	Design peak flow (m^3/s)[a]	Minimum base width (m)	Minimum channel depth (m)[b]	Riprap D50 (mm)
WRD N1 A	S1	172	2.3%	1.0	1.0	1.0	150
	S2	201	0.9%				100
	S3	370	0.3%				50
WRD N1 B	S1	386	0.7%	4.1	4.0	1.0	100
	S2	514	2.2%				150
	S3	477	0.6%				50
	S4	278	1.2%				100
Dingo North Channel 1	S1	28	4.1%	30.6	7.0	2.0	450
	S2	330	0.3%				100

Diversion channel ID	Section	Section length (m)	Minimum longitudinal slope	Design peak flow (m^3/s)[a]	Minimum base width (m)	Minimum channel depth (m)[b]	Riprap D50 (mm)
Dingo North Channel 2	S1	316	0.3%	0.4	1.0	1.0	50
	S2	317	3.7%				150
	S3	56	1.7%				100
WRD S 2 Channel 1	S1	72	0.3%	1.6	2.0	1.0	50
	S2	287	3.6%				200
WRD S 2 Channel 2	S1	331	1.8%	9.6	4.0	1.5	200
	S2	1028	0.3%				50
Dingo South	S1	125	0.4%	2.3	2.0	1.0	50
	S2	112	1.4%				150
	S3	65	4.2%				250
Dingo South & WRD S 2 Channel 1 Junction	S1	87	6.1%	2.3	2.0	1.0	250
	S2	176	3.9%				200

Notes:

a) Design peak flow as determined by TUFLOW modelling and presented in Scenario 2 results (refer to Section 5.2.2).

b) Minimum channel depth accounting for 0.3 m freeboard above peak flow depth estimated.

For certain diversion channels with steep longitudinal slopes resulting in high flow velocities, stilling basins were designed to dissipate hydraulic energy and mitigate erosion risks at the outlet. These basins were dimensioned to accommodate the full length and height of the hydraulic jump, based on the USBR Method (Basin Type I) (Peterka, 1984). Table 6.3 presents the channels for which stilling basins were incorporated, along with the corresponding height and length requirements defined for each structure.

Table 6.3 Summary of energy dissipation structures design

Structure	Minimum depth (m)	Minimum Length (m)
WRD N1 B	1.0	2.0
Dingo North Channel 2	1.0	1.5
Dingo South & WRD S 2 Channel 1 Junction	1.0	2.5

Design details of the open channel diversions and energy dissipation structures can be found in Appendix C, which presents the channel layout drawings and typical sections. Further design details will be developed during the next stage of the study.

6.3 ROM pad stormwater pond

The minimum required storage volume of 7,700 m^3 was estimated for a 1 in 20 AEP, 24-hour storm event for the ROM pad Stormwater Pond. This pond has been designed for the ROM Pad stormwater management assuming a runoff coefficient of 0.9 (assumed to be compacted, well trafficked and capped surface) and a catchment area of 10.2 ha (refer to Figure 6.2 for the reporting catchment area of the pond).

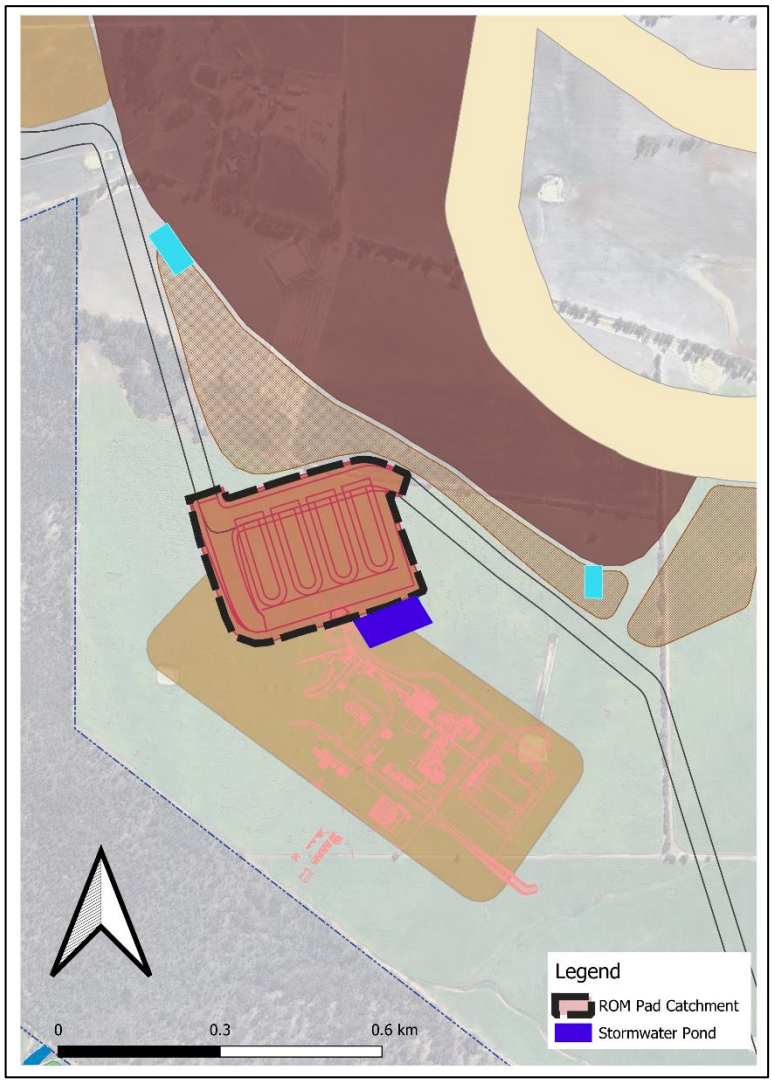

Figure 6.2 Stormwater Pond catchment area and layout

A summary of the dimensions of the ROM pad Stormwater Pond is presented in Table 6.4

Table 6.4 Stormwater Pond dimensions

Parameter	Value
Pond base width (m)	20
Pond base length (m)	80
Total pond depth (m)	5.0
Internal embankment slopes	1H:1V
Total volume to crest (m^3)	8,000

The stage storage curve for the Stormwater Pond is provided in Appendix B. A dead storage of 0.5 m depth at the base of the pond is provided as an allowance for sediment storage from the ROM pad area (i.e., sediment-laden surface runoff). The pond will be lined with a minimum thickness of 300 mm of clay to minimise seepage outflows from the pond.

The pond will be equipped with a pumping system to maintain the water levels within an optimal range to minimise uncontrolled spills during frequent events as per the zero-discharge license agreement, refer to Section 6.5 for further detail. In addition, the pond will include an emergency spillway designed to the 1 in 50 AEP storm event. Details on the spillway is included in Section 6.6.

Runoff from the ROM pad surface resulting from the 1 in 20 AEP storm event containing sediment laden contact water will report to a perimeter drain aligned on the downstream crest perimeter of the pad and conveyed to the Stormwater Pond. The perimeter drain will entail a trapezoidal cross-section with minimum hydraulic dimensions of 2 m base width, 0.8 m depth including freeboard with 2H:1V side slopes. A minimum longitudinal slope of 0.5% is recommended conveying accumulated runoff to the pond. It is recommended the perimeter drains be armoured with rock protection.

6.4 Sediment retention ponds

6.4.1 General

The intent of a sediment retention pond (SRP) is to collect and settle sediment-laden surface runoff expected from the WRDs and TSF. The intent is to also store volumes of seepage outflows from the WRD and TSF.

Similar to the Stormwater Pond, all SRPs are sized to contain the runoff volume from the 1 in 20 AEP storm event from the delineated upstream catchments. A dead storage of 10% of total pond volume for the SRPs is provided as an allowance for sediment storage from the WRD and TSF areas. The cleanout frequency of the accumulated sediment for each SRP is summarised in Section 7. All SRPs will be lined with clay placed to a minimum thickness of 300 mm to minimise seepage outflows.

The SRPs will be equipped with a pumping system to maintain the water levels within an optimal range to minimise uncontrolled spills during frequent events as per the zero-discharge license agreement. This was determined through a water balance assessment summarised in Section 6.5. In addition, the pond will include an emergency spillway designed to convey the peak flow resulting from the 1 in 50 AEP storm event. Details on the spillways are included in Section 6.6.

6.4.2 Design methodology

Estimating the composition of WRDs is inherently challenging due to the heterogeneous and often unpredictable nature of the materials involved. WRDs significantly vary in both the lateral and vertical direction of the landform and will comprise a mixture of mineralogy, grain size, moisture content, and degree of weathering. At this stage of design, there is limited data and information on what the KGP WRDs will be composed of without field tests and/or accurate site data. Therefore, an empirical approach has been adopted at this stage of design to estimate the volume of sediment yield that would be generated from the final landform of the WRDs. WSP is not the designer of record for the WRDs; therefore, the proposed methodology herein can be improved upon in future design stages when more site-specific information is available through laboratory testing (such as erodibility testing, suspended sediment yield testing, hydraulic wash testing, etc.).

Sediment management requirements, specifications and designs are based on the recommended Revised Universal Soil Loss Equation (RUSLE) method (K.G. Renard, 1997) approach and similar projects conducted by WSP. RUSLE is an empirically derived model based on extensive field data and statistical analysis to estimate average annual soil loss caused by sheet and rill erosion. For the approach herein, this annual soil loss represents the fines content present on the WRD landform surface that would be mobilised and conveyed downstream to the SRPs through rainfall-runoff. The RUSLE equation computes the average annual erosion expected on field slopes as:

$$A = R. K. L. S. C. P$$

Where:

- A = Average annual soil loss – *tons/ha/yr* or, $m^3/ha/yr$
- R = Rainfall-runoff erosivity factor – *MJ mm/(ha.h.yr)*
- K = Soil erodibility factor – *tons.h/(MJ.mm)* or, m^3 *h/(MJ.mm)*
- L.S = Slope length and steepness factor – unitless

- C = Cover management factor – unitless
- P = Support practice factor – unitless

The units are empirical and for the KGP, metric units have been used for consistency. Further description of the coefficients includes the following:

- **Rainfall-runoff erosivity**: The R factor is a measure of raindrops and intensity, which is defined by the mean annual sum of all individual storm erosion kinetic energy and the rainfall intensity (Yu, 2002).

  The unit of R factor is MJ.mm/(ha.h.yr),

  where:

  - MJ: the energy imparted by rainfall, which contributes to soil particle detachment
  - mm: the depth of rainfall
  - ha: the catchment area
  - h: duration of the rainfall event
  - yr: the annual period

- **Soil erodibility factor**: The K factor presents the effect of soil properties and soil profile characteristics on soil loss (K.G. Renard, 1997). This is the parameter which represents how easily the soil can be eroded based on the site soil type. The unit of K factor is tons.ha.h/(MJ.ha.mm) or tons.h/(MJ.mm). For calculations, metric unit (i.e., m^3. h/(MJ.mm)) has been used.

- **Slope Length factor**: The L.S is a dimensionless factor derived from topographic data. The erosion potential increases with the longer and steeper slopes.

- **Cover factor**: The C factor reflects the impact of cropping and management practices on erosion rates. This is a dimensionless factor

- **Support practice factor**: The P factor is a ratio of soil loss with a support practice i.e., contouring, strip cropping or terracing to soil loss with straight row farming up and down the slope (K.G. Renard, 1997).

- The volume of sediment has been calculated using the specific density of 2.65 tonnes/m^3 of the soil material type (silt and clay) and the catchment area.

The RUSLE equation was applied to delineated catchment areas for each WRD and the TSF. Delineated catchments are presented in Figure 6.3 for WRD North 1A and WRD North 2, Figure 6.4 for WRD North 1B, Figure 6.5 for WRD Main and TSF, and Figure 6.6 for WRD South 1 and WRD South 2. Table 6.5 summarises the selected factors considered to be typical for the KGP WRDs based on the information available at this stage of design.

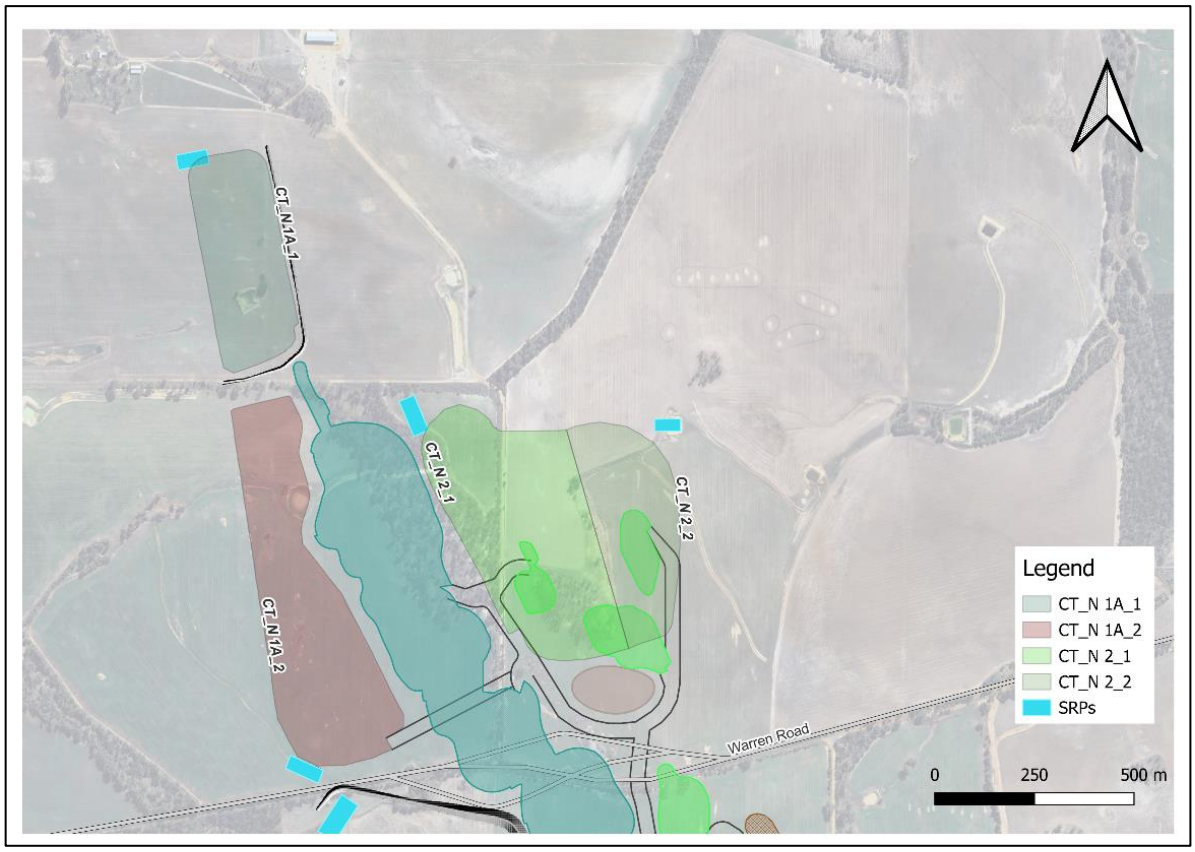

Figure 6.3 WRD N 1A and WRD N2 catchments

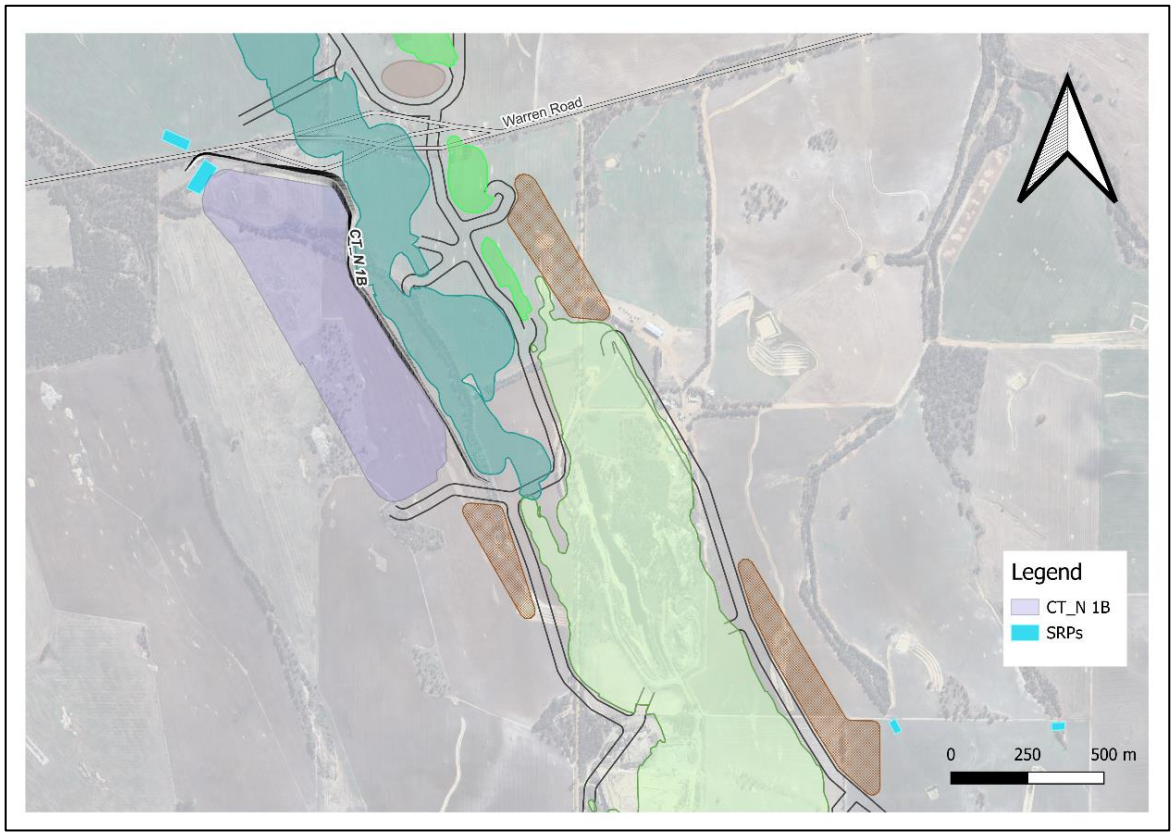

Figure 6.4 WRD N 1B catchment

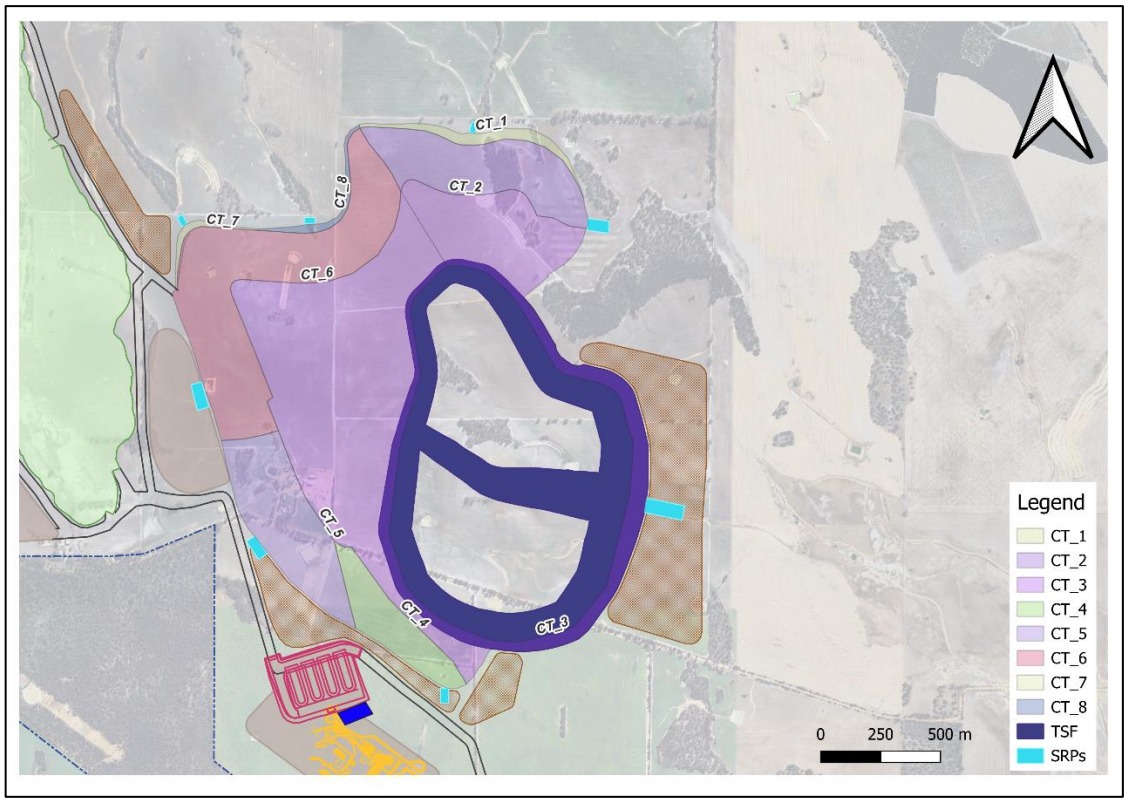

Figure 6.5 WRD Main catchments and TSF

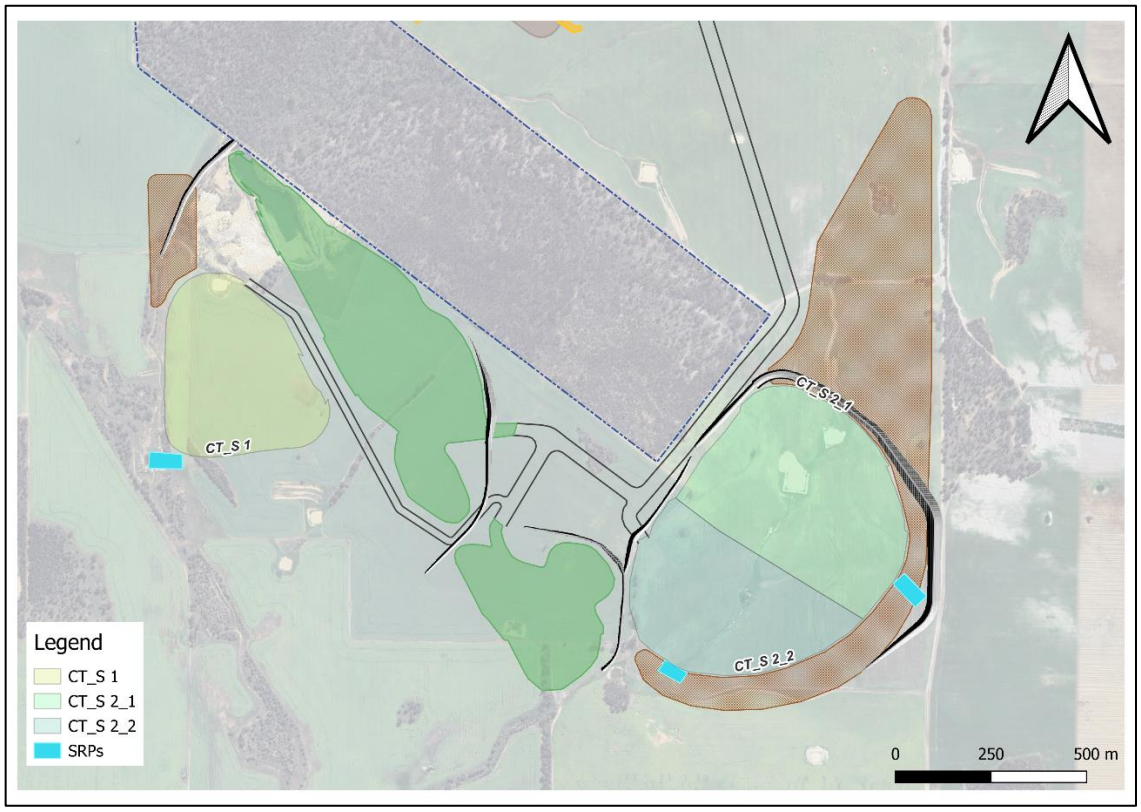

Figure 6.6 WRD S 1 and WRD S 2 catchments

Table 6.5 Factors considered to be typical for the KGP WRDs

WRD Name	Catchment name	Pond name	R factor	K factor	LS factor	C factor	P factor
WRD Main	CT_1	Main SRP POND 1	696	0.035	6.18	0.05	1
	CT_2	Main SRP POND 2	696	0.035	7.2	0.05	1
	CT_3	Main SRP POND 3	696	0.035	4.23	0.05	1
	CT_4	Main SRP POND 4	696	0.035	2.93	0.05	1
	CT_5	Main SRP POND 5	696	0.035	14.04	0.05	1
	CT_6	Main SRP POND 6	696	0.035	9.65	0.05	1
	CT_7	Main SRP POND 7	696	0.035	5.06	0.05	1
	CT_8	Main SRP POND 8	696	0.035	5.03	0.05	1
WRD N 1B	CT_N 1B	SRP N 1B POND 1	696	0.035	10.91	0.05	1
WRD N 1A	CT_N 1A_1	SRP N 1A POND 1	696	0.035	5.74	0.05	1
	CT_N 1A_2	SRP N 1A POND 2	696	0.035	7.94	0.05	1
WRD N 2	CT_N 2_1	SRP N 2 POND 1	696	0.035	2.93	0.05	1
	CT_N 2_2	SRP N 2 POND 2	696	0.035	7.13	0.05	1
WRD S 2	CT_S 2_1	SRP S 2 POND 1	696	0.035	8.68	0.05	1
	CT_S 2_2	SRP S 2 POND 2	696	0.035	9.71	0.05	1
WRD S 1	CT_S 1	SRP S 1 POND 1	696	0.035	9.99	0.05	1

A SRP is designed for each reporting catchment area delineated for the WRD and TSF. Refer to Figure 6.1 for location of SRPs downstream of the WRDs and TSF (alternatively, refer to the design figures provided in Appendix C). SRPs are located at local topographic lows surrounding the WRD footprint to encourage passive drainage of runoff upstream. The stage-storage curves for the SRPs are provided in Appendix B.

Table 6.6 provides a summary of the WRD delineated catchment areas and the estimated average annual soil loss for reach SRP.

Table 6.6 WRD catchment area and estimated average annual soil loss

WRD ID	Catchment ID	Catchment area (km^2)	SRP ID	Estimate average annual soil loss (m^3/ha/yr)	Estimated sediment volume per year (m^3)
WRD Main	CT_1	0.03	Main SRP POND 1	2.8	9
	CT_2	0.20	Main SRP POND 2	3.3	65
	CT_3	1.07	Main SRP POND 3	1.9	207
	CT_4	0.10	Main SRP POND 4	1.3	13
	CT_5	0.20	Main SRP POND 5	6.5	127
	CT_6	0.40	Main SRP POND 6	4.4	179
	CT_7	0.01	Main SRP POND 7	2.3	2
	CT_8	0.01	Main SRP POND 8	2.3	3

WRD ID	Catchment ID	Catchment area (km^2)	SRP ID	Estimate average annual soil loss (m^3/ha/yr)	Estimated sediment volume per year (m^3)
WRD N 1B	CT_N 1B	0.15	SRP N 1B POND 1	5.0	77
WRD N 1A	CT_N 1A_1	0.20	SRP N 1A POND 1	2.6	53
	CT_N 1A_2	0.31	SRP N 1A POND 2	3.6	113
WRD N 2	CT_N 2_2	0.10	SRP N 2 POND 2	3.3	34
	CT_N 2_1	0.20	SRP N 2 POND 1	1.3	26
WRD S 2	CT_S 2_1	0.11	SRP S 2 POND 1	4.0	44
	CT_S 2_2	0.28	SRP S 2 POND 2	4.5	125
WRD S 1	CT_S 1	0.16	SRP S 1 POND 1	4.6	72

A WRD perimeter drain, and separation bund conveyance system will be established along the outer toe of the WRD footprint. Runoff from the WRD resulting from the 1 in 20 AEP storm event containing sediment laden contact water will report to the perimeter drain and conveyed to the SRPs. The perimeter drain will entail a trapezoidal cross-section with minimum hydraulic dimensions of 2 m base width, 0.8 m depth with 2H:1V side slopes. A minimum longitudinal slope of 0.5% is recommended conveying accumulated runoff to the SRPs. It is recommended the perimeter drains be armoured with rock protection.

A separation berm will be established downstream of the perimeter drain (between the perimeter drain and the outer natural catchments) and along the same perimeter drain alignment towards the SRPs. The intent of the separation berm is to prevent contact water from the WRD and non-contact water from the natural catchment (or from adjacent diversion channels) from crossing. The separation berm will be sized to contain the peak runoff flows generated from the WRD during the 1 in 100 AEP design storm event; the perimeter drain will be used as part of the hydraulic capacity for this event as well. The minimum dimensions of the separation bund include a trapezoidal cross-section with a minimum 1 m crest width, 1 m height, and 2H:1V side slopes.

The final rehabilitated WRD design surfaces in closure were provided by Ausgold for this assessment which include shallower batter slopes than that during operations. With that, more area is available for the SRPs, and the perimeter drain and separation bund conveyance systems than that shown in the design figures.

6.5 Pond operating water levels and pumping rates

To maintain all pond operating water levels to avoid uncontrolled spills as per the zero-discharge permit for frequent rainfall events, the pond will be equipped with a pumping system. To determine the optimum pump rate and operating range to avoid uncontrolled spills due to climatic variation accounting for large storm events, a water balance model was developed.

The water balance model was developed using the GoldSim software (version 15.0.0257), developed by GoldSim Technology Group LLC (www.goldsim.com). GoldSim is a probabilistic simulation and modelling software package and is well suited to the development of graphically oriented models and with developed logic for networks, such as water balances. The model operates as a daily timestep and predicts the water storage volume of the SRPs and its associated variabilities driven by the simulation of paired annual rainfall and evaporation data derived from long term historical records.

The SRPs water balance concept and associated water fluxes into and out of the pond are represented in Figure 6.7.

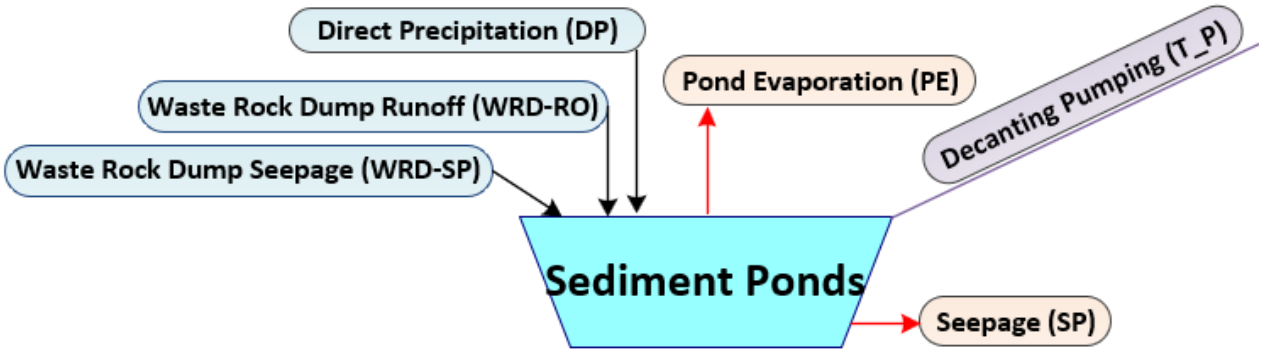

Figure 6.7 Pond water balance concept

The development of the stochastic climate generator that allows for probabilistic simulations for a range of outcomes based on climate variability is further described in the site-wide water balance model report (WSP, 2025a). The outcomes of the water balance herein have also been incorporated into the site-wide water balance model (WSP, 2025a).

The basis and criteria (WSP, 2025c) adopted to determine the optimal operating water levels within the KGP ponds include the following:

- A 10% of total pond volume allowance was assumed for sediment storage.
- A 10% runoff coefficient is applied to the WRDs and 90% to the ROM pad for daily rainfall.
- A 35% coefficient for daily rainfall is assumed to represent seepage from the WRDs.
- A pump capacity of 200 m^3/hour was adopted with one pump for each sediment pond; however, to avoid any uncontrolled spills, additional (or back up) pumps were included in the model. The model will determine the number of pumps required in any given day. Pumping was assumed to be activated when the water level in the pond is within 1 metre of the crest (using the crest as a reference due to variable pond depths).
- A clay lined pond with a seepage rate of 10 mm/d over the ponded area.

Table 6.7 summarises general variations in pumping to avoid uncontrolled spills from the SRPs and Stormwater Pond under different climatic scenarios (baseline, wetter, and drier). In general, for baseline climate, average pumping frequencies range from 35 to 48 events per year for all the ponds, with the highest activity in Main SRP Pond 8 (up to 48 events per year). The Stormwater Pond is anticipated to have a pumping frequency of 9 days per year. Volumes pumped away from the ponds vary widely from as low as 1 ML/year in smaller or low-activity ponds (e.g., Main SRP Pond 7) to over 145 ML/year in the Main SRP Pond 3. In subsequent stages of the SWMP design, the fate of pumped volumes from SRPs and Stormwater Pond can be further assessed and managed by mechanical evaporators or an evaporation pond (or suitable alternative storage area).

For baseline climate, most SRPs can handle the required pumping to avoid uncontrolled spills using a single 200 m^3/hour pump for 97% of the time modelled with additional (or back up) pumps the remaining 3% of the time. However, the Main SRP Pond 3 requires one additional pump 28.3% of the time and two additional pumps 4.5% of the time. Similarly, the Stormwater Pond needs one additional pump 65.3% of the time and two additional pumps 4.2% of the time. Events larger than those modelled in the water balance model may still result in uncontrolled spills; however, these are expected to be rare.

Figure 6.8 and Figure 6.9 represents the volume and water level, respectively, of Main SRP Pond over a 10-year operational trend as an example of the probabilistic water balance modelling results. Overall, the data indicates that wetter conditions typically lead to slightly increased pumping rates, while drier conditions reduce both frequency and volume.

Table 6.7 Summary of frequency of pumping, pumped volume under different climatic scenarios

Mine Structure	SRP Name	Year to come online	Average Frequency of Pumping (per year)			Average Pumped Outflow Volumes (ML/year)		
			Baseline	Wetter	Drier	Baseline	Wetter	Drier
WRD Main	Main SRP POND 1	Year 3	46	46	41	5	5	3
	Main SRP POND 2	Year 3	41	42	34	28	30	19
	Main SRP POND 3	Year 1	35	36	28	145	150	100
	Main SRP POND 4	Year 1	43	44	37	15	15	10
	Main SRP POND 5	Year 1	41	42	34	28	30	19
	Main SRP POND 6	Year 1	35	36	28	55	57	37
	Main SRP POND 7	Year 1	45	46	39	1	1	1
	Main SRP POND 8	Year 1	47	48	43	2	2	1
WRD N 1B	SRP N 1B POND 1	Year 3	45	46	40	45	47	31
WRD N 1A	SRP N 1A POND 1	Year 3	46	47	41	15	15	10
	SRP N 1A POND 2	Year 3	41	42	34	29	30	20
WRD N 2	SRP N 2 POND 1	Year 3	43	44	37	15	16	10
	SRP N 2 POND 2	Year 3	41	42	34	28	30	20
WRD S 2	SRP S 2 POND 1	Year 7	39	40	32	31	32	21
	SRP S 2 POND 2	Year 7	43	44	36	25	26	17
WRD S 1	SRP S 1 POND 1	Year 7	47	47	41	21	22	14
Stormwater Pond	Stormwater Pond	Year 1	9	9	7	53	54	36

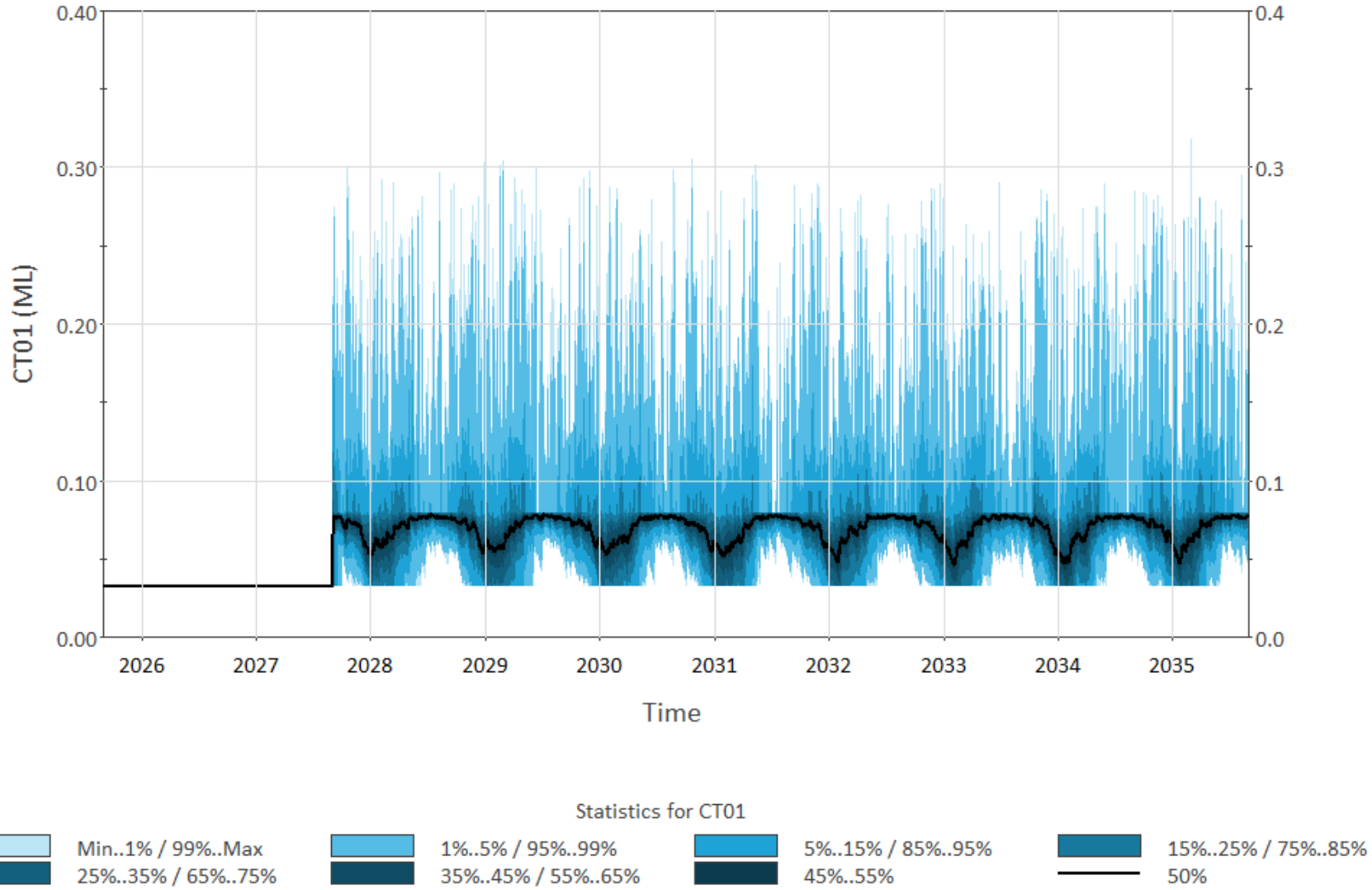

Figure 6.8 Main SRP Pond 1 volume statistics over 10-year operational period

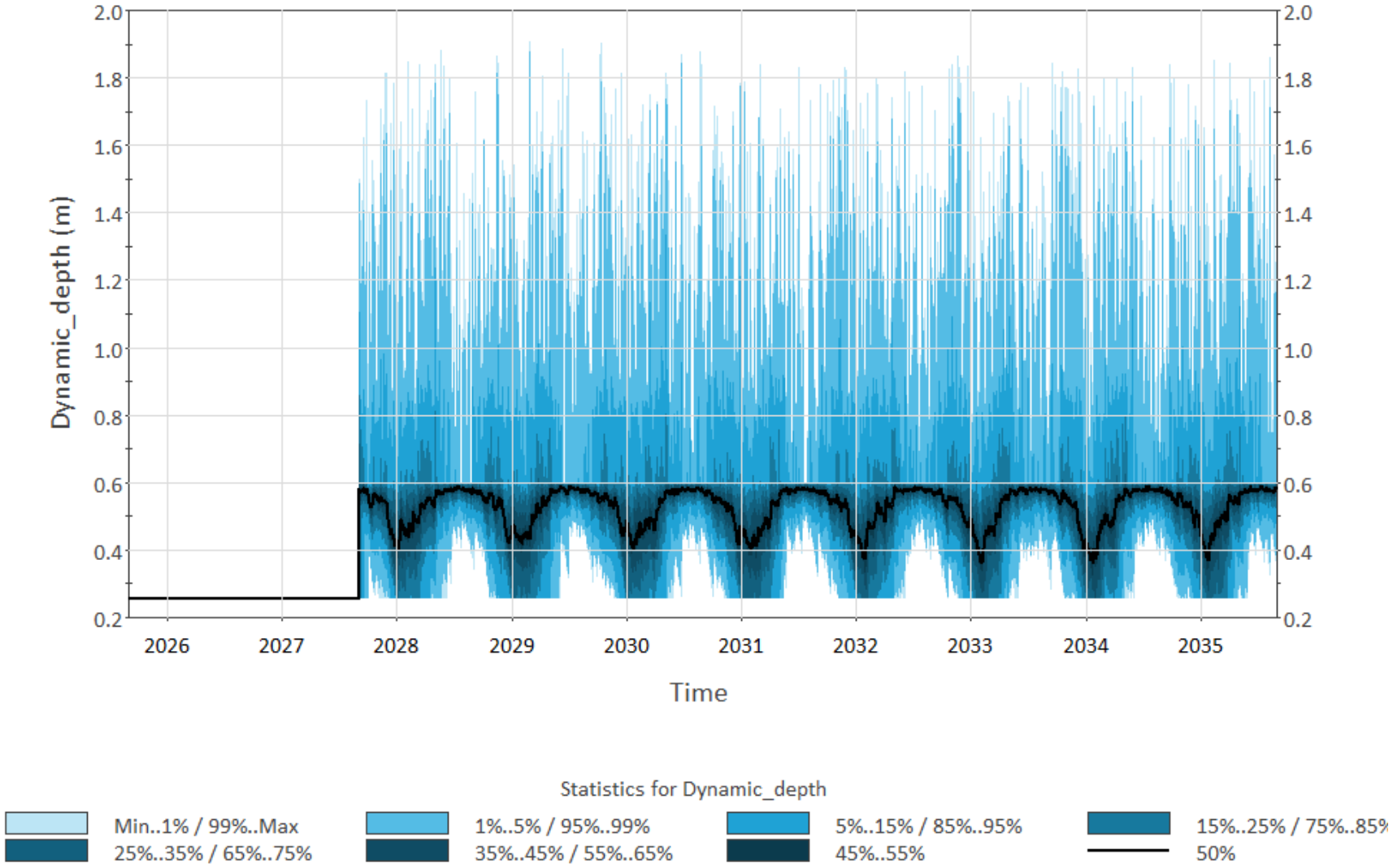

Figure 6.9 Main SRP Pond 1 water level statistics over 10-year operational period

6.6 Pond emergency spillways

All ponds must have emergency spillways to safely convey discharges associated with extreme storm events that exceed the design capacity of the ponds or multiple storms occurring within a short period. All pond spillways have been designed to convey the peak flow resulting from the 1 in 50 years AEP storm event.

The estimation of design peak flows for the upstream catchments of the ponds were based on application of the DRAINS runoff-routing model, Watercom Drains x64 (Version 2025.01) software package. This software is capable of simulating watershed systems and flood routing events using the Australian Rainfall and Runoff (ARR) recommended procedures (Ball J, 2019). A summary of the DRAINS model input parameters used to size the spillway crest width is presented in Table 6.8 and the dimensions are provided in Table 6.9 for each spillway.

Assuming a broad-crested weir with a discharge coefficient of 1.6, the required spillway crest widths and depths were estimated. Rock riprap will also be placed on the spillway and downstream of the embankment to provide protection against the higher flow velocities and increased risk of erosion during periods of spillway discharge.

Table 6.8 Summary of Spillway Hydraulic Modelling Parameters

Parameter	Value
Hydrologic model	Storage routing model (Runoff Analysis and Flow Training Simulation; RAFTS)
Initial and continuous losses (IL/CL)	See Table 6.9
Initial water level	At spillway crest invert elevation
Design storm event	1 in 50 AEP
Spillway geometry	Broad-crested trapezoidal weir with 2H:1V side slopes
Target spillway depth including 0.3 m freeboard	0.8 m
Spillway lining	Minimum D50 = 100 mm placed to a minimum thickness of 150 mm (1.5 x D50) following the methodology presented in HEC-15 (Kilgore & Cotton, 2005).

Table 6.9 Emergency spillway dimensions summary

Mine Structures	Pond Name	Critical Duration (hour)	Initial Losses (IL) (mm)	Continuing Losses (CL) (mm/hour)	Peak Spillway Outflow (m^3/s)	Spillway crest base width (m)
WRD Main	Main SRP POND 1	5 min	1	15	0.8	4
	Main SRP POND 2	25 min	2.9	35	1.1	6
	Main SRP POND 3	25 min	2.1	22.5	2.7	17
	Main SRP POND 4	10 min	2.9	33	1.1	6
	Main SRP POND 5	10 min	2.9	35	2.2	13
	Main SRP POND 6	20 min	2.5	28	1.2	6
	Main SRP POND 7	5 min	0.5	10	0.3	2
	Main SRP POND 8	5 min	0.6	11	0.4	2
WRD N 1B	SRP N 1B POND 1	15 min	2.8	31.5	1.3	7
WRD N 1A	SRP N 1A POND 1	15 min	2.9	32	0.6	2
	SRP N 1A POND 2	20 min	2.4	30	0.7	3
WRD N 2	SRP N 2 POND 2	20 min	2.5	30	0.5	2
	SRP N 2 POND 1	15 min	2.7	35	1.6	9
WRD S 2	SRP S 2 POND 1	10 min	2.8	35	2.3	14
	SRP S 2 POND 2	15 min	2.8	35	1.7	9
WRD S 1	SRP S 1 POND 1	10 min	2.7	33	1.8	10
ROM Pad	STORMWATER POND	10min	3	45	0.5	2

6.7 Considerations for future design stages

The following considerations can be further assessed in subsequent design stages of the SWMP:

- At this stage of design, there is limited data and information on what the KGP WRDs will be composed of without field tests and/or accurate site data. Therefore, the RUSLE equation (an empirical approach) has been adopted to estimate the volume of sediment yield that would be generated from the final landform of the WRDs to size the SRPs. WSP is not the designer of record for the WRDs; therefore, the proposed methodology herein can be improved upon in future design stages when more site-specific information is available through laboratory testing (such as erodibility testing, suspended sediment yield testing, hydraulic wash testing, etc.).
- The cross-sectional side slopes of the drains, diversion channels and ponds can be further assessed through geotechnical stability analyses using parameters obtained from a site investigation along the alignments and locations. Stability analyses were excluded from the assessment herein.
- Based on the flood mapping results for Scenario 3 (refer to Section 5.2.3), floodways sized to the 1 in 100 AEP storm event are recommended to be subsequently designed at certain locations along the site access roads. Sizing of floodways were excluded from the assessment herein. Figure 6.10 presents the access road locations for the recommended floodways. Should site access roads be amended in the next stage of design, floodway locations should be revisited.

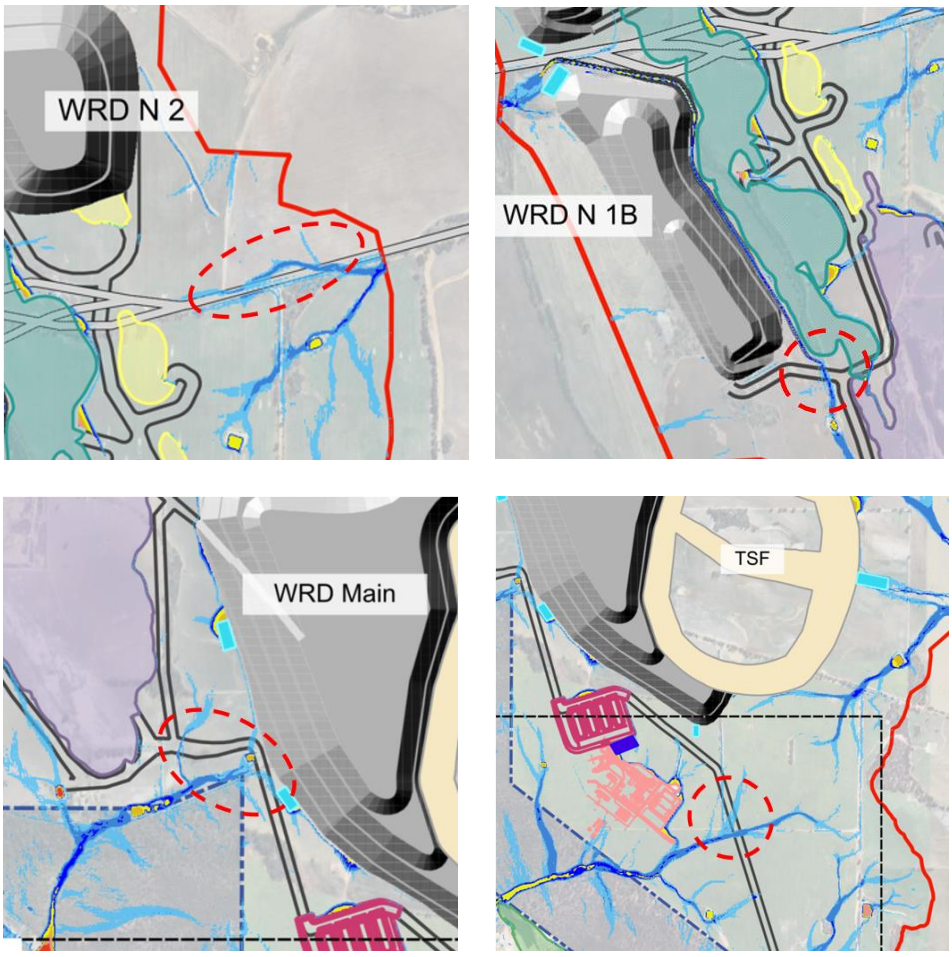

Figure 6.10 Proposed locations of recommended floodways on site access roads

- Topographic depressions near critical infrastructure have been identified. To reduce ponding in these areas, infilling the low-lying zones with inert waste rock or bulk fill, and grading away from the critical infrastructure is recommended over constructing large diversion channels. Examples of such areas are shown in Figure 6.11.

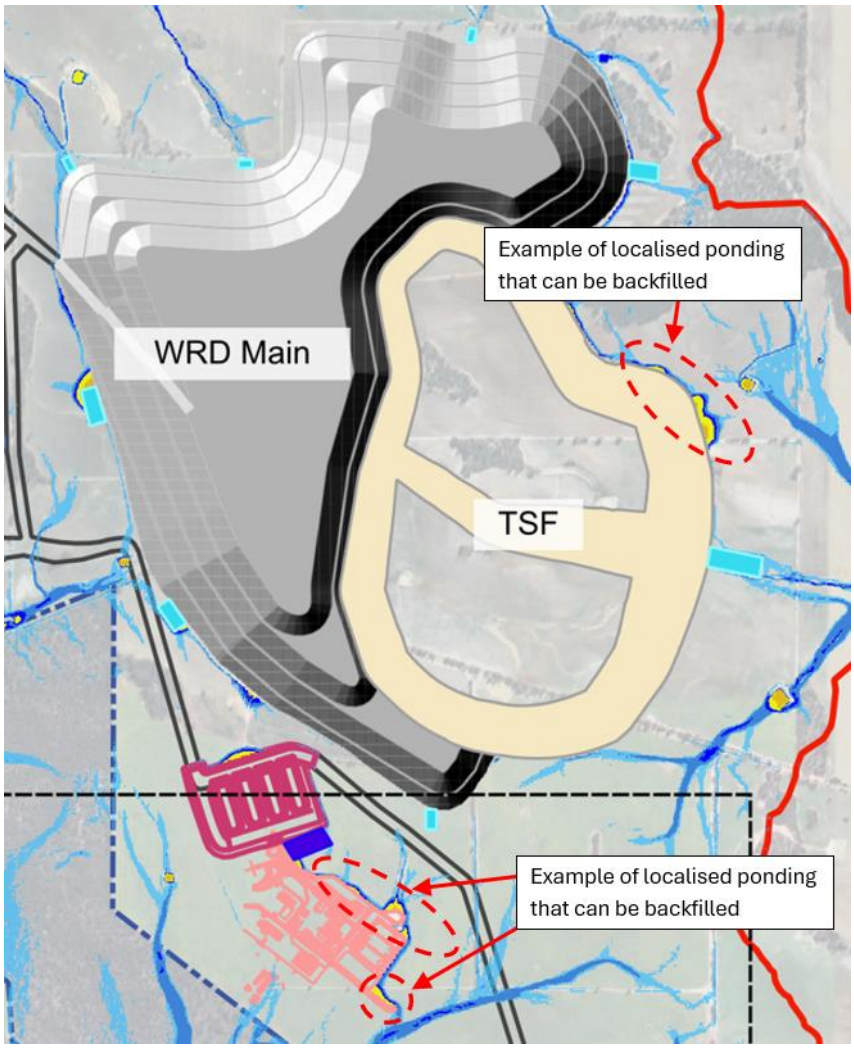

Figure 6.11 Example of locations where localised ponding occurs against critical infrastructure that can be managed through backfilling of topographic lows

- The fate of pumped volumes from ponds should be assessed in later design stages considering the site-wide water balance (WSP, 2025a). The next design phase should also evaluate the feasibility and efficiency of mechanical evaporators versus an evaporation pond. The efficiency use of mechanical evaporators declines during high rainfall events, which is when pumped volumes from ponds increase.
- Location of SRPs and alignments of non-contact water diversion channels should be confirmed using the operation landform of the WRDs, not the rehabilitated surface as used herein.

7 Monitoring and maintenance

A monitoring and maintenance plan should be developed and implemented for the site-wide SWMP considering the following as a minimum:

- All pond locations, localised drains, and diversion channels should be inspected on an annual basis, as a minimum, particularly prior to the onset of the wet season.
- The SWMP structure inspections should also be undertaken after large rainfall events to document signs of erosion and scour, or worsened erosion and scour, along critical components of the SWMP structures and downstream outlet areas due to the large rainfall event.
- Restoration of any failed areas to reinstate conveyance capacity of the design peak flow and containment of peak water depths should be undertaken immediately after a rainfall event.
- Monitoring of sediment accumulation along localised drains, diversion channels, spillway channels, and energy dissipation basins should also be undertaken on annual basis, as a minimum, to ensure the minimum depths are still achieved prior to the onset of any large rainfall event. Should sediment accumulation cause a reduction in available storage, removal of silt/sediment from the spillway structures may be required.
- Monitoring and regular clean-out of accumulated sediment in ponds should be undertaken at the minimum recommended frequency as per Table 7.1 estimated from the average sediment yield estimated in Section 6.4.

Table 7.1 Estimated frequency of sediment clean out for SRPs per year

Mine structure	SRP Name	Maximum allowance for sediment storage (m^3)	Estimated sediment volume per year (m^3)	Minimum frequency of Clean out per year
WRD Main	Main SRP POND 1	57	9	6
	Main SRP POND 2	234	65	4
	Main SRP POND 3	1201	207	6
	Main SRP POND 4	130	13	10
	Main SRP POND 5	234	127	2
	Main SRP POND 6	530	179	3
	Main SRP POND 7	18	2	8
	Main SRP POND 8	18	3	5
WRD N 1B	SRP N 1B POND 1	265	77	3
WRD N 1A	SRP N 1A POND 1	94	53	2
	SRP N 1A POND 2	234	113	2
WRD N 2	SRP N 2 POND 1	130	34	4
	SRP N 2 POND 2	234	26	9
WRD S 2	SRP S 2 POND 1	283	44	7
	SRP S 2 POND 2	189	125	2
WRD S 1	SRP S 1 POND 1	117	72	2

- Monitor the minimum thickness of clay liner in the ponds, notably during clean out activity and inspect whether surface desiccation occurs within the clay layer which prevents performing as intended.
- Removal of established vegetation that may impact conveyance capacity in drains and channels or displace operational volumes in storage ponds.
- Monitor for animal activity such as established nesting, or dead animals, within the SWMP structures that may potentially obstruct flow or displace volume. These should be removed immediately upon identification.
- Infrastructure downstream of any discharge locations should be monitored for progressive erosion or flooding. Erosion protection or localised surface water management should be implemented if erosion or flooding occurs during frequent rainfall events.
- KGP environmental monitoring regime should be combined, where relevant, with the monitoring and maintenance plan for the SWMP.
- Maintain logs of inspections, maintenance actions, sediment removal volumes, and any repair work done.
- Access for continued monitoring and maintenance of these structures per the above items should remain until final closure and rehabilitation of the facility. If inspections confirm unacceptable conditions, corrective repairs or modifications should be implemented, so the structure's performance becomes acceptable again.

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The report is provided by WSP Australia Pty Limited (*WSP*) for Ausgold Limited (*Client*) in response to specific instructions from the Client and in accordance with WSP's proposal dated 07 March 2025 and agreement with the Client dated 11 March 2025 (*Agreement*).

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Appendix B

Sediment retention pond stage-storage curves

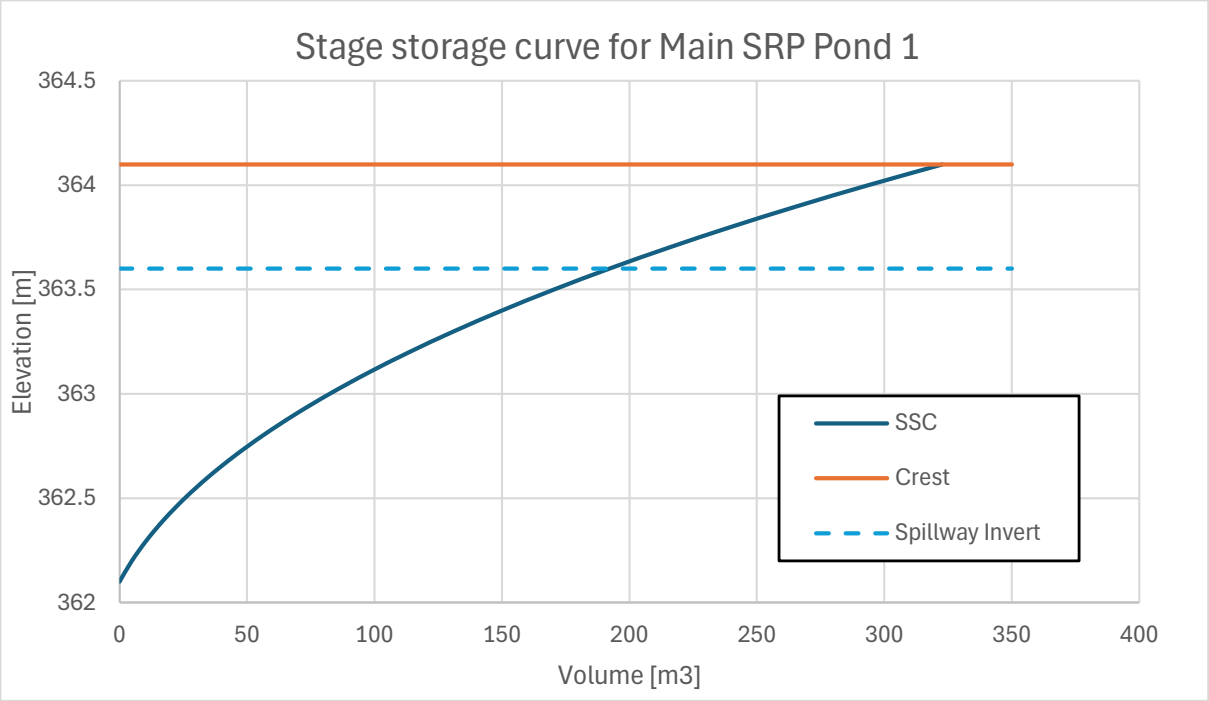


Figure 1 SSC for Main SRP Pond 1

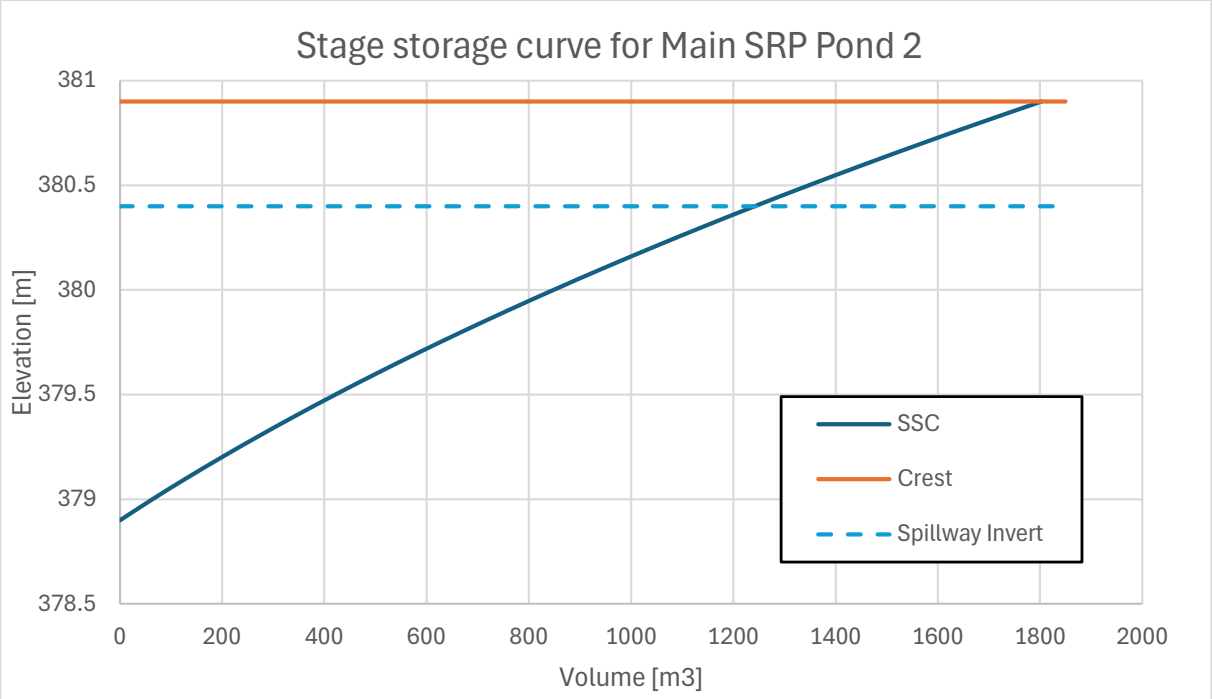


Figure 2 SSC for Main SRP Pond 2

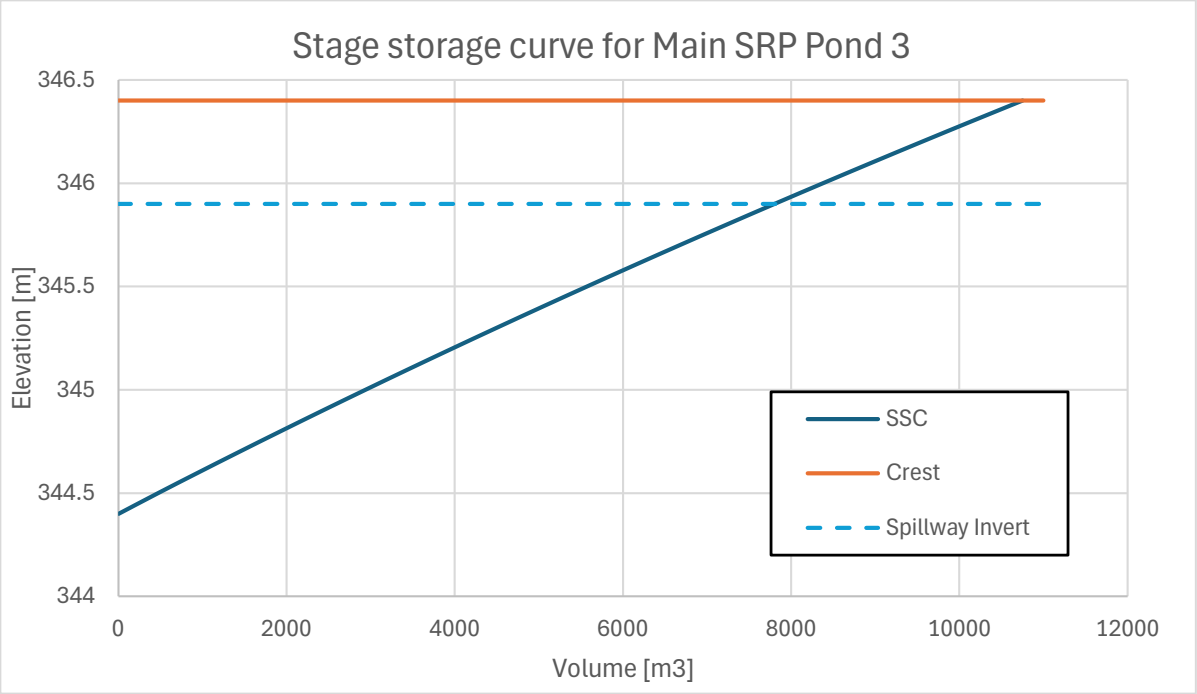


Figure 3 SSC for Main SRP Pond 3

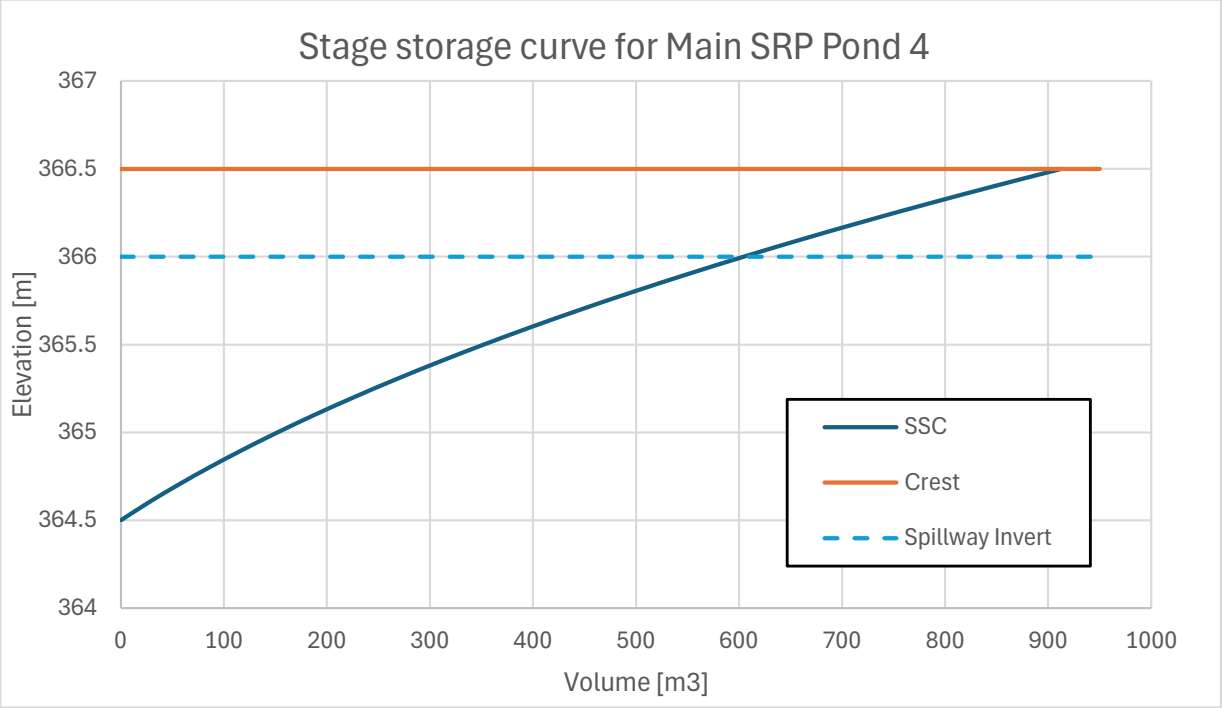
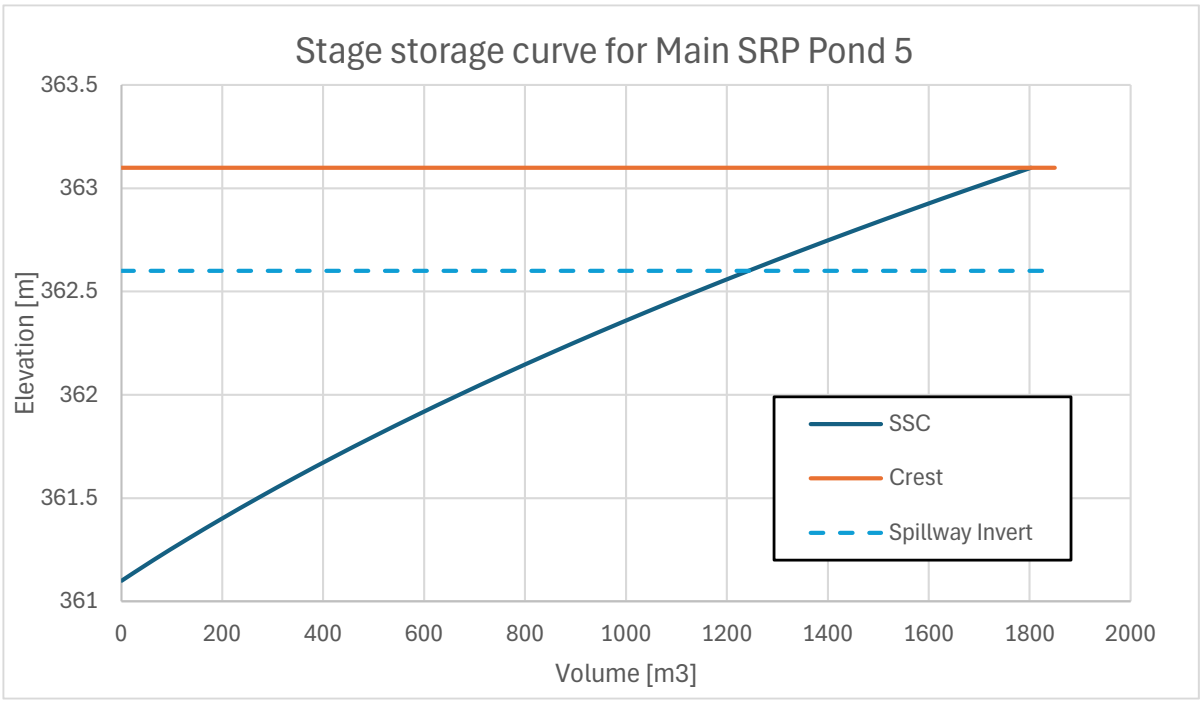


Figure 4 SSC for Main SRP Pond 4



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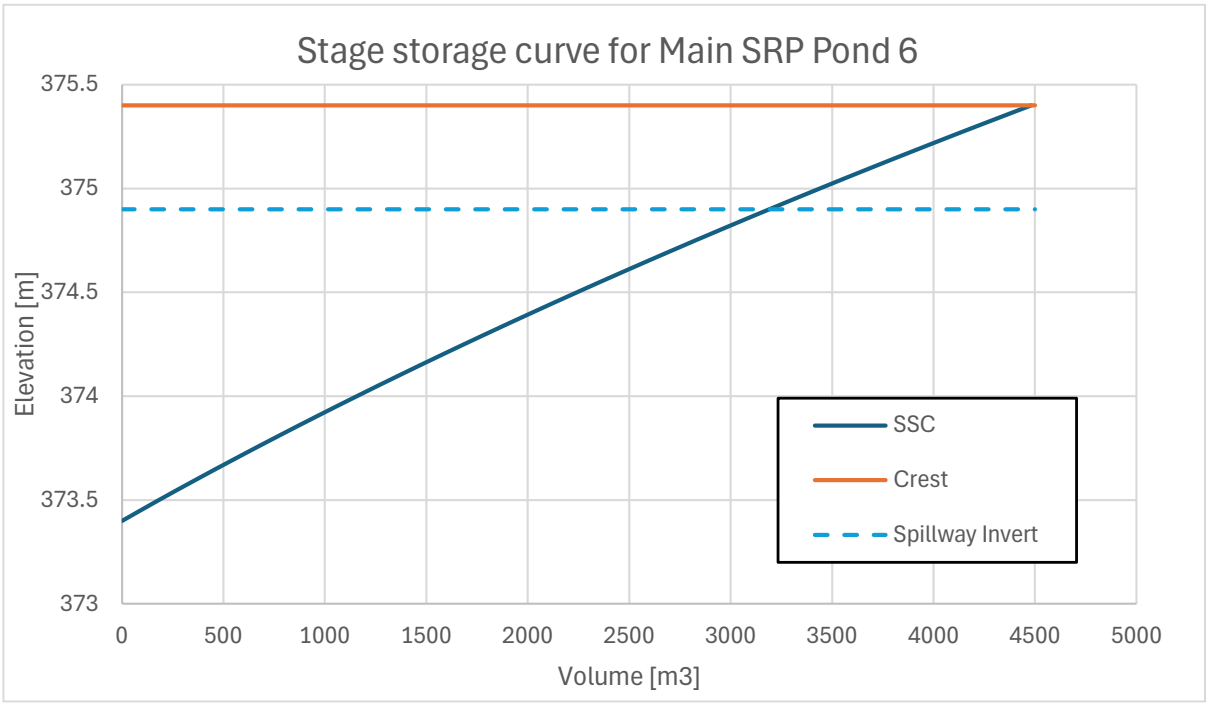
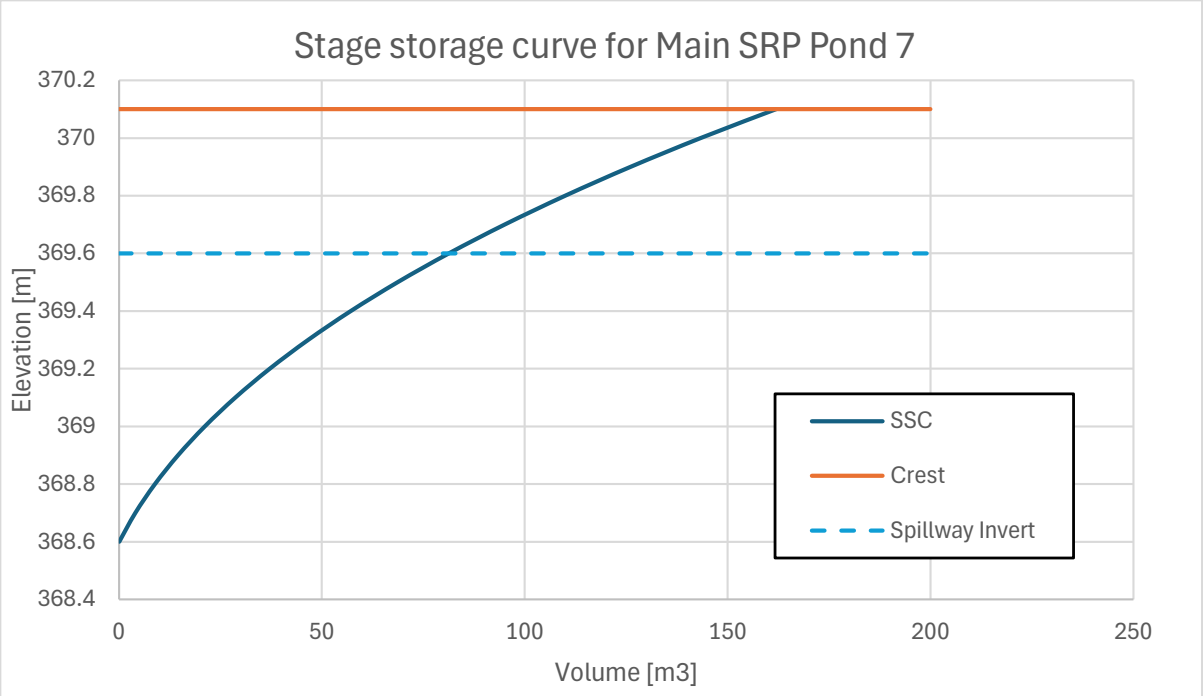


Figure 6 SSC for Main SRP Pond 6



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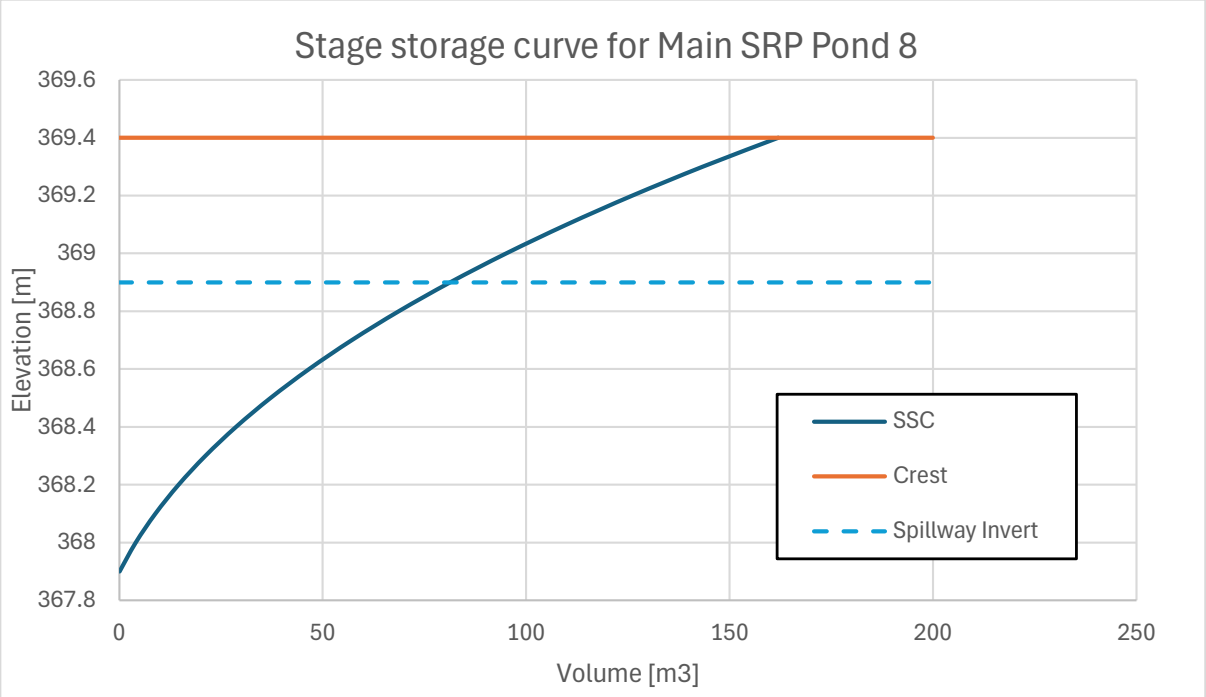

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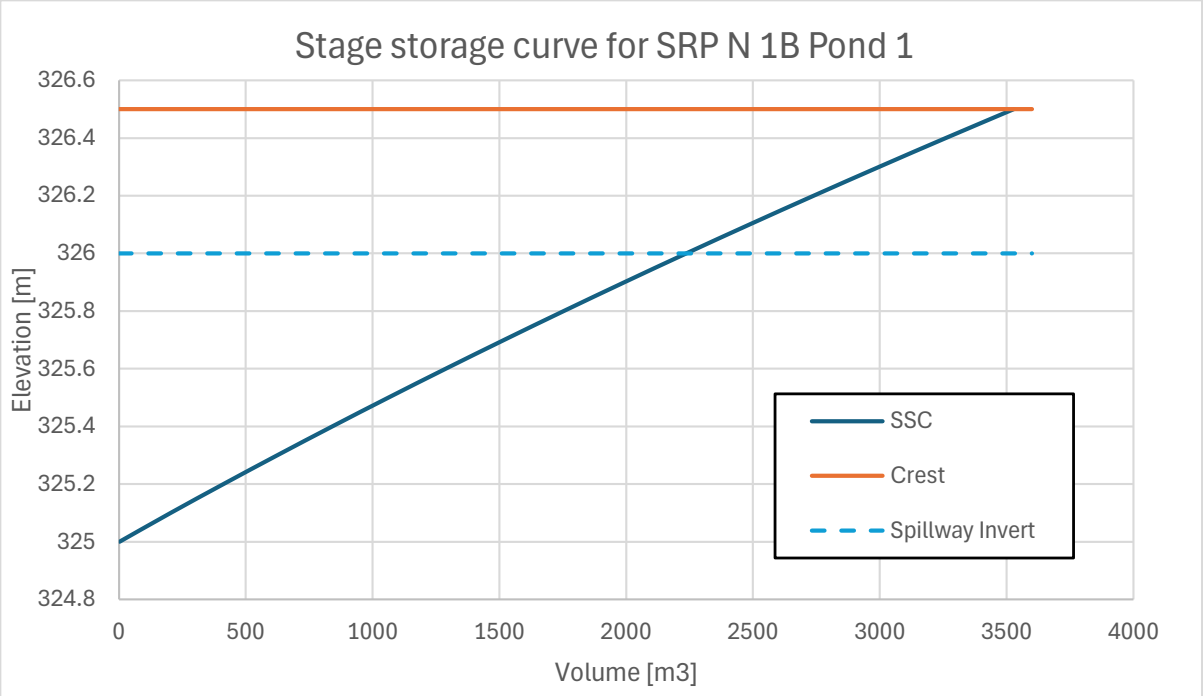
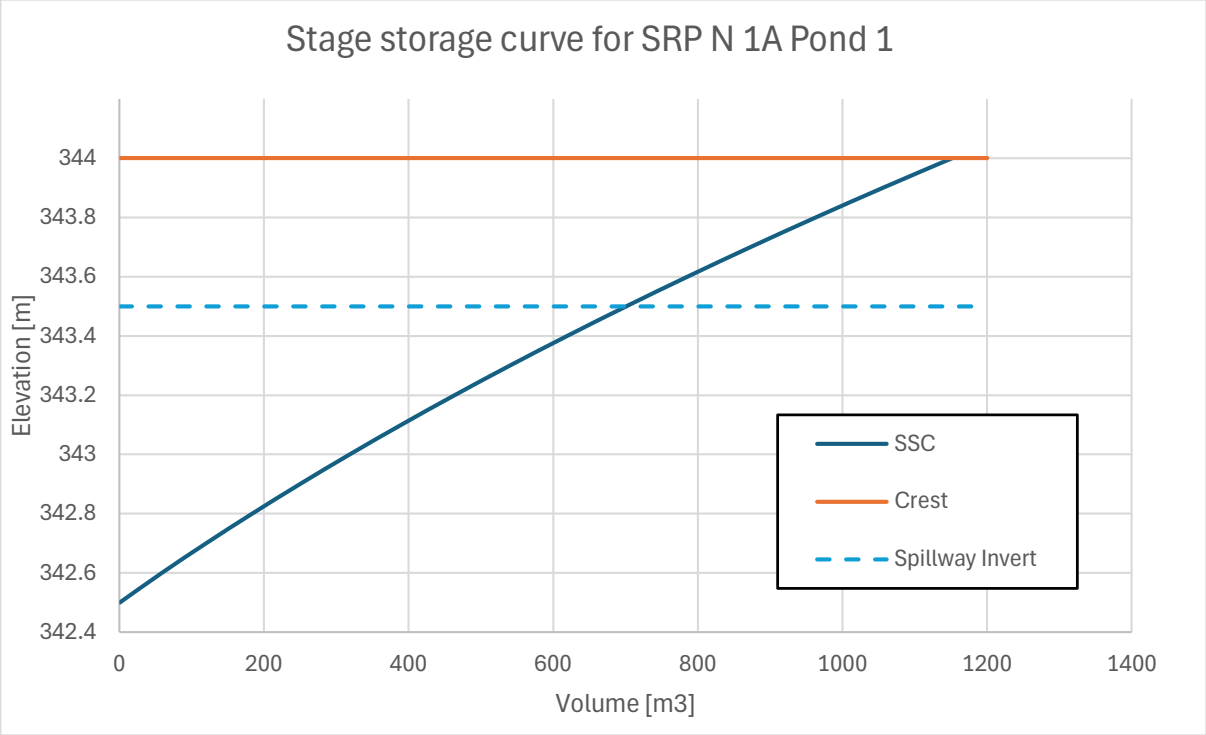


Figure 9 SSC for SRP N 1B Pond 1



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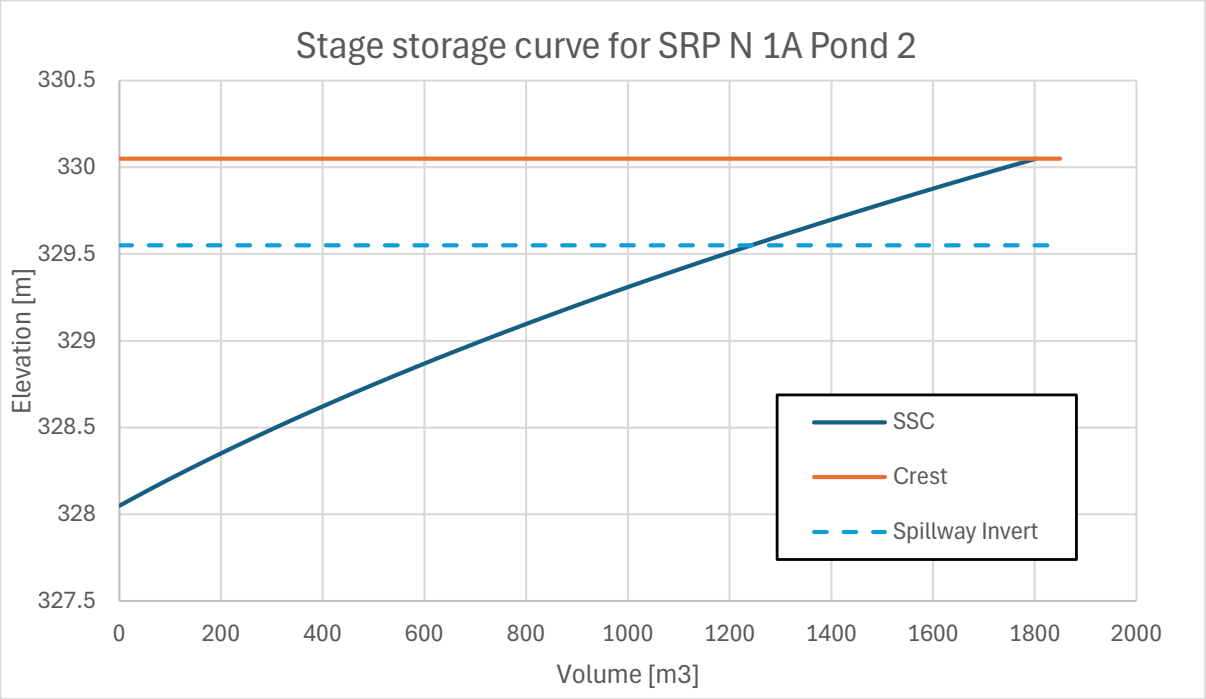


Figure 11 SSC for SRP N 1A Pond 2

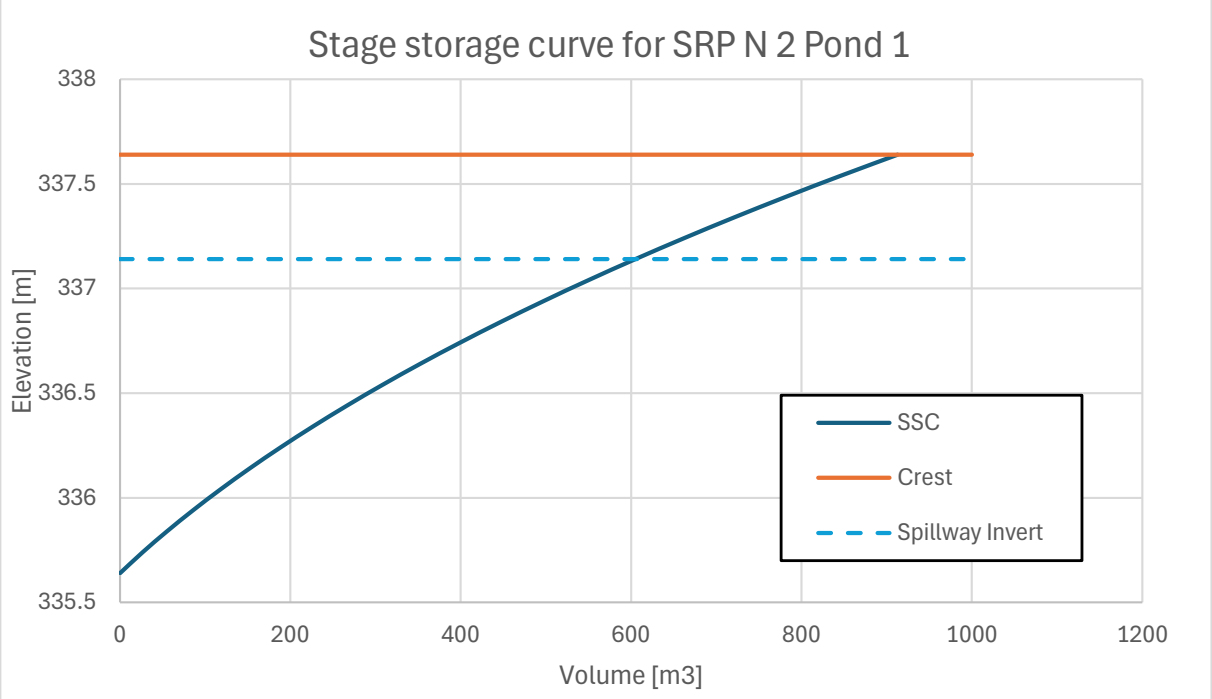


Figure 12 SSC for SRP N 2 Pond 1

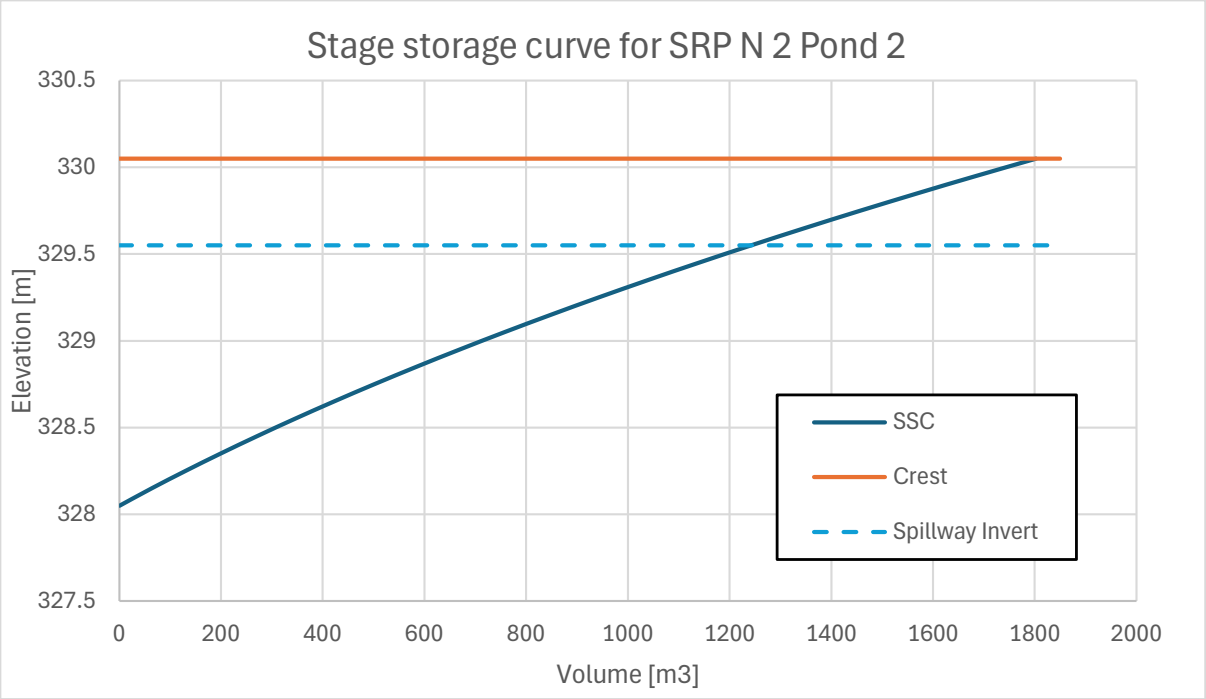


Figure 13 SSC for SRP N 2 Pond 2

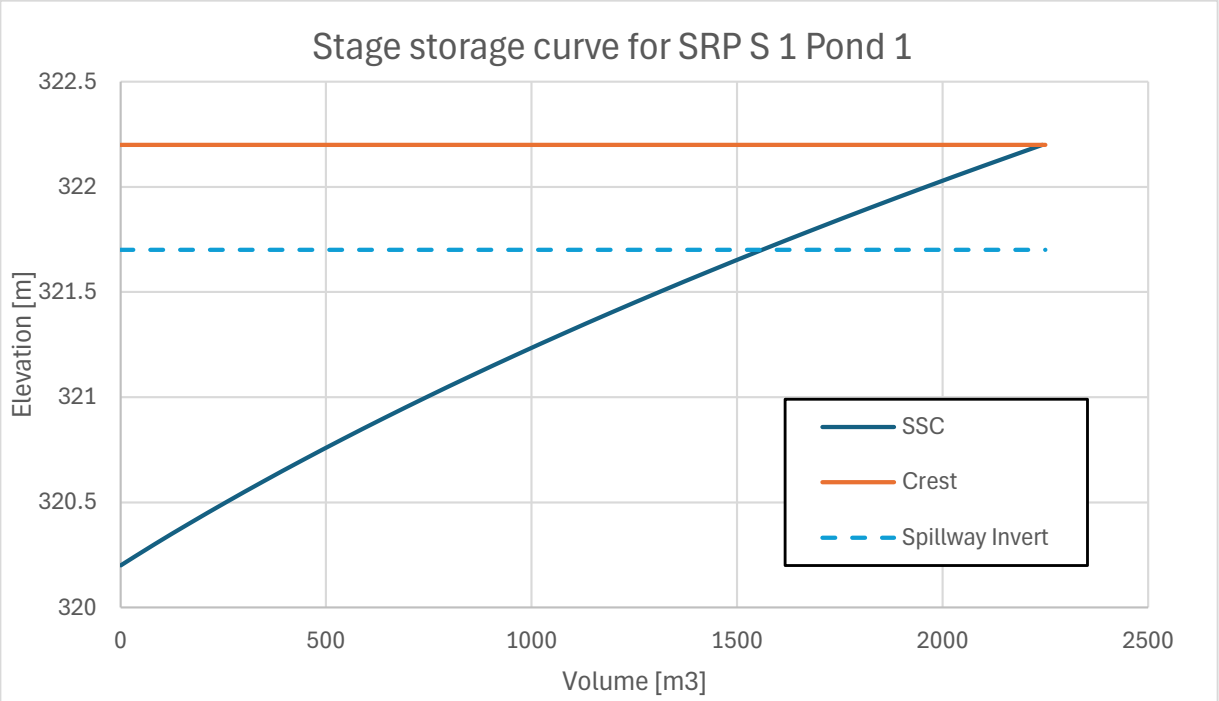
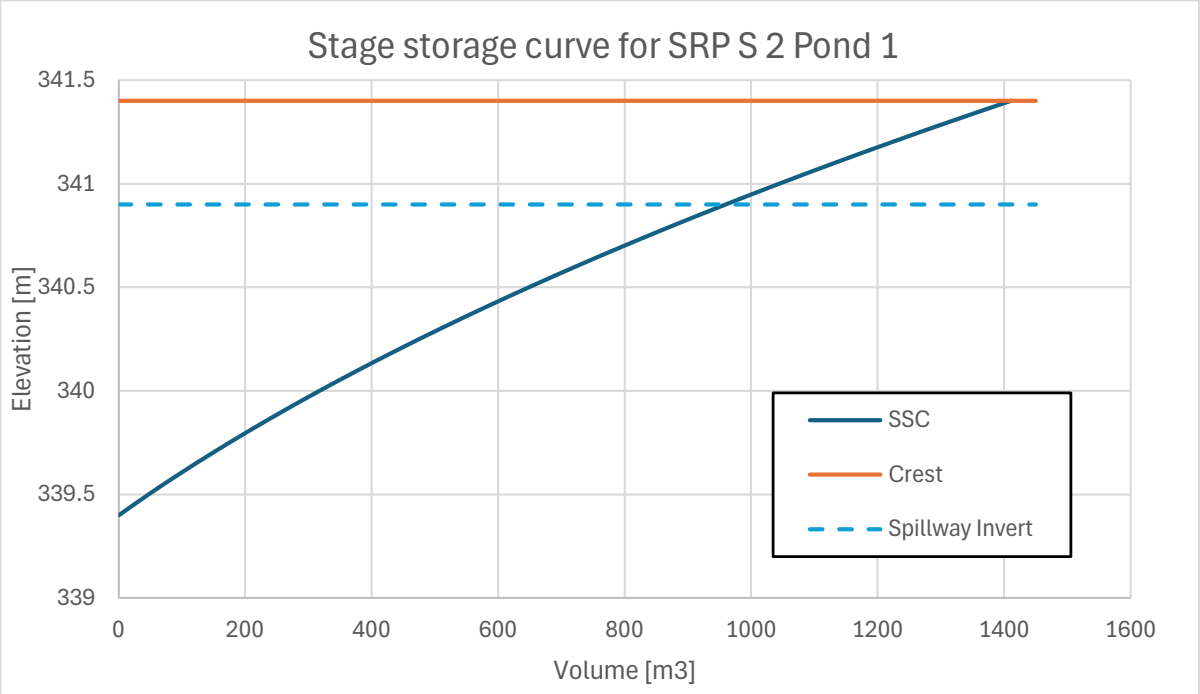


Figure 14 SSC for SRP S 1 Pond 1



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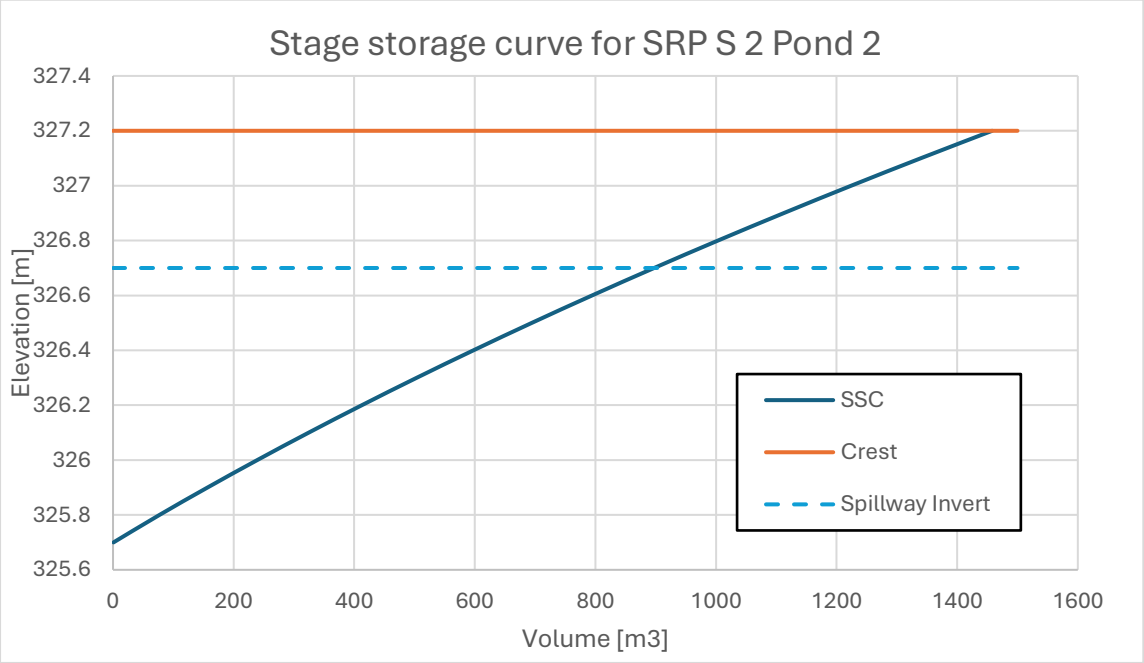


Figure 16 SSC for SRP S 2 Pond 2

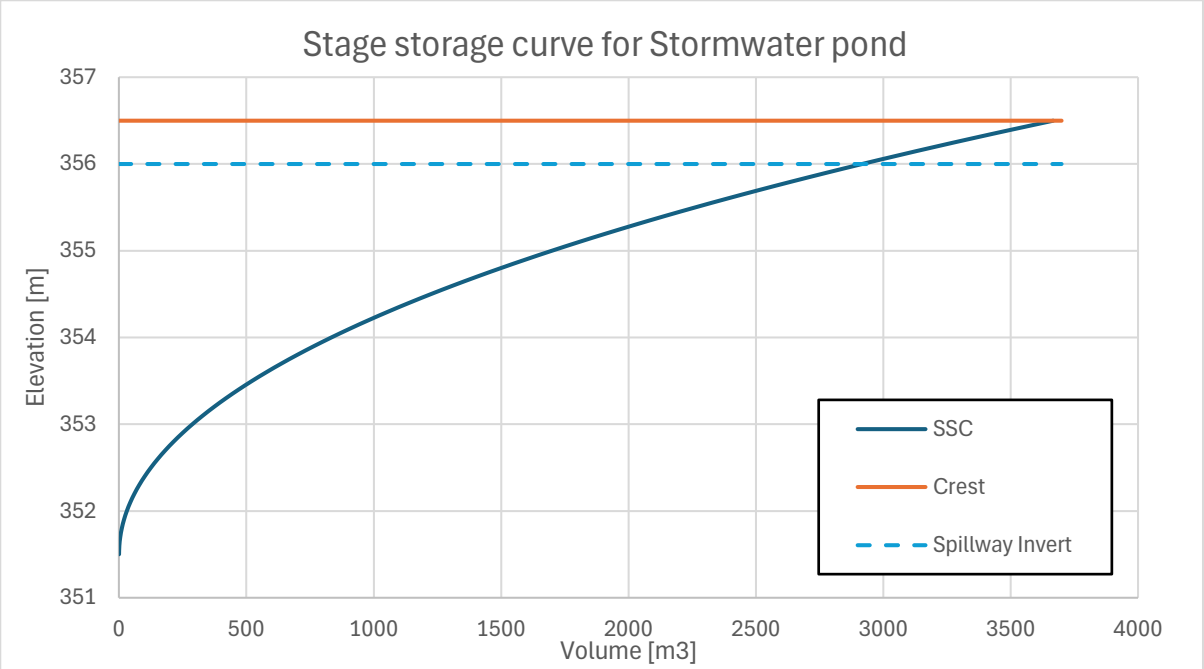
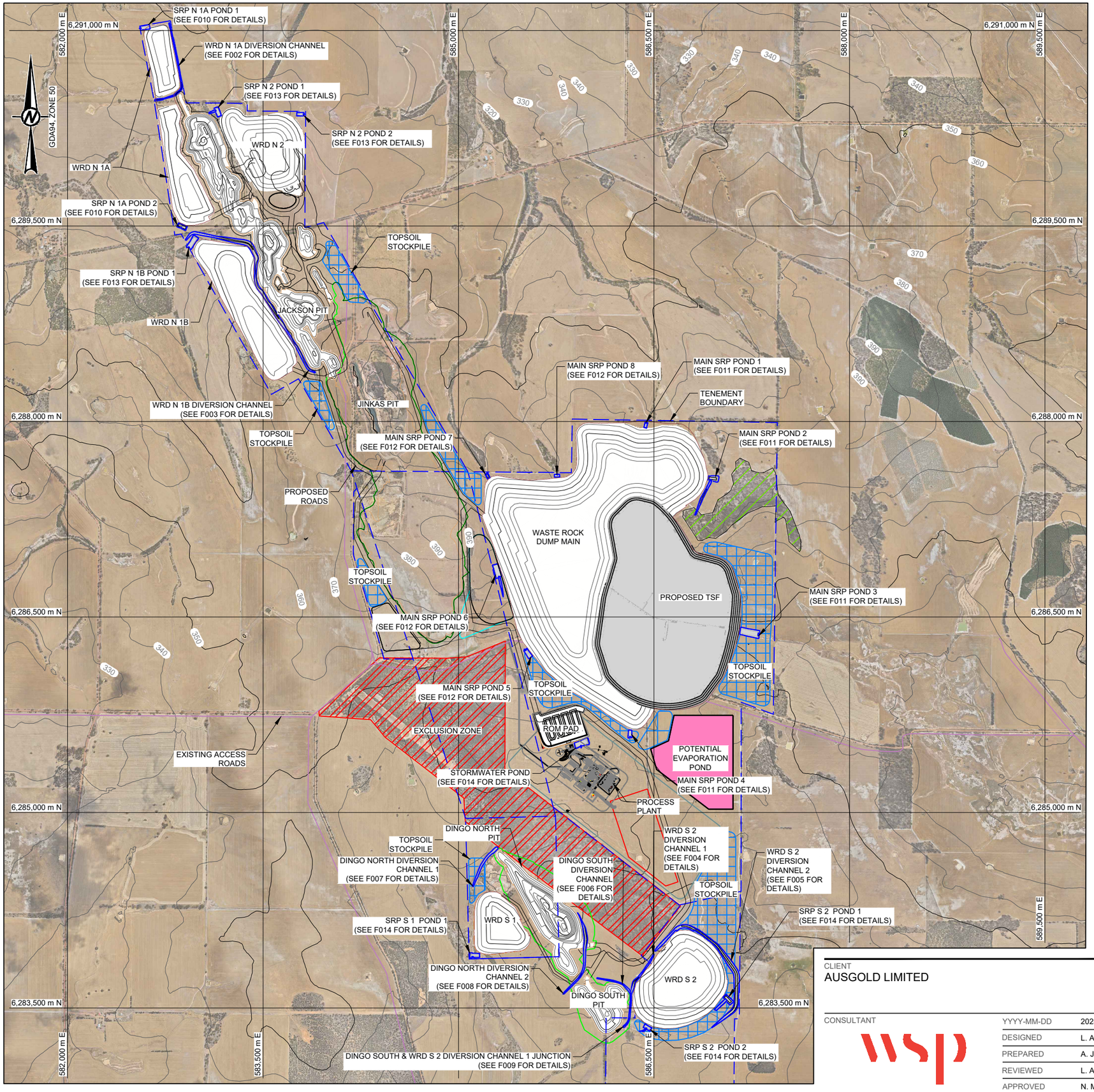


Figure 17SSC for Stormwater Pond

Appendix C

SWMP figures



LEGEND

- EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- EXEMPTION WOODLAND ZONE
- TOPSOIL STOCKPILE (PROVIDED BY AUSGOLD)
- EXCLUSION ZONE
- TENEMENT BOUNDARY
- EXISTING ROADS
- PROPOSED ROADS (PROVIDED BY AUSGOLD)

NOTE(S)

1. SURVEY DATA PROVIDED BY AUSGOLD, DATED 31 OCTOBER 2023.
2. WASTE ROCK DUMP NORTH 1B AND ROM PAD MODELS PROVIDED BY AUSGOLD, DATED 05 MARCH 2025.
3. JACKSON PIT AND OLYMPIA PIT MODELS PROVIDED BY AUSGOLD, DATED 15 MARCH 2025.
4. DINGO NORTH PIT, DINGO SOUTH PIT AND WASTE ROCK NORTH 2 MODELS PROVIDED BY AUSGOLD, DATED 15 APRIL 2025.
5. WASTE ROCK DUMP NORTH 1A, WASTE ROCK DUMP SOUTH 2 AND WASTE ROCK DUMP MAIN MODELS PROVIDED BY AUSGOLD, DATED 14 MAY 2025.
6. SURFACE PROVIDED FOR WASTE ROCK DUMPS REPRESENT FINAL REHABILITATED SLOPES. ADDITIONAL AREA IS AVAILABLE TO ACCOMMODATE SURFACE WATER MANAGEMENT INFRASTRUCTURE DURING OPERATIONS. AS A RESULT, OVERLAP MAY BE PRESENT IN THESE FIGURES.
7. ACRONYMS INCLUDE: WASTE ROCK DUMP (WRD), SEDIMENT RETENTION POND (SRP) AND TAILINGS STORAGE FACILITY (TSF).

NOT FOR CONSTRUCTION

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1:30,000 METRES

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
OVERALL SITE LAYOUT

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F001

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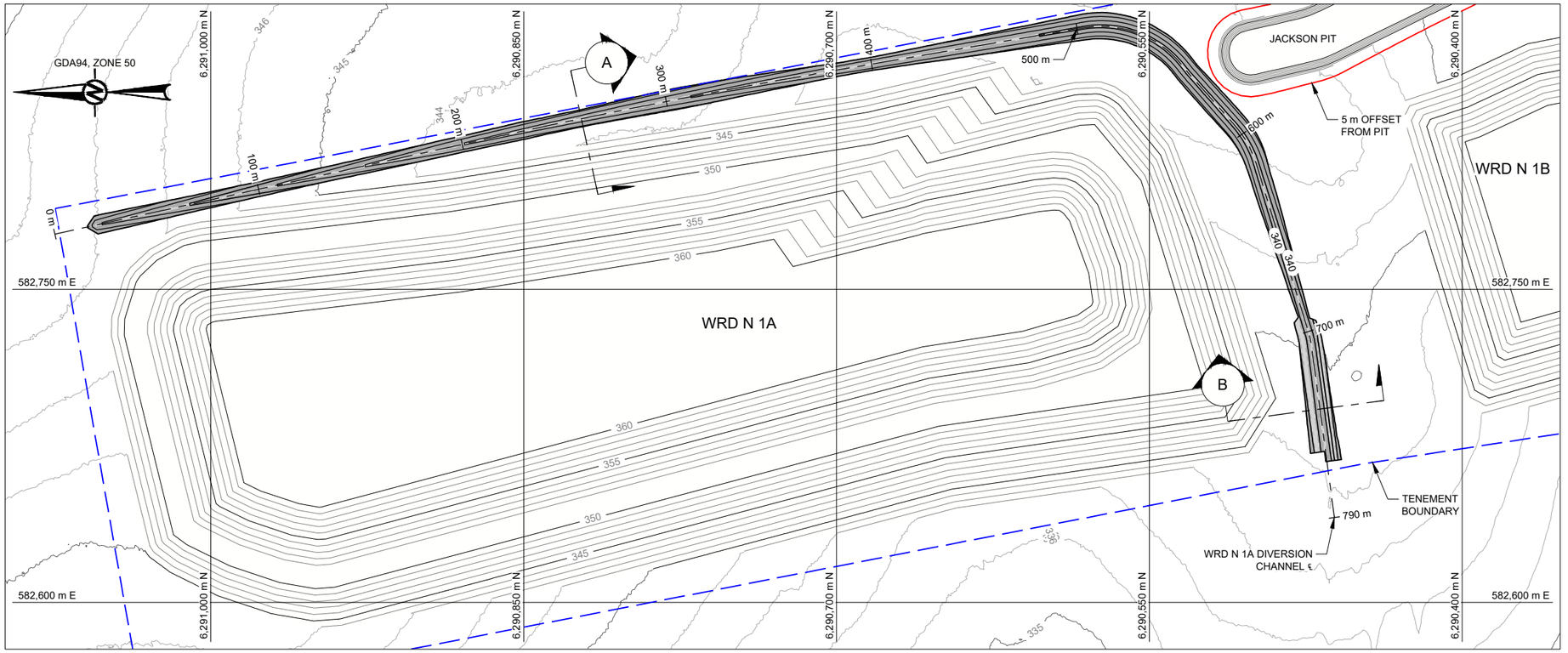


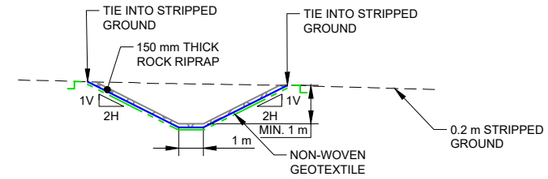
WRD N 1A DIVERSION CHANNEL - LAYOUT PLAN
SCALE 1:2,500

LEGEND

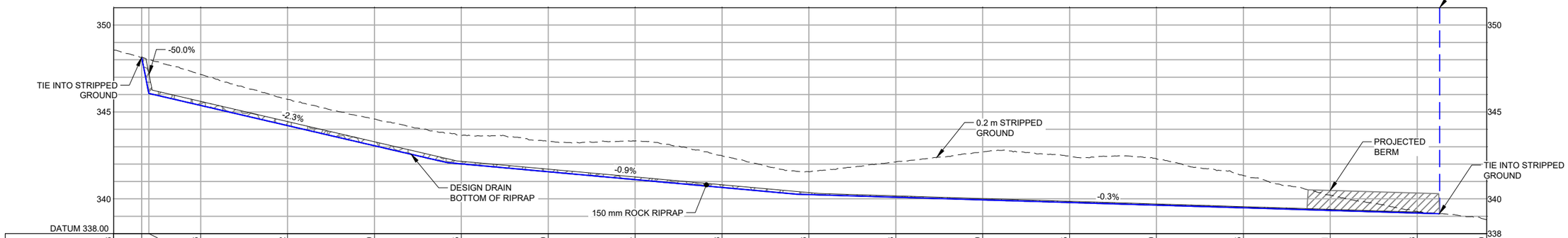
- EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY
- 5 m OFFSET FROM PIT (TO ACCOMMODATE PIT BUND)
- ROCK RIPRAP
- EMBANKMENT FILL
- NON-WOVEN GEOTEXTILE

NOTE(S)

1. SURVEY DATA PROVIDED BY AUSGOLD, DATED 31 OCTOBER 2023.
2. WASTE ROCK DUMP NORTH 1B AND ROM PAD MODELS PROVIDED BY AUSGOLD, DATED 05 MARCH 2025.
3. JACKSON PIT AND OLYMPIA PIT MODELS PROVIDED BY AUSGOLD, DATED 15 MARCH 2025.
4. DINGO NORTH PIT, DINGO SOUTH PIT AND WASTE ROCK NORTH 2 MODELS PROVIDED BY AUSGOLD, DATED 15 APRIL 2025.
5. WASTE ROCK DUMP NORTH 1A, WASTE ROCK DUMP SOUTH 2 AND WASTE ROCK DUMP MAIN MODELS PROVIDED BY AUSGOLD, DATED 14 MAY 2025.
6. SURFACE PROVIDED FOR WASTE ROCK DUMPS REPRESENT FINAL REHABILITATED SLOPES. ADDITIONAL AREA IS AVAILABLE TO ACCOMMODATE SURFACE WATER MANAGEMENT INFRASTRUCTURE DURING OPERATIONS. AS A RESULT, OVERLAP MAY BE PRESENT IN THESE FIGURES.

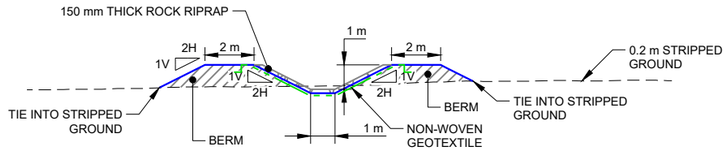


SCALE 1:250 (A) WRD N 1A DIVERSION CHANNEL - TYPICAL SECTION 1



DESIGN DRAIN BOTTOM OF RIPRAP	348.56	348.14	348.01	347.16	345.72	344.60	343.65	343.30	343.34	342.48	341.56	342.13	342.70	342.45	342.30	341.35	340.21	339.28	338.80		
0.2m STRIPPED GROUND		348.14	346.07	345.38	344.22	343.05	342.01	341.56	341.11	340.66	340.25	340.10	339.94	339.79	339.64	339.49	339.34	339.18			
CUT AND FILL DEPTH (m)		0.00	1.94	-1.78	-1.51	-1.54	-1.64	-1.74	-2.23	-1.82	-1.31	-2.03	-2.75	-2.66	-2.66	-1.86	-0.88	-0.10			
CHAINAGE	0	16	20	50	100	150	200	250	300	350	400	450	500	550	600	650	700	750	790		

WRD N 1A DIVERSION CHANNEL - LONGITUDINAL SECTION
HOR. SCALE 1:2,500
VER. SCALE 1:250



SCALE 1:250 (B) WRD N 1A DIVERSION CHANNEL - TYPICAL SECTION 2

NOT FOR CONSTRUCTION

0 5 10
1:250 METRES

0 50 100
1:2,500 METRES

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

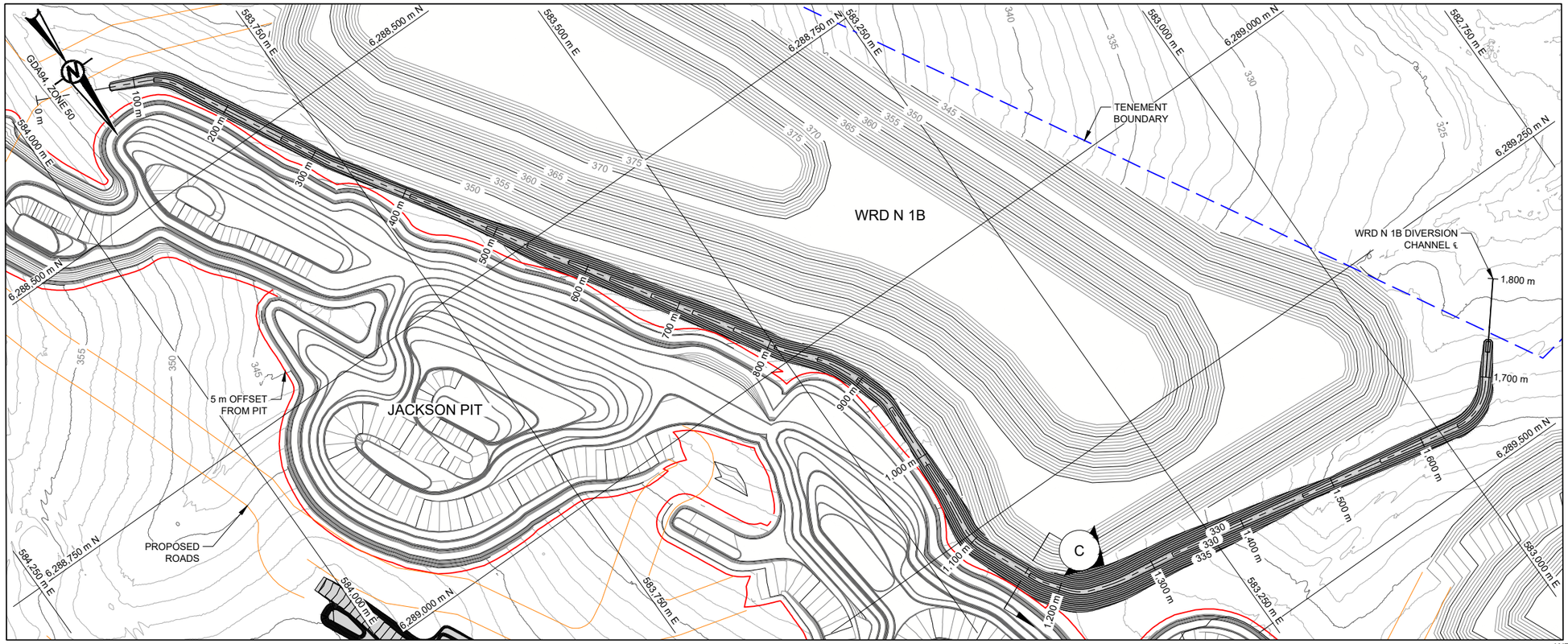
PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
WRD N 1A DIVERSION CHANNEL LAYOUT PLAN AND SECTIONS

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F002

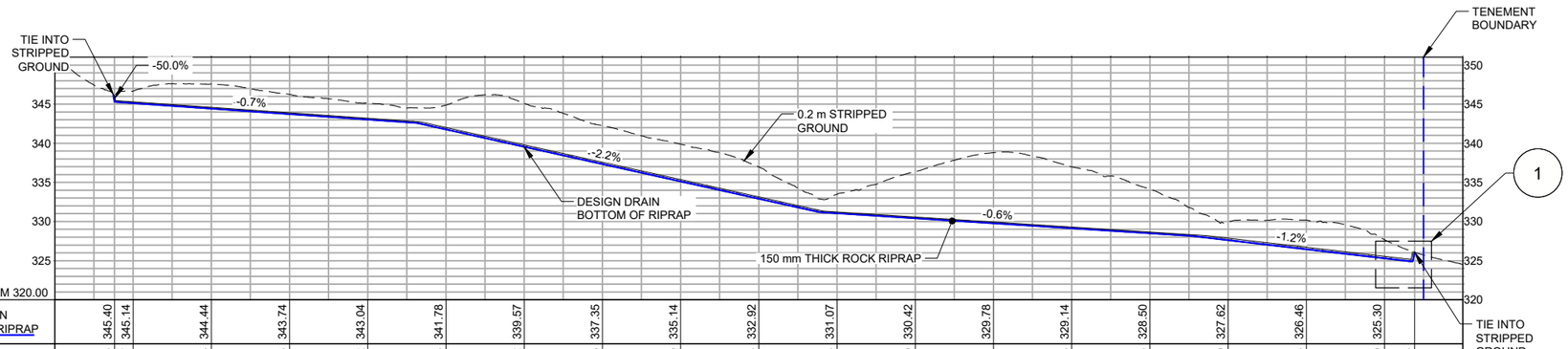
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3
25 mm
0

Path: C:\Users\AUC\506820\DOCS\DOCS\WSP (AUS)\AU-AusGold, Katanning\Project Files\09_PROJECTS\PS222221_Surface_Water_Management\xxxx_Feasibility Study Figures\02_PRODUCTION\DWG\ | File Name: F002-F009 - Diversion Drains.dwg | Last Edited By: auc506882 Date: 2025-07-17 Time:11:51:32 AM | Printed By: AUC-506882 Date: 2025-07-18 Time:10:27:18 AM



WRD N 1B DIVERSION CHANNEL - LAYOUT PLAN

SCALE 1:5,000



DESIGN DRAIN BOTTOM OF RIPRAP		345.40	345.14	344.44	343.74	343.04	341.78	339.57	337.35	335.14	332.92	331.07	330.42	329.78	329.14	328.50	327.62	326.46	325.30						
0.2m STRIPPED GROUND	350.91	346.16	346.67	347.58	346.26	345.12	344.88	345.12	342.25	339.90	336.98	333.48	336.40	338.81	336.98	334.16	329.99	330.18	327.69	326.08	324.51				
CUT AND FILL DEPTH (m)		0.76	-1.53	-3.13	-2.51	-2.08	-3.09	-5.55	-4.90	-4.76	-4.06	-2.41	-5.98	-9.02	-7.84	-5.65	-2.37	-3.72	-2.39						
CHAINAGE	0	76	100	200	300	400	500	600	700	800	900	1,000	1,100	1,200	1,300	1,400	1,500	1,600	1,700	1,738	1,800				

WRD N 1B DIVERSION CHANNEL - LONGITUDINAL SECTION

HOR. SCALE 1:7,500
VER. SCALE 1:750

NOT FOR CONSTRUCTION

0 5 10
1:250 METRES

0 12.5 25
1:750 METRES

0 25 50
1:1,000 METRES

0 100 200
1:5,000 METRES

0 125 250
1:7,500 METRES

LEGEND

- 500 — EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- 500 — DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY
- 5 m OFFSET FROM PIT (TO ACCOMMODATE PIT BUND)
- ROCK RIPRAP
- PROPOSED ROADS (PROVIDED BY AUSGOLD)
- NON-WOVEN GEOTEXTILE

NOTE(S)

1. SURVEY DATA PROVIDED BY AUSGOLD, DATED 31 OCTOBER 2023.
2. WASTE ROCK DUMP NORTH 1B AND ROM PAD MODELS PROVIDED BY AUSGOLD, DATED 05 MARCH 2025.
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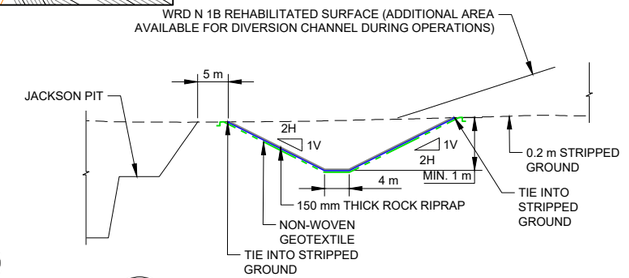
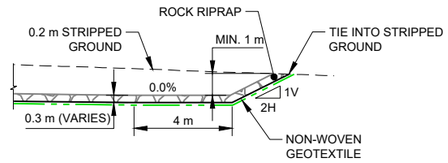


SCALE 1:1,000 C **WRD N 1B DIVERSION CHANNEL - TYPICAL SECTION**



SCALE 1:250 1 **WRD N 1B DIVERSION CHANNEL ENERGY DISSIPATION STRUCTURE**

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
WRD N 1B DIVERSION CHANNEL LAYOUT PLAN AND SECTIONS

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F003

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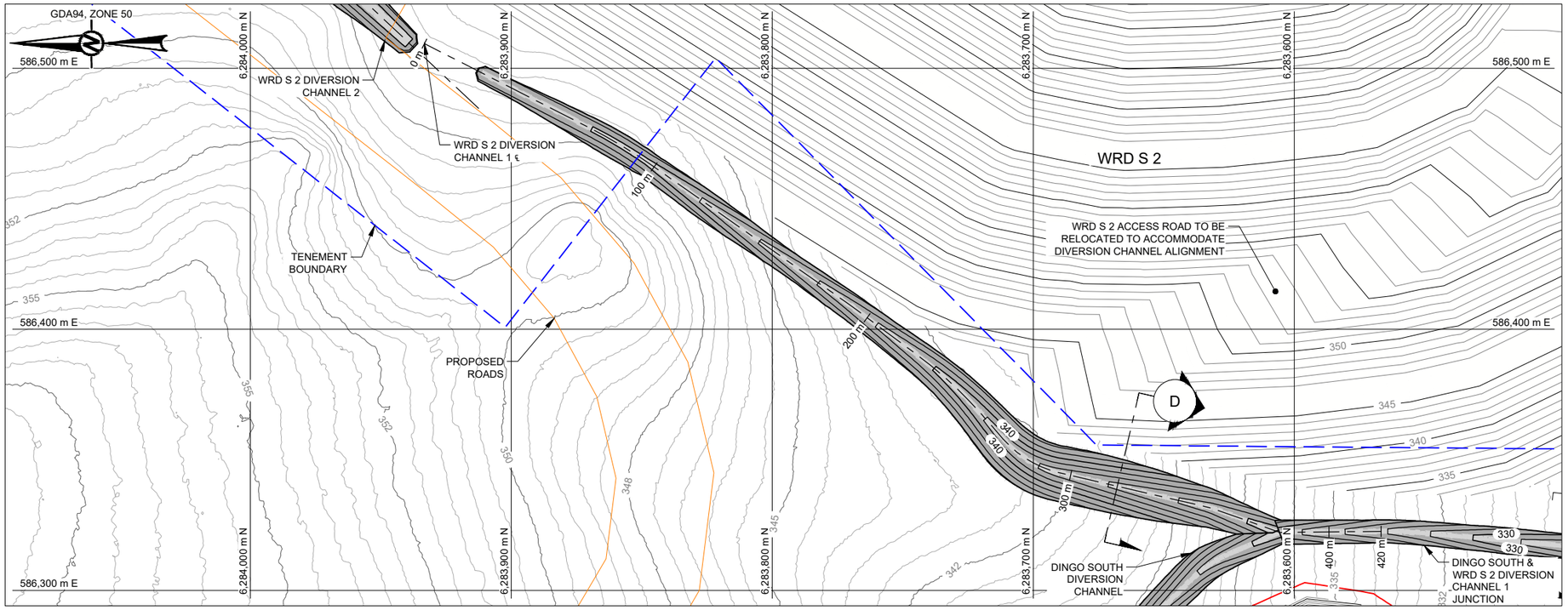
IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3
25 mm
0



WRD S 2 DIVERSION CHANNEL 1 - LAYOUT PLAN

SCALE 1:2,000

LEGEND

- EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY
- 5 m OFFSET FROM PIT (TO ACCOMMODATE PIT BUND)
- ROCK RIPRAP
- PROPOSED ROADS (PROVIDED BY AUSGOLD)
- NON-WOVEN GEOTEXTILE

NOTE(S)

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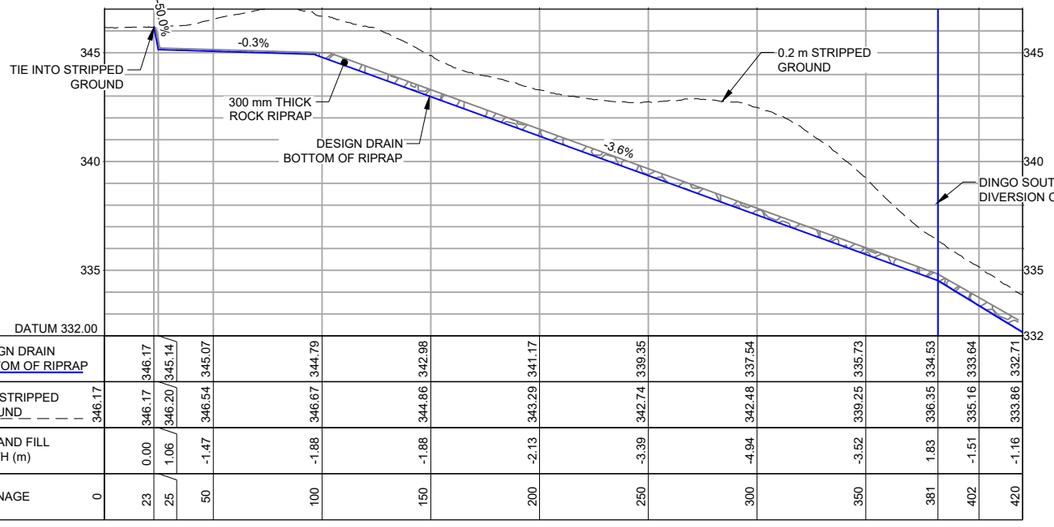
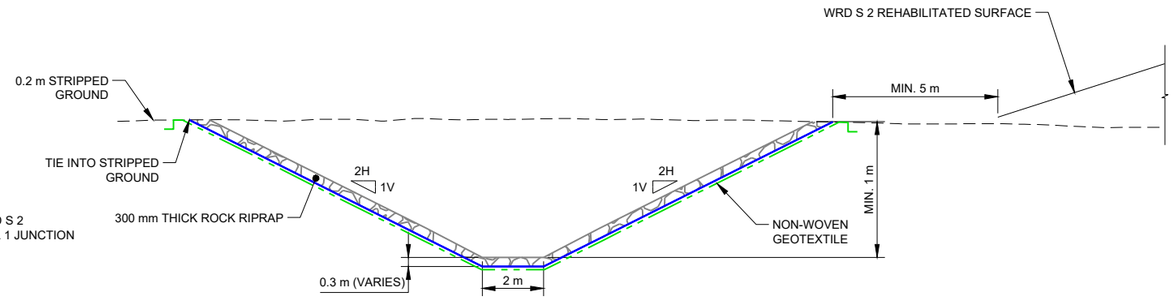


DESIGN DRAIN BOTTOM OF RIPRAP		346.17	345.14	345.07	344.79	342.98	341.17	339.35	337.54	335.73	334.53	333.64	332.71
0.2m STRIPPED GROUND	346.17	346.17	346.20	346.54	346.67	344.86	343.29	342.74	342.48	339.25	336.35	335.16	333.86
CUT AND FILL DEPTH (m)		0.00	1.06	-1.47	-1.88	-1.88	-2.13	-3.39	-4.94	-3.52	1.83	-1.51	-1.16
CHAINAGE	0	23	25	50	100	150	200	250	300	350	381	402	420

WRD S 2 DIVERSION CHANNEL 1 - LONGITUDINAL SECTION

HOR. SCALE 1:2,000

VER. SCALE 1:200



SCALE 1:200 D WRD S 2 DIVERSION CHANNEL 1 - TYPICAL SECTION

NOT FOR CONSTRUCTION

0 5 10
1:200 METRES

0 50 100
1:2,000 METRES

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
WRD S 2 DIVERSION CHANNEL 1 LAYOUT PLAN AND SECTIONS

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F004

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3

25 mm 0

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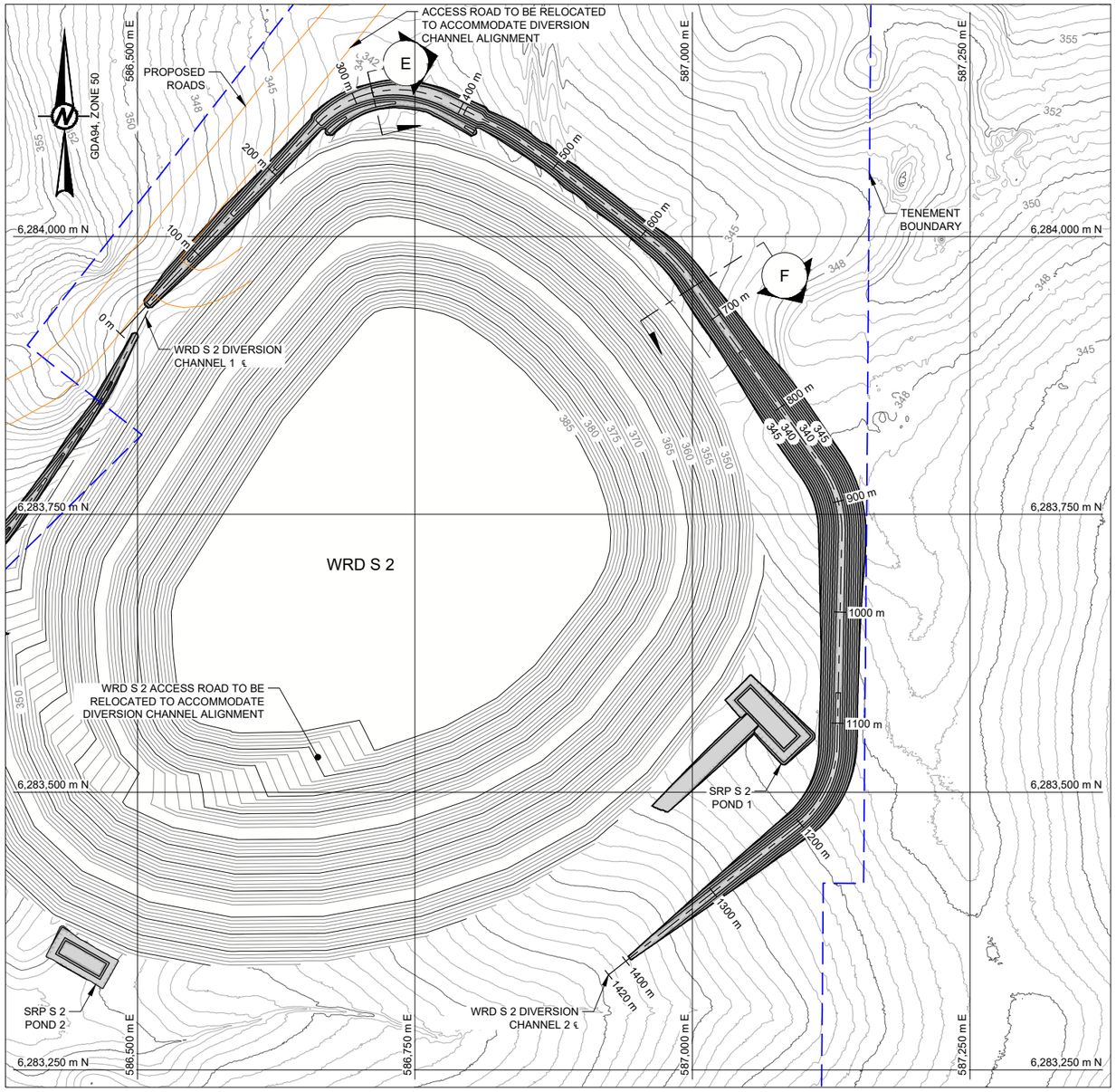
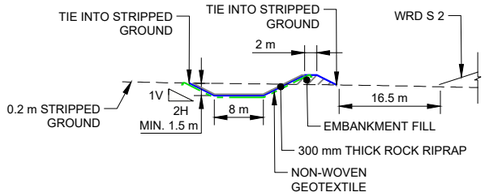


WRD S 2 DIVERSION CHANNEL 2 - LAYOUT PLAN

SCALE 1:5,000



SCALE 1:1,000 (E)

WRD S 2 DIVERSION CHANNEL 2 - TYPICAL SECTION 1

LEGEND

- EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY
- 5 m OFFSET FROM PIT (TO ACCOMMODATE PIT BUND)
- ROCK RIPRAP
- EMBANKMENT FILL
- PROPOSED ROADS (PROVIDED BY AUSGOLD)
- NON-WOVEN GEOTEXTILE

NOTE(S)

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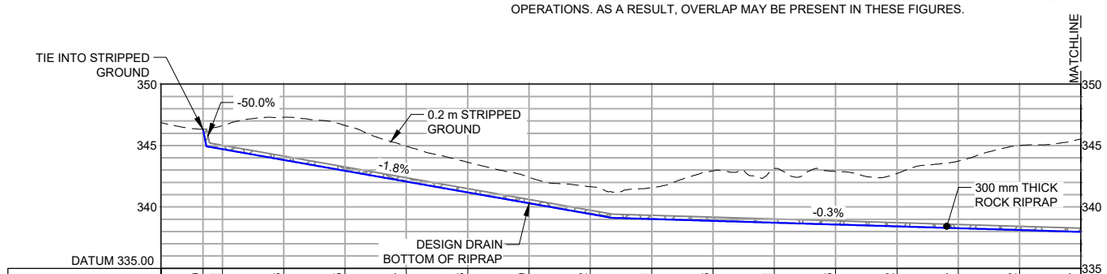
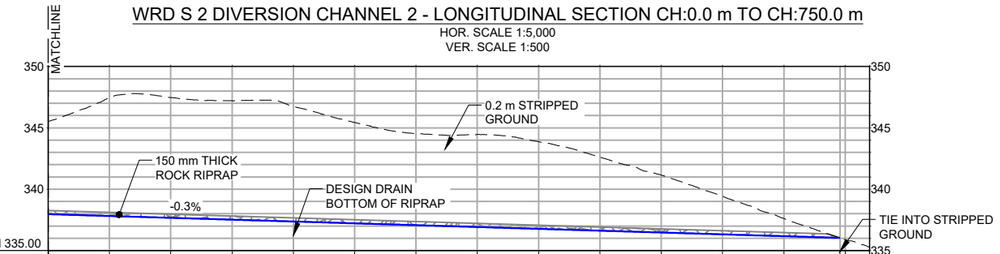


CHAINAGE	DESIGN DRAIN BOTTOM OF RIPRAP	0.2m STRIPPED GROUND	CUT AND FILL DEPTH (m)
0	346.30	346.87	0.03
34	344.71	346.33	-1.91
50	343.83	346.62	-3.48
100	342.95	347.30	-3.68
150	342.07	346.63	-2.88
200	341.18	344.95	-2.45
250	340.30	343.64	-2.12
300	339.42	342.42	-2.23
350	339.01	341.65	-2.56
400	338.86	341.58	-4.08
450	338.71	342.94	-4.39
500	338.56	343.11	-4.32
550	338.42	342.89	-4.30
600	338.27	342.72	-5.46
650	338.12	343.73	-6.90
700	337.97	345.01	-7.57
750		345.53	

WRD S 2 DIVERSION CHANNEL 2 - LONGITUDINAL SECTION CH:0.0 m TO CH:750.0 m

HOR. SCALE 1:5,000
VER. SCALE 1:500

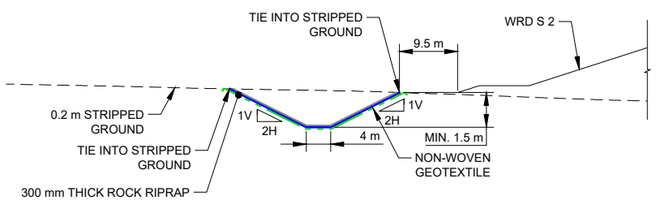


CHAINAGE	DESIGN DRAIN BOTTOM OF RIPRAP	0.2m STRIPPED GROUND	CUT AND FILL DEPTH (m)
750	337.97	345.53	-7.57
800	337.82	347.46	-9.65
850	337.67	347.47	-9.80
900	337.52	347.21	-9.70
950	337.37	346.75	-9.38
1,000	337.22	345.44	-8.22
1,050	337.07	344.53	-7.47
1,100	336.92	344.46	-7.54
1,150	336.77	343.88	-7.11
1,200	336.62	342.63	-6.01
1,250	336.47	341.15	-4.68
1,300	336.32	339.42	-3.10
1,350	336.17	337.61	-1.44
1,396	336.03	336.03	0.00
1,400		335.89	
1,420		335.29	

WRD S 2 DIVERSION CHANNEL 2 - LONGITUDINAL SECTION CH:750.0 m TO CH:1,420.0 m

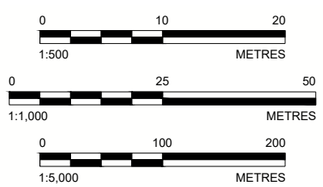
HOR. SCALE 1:5,000
VER. SCALE 1:500

NOT FOR CONSTRUCTION



SCALE 1:1,000 (F)

WRD S 2 DIVERSION CHANNEL 2 - TYPICAL SECTION 2



CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
WRD S 2 DIVERSION CHANNEL 2
LAYOUT PLAN AND SECTIONS

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F005

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3

25 mm

0

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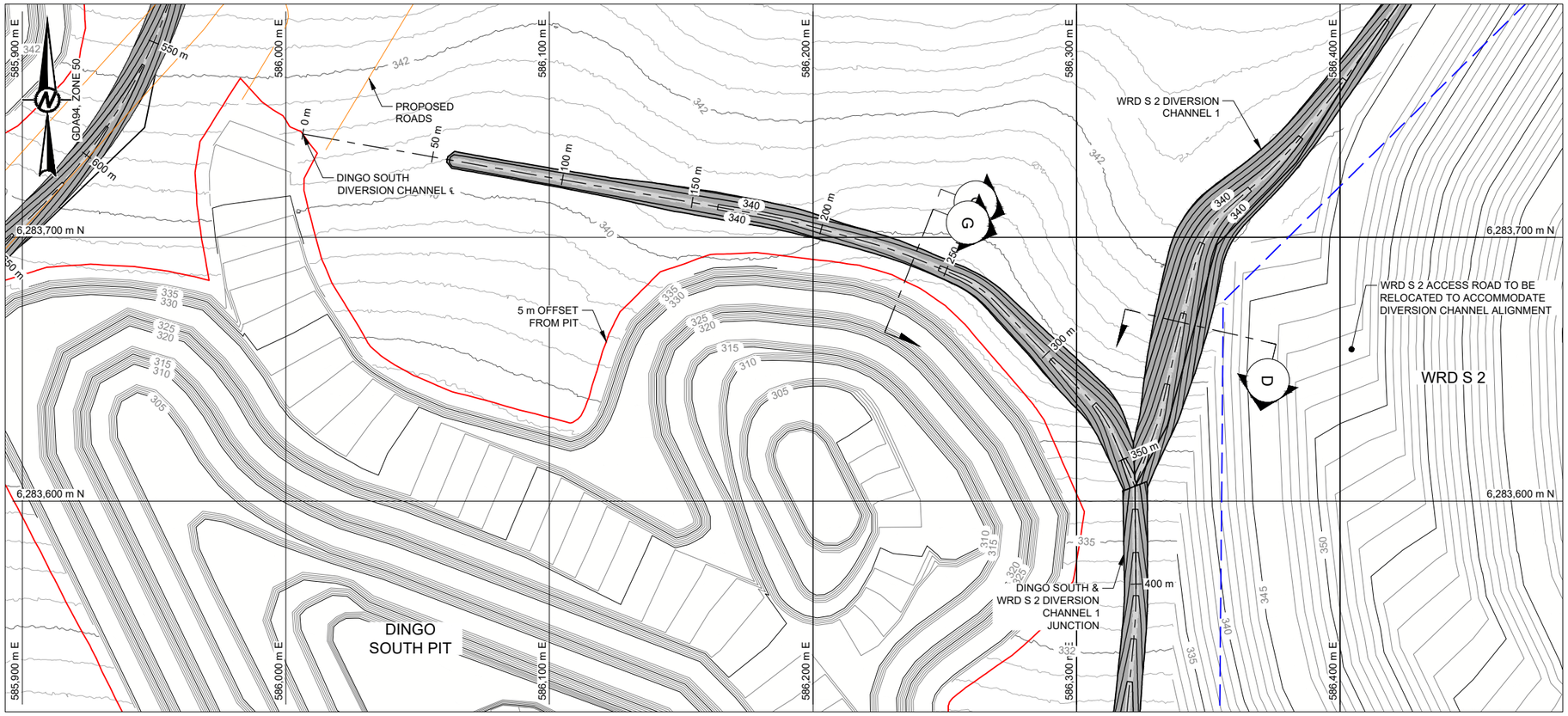

DINGO SOUTH DIVERSION CHANNEL - LAYOUT PLAN
SCALE 1:2,000

LEGEND

- EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY
- 5 m OFFSET FROM PIT (TO ACCOMMODATE PIT BUND)
- ROCK RIPRAP
- PROPOSED ROADS (PROVIDED BY AUSGOLD)
- NON-WOVEN GEOTEXTILE

NOTE(S)

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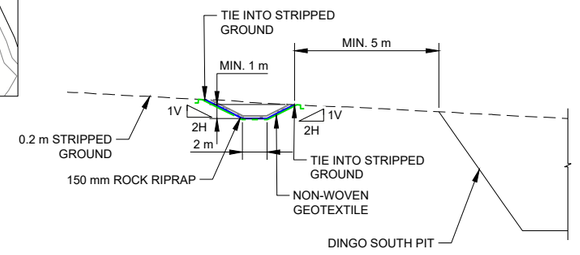
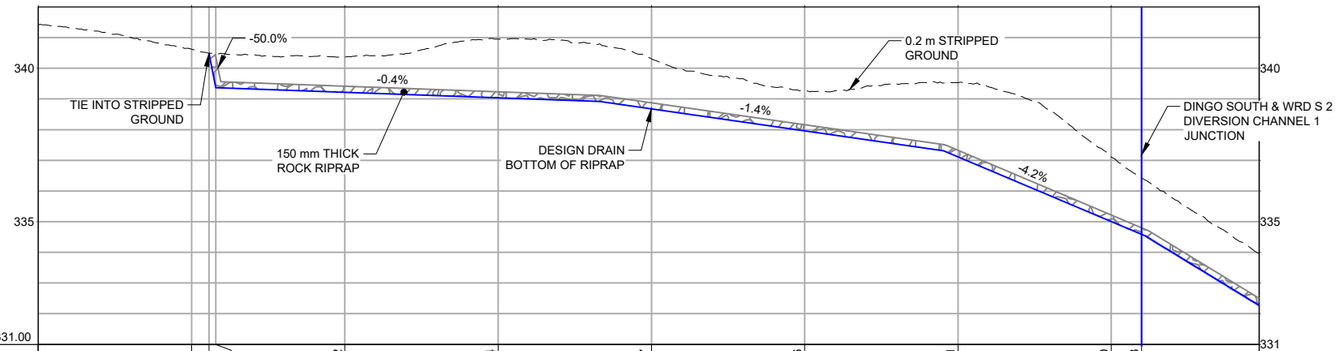


SCALE 1:500 G DINGO SOUTH DIVERSION CHANNEL - TYPICAL SECTION



CHAINAGE	0	50	56	58	100	150	200	250	300	350	361	400
DESIGN DRAIN BOTTOM OF RIPRAP			340.48	339.37	339.22	339.04	338.67	337.96	337.11	335.00	334.58	
0.2m STRIPPED GROUND	341.42	340.62	340.48	340.47	340.37	340.95	340.31	339.27	339.54	337.11	336.43	333.96
CUT AND FILL DEPTH (m)		0.00	0.00	1.10	-1.15	-1.91	-1.63	-1.31	-2.42	-2.11	1.85	

DINGO SOUTH DIVERSION CHANNEL - LONGITUDINAL SECTION
HOR. SCALE 1:2,000
VER. SCALE 1:200

NOT FOR CONSTRUCTION

0 5 10
1:200 METRES

0 10 20
1:500 METRES

0 50 100
1:2,000 METRES

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
DINGO SOUTH DIVERSION CHANNEL LAYOUT PLAN AND SECTIONS

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F006

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3
25 mm
0

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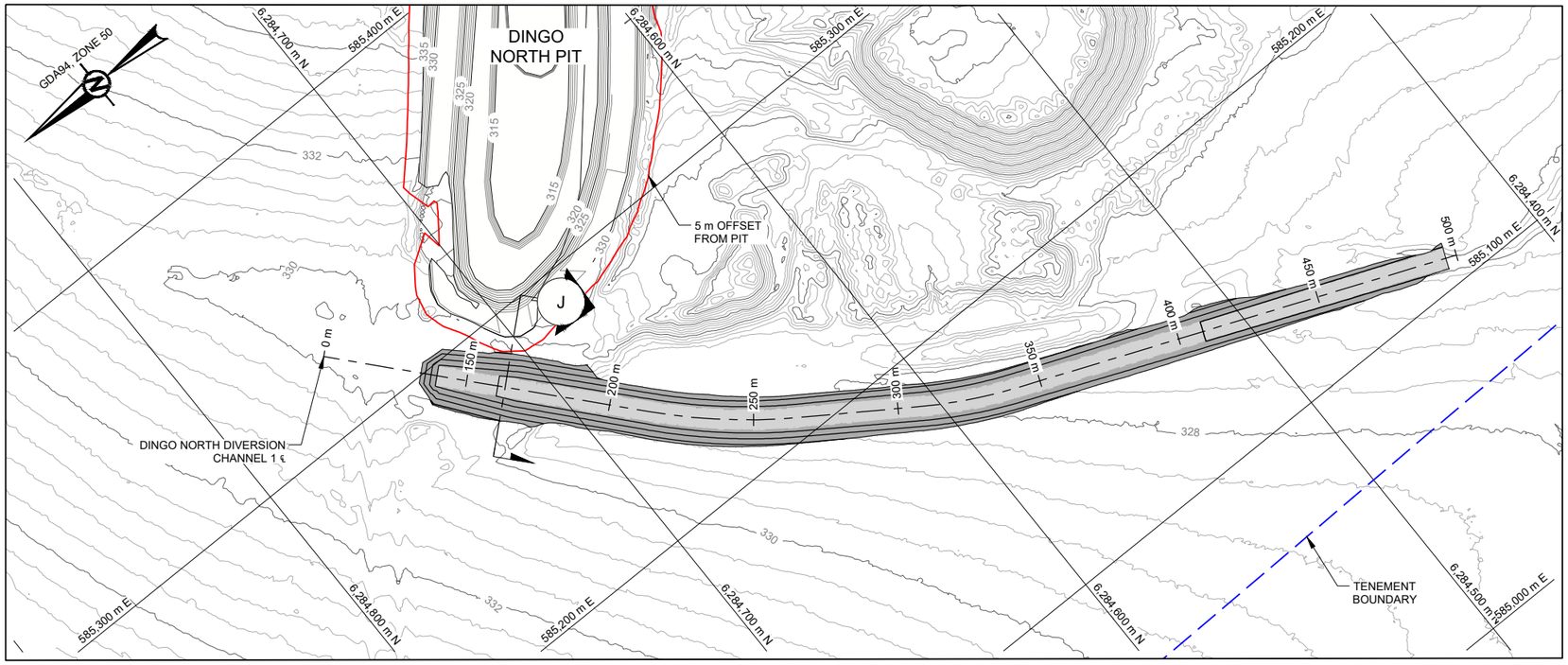
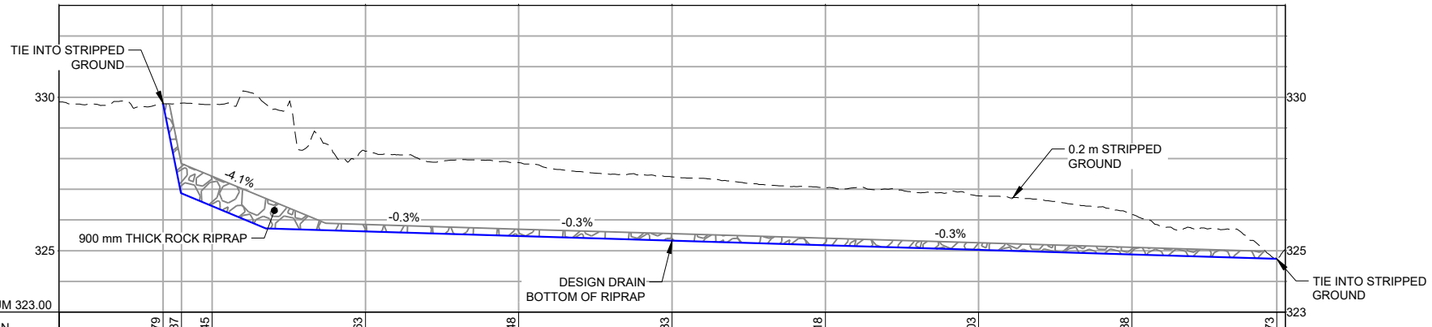


DINGO NORTH DIVERSION CHANNEL 1 - LAYOUT PLAN

SCALE 1:2,000



DESIGN DRAIN BOTTOM OF RIPRAP		329.79	326.87	326.45	325.63	325.48	325.33	325.18	325.03	324.88	324.73
0.2m STRIPPED GROUND	329.85	329.79	329.81	329.76	328.24	327.87	327.41	327.05	326.78	326.17	324.74	325.05
CUT AND FILL DEPTH (m)		0.00	2.94	-3.31	-2.61	-2.39	-2.08	-1.88	-1.76	-1.30	0.00	
CHAINAGE	0	134	140	150	100	250	200	350	300	450	497	400

DINGO NORTH DIVERSION CHANNEL 1 - LONGITUDINAL SECTION

HOR. SCALE 1:2,000

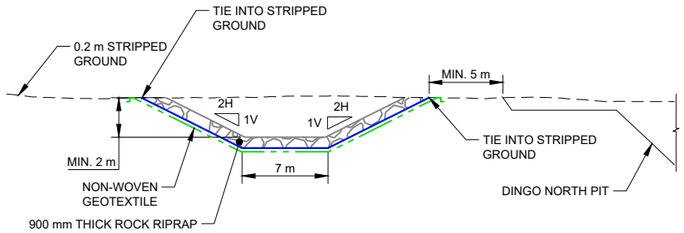
VER. SCALE 1:200

LEGEND

- 500 — EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- 500 — DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY
- 5 m OFFSET FROM PIT (TO ACCOMMODATE PIT BUND)
- ROCK RIPRAP
- NON-WOVEN GEOTEXTILE

NOTE(S)

1. SURVEY DATA PROVIDED BY AUSGOLD, DATED 31 OCTOBER 2023.
2. WASTE ROCK DUMP NORTH 1B AND ROM PAD MODELS PROVIDED BY AUSGOLD, DATED 05 MARCH 2025.
3. JACKSON PIT AND OLYMPIA PIT MODELS PROVIDED BY AUSGOLD, DATED 15 MARCH 2025.
4. DINGO NORTH PIT, DINGO SOUTH PIT AND WASTE ROCK NORTH 2 MODELS PROVIDED BY AUSGOLD, DATED 15 APRIL 2025.
5. WASTE ROCK DUMP NORTH 1A, WASTE ROCK DUMP SOUTH 2 AND WASTE ROCK DUMP MAIN MODELS PROVIDED BY AUSGOLD, DATED 14 MAY 2025.
6. SURFACE PROVIDED FOR WASTE ROCK DUMPS REPRESENT FINAL REHABILITATED SLOPES. ADDITIONAL AREA IS AVAILABLE TO ACCOMMODATE SURFACE WATER MANAGEMENT INFRASTRUCTURE DURING OPERATIONS. AS A RESULT, OVERLAP MAY BE PRESENT IN THESE FIGURES.



SCALE 1:500 J DINGO NORTH DIVERSION CHANNEL 1 - TYPICAL SECTION

NOT FOR CONSTRUCTION

0 5 10
1:200 METRES

0 10 20
1:500 METRES

0 50 100
1:2,000 METRES

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
DINGO NORTH DIVERSION CHANNEL 1 LAYOUT PLAN AND SECTIONS

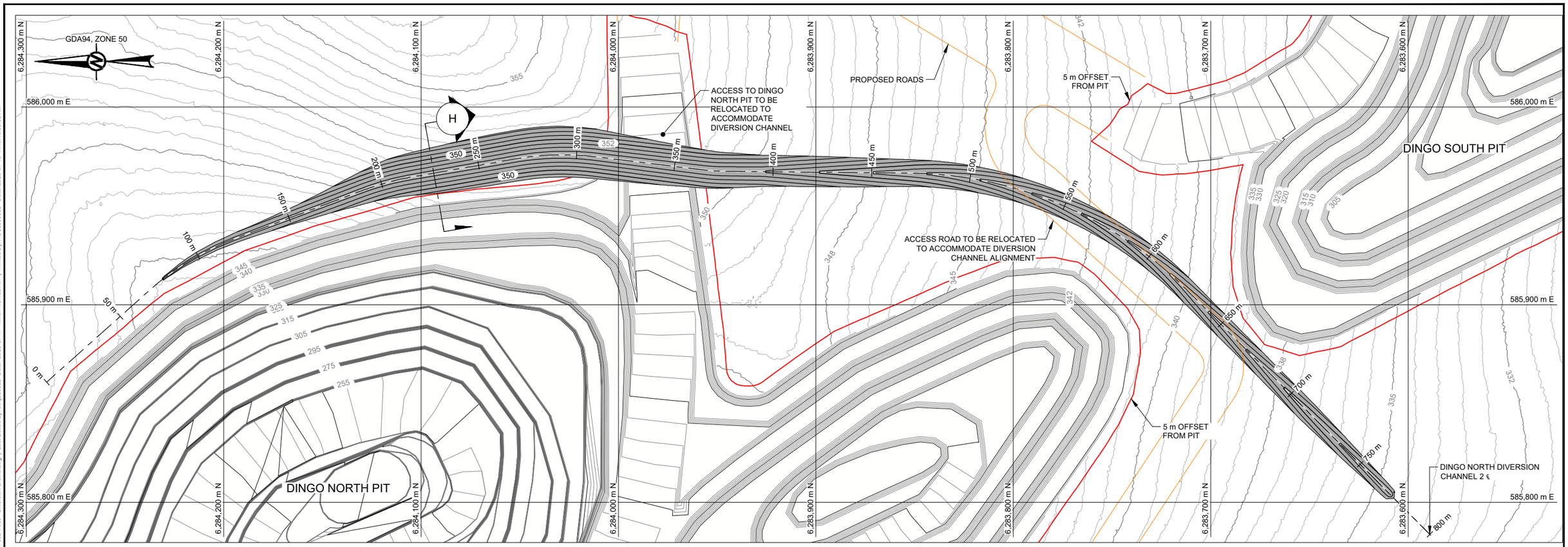
PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F007

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3

25 mm

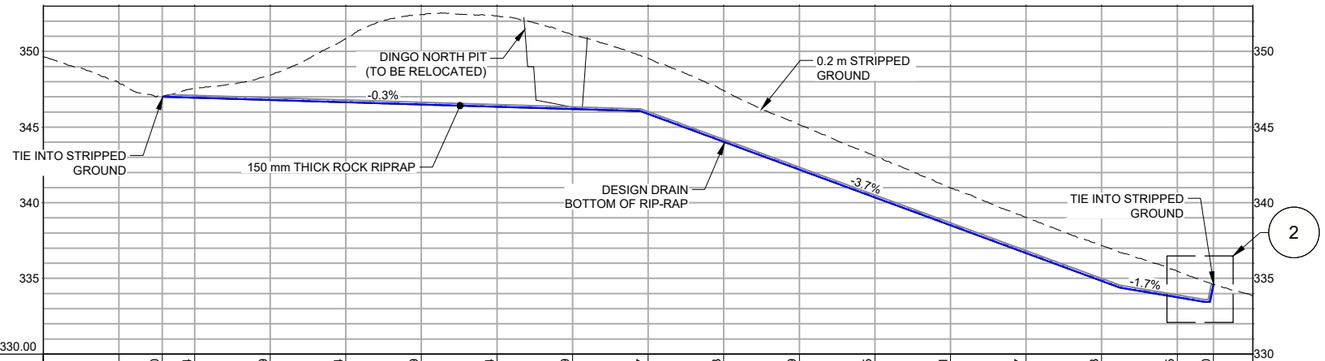
0

Path: C:\Users\AUC506882\DC\ACCDocs\WSP (AUS) ALL-AusGold_Katanning\Project Files\99_PROJECTS\PS222221_Surface_Water_Management\xxx_Feasibility Study Figures\02_PRODUCTION\DWG\ | File Name: F002-F009 - Diversion Drains.dwg | Last Edited By: auc506882 Date: 2025-07-17 Time:11:51:32 AM | Printed By: AUC506882 Date: 2025-07-18 Time:10:30:20 AM



DINGO NORTH DIVERSION CHANNEL 2 - LAYOUT PLAN

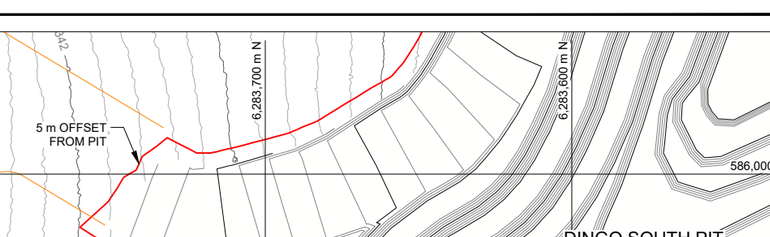
SCALE 1:2,000



CHAINAGE	0	50	79	100	150	200	250	300	350	400	450	500	550	600	650	700	750	774	800	
DESIGN DRAIN BOTTOM OF RIPRAP			347.00	346.94	346.79	346.64	346.49	346.34	346.19	345.87	344.03	342.19	340.35	338.51	336.67	334.83	333.75	334.60		
0.2m STRIPPED GROUND	349.64	347.91	347.00	347.55	348.43	350.85	352.44	352.35	351.09	349.55	347.41	345.15	343.09	340.97	339.03	337.18	335.48	334.60	333.86	
CUT AND FILL DEPTH (m)			0.00	-0.62	-1.64	-4.22	-5.95	-6.01	-4.90	-3.69	-3.39	-2.96	-2.74	-2.46	-2.36	-2.35	-1.73	0.00		

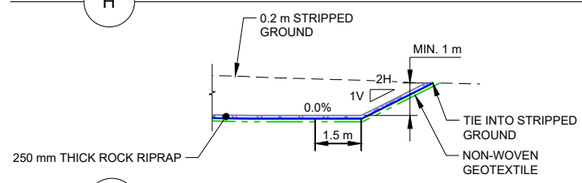
DINGO NORTH DIVERSION CHANNEL 2 - LONGITUDINAL SECTION

HOR. SCALE 1:2,000
VER. SCALE 1:200



SCALE 1:500 H

DINGO NORTH DIVERSION CHANNEL 2 - TYPICAL SECTION



SCALE 1:200 2

DINGO NORTH DIVERSION CHANNEL 2 DISSIPATION STRUCTURE

0 5 10
1:200 METRES

0 10 20
1:500 METRES

0 50 100
1:2,000 METRES

NOT FOR CONSTRUCTION

NOTE(S)

1. SURVEY DATA PROVIDED BY AUSGOLD, DATED 31 OCTOBER 2023.
2. WASTE ROCK DUMP NORTH 1B AND ROM PAD MODELS PROVIDED BY AUSGOL, DATED 05 MARCH 2025.
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CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
DINGO NORTH DIVERSION CHANNEL 2 LAYOUT PLAN AND SECTIONS

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F008

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3
25 mm
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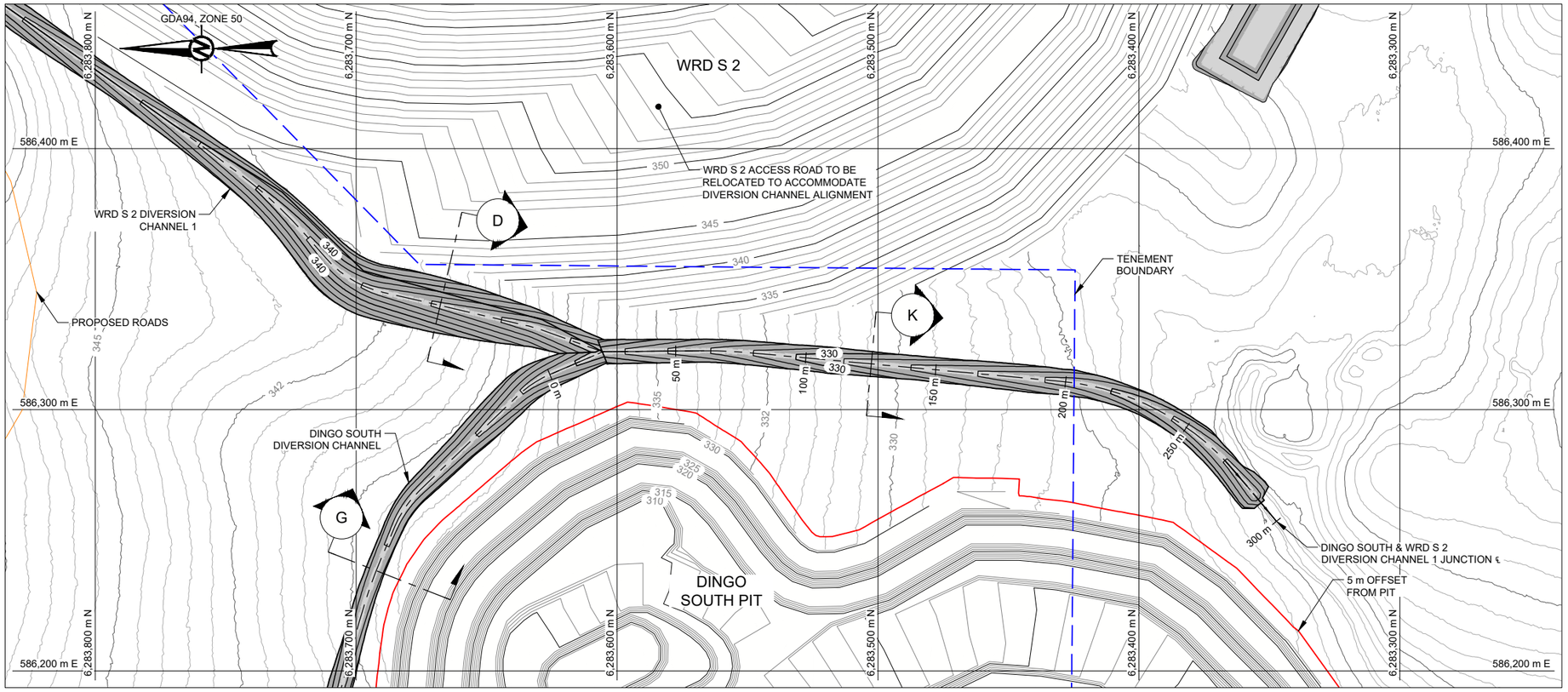

DINGO SOUTH & WRD S 2 DIVERSION CHANNEL 1 JUNCTION - LAYOUT PLAN

SCALE 1:2,000

LEGEND

- EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY
- 5 m OFFSET FROM PIT (TO ACCOMMODATE PIT BUND)
- ROCK RIPRAP
- NON-WOVEN GEOTEXTILE

NOTE(S)

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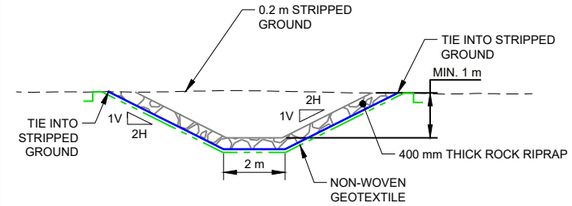
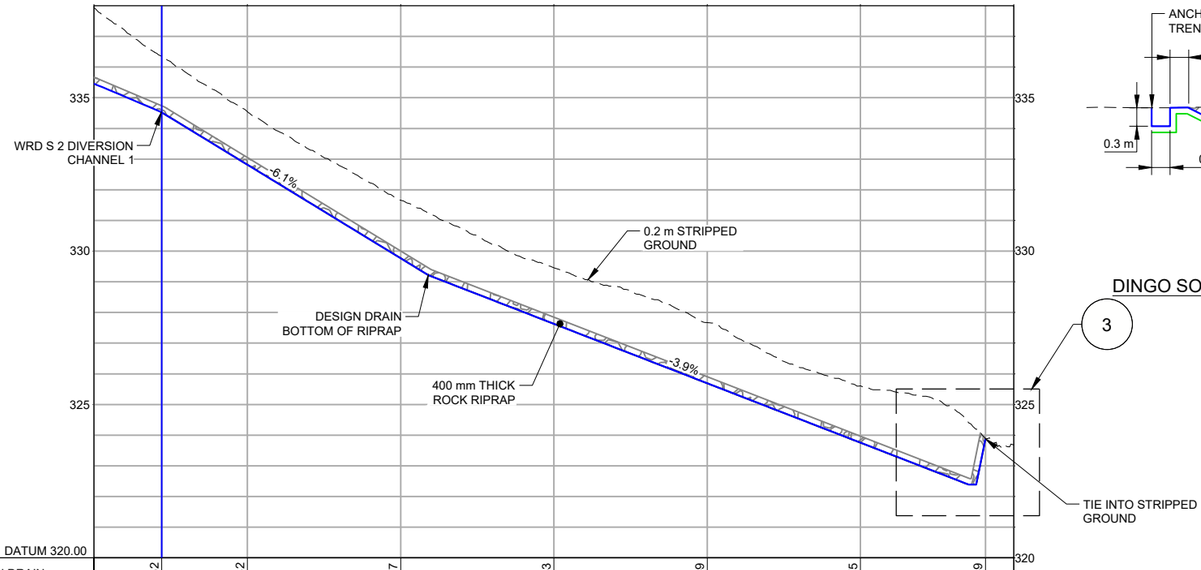


DINGO SOUTH & WRD S 2 DIVERSION CHANNEL 1 JUNCTION - TYPICAL SECTION

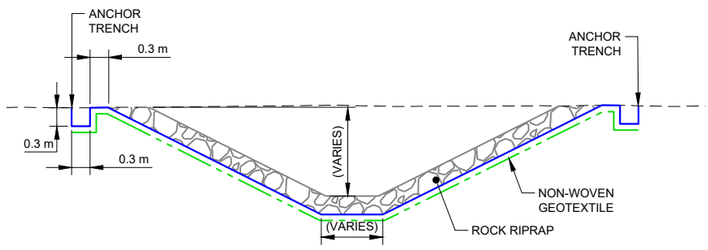
SCALE 1:200 K



DESIGN DRAIN BOTTOM OF RIPRAP		334.52	332.82	329.77	327.63	325.69	323.75	323.89
0.2m STRIPPED GROUND	337.93	336.35	334.55	331.66	329.46	327.67	325.61	323.89	323.69
CUT AND FILL DEPTH (m)		1.82	-1.73	-1.89	-1.83	-1.98	-1.85	0.00	
CHAINAGE	0	22	50	100	150	200	250	291	300

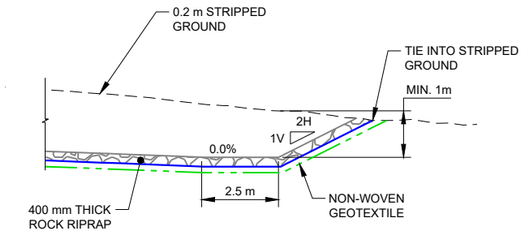
DINGO SOUTH & WRD S 2 DIVERSION CHANNEL 1 JUNCTION - LONGITUDINAL SECTION

HOR. SCALE 1:2,000
VER. SCALE 1:200



DINGO SOUTH & WRD S 2 DIVERSION CHANNEL 1 JUNCTION - TYPICAL DETAIL

SCALE 1:100



DINGO SOUTH & WRD S 2 DIVERSION CHANNEL 1 JUNCTION DISSIPATION STRUCTURE

SCALE 1:200 3

0 2.5 5
1:100 METRES

0 5 10
1:200 METRES

0 50 100
1:2,000 METRES

NOT FOR CONSTRUCTION

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
DINGO SOUTH & WRD 2 DIVERSION CHANNEL 1 JUNCTION LAYOUT PLAN AND SECTIONS

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F009

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ISO A3

25 mm

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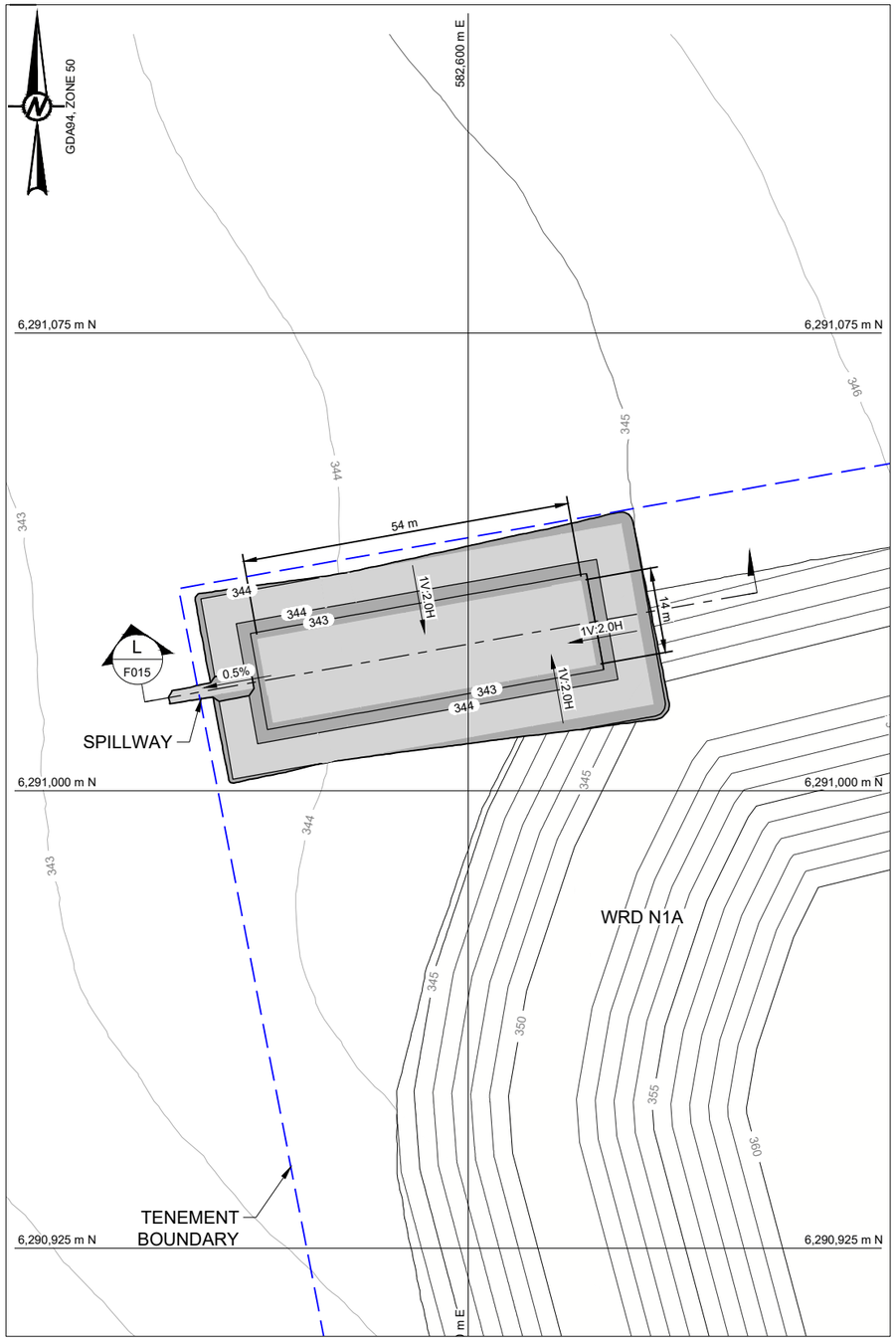
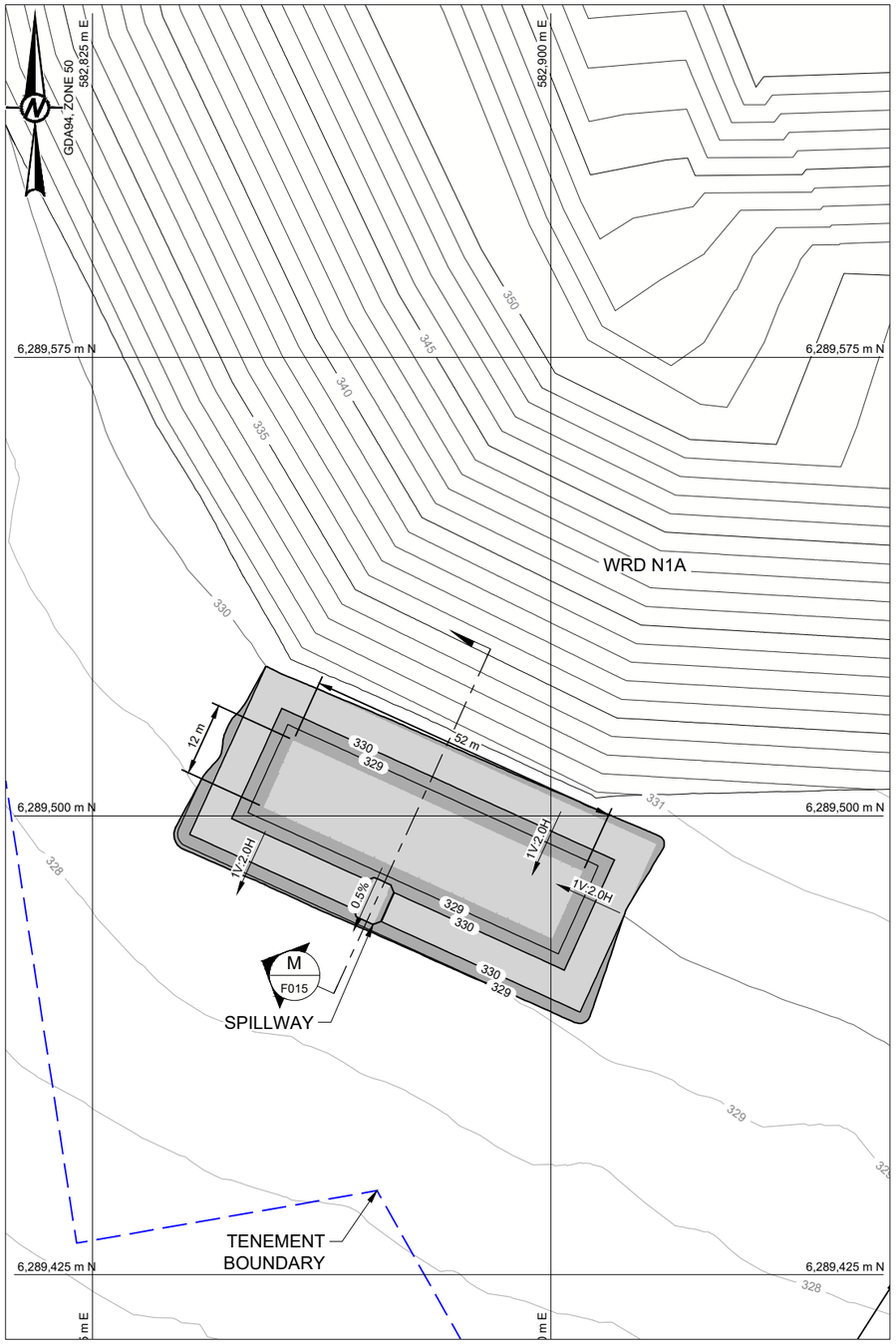


SRP N 1A POND 1 - LAYOUT PLAN
SCALE 1:1,000



SRP N 1A POND 2 - LAYOUT PLAN
SCALE 1:1,000

LEGEND

- 500 — EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- 500 — DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY

NOTE(S)

1. SURVEY DATA PROVIDED BY AUSGOLD, DATED 31 OCTOBER 2023.
2. WASTE ROCK DUMP NORTH 1B AND ROM PAD MODELS PROVIDED BY AUSGOLD, DATED 05 MARCH 2025.
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5. WASTE ROCK DUMP NORTH 1A, WASTE ROCK DUMP SOUTH 2 AND WASTE ROCK DUMP MAIN MODELS PROVIDED BY AUSGOLD, 14 MAY 2025.
6. SURFACE PROVIDED FOR WASTE ROCK DUMPS REPRESENT FINAL REHABILITATED SLOPES. ADDITIONAL AREA IS AVAILABLE TO ACCOMMODATE SURFACE WATER MANAGEMENT INFRASTRUCTURE DURING OPERATIONS. AS A RESULT, OVERLAP MAY BE PRESENT IN THESE FIGURES.
7. CONTACT RUNOFF FROM WASTE ROCK DUMPS REPORT TO SEDIMENT RETENTION PONDS VIA PERIMETER DRAIN AND SEPARATION BERMS (NOT SHOWN) ALONG WASTE ROCK DUMP TOES.

NOT FOR CONSTRUCTION

0 25 50
1:1,000 METRES

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
SEDIMENT RETENTION POND N 1A POND 1 AND POND 2 LAYOUT PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F010

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3

25 mm

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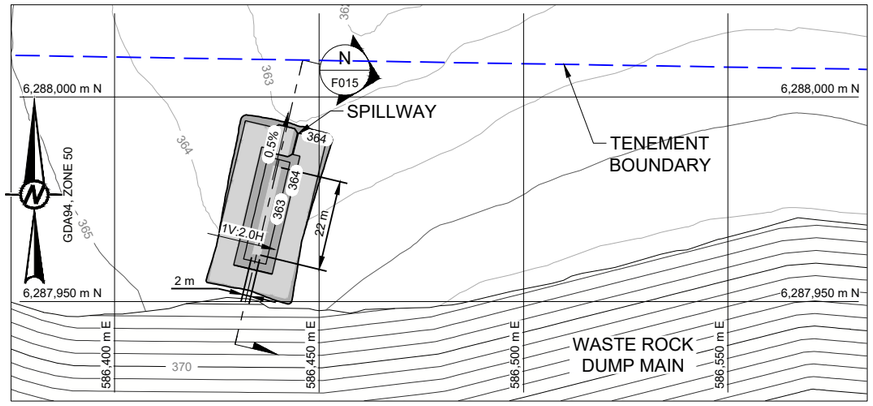
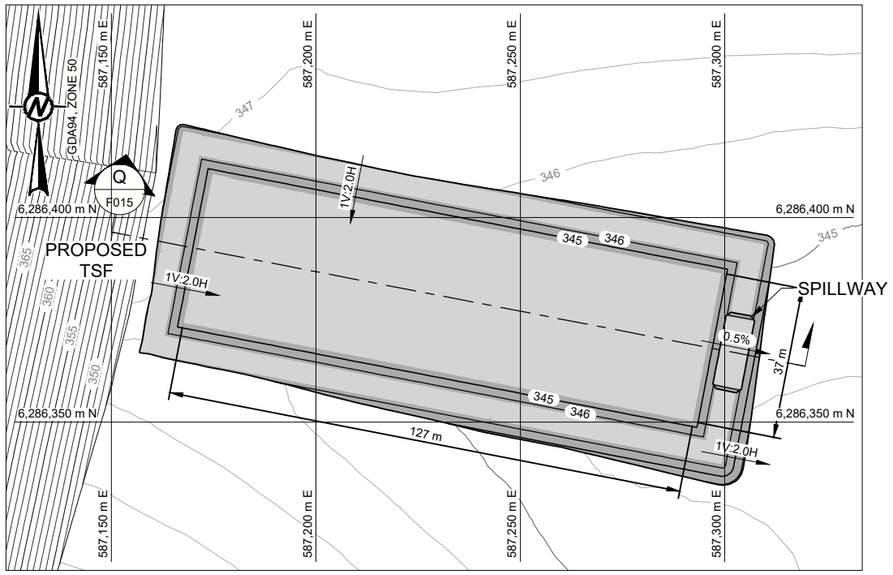
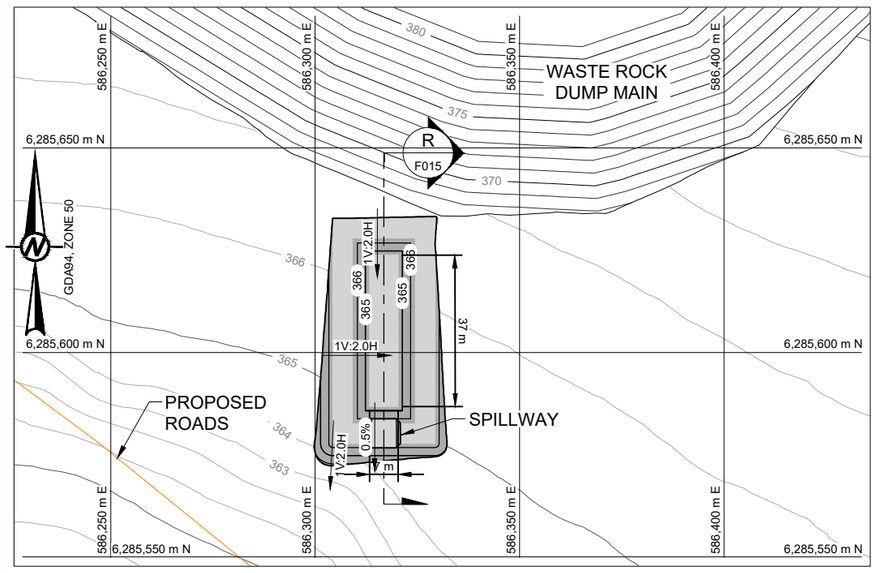


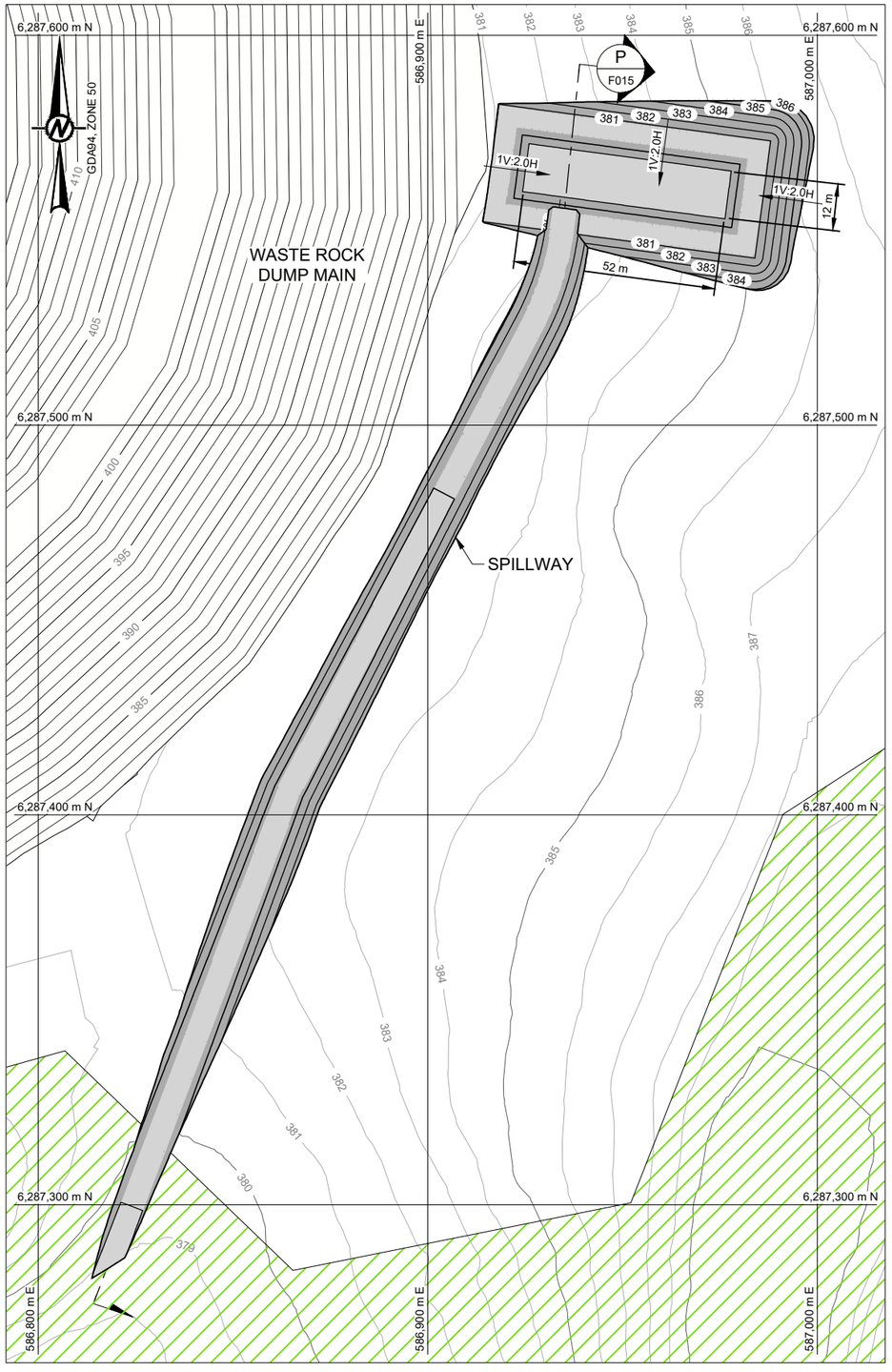
MAIN SRP POND 1 - LAYOUT PLAN
SCALE 1:1,500



MAIN SRP POND 3 - LAYOUT PLAN
SCALE 1:1,500



MAIN SRP POND 4 - LAYOUT PLAN
SCALE 1:1,500



MAIN SRP POND 2 - LAYOUT PLAN
SCALE 1:1,500

LEGEND

- EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY
- PROPOSED ROADS (PROVIDED BY AUSGOLD)
- EXEMPTION WOODLAND ZONE

NOTE(S)

1. SURVEY DATA PROVIDED BY AUSGOLD, DATED 31 OCTOBER 2023.
2. WASTE ROCK DUMP NORTH 1B AND ROM PAD MODELS PROVIDED BY AUSGOLD, DATED 05 MARCH 2025.
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NOT FOR CONSTRUCTION

0 25 50
1:1,500 METRES

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
MAIN SEDIMENT RETENTION PONDS 1 TO 4 LAYOUT PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F011

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3

25 mm

0

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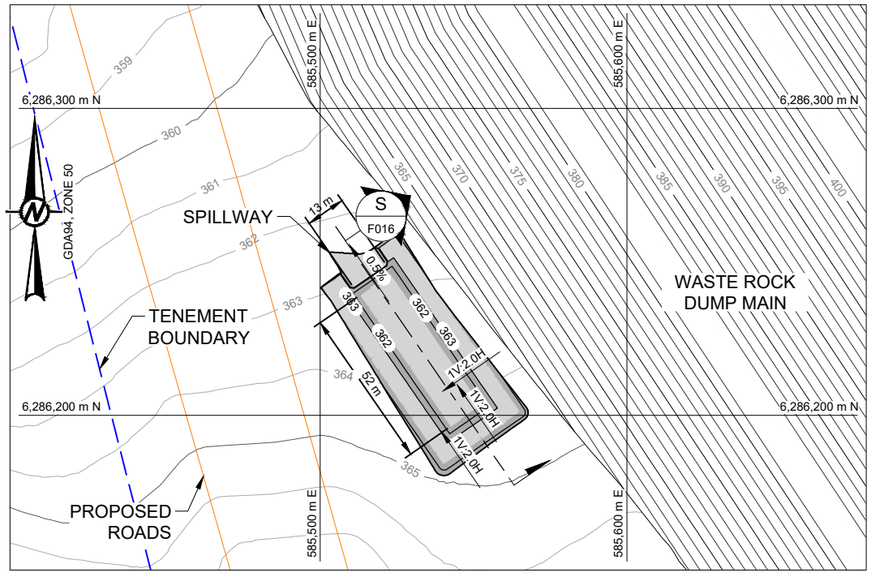
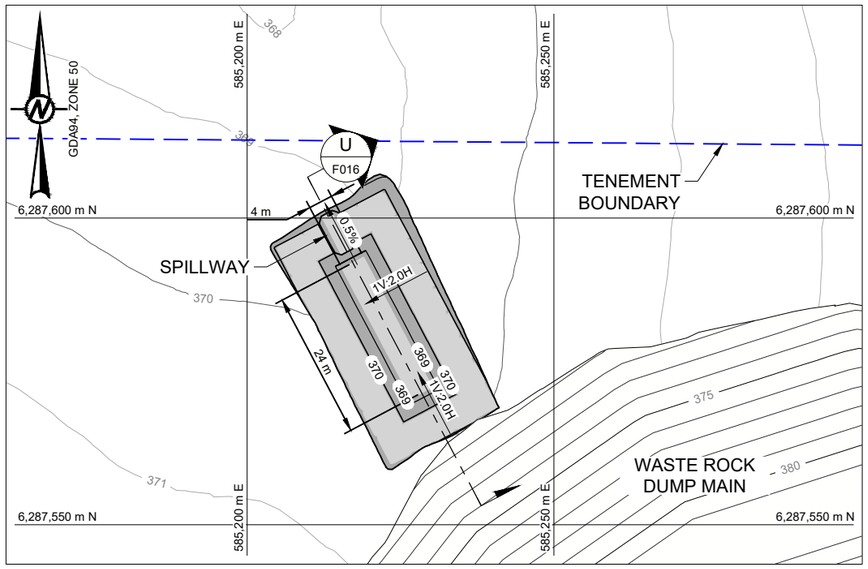
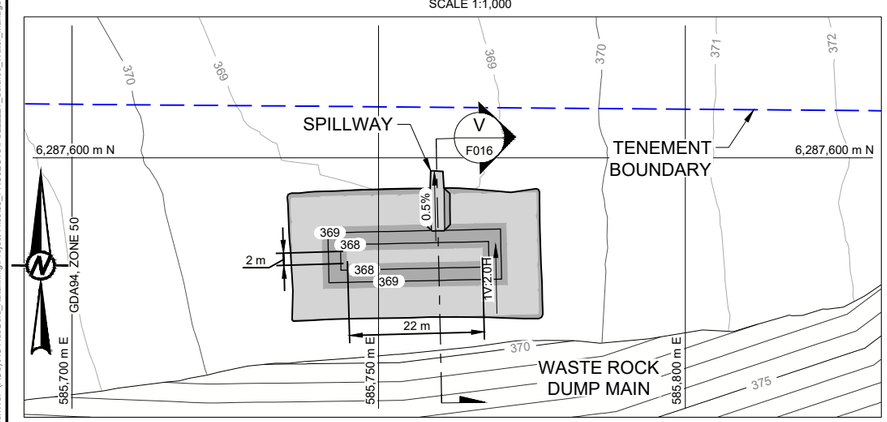


MAIN SRP POND 5 - LAYOUT PLAN
SCALE 1:1,000



MAIN SRP POND 7 - LAYOUT PLAN
SCALE 1:1,000



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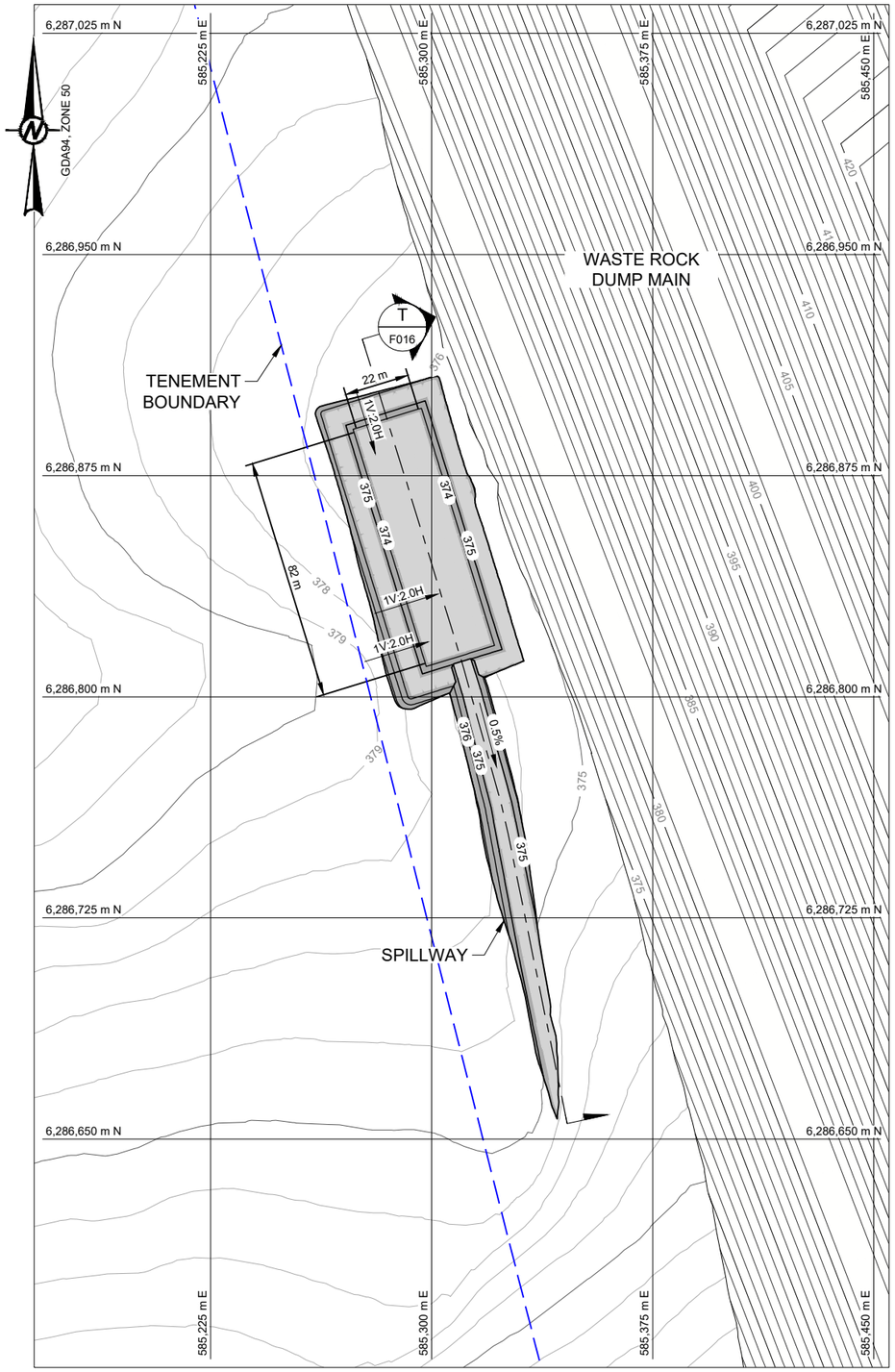
SCALE 1:1,000



MAIN SRP POND 6 - LAYOUT PLAN
SCALE 1:2,000

LEGEND

- EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY
- PROPOSED ROADS (PROVIDED BY AUSGOLD)

NOTE(S)

1. SURVEY DATA PROVIDED BY AUSGOLD, DATED 31 OCTOBER 2023.
2. WASTE ROCK DUMP NORTH 1B AND ROM PAD MODELS PROVIDED BY AUSGOLD, DATED 05 MARCH 2025.
3. JACKSON PIT AND OLYMPIA PIT MODELS PROVIDED BY AUSGOLD, DATED 15 MARCH 2025.
4. DINGO NORTH PIT, DINGO SOUTH PIT AND WASTE ROCK NORTH 2 MODELS PROVIDED BY AUSGOLD, DATED 15 APRIL 2025.
5. WASTE ROCK DUMP NORTH 1A, WASTE ROCK DUMP SOUTH 2 AND WASTE ROCK DUMP MAIN MODELS PROVIDED BY AUSGOLD, 14 MAY 2025.
6. SURFACE PROVIDED FOR WASTE ROCK DUMPS REPRESENT FINAL REHABILITATED SLOPES. ADDITIONAL AREA IS AVAILABLE TO ACCOMMODATE SURFACE WATER MANAGEMENT INFRASTRUCTURE DURING OPERATIONS. AS A RESULT, OVERLAP MAY BE PRESENT IN THESE FIGURES.
7. CONTACT RUNOFF FROM WASTE ROCK DUMPS REPORT TO SEDIMENT RETENTION PONDS VIA PERIMETER DRAIN AND SEPARATION BERMS (NOT SHOWN) ALONG WASTE ROCK DUMP TOES.

NOT FOR CONSTRUCTION

0 25 50
1:1,000 METRES

0 50 100
1:2,000 METRES

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
MAIN SEDIMENT RETENTION PONDS 5 TO 8 LAYOUT PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F012

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3

0 25 mm

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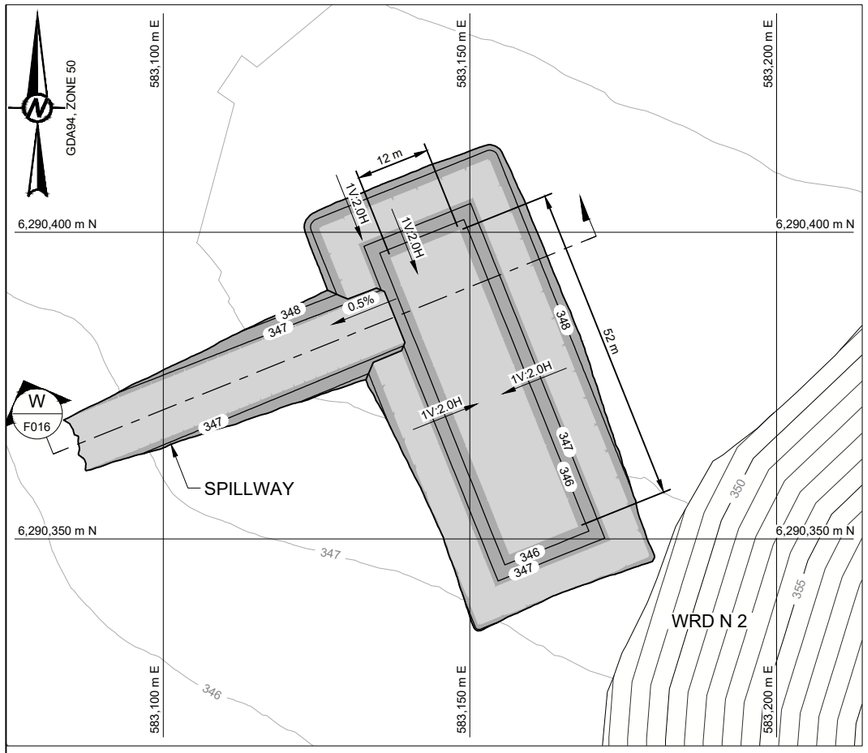
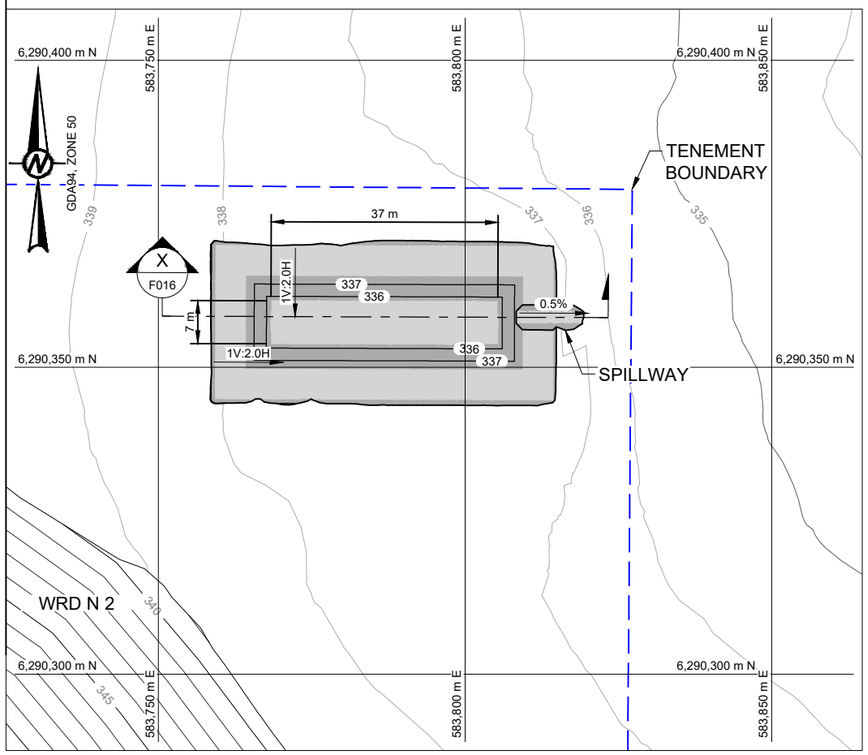


SRP N 2 POND 1 - LAYOUT PLAN
SCALE 1:1,000



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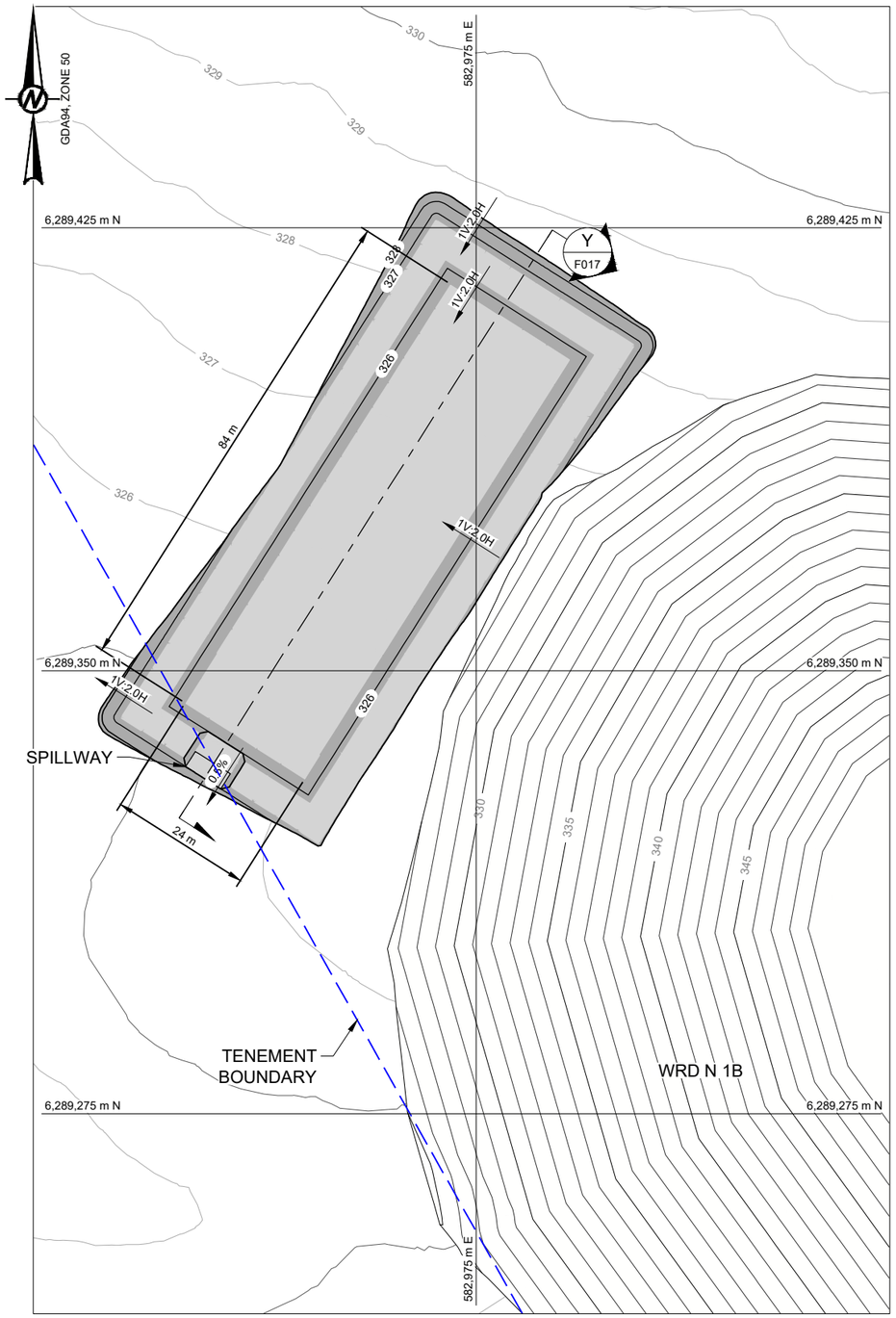

SRP N 1B POND 1 - LAYOUT PLAN
SCALE 1:1,000

LEGEND

- 500 — EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- 500 — DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY

NOTE(S)

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7. CONTACT RUNOFF FROM WASTE ROCK DUMPS REPORT TO SEDIMENT RETENTION PONDS VIA PERIMETER DRAIN AND SEPARATION BERMS (NOT SHOWN) ALONG WASTE ROCK DUMP TOES.

NOT FOR CONSTRUCTION

0 25 50
1:1,000 METRES

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
SEDIMENT RETENTION POND N2 POND 1, N2 POND 2 AND N 1B POND 1
LAYOUT PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F013

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3
25 mm
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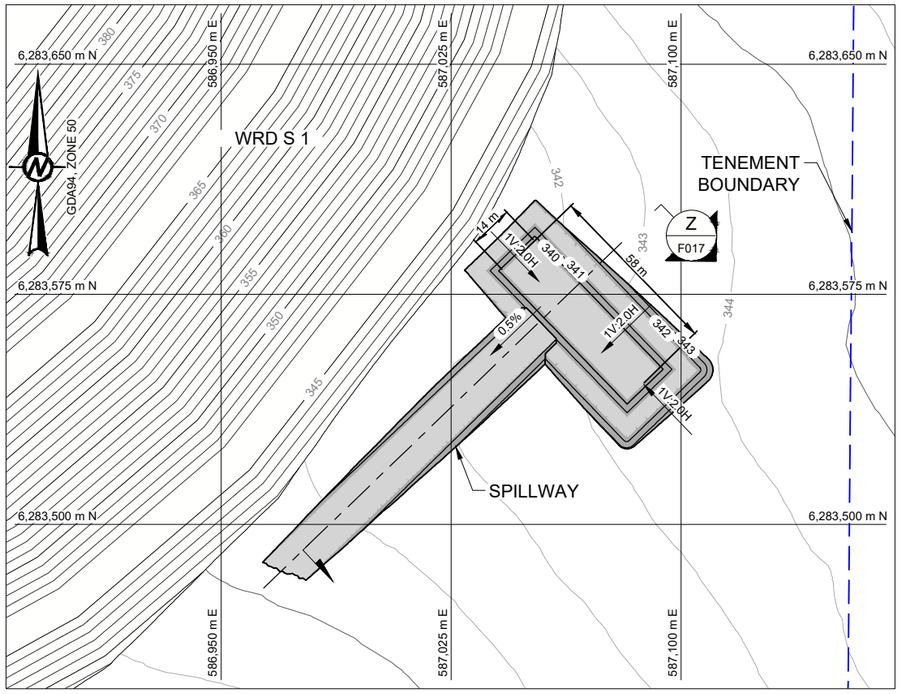
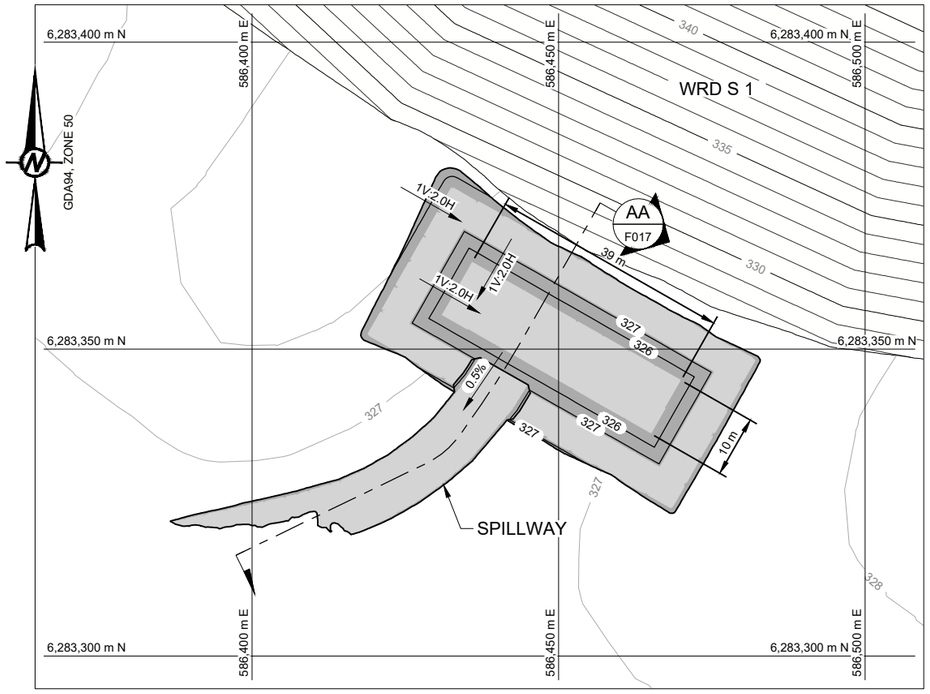


SRP S 2 POND 1 - LAYOUT PLAN
SCALE 1:2,000



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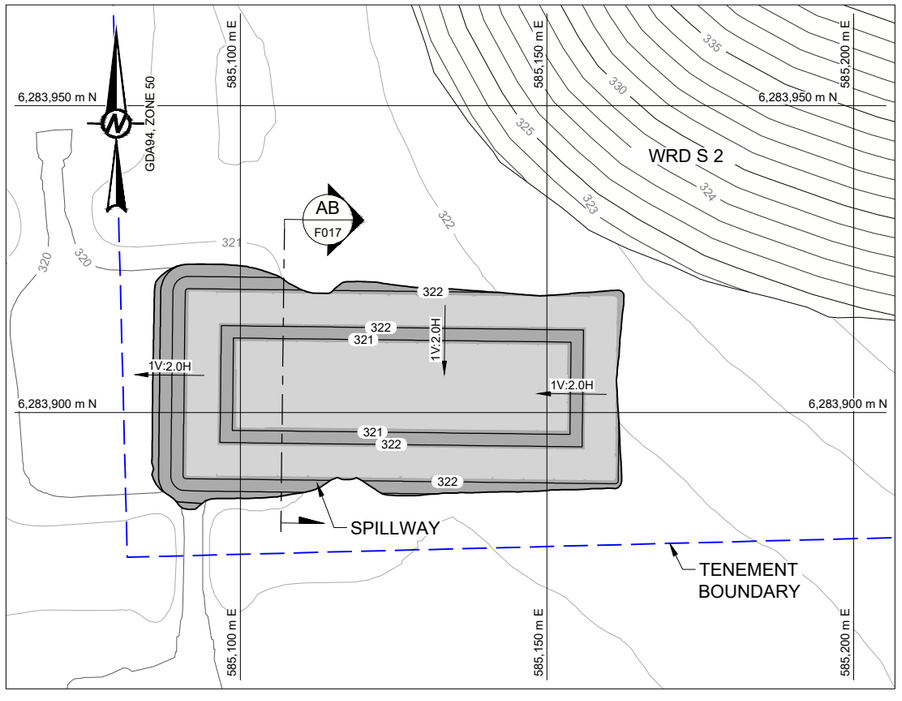
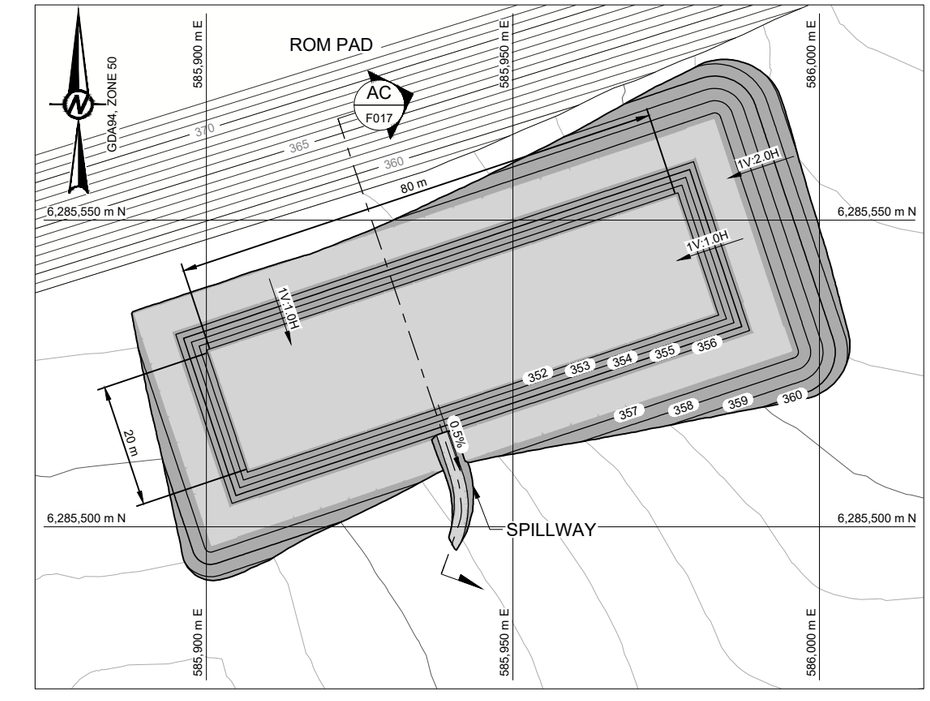


SRP S 1 POND 1 - LAYOUT PLAN
SCALE 1:1,000



STORMWATER POND - LAYOUT PLAN
SCALE 1:1,000

LEGEND

- 500 — EXISTING TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- 500 — DESIGN TOPOGRAPHICAL CONTOUR AND ELEVATION (mAHD)
- TENEMENT BOUNDARY

NOTE(S)

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7. CONTACT RUNOFF FROM WASTE ROCK DUMPS REPORT TO SEDIMENT RETENTION PONDS VIA PERIMETER DRAIN AND SEPARATION BERMS (NOT SHOWN) ALONG WASTE ROCK DUMP TOES.

NOT FOR CONSTRUCTION

0 25 50
1:1,000 METRES

0 50 100
1:2,000 METRES

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
SEDIMENT RETENTION POND S 2 POND 1, S 2 POND 2, S 1 POND 1, AND STORMWATER POND LAYOUT PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F014

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3
25 mm
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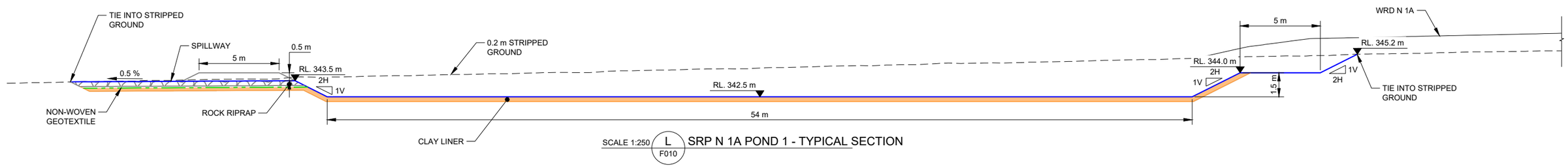
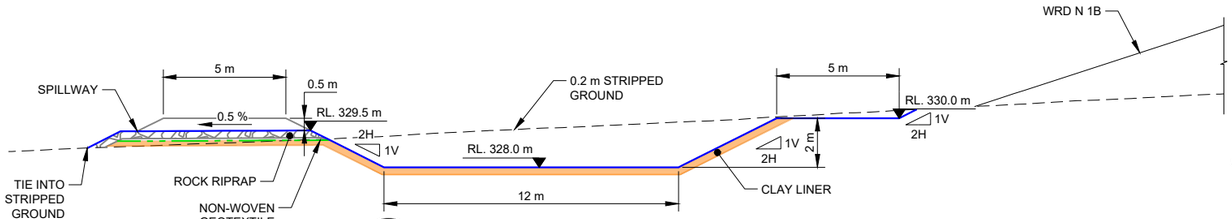


SCALE 1:250 L F010 SRP N 1A POND 1 - TYPICAL SECTION



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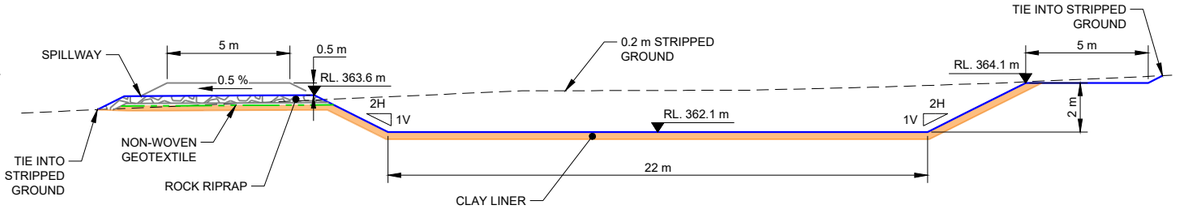

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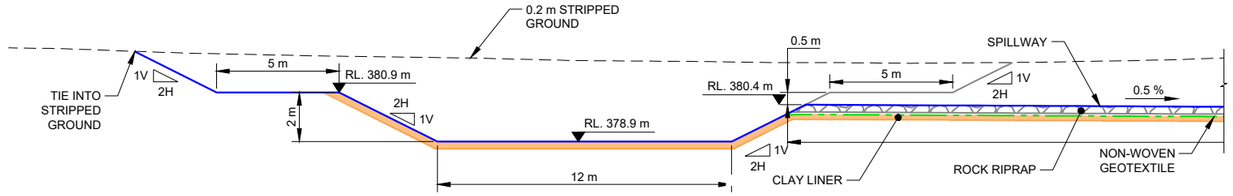

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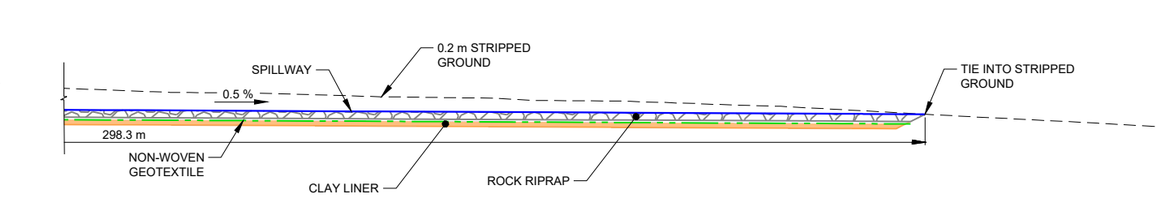

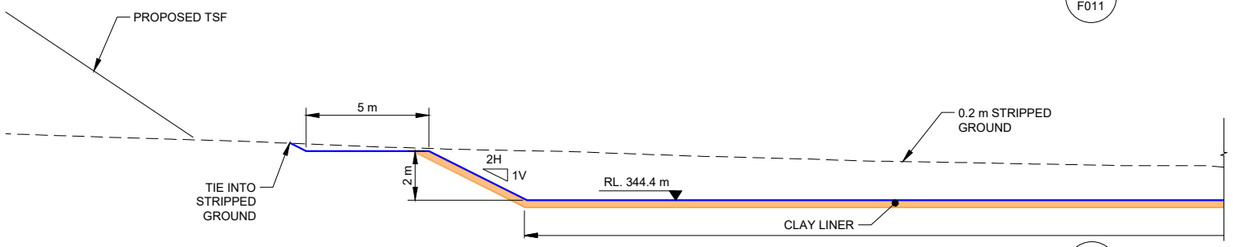

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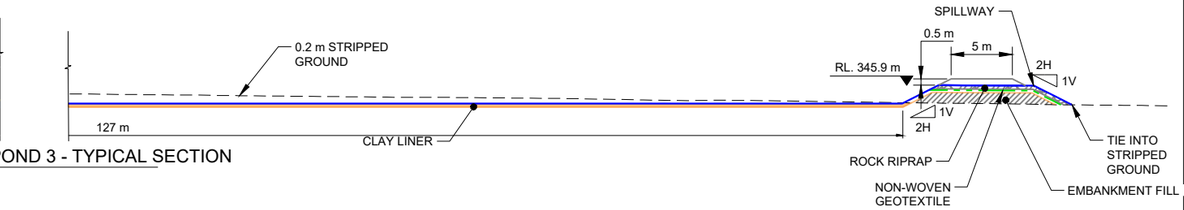

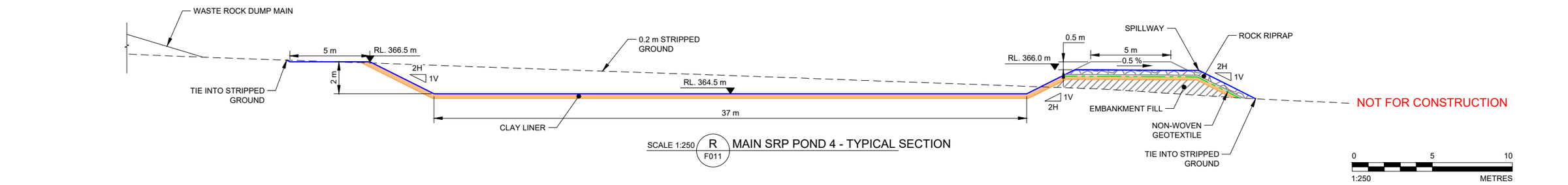

SCALE 1:250 R F011 MAIN SRP POND 4 - TYPICAL SECTION

LEGEND

- ROCK RIPRAP
- EMBANKMENT FILL
- CLAY LINER
- NON-WOVEN GEOTEXTILE

NOTE(S)

1. SURVEY DATA PROVIDED BY AUSGOLD, DATED 31 OCTOBER 2023.
2. WASTE ROCK DUMP NORTH 1B AND ROM PAD MODELS PROVIDED BY AUSGOLD, DATED 05 MARCH 2025.
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CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
POND TYPICAL SECTIONS AND DETAILS (1 OF 3)

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F015

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ISO A3
25 mm
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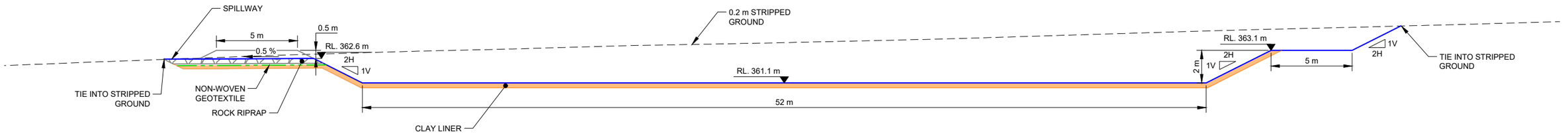

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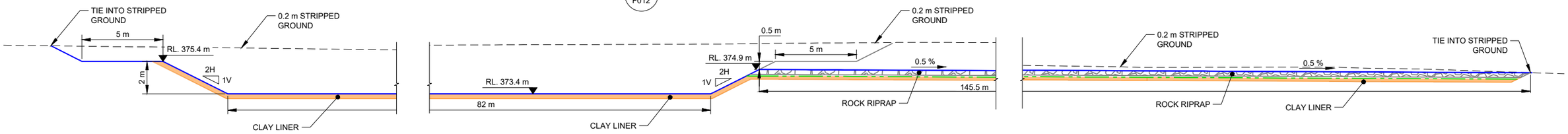

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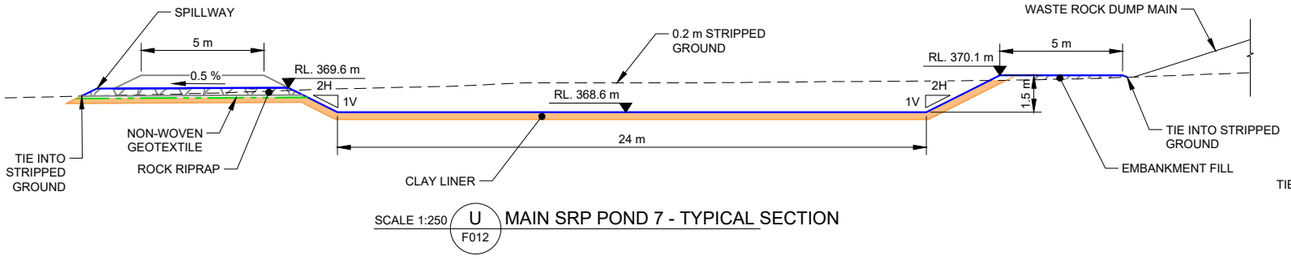

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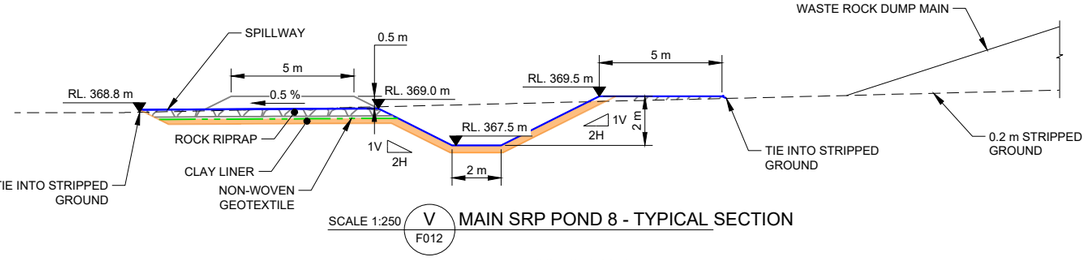

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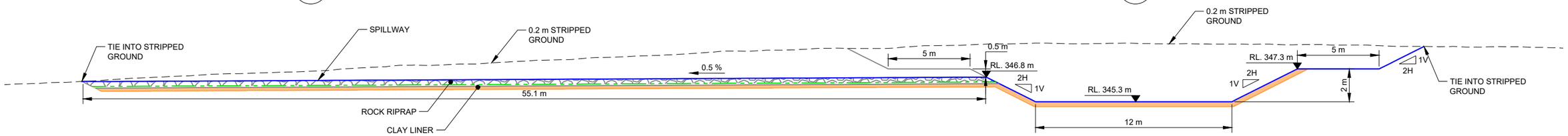
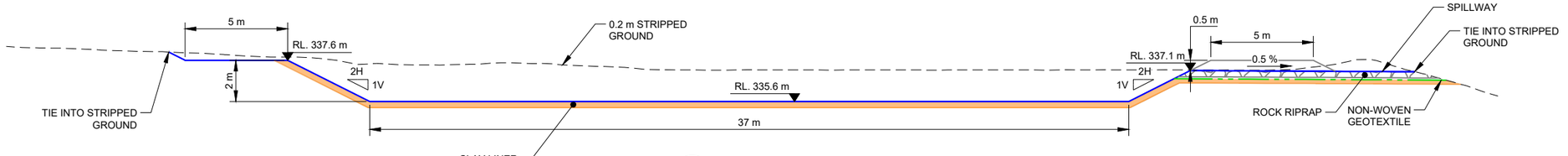


SCALE 1:250 W F013 SRP N 2 POND 1 - TYPICAL SECTION



SCALE 1:250 X F013 SRP N 2 POND 2 - TYPICAL SECTION

NOT FOR CONSTRUCTION

0 5 10
1:250 METRES

LEGEND

- ROCK RIPRAP
- EMBANKMENT FILL
- CLAY LINER
- NON-WOVEN GEOTEXTILE

NOTE(S)

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CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
POND TYPICAL SECTIONS AND DETAILS (2 OF 3)

PROJECT NO.	CONTROL	REV.	FIGURE
PS222221	001	0	F016

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ISO A3
0 25 mm

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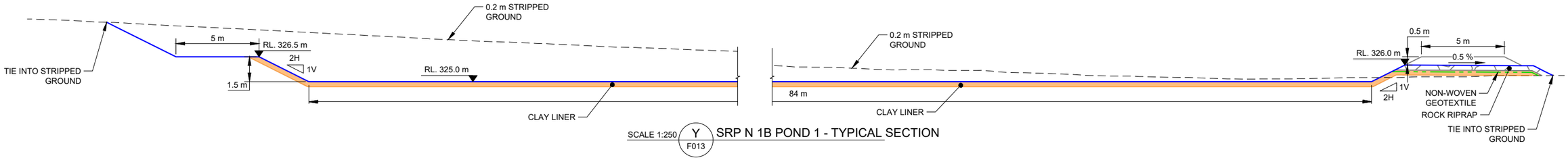

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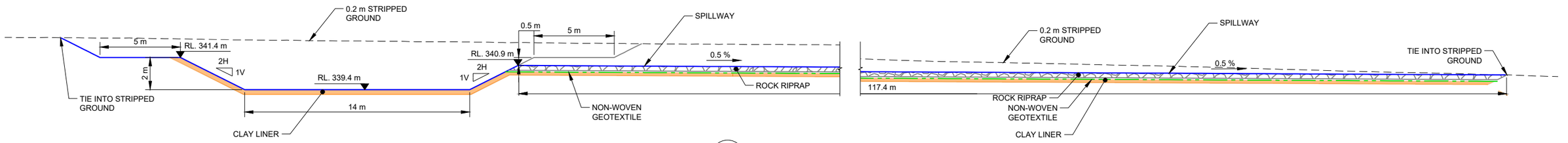

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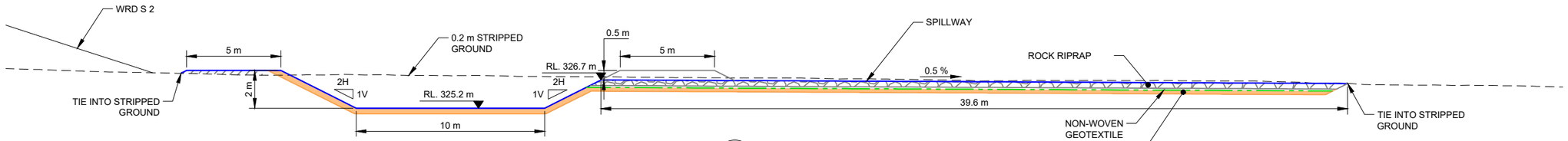

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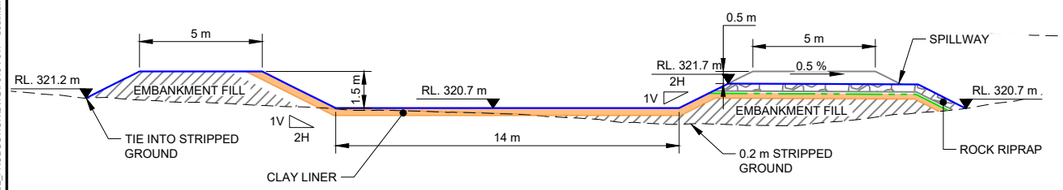

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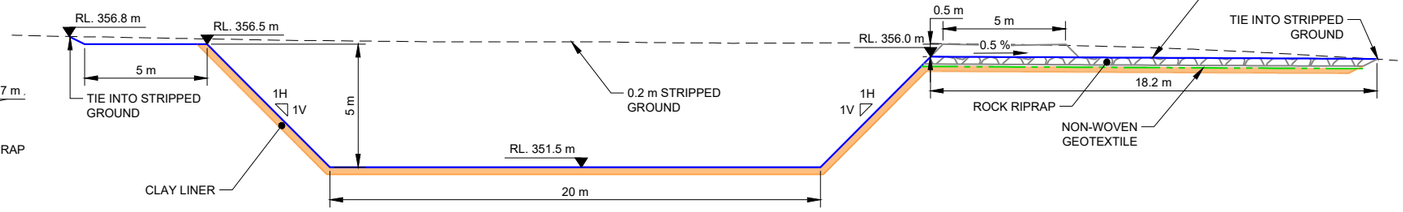
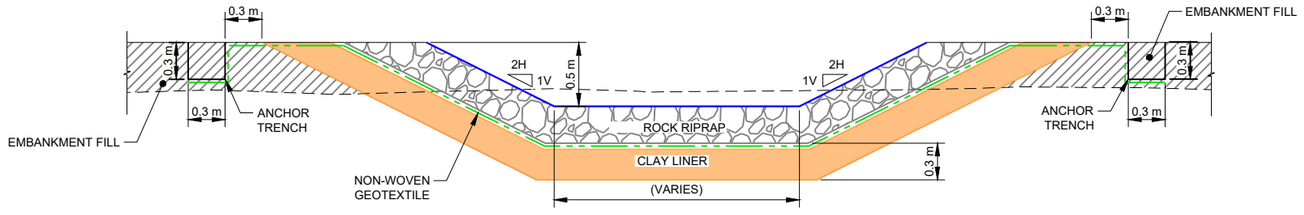


SCALE 1:250 AC F014 STORM WATER POND - TYPICAL SECTION



SPILLWAY - TYPICAL DETAIL
SCALE 1:50

NOT FOR CONSTRUCTION

0 1 2
1:50 METRES

0 5 10
1:250 METRES

LEGEND

- ROCK RIPRAP
- EMBANKMENT FILL
- CLAY LINER
- NON-WOVEN GEOTEXTILE

NOTE(S)

1. SURVEY DATA PROVIDED BY AUSGOLD, DATED 31 OCTOBER 2023.
2. WASTE ROCK DUMP NORTH 1B AND ROM PAD MODELS PROVIDED BY AUSGOLD, DATED 05 MARCH 2025.
3. JACKSON PIT AND OLYMPIA PIT MODELS PROVIDED BY AUSGOLD, DATED 15 MARCH 2025.
4. DINGO NORTH PIT, DINGO SOUTH PIT AND WASTE ROCK NORTH 2 MODELS PROVIDED BY AUSGOLD, DATED 15 APRIL 2025.
5. WASTE ROCK DUMP NORTH 1A, WASTE ROCK DUMP SOUTH 2 AND WASTE ROCK DUMP MAIN MODELS PROVIDED BY AUSGOLD, DATED 14 MAY 2025.
6. SURFACE PROVIDED FOR WASTE ROCK DUMPS REPRESENT FINAL REHABILITATED SLOPES. ADDITIONAL AREA IS AVAILABLE TO ACCOMMODATE SURFACE WATER MANAGEMENT INFRASTRUCTURE DURING OPERATIONS. AS A RESULT, OVERLAP MAY BE PRESENT IN THESE FIGURES.

CLIENT
AUSGOLD LIMITED

CONSULTANT
wsp

YYYY-MM-DD	2025-07-17
DESIGNED	L. ANG
PREPARED	A. JUSTINICO
REVIEWED	L. ANG
APPROVED	N. MOON

PROJECT
KATANNING GOLD PROJECT
SURFACE WATER MANAGEMENT PLAN
FEASIBILITY STUDY

TITLE
POND TYPICAL SECTIONS AND DETAILS (3 OF 3)

PROJECT NO.	CONTROL	REV.	FIGURE
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Appendix 8: Pit Lake Post-closure Recovery (Rockwater, 2026)

KATANNING GOLD PROJECT

GROUNDWATER MODELLING – CLOSURE ASSESSMENT

REPORT FOR
AUSGOLD

JUNE 2026

Report No. 72.262/26/01a

Rockwater
HYDROGEOLOGICAL AND ENVIRONMENTAL CONSULTANTS

76 Jersey Street Jolimont 6014 Western Australia Postal: PO Box 201 Wembley 6913 Western Australia
Ph: 61 8 9284 0222 Fax: 61 8 9284 1785 Email: consult@rockwater.com.au www.rockwater.com.au ABN: 43 008 804 653

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REVISION	AUTHOR	REVIEW	AUTHORISED	ISSUED
1	GL / CN	MT	MT	22/06/2026

1 INTRODUCTION

Ausgold Limited (Ausgold) is developing the Katanning Gold Project (KGP) in the southern wheatbelt region of Western Australia (WA) (Figure 1). Gold mineralisation occurs within the Archaean Katanning Greenstone Belt, hosted within sheared metasediments and granitoids. The project area is underlain by a variably weathered saprolitic profile which together with the fractured bedrock constitutes the aquifer system that locally contains groundwater.

Between 2021 and 2024, SRK consulting completed groundwater investigations which included drilling, bore construction, test-pumping, and modelling in support of a hydrogeological conceptualisation, a groundwater model and a H3 Hydrogeological Assessment. Subsequent peer reviews and revised groundwater modelling (Rockwater, 2025a; EMM, 2025) concluded that SRK's predicted dewatering rates were likely over-estimated by one to two orders of magnitude, mainly due to use of an unrealistic specific yield value to represent the fractured bedrock. In 2025, Rockwater produced updated groundwater modelling to reflect KGP's current base-case water management strategy, incorporating dewatering of pit inflows, water supply borefield operation and the use of a fully lined wet tailings storage facility (TSF) during the dewatering phase (Rockwater, 2025b).

To support its approvals requirements, Ausgold has engaged Rockwater to further refine its model to support a specific focus on the post-closure conditions, including the potential mounding and contaminant transport pathways relating to the wet TSF, as well as pit lake recovery and hydrochemistry.

Throughout this report, the two models will be referred to as the "dewatering model", representing the operational mine phase, and the "recovery model" representing the closure phase upon cessation of dewatering and TSF utilisation activities.

2 HYDROGEOLOGICAL SETTING

2.1 PHYSIOGRAPHY AND CLIMATE

The KGP project landscape is typical of the WA Wheatbelt, featuring gently rolling agricultural landscapes hosting a mix of low hills and broad valleys, with elevations ranging between 219 and 433 m Australian Height Datum (AHD). The regional climate is Mediterranean with average annual rainfall ~390 mm/yr and potential evaporation exceeding 2,000 mm/yr, resulting in limited groundwater recharge. Regionally, the project area sits within the Blackwood River Catchment, with surface water draining toward the north via the Datatine Gully into Dumbleyung Lake to the north, as well as toward the south via the Coblinine River before also discharging into Dumbleyung Lake.

Historic land clearing has resulted in dryland salinity issues in the area, particularly in low-lying areas where the groundwater table is close to the ground surface.

2.2 GEOLOGY

The project area is underlain by the Yilgarn Craton, comprising predominantly Archaean gneiss and granite. The bedrock is intersected by numerous south-west to north-east-trending faults and east–west-trending Proterozoic dykes composed of dolerite, gabbro, and quartz, which locally influence groundwater movement.

The upper bedrock is extensively weathered to form a saprolitic zone, marking the transition to the overlying regolith profile of variable thickness. This regolith includes both residual and transported materials, such as colluvial and alluvial sediments, derived from in-situ weathering of local lithologies.

2.3 HYDROGEOLOGY

Groundwater within the KGP area occurs in a multi-layered system that reflects the underlying geological profile. Three principal aquifer units are recognised:

- Superficial aquifers; comprising colluvial and alluvial deposits within the regolith. These host shallow groundwater that is variably connected to surface drainage and are generally unconfined to semi-confined.
- Weathered rock aquifers; corresponding to the saprolitic and lateritic zones developed at the top of the bedrock. Groundwater is stored within fine-grained pore spaces and minor secondary fractures, typically forming low-permeability, semi-confined systems.
- Fractured rock aquifers; comprising fractured gneiss and greenstone units that provide the main transmissive pathways for groundwater flow and potential dewatering inflows. Hydraulic conductivity is controlled primarily by the density and orientation of faults, joints and dykes.

Groundwater levels across the project area range from approximately 19 m below ground level (bgl) to locally above ground level, with elevations between 265 m and 360 m AHD. Above ground levels represent potentiometric heads in semi-confined to confined aquifers within low-lying areas, rather than actual groundwater expressions at ground surface. Elevations are highest near Jinka Pit on a topographic high and lowest near surface-water tributaries draining toward Lake Dumbleyung. Regional groundwater flow is radial and outward from these higher areas toward lower-lying discharge zones.

3 MODEL BASIS OF DESIGN

Given the inherent heterogeneity of the KGP hydrogeological system, the operational phase numerical groundwater model was developed as a fit-for-purpose simplified three-layer representation of the conceptual hydrogeology. The model was designed to efficiently simulate base-case drawdown associated with combined pit dewatering, wet TSF operation, and groundwater supply extraction during mining operations, while remaining consistent with the available hydrogeological data and the conceptual understanding of aquifer behaviour.

To improve representation of pit lake recovery during closure, a modified version of the dewatering model (Rockwater, 2025b) was developed incorporating additional vertical discretisation and recovery-phase boundary conditions.

3.1 RECOVERY MODEL SETUP

Layers 1 (superficial alluvium and clays) and 2 (weathered bedrock) from the dewatering model (Rockwater, 2025b) were vertically refined into two and seven layers, respectively, to increase vertical discretisation of the pit voids.

For simplicity and to reduce model instability, it was assumed that all pits were fully dewatered at the end of operations. The operational model was therefore re-run to ensure all final pit void cells were dry at the commencement of recovery simulations. Simulated heads from the final operational timestep were adopted as initial heads for the recovery model, and pit lake recovery was undertaken simultaneously for Dingo, Jackson and Jinka pits.

Model cells intersected by the final pit voids were attributed high hydraulic conductivity of 100 m/d and a specific yield of 1, to represent open-water conditions within recovering pit lakes.

Modflow 2005's wetting capability was activated to enable rewetting of initially dry pit cells from underlying and adjacent saturated cells during pit lake recovery.

Average annual recharge of 0.00106 m/day (or 386.9 mm/yr), based on 1976–2025 records from the Badgebup weather station, was applied to the uppermost active pit lake cells.

Average annual evaporation at the Badgebup weather station (0.00439 m/day) was also applied to the pit lake surfaces using a Morton lake evaporation factor of 0.6, resulting in an effective evaporation rate of 0.00263 m/day.

A summary of the model set up is provided below:

Software: FloPy 3.10.0 (Bakker et al., 2016), Processing Modflow 8 (Modflow 2005) and Modpath7 (Pollock, 2016).

Grid and cell size: The model grid spans a 30 km by 40 km area centred on project. This is discretised into 400 rows and 300 columns equivalent to a homogenous cell size of 100 m x 100 m.

Topography: The top of the model was derived from the local Digital Elevation Model (DEM).

Layers:

- Layer 1 and 2 – Superficial alluvium and clay (up to 30 m thick)
- Layers 3 to 9 – Weathered and fractured rock (90–205 m thick, including faults & dykes)
- Layer 10 – Fresh bedrock (150 m thick).

Boundaries:

- Constant head boundary conditions applied on all the east, west, north and south vertical boundaries of Layers 4 to 10
- Surface drainage lines are represented along the western boundary with a calibrated riverbed conductance of 1.42 m/d
- Calibrated recharge zones are applied, with higher rates on topographic highs. Average annual rainfall reported at Badgebup weather station for the period 1976-2025
- Morton evaporation applied to the recovering pit lake based on average annual evaporation and at Badgebup station and a Morton lake evaporation factor of 0.6.

The recovery model includes one transient stress period of 1,000 timesteps spanning a post-closure period of 500 years, which is considered suitable for the assessment of long-term groundwater recovery and pit lake hydrochemical evolution in accordance with closure modelling guidelines (DMIRS, 2025).

Table 1 – Base-case model parameters

Layer and Description		Kh, Kv (m/day)	Specific Storage (SS)	Specific Yield (Sy)
1 to 2	Tertiary clay and alluvium	0.007	5.0×10^{-4}	0.02
3 to 9	Weathered bedrock	0.009	5.0×10^{-5}	0.02
	Faults	1.50	1.0×10^{-4}	0.02
	Dykes	0.50	5.0×10^{-4}	0.02
	Pit Voids	100	5.0×10^{-4}	1
10	Fresh bedrock	0.0001	1.0×10^{-5}	0.02

3.2 TSF SEEPAGE ASSUMPTIONS

Simulation of the TSF seepage and associated mounding was undertaken based on the following assumptions:

- The base of the TSF was assumed to be horizontal at 360 m AHD (both TSF cells) and above the simulated pre-mining groundwater table
- The deposition and thickness of the tailings was assumed identical in both TSF cells and followed the predicted consolidated tailings thicknesses at the thickest section (WSP 2025, Figure 8.4). The thickness of tailings material that was applied for the for the operational and post-closure phases of the seepage modelling is shown in Chart 1.
- It was assumed that TSF seepage occurs continuously for the first 15 years after the start of tailings discharge into the TSF dam
- Two seepage modelling scenarios were completed including:
  - A conservative Scenario 1, where the base and internal benches of the TSF are fully lined with a Linear Low-Density Polyethylene (LLDPE) geomembrane of low hydraulic conductivity (8.64×10^{-6} m/d)
  - A worse-case Scenario 2, where the base of TSF lies directly on the underlying fine-grained soil compacted to 95% Maximum Modified Dry Density (MMDD) with a hydraulic conductivity of 8.64 x10-4 m/d.
- Modflow's reservoir package was used to simulate the seepage, assuming a continuous 15-year seepage from a fully saturated tailings residue (i.e. no decant) based on the TSF progression provided in Chart 1. The first 10 years of TSF seepage were simulated within the dewatering model during the operational mining phase. The final simulated heads from the dewatering model were used as initial conditions in the recovery model. The last five years of seepage were incorporated in the recovery model (i.e. first 5 years post-closure).

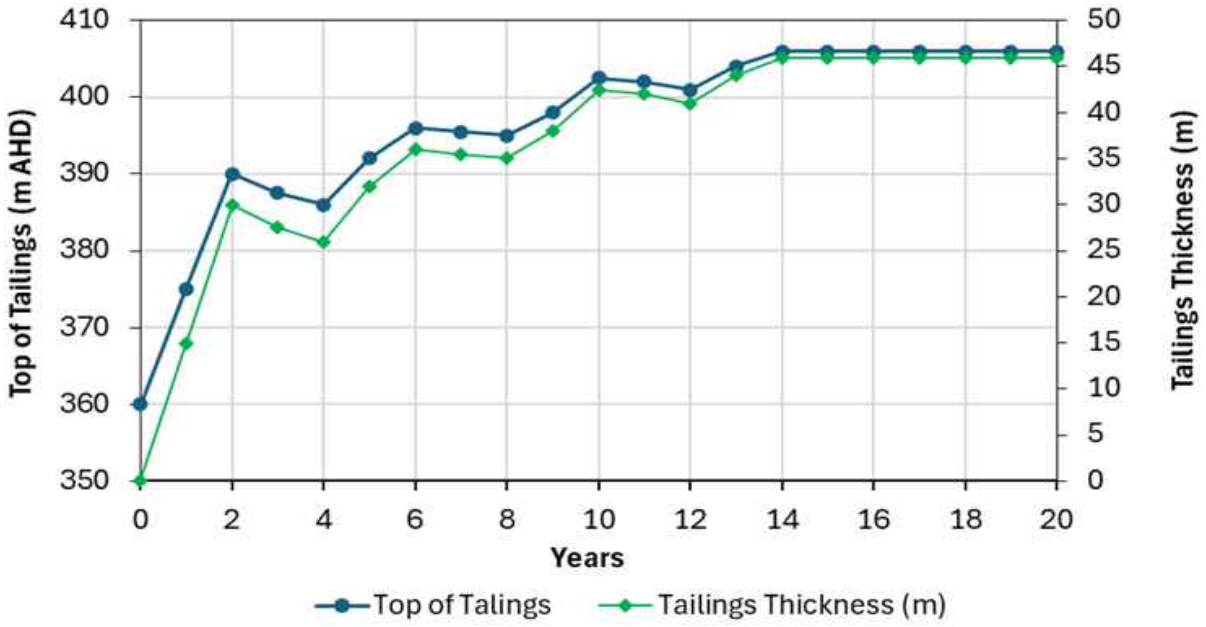

Chart 1 – Planned tailings depositional thickness over time

3.3 PIT LAKE WATER QUALITY MODELLING

Water and solute mass balance was completed for each of the six pit voids – Dingo1, Dingo2, Jinka, the combined Jackson voids 1 to 4 based on the groundwater discharge, rainfall recharge and evaporation extracted from the water budget during the recovery period of the pit voids (Figure 2; Appendix 1).

Pit wall runoff was excluded from the water and solute mass balances due to insufficient information regarding exposed pit wall surface areas and lithological distributions.

3.3.1 SOLUTE MASS BALANCE AND SOURCE TERM DERIVATION

The solute mass balance approach was based on the derived average groundwater and rainwater compositions presented in Table 2, and are summarised as follows:

- The groundwater composition was derived from records of 17 monitoring bores reported between July 2023 and October 2024 (SRK, 2024). The average groundwater composition is neutral (pH 6.8) with elevated alkalinity (251 mg/L $CaCO_3$). Salinity is brackish (7,843 mg/L Total Dissolved Solids (TDS)) from elevated sodium (2,029 mg/L) and chloride (4,204 mg/L) concentrations. Levels of reported metals and metalloids were low with bromide concentrations of 13 mg/L.
- The rainwater source term was derived using data from a rainfall composition monitoring network established by the Commonwealth Scientific and Industry Research Organisation (CSIRO) (Crosbie *et al.* 2012). Data from the Esperance monitoring station were adopted (being the closest to the Project area) and reflects the local rainfall composition influences. Average concentrations of analytes were used to define the composition provided in Table 2. The derived rainwater is slightly acidic (pH 5.79), low salinity (77 mg/L TDS), low alkalinity (14 mg/L) and of sodium-chloride type (17 and 34 mg/L, respectively).

Table 2 – Groundwater and Rainwater Composition used for Pit Lake Water Quality modelling

Parameter	Groundwater (mg/L)	Rainwater (mg/L)	Parameter	Groundwater (mg/L)	Rainwater (mg/L)
pH	6.80	5.79	Al	0.05	0.08
Alkalinity *	251	14	B	0.40	-
TDS (calc)	7,843	77	Ba	0.21	-
Ca	197	4.45	Br	13	0.07
Cl	4,204	34	Fe	0.51	-
K	197	0.65	Mn	1.83	-
Mg	474	2.62	Ni	0.02	0.08
Na	2,029	17	P	-	0.11
SO_4	491	4.61	Si	56	0.39
F	0.35	0.05	Sr	1.37	0.13
NO_3	0.27	0.15	Zn	0.02	0.23

** Total Alkalinity in mg $CaCO_3$ /L*

Geochemical speciation modelling was undertaken independently for each pit lake using PHREEQC version 3.8.7 (USGS 2025) with LLNL.dat thermodynamic databases. The main features of the geochemical model include:

- Implementation of the solute mass balance for each selected time step during the recovery period used the volume ratios of each source term contribution to the pit lakes and evapo-concentration
- Pit lakes were assumed to be fully mixed and oxygenated for the entire duration of the simulations and therefore the pit lake waters were at equilibrium with atmospheric carbon dioxide and oxygen (400 ppm CO_2, 21% O_2)
- Equilibrium with minerals that are likely to precipitate in pit lakes were investigated, based upon saturation indices calculated by PHREEQC at each mixing step. Relevant mineral phases showing positive saturation indices during the conservative solute mass were added to the simulations. These mineral phases essentially include silicates (feldspars, quartz), dolomite and iron-manganese oxides (goethite, pyrolusite, manganite).

3.3.2 ASSUMPTIONS AND LIMITATIONS

The following assumptions and limitations apply to the solute balance and geochemical speciation for pit lake modelling:

- Geochemical modelling was based on the recovery model including its limitations and assumptions (Section 3.1)
- Due to insufficient information about the pit wall lithologies and surface area distributions, pit wall runoff was not included in the water balance and water quality modelling of the pit lakes. Similarly, the model does not include potential seepage from the surrounding waste rock dumps. The contribution from TSF seepage through the pit walls was also excluded.
- Geochemical characterisation indicates the presence of potentially acid forming (PAF) materials within the monzogranite and granulite (gneiss) waste types; however, the distribution of these materials on the final pit walls is not currently defined. As a result, their potential contribution to pit lake water quality cannot be reliably quantified.

- The geochemical modelling work was completed independently for each pit lake and did not account for potential connections between the pits, rate-limited reactions including gas exchange and mineral dissolution/precipitation. The rates of some of these processes can affect the accuracy of pH prediction over time and consequently pit lake solute composition
- The pit lakes were assumed to be completely mixed and did not account for stratification in terms of oxygen, salinity or temperature. This approach would require undertaking a preliminary hydrodynamic limnological model (such as General Lake Model 3.0, Hipsey et al., 2019)
- PHREEQC uses solution equilibria data generated by laboratory studies of solutes for low to moderate ionic strength solutions, corresponding with fresh to slightly saline conditions. PHREEQC modelling of highly saline solutions represents an extrapolation of solution equilibria data. This will affect predictions for various metals and metalloids which will be more-or-less soluble under these conditions versus equilibrium constants measured at lower salinity
- The geochemical model does not simulate biochemical processes and concentrations of biologically important species (nitrate, phosphate and silicon) were not considered. Concentrations predicted for these species by PHREEQC are therefore likely conservative.

4 MODELLING RESULTS

4.1 PREDICTED PIT LAKE RECOVERY

Predicted pit lake level recovery after the end of dewatering for Dingo, Jackson and Jinka pits for both scenarios are presented Chart 2 and Chart 3 with a summary in Table 3. Water balance results are presented in Appendix 1. The following key points were noted:

- Pit lake recovery levels for both scenarios are very similar indicating that the TSF seepage under the worse-case Scenario 2 has limited (negligible) contribution to the recovery of the pit lakes
- Simulated drawdown contours at the end of the dewatering (i.e. start of recovery) shown in Figures 3 and 4 confirmed that the Dingo, Jinka and Jackson open pits will become groundwater sinks. Also, during recovery very limited groundwater discharge is anticipated to occur from the superficial alluvium
- Predicted pit lake recovery for Dingo1 and Dingo2 reached the same level from 60 years post-closure. From approximately 125 years the recovery in both pits started to stabilise significantly. Groundwater inflows through intersected faults and dykes on the pit walls resulted in relatively quick recovery. The predicted pit lake levels reached approximately 303-305 m AHD after 500 years which represents 92-94% of the initial water levels
- Pit lake level recovery in the final Jinka pit voids was slower due to its depth (169 m AHD) and volume, as well as there being less hydraulic connectivity to modelled faults and dykes through the pit walls. The predicted pit lake level reaches equilibrium at ~287 m AHD (82% of initial water level) after ~300 years. Groundwater discharge and direct recharge were the most important influences compared to the other pits due its larger size and depth (Appendix 1)
- Pit lake levels in the Jackson pits follow similar trends. During the first 100 years, the pit lake level increases more rapidly in Jackson 4. This was attributed to a relatively higher groundwater discharge into the pit during the first 25 years post-closure (Appendix 1). Jackson 2 pit is shallower therefore the simulated groundwater discharge rates were lower, and recovery was essentially affected by direct recharge from the first few years post-closure. All Jackson pits are anticipated to

reach equilibrium after 150 to 200 years and stabilise around 287-294 m AHD (85-87% of initial levels)

- No groundwater is predicted to report into the shallow Olympia pits due to their shallow depth.

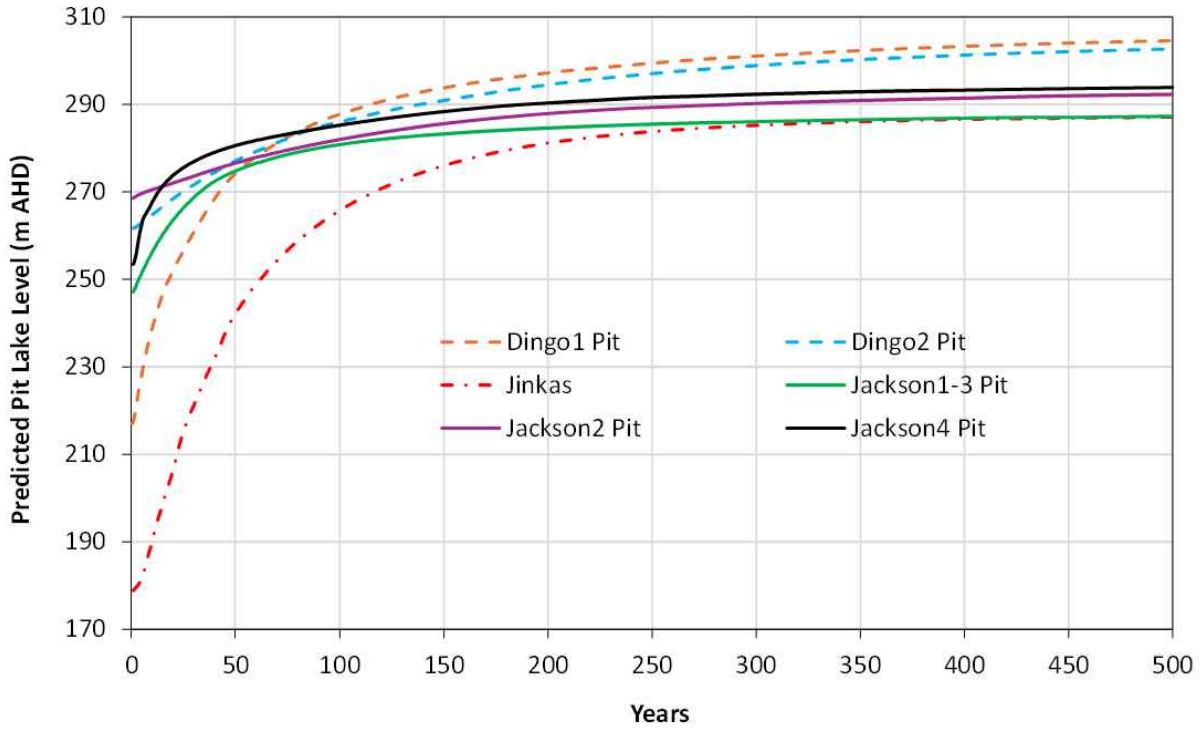

Chart 2 – Predicted Pit Lake Level Recoveries (Scenario 1)

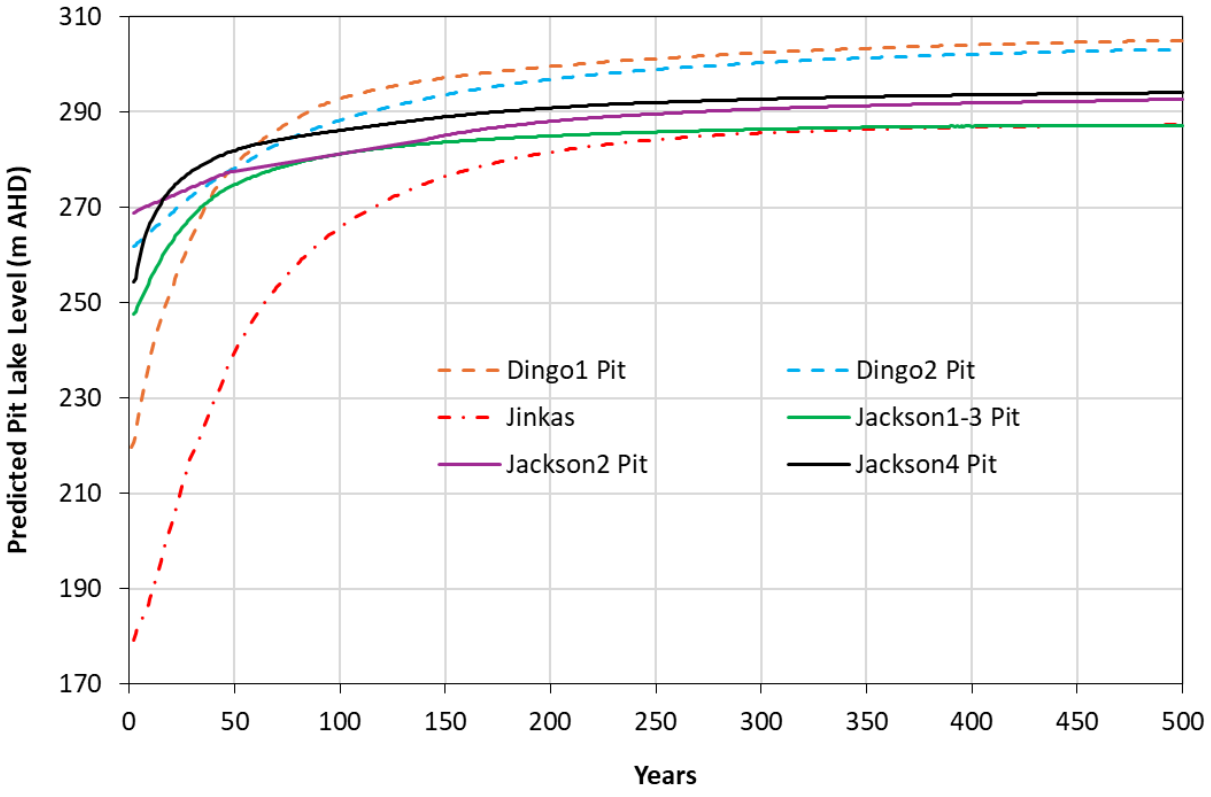

Chart 3 – Predicted Pit Lake Level Recoveries (Scenario 2)

Table 3 – Summary of Pit Lake Recoveries

Open Pit	Initial Simulated WL	Pit Level Recovery (500 years)	% Recovery of Initial Level	Time to Reach Relative Equilibrium
	(m AHD)	(m AHD)	%	Years
Jinka	350	287	82	~ 300
Jackson1-3	330	287	87	~ 150
Jackson2	345	294	85	~ 200
Jackson4	340	294	86	~ 200
Dingo1	332	305	92	~ 400
Dingo2	324	303	94	~ 400

4.2 PREDICTED TSF SEEPAGE

The following key findings were identified:

- Seepage from the TSF under the base-case Scenario 1 conditions is predicted to reach the Jinka and Dingo1 pit voids after approximately 110 years and 300 years post-closure, respectively
- Seepage from the TSF under the worst-case Scenario 2 conditions is predicted to reach the Jinka and Dingo1 pit voids after approximately 50 years and 160 years post-closure, respectively
- Under both scenarios, seepage concentrations are expected to undergo dilution during groundwater transport prior to discharging into the pit lakes
- As expected, simulated 10-year groundwater contours for Scenario 1 were not affected by the limited seepage from the TSF (Figure 5). For Scenario 2, 10-year simulated contours shows that groundwater mounding is predicted to rise beneath the TSF footprint up to approximately 385 m AHD (Figure 6). Results for this scenario show that seepage migration is expected to spread radially
- Particle tracking results presented in Figures 7 and 8 indicate that seepage from both the lined TSF configuration (Scenario 1) and unlined TSF configuration (Scenario 2) is predicted to infiltrate into the upper weathered bedrock aquifer and migrate preferentially westward along intersected faults and dyke structures toward the Jinka and Dingo1 pit voids.

Simulated groundwater mounding results for the two TSF seepage scenarios (Section 3.3) are presented in Chart 4. The following key observations were noted:

Scenario 1:

- Negligible groundwater mounding beneath the TSF footprint, with maximum mounding of less than 0.5 m immediately beneath the TSF cells during operations
- Groundwater levels beneath the TSF decline rapidly to approximately 310 m AHD, below pre-mining groundwater levels, due to significant groundwater discharge toward the Jinka and Dingo1 pit lakes during the first 50 to 100 years post-closure, then recover gradually toward approximately 330 m AHD after 200 years.

Scenario 2:

- Significant groundwater mounding beneath both TSF cells, peaking at approximately 15 m above local pre-mining groundwater levels after 10 years of operation

- Groundwater levels beneath the TSF are predicted to decline below pre-mining groundwater levels within approximately 50 years due to discharge toward the recovering pit lakes, then are predicted to stabilise at approximately 330 m AHD before gradually recovering toward pre-mining conditions over the longer term.

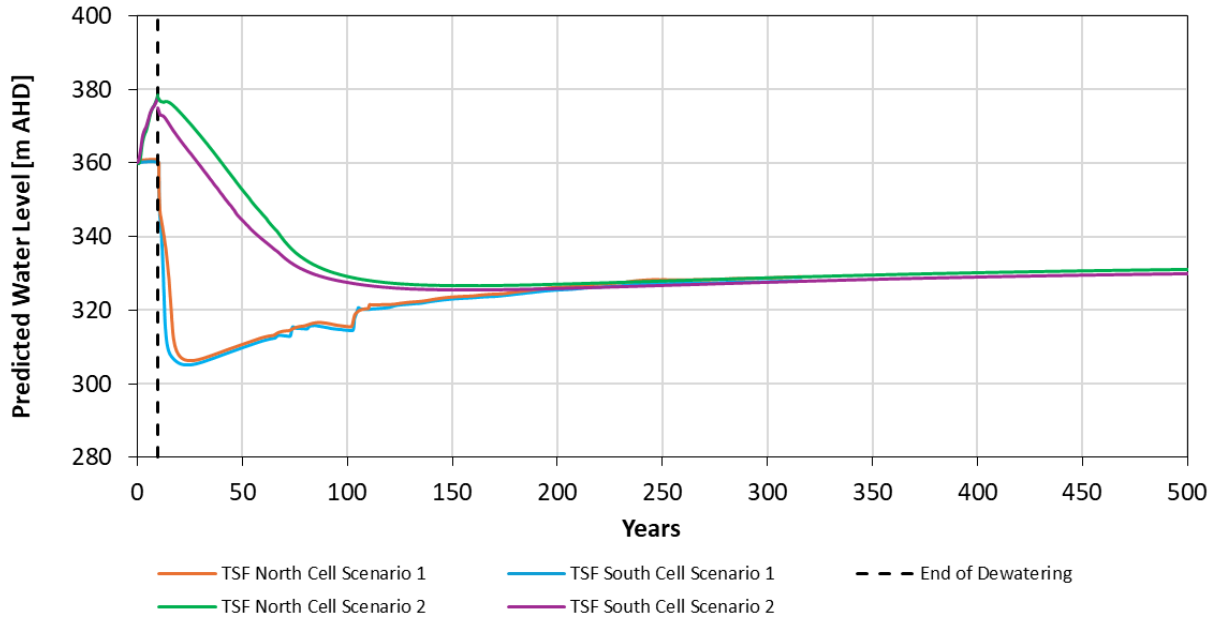

Chart 4 – TSF Seepage Prediction for Base-Case (Scenario 1) and Worse Case (Scenario 2)

Particle tracking presented in Figures 7 and 8 indicate seepage resulting from both scenarios are predicted to infiltrate to the top of the weathered bedrock aquifer and discharge through the Jinka and Dingo1 pit walls via intersected faults and dykes, with the following findings:

- TSF seepage under Scenario 1 is predicted to reach Jinka and Dingo1 pits after 110 and 300 years, respectively
- TSF seepage under Scenario 2 is predicted to reach Jinka and Dingo1 open pits after 50 and 160 years, respectively
- Particle tracking indicate that TSF seepage is predicted to predominantly travel towards the west and south through more conductive faults and dykes, with very limited and temporary expansion of the plume toward the east of the TSF footprint.

It should be noted that any solute concentrations within TSF seepage will undergo dilution with surrounding groundwater during transportation.

4.3 PREDICTED PIT LAKE WATER QUALITY

Predicted water quality for Dingo1, Dingo2, Jinka, the combined Jackson 1 and 3, Jackson 2 and Jackson 4 pit lakes are presented in Appendix 2. Water quality predictions were generally similar across all pit lakes, with key simulation results indicating:

- Water quality in Dingo1 and Dingo2 pit lakes is anticipated to be broadly similar. Predicted pH decreased steadily from pH 6.8 to 6.35 over the 500-year simulation period. Salinity was generally steady for the first 50 years post-closure to about 7,500 mg/L TDS. From 50 years onwards, TDS values increased linearly to 15,000 mg/L due to the increase of evapo-concentration and reduced groundwater discharge into the pits. Composition of major ions followed the same trend and as expected was dominated by sodium (1,860-3,700 mg/L) and chloride (4,100-8,100 mg/L). Levels of sulfate (464-890 mg/L) and magnesium (442-842 mg/L) were also significant. Concentrations of key metals and metalloids were low, the highest concentrations were reported for manganese (1.67-3.26 mg/L) and strontium (1.27-2.90 mg/L). Iron and manganese oxide minerals are predicted to precipitate essentially in the form of goethite and pyrolusite, which will promote surface of sorption and reduce dissolved concentrations of barium, strontium and fluoride.
- Predicted pit lake water quality for the Jacksons and Jinka pits were very similar to the Dingo Pits. Water quality in Jinka pit is expected to follow the same trend as Dingo pits but showed relatively lower salinities (5,700-8,300 mg/L TDS) and concentrations of major ions and metals/metalloids. For instance, chloride concentrations in Jinka were predicted to range between 3,200 and 4,600 mg/L after 500 years post-closure. These differences are attributed to higher groundwater discharge rates relative to evaporation.
- Predicted salinity and compositions for the Jackson pits were intermediate. Salinity is expected to increase from approximately 8,000 to 12,000 mg/L TDS, which is also dominated by chloride (4,500-6,000 mg/L) and sodium (2,000-3,000 mg/L).

Overall, pit lake water quality is predicted to be brackish to saline, with elevated sodium, chloride, sulfate, and magnesium concentrations. Concentrations of metals and metalloids are generally low and are dominated by manganese and strontium. Dissolved metal concentrations are expected to be moderated through sorption onto precipitated iron and manganese oxides within the pit lakes.

5 IMPACT ASSESSMENT

Potential impacts to groundwater dependent ecosystems (GDEs) during the operational phase were previously assessed by Rockwater (2025b) through comparison of simulated drawdown against mapped potential GDE occurrence from the Bureau of Meteorology Groundwater Dependent Ecosystem Atlas (BoM, 20XX). The assessment concluded that the primary potential risks to GDEs are associated with operational pit dewatering and water supply extraction, particularly within the southern borefield area where shallow groundwater conditions coincide with mapped aquatic GDE potential.

The closure-phase recovery modelling undertaken for the current study indicates groundwater levels progressively recover following cessation of dewatering, with pit lake water levels predicted to recover to approximately 92% of baseline groundwater levels over the 500-year post-closure simulation period.

Particle tracking and seepage modelling indicate TSF seepage is predicted to migrate predominantly westward toward the recovering Jinka and Dingo pit voids via preferential flow along interpreted faults and dyke structures. Under the base-case lined TSF scenario (Scenario 1), simulated groundwater mounding beneath the TSF is negligible (<0.5 m), with minimal eastward seepage migration predicted (Figures 3 and 5). The worst-case unlined TSF scenario (Scenario 2), despite generating greater groundwater mounding beneath the TSF footprint, also predicts minimal eastward migration of seepage and groundwater mounding (Figures 4 and 6).

Given the predicted groundwater flow directions and the presence of persistent terminal pit lakes acting as long-term hydraulic sinks, the potential for long-term seepage-related impacts to mapped regional GDE areas is considered low under both closure scenarios.

The risk of pit lake overtopping is considered low, with predicted equilibrium pit lake levels remaining approximately 40 m below pit crest level in Dingo Pit, 49 -56 m below pit crest level in Jackson Pit, and 111 m below pit crest level in Jinka Pit. This is assumed that appropriate pit bunding is maintained to eliminate any surface water inflows.

Predicted pit lake water quality is expected to remain brackish to saline and may exceed selected guideline values for some potential end uses. Dissolved metal and metalloid concentrations are generally low relative to major ion concentrations, with manganese and strontium representing the dominant dissolved trace constituents throughout the simulation period. Predicted pit lake salinities, increasing from brackish to hypersaline, are also broadly consistent with naturally saline water bodies commonly found throughout the WA Wheatbelt region. Therefore, pit lake waters will be unpalatable for local fauna which could access the pit lakes such as birds, bats or ducks.

6 CONCLUSIONS

Ausgold engaged Rockwater to undertake additional groundwater modelling to reflect the broader water management strategy, incorporating dewatering, water supply borefield operation and use of a wet TSF, and to prepare an updated technical report to support the KGP Mine Closure Plan. The following key points of this work are summarised below:

- The 500-year particle tracking simulation of the groundwater and pit lake recovery indicated that all pit final pit voids, except for the shallow Olympia open pits, are predicted to be behave as groundwater sinks.
- TSF seepage is predicted to infiltrate the upper weathered bedrock aquifer and discharge through the Jinka and Dingo1 pit walls via intersected faults and dykes from approximately 110 and 300 years for Scenario 1, and 50 and 160 years for Scenario 2.The 500-year post-closure simulation indicated that the early recovery of final pit voids during the first 50 years post-closure varied with the initial depths, shapes and connectivity with conductive faults and dykes. Jinka and Jacksons pit are predicted to stabilise after 150-200 years to 287-290 m AHD. Dingos pit lake levels are anticipated to reach 304 m AHD after 500 years post-closure.
- Seepage for a fully lined TSF including an underdrainage system (base-case Scenario 1) is predicted to be negligible and therefore unlikely to affect the groundwater. Results for worst-case Scenario 2 indicated that a significant seepage and mounding can occur beneath the TSF for the first 35 years since the beginning of operations. However, meaningful seepage-related water quality impacts to the Jinka and Dingo1 pit voids are not predicted until the later stages of the simulation period due to dilution and the low hydraulic conductivity of the aquifer. Pit lake recovery and hydrochemical evolution under a leaky TSF scenario (Scenario 2) is not expected to materially deviate from the predicted Scenario 1 outcomes.
- Water quality of the six pit lakes assessed (i.e. excluding Olympia pits) is predicted to be brackish to saline with elevated sodium, chloride, sulfate and magnesium concentrations. Level of key metals and metalloids are predicted to be low and dominated by manganese and strontium. Predicted soluble concentrations of metals and metalloids were reduced by adsorption on precipitated manganese and iron oxides in the pit lakes.

Due to a lack of data, this assessment does not include contributions from pit wall runoff, waste rock or TSF seepage in the pit lake water balance and water quality modelling. These inputs represent the primary sources of geochemical uncertainty in the predicted pit lake chemistry.

Geochemical characterisation indicates the presence of potentially acid forming (PAF) materials within the monzogranite and granulite (gneiss) waste types; however, the distribution of these materials on the final pit walls is not currently defined. As a result, their potential contribution to pit lake water quality cannot be reliably quantified.

Pit wall runoff derived from these materials could locally reduce pit lake pH, although this effect is likely to be partially buffered by the relatively high alkalinity of the groundwater. Additional solute loading from these sources may also increase salinity.

TSF seepage composition has not been defined for the purposes of this assessment. While particle tracking indicates potential long-term hydraulic connectivity to pit voids, this pathway occurs at extended timeframes and was not explicitly incorporated into the pit lake water quality modelling.

Dated: 22 May 2026

Rockwater Pty Ltd

Greg Lekmine
Supervising Geochemist & Modeller

Craig Noble
Principal Hydrogeologist

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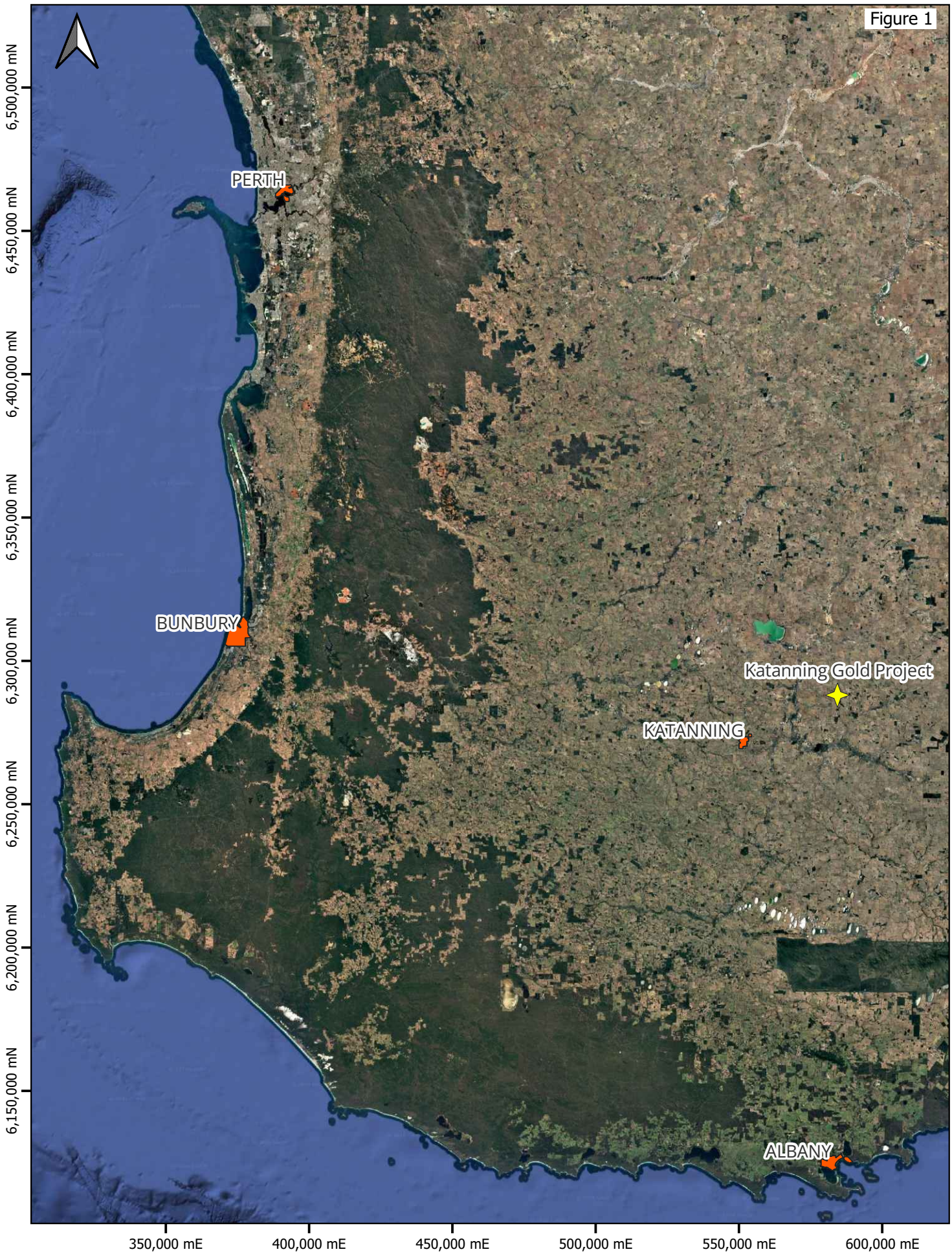
FIGURES



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Rockwater

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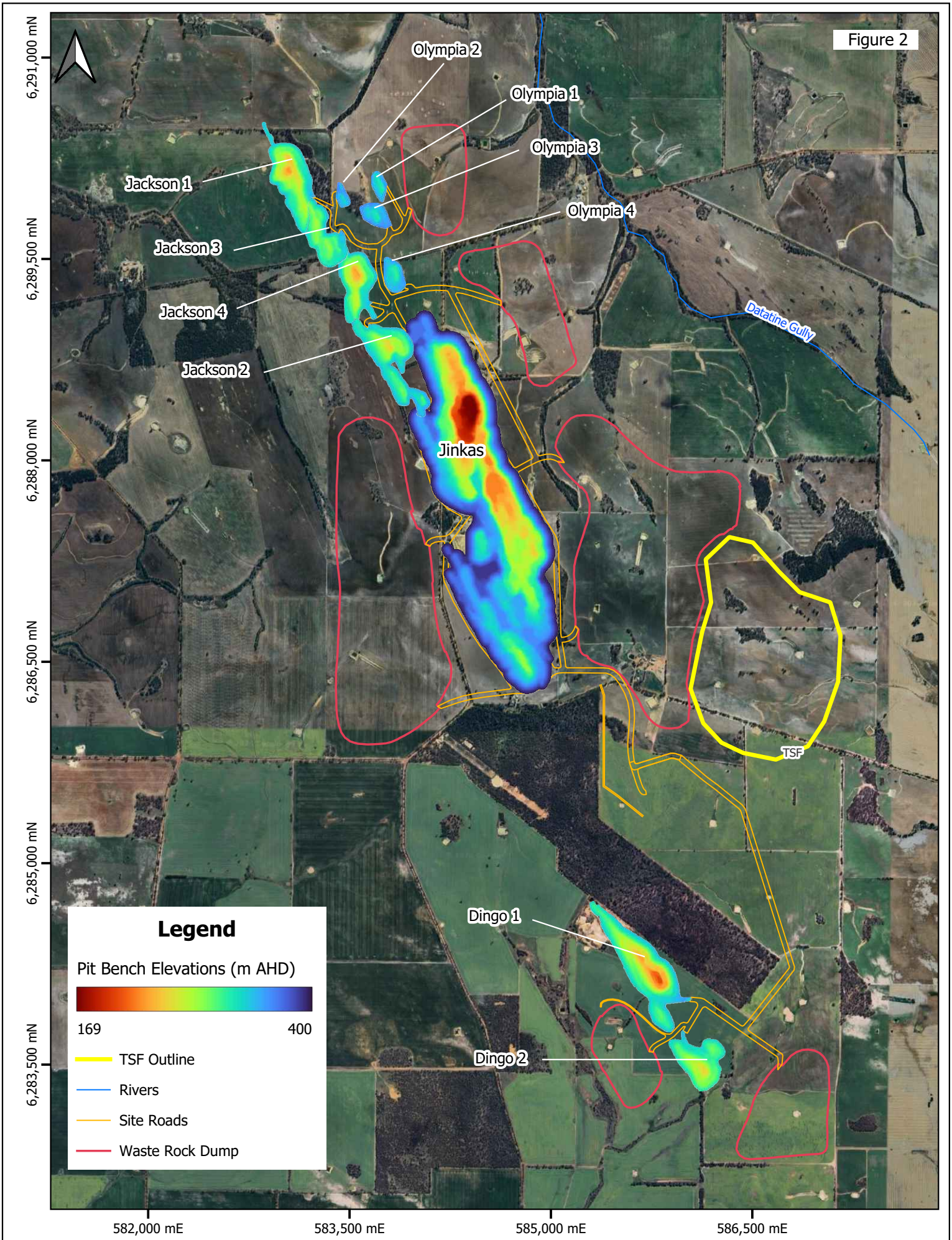
Coordinate System: GDA 2020
MGA Zone 50

Project	Katanning Gold Project
Client	Ausgold
Date	May 2026
Figure Number	72-262/26-01/1

Project Location



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Rockwater HYDROGEOLOGICAL + ENVIRONMENTAL

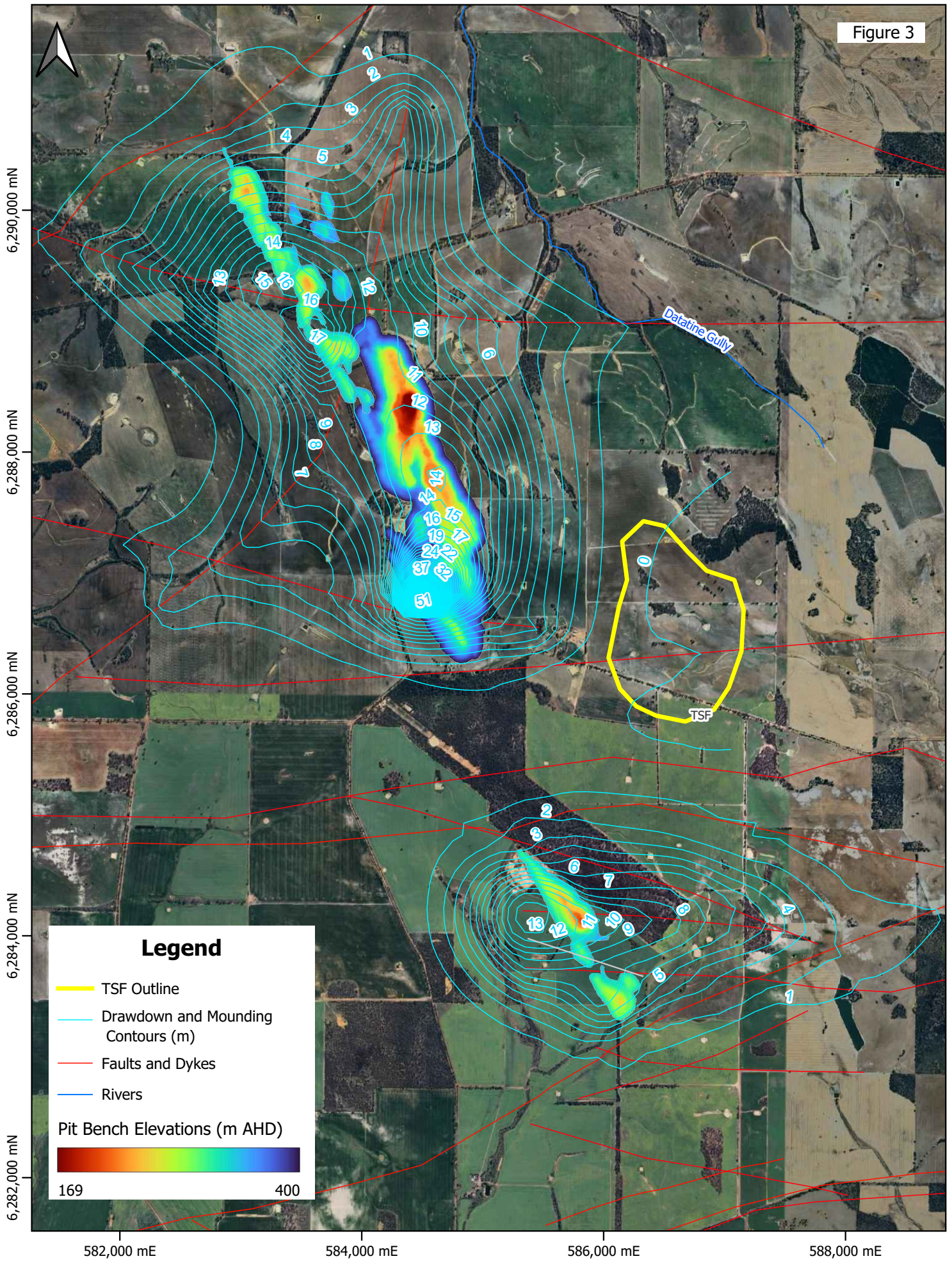
0 500 1,000 m

Coordinate System: GDA 2020
MGA Zone 50

Project	Katanning Gold Project
Client	AUSGOLD
Date	May 2026
Figure Number	72-262/26-01/2

Site Layout

Figure 3



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Rockwater HYDROGEOLOGICAL + ENVIRONMENTAL

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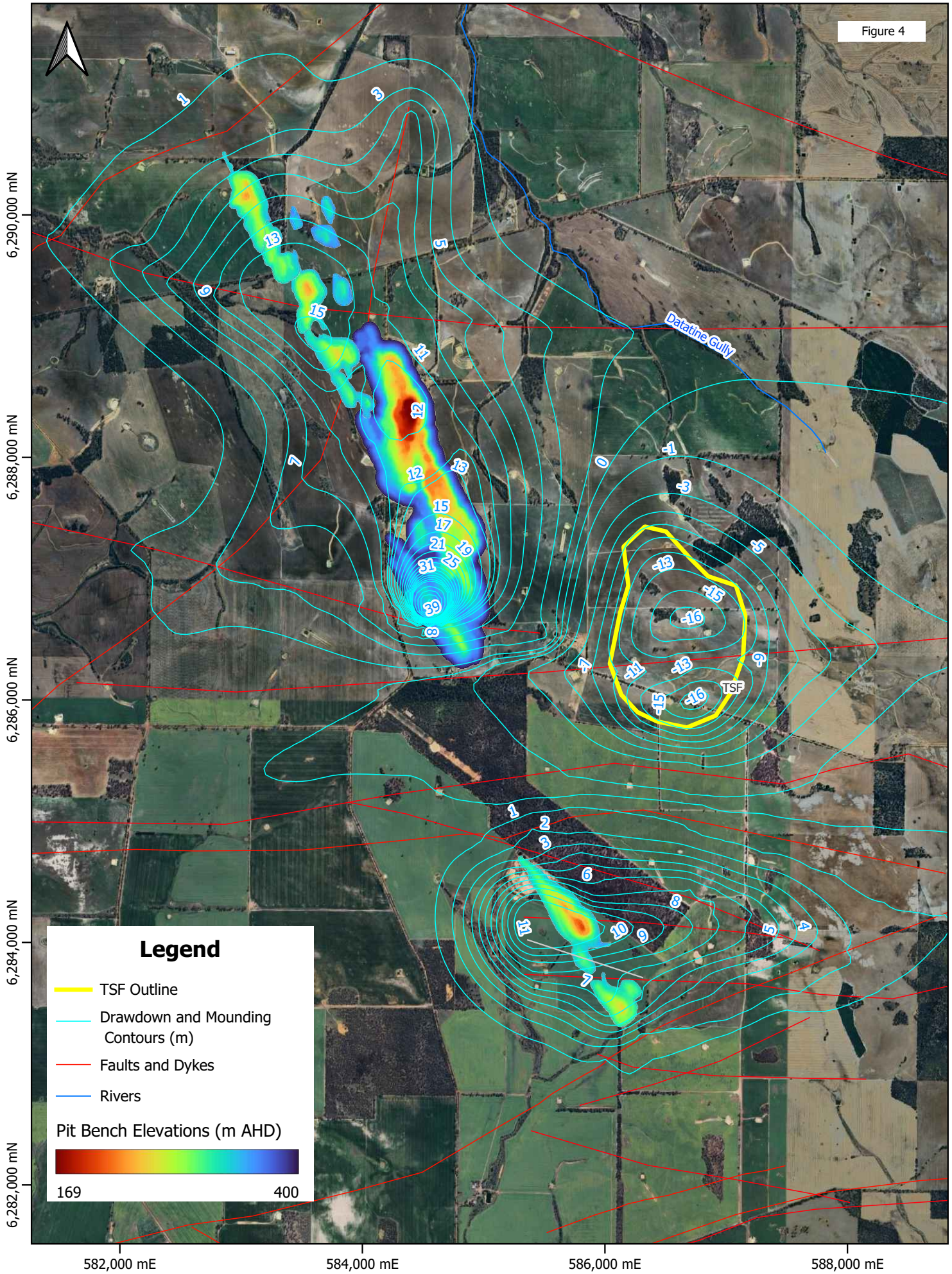
Coordinate System: GDA 2020 MGA Zone 50

Project	Katanning Gold Project
Client	AUSGOLD
Date	May 2026
Figure Number	72-262/26-01/3

Simulated Pit Drawdown and TSF Mounding - Scenario 1 (10 years)

Figure 4



Legend

- TSF Outline
- Drawdown and Mounding Contours (m)
- Faults and Dykes
- Rivers

Pit Bench Elevations (m AHD)

169 — 400

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Rockwater HYDROGEOLOGICAL + ENVIRONMENTAL

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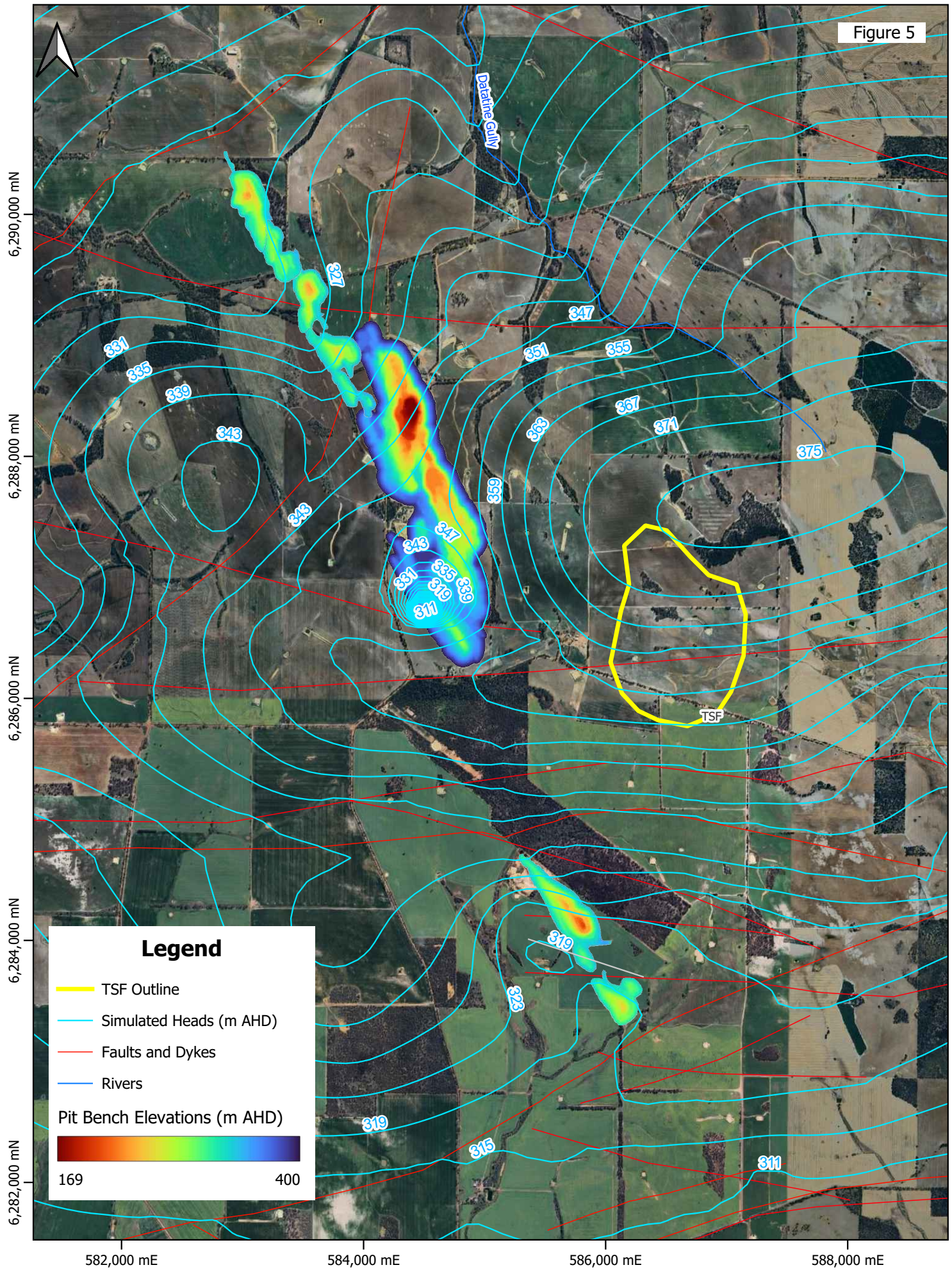
Coordinate System: GDA 2020 MGA Zone 50

Project	Katanning Gold Project
Client	AUSGOLD
Date	May 2026
Figure Number	72-262/26-01/4

Simulated Pit Drawdown and TSF Mounding - Scenario 2 (10 years)

Figure 5



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Rockwater HYDROGEOLOGICAL + ENVIRONMENTAL

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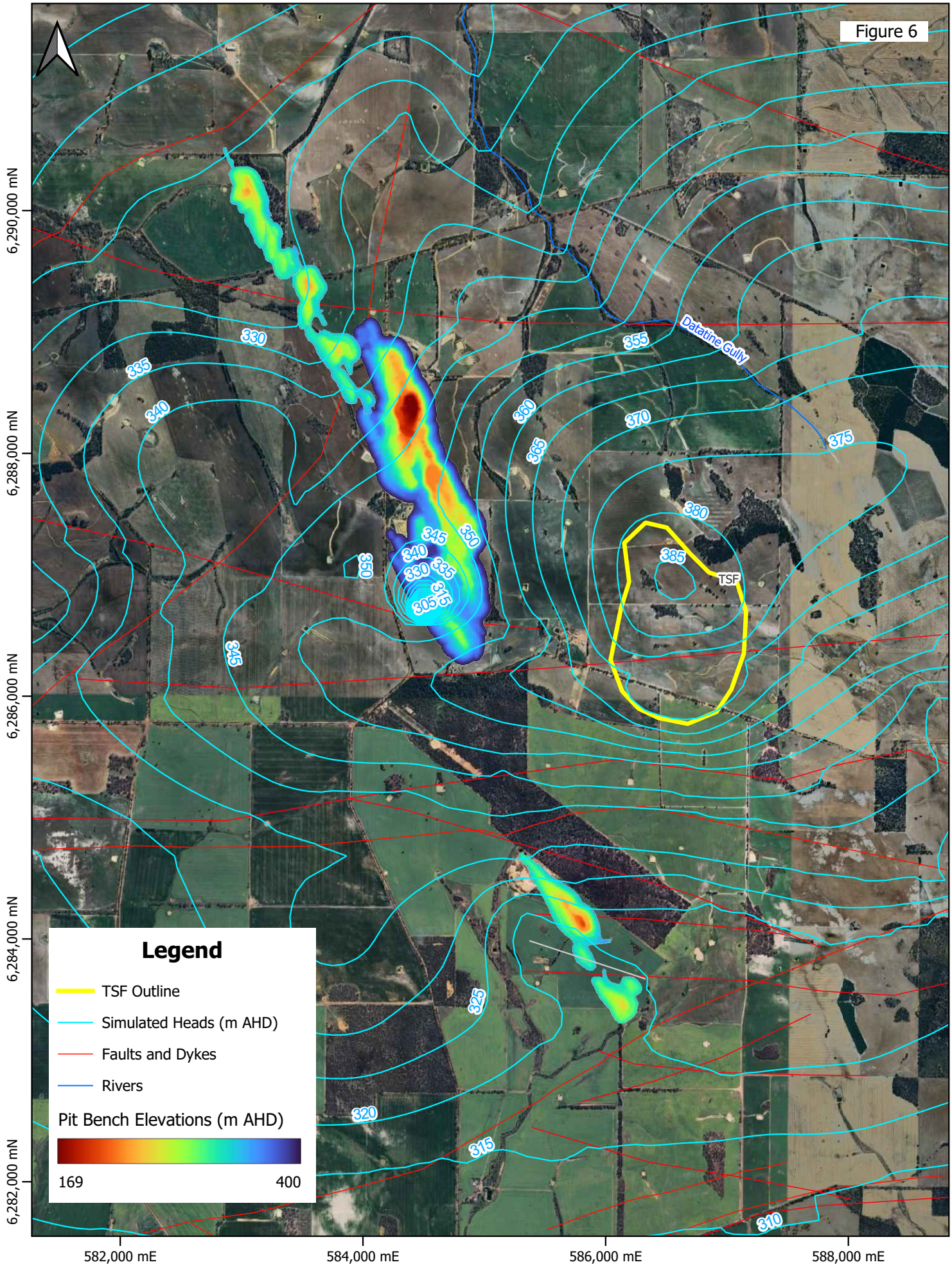
Coordinate System: GDA 2020
MGA Zone 50

Project	Katanning Gold Project
Client	AUSGOLD
Date	May 2026
Figure Number	72-262/26-01/5

Simulated Water Levels
Scenario 1 (10 years)

Figure 6



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Rockwater HYDROGEOLOGICAL + ENVIRONMENTAL

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Coordinate System: GDA 2020
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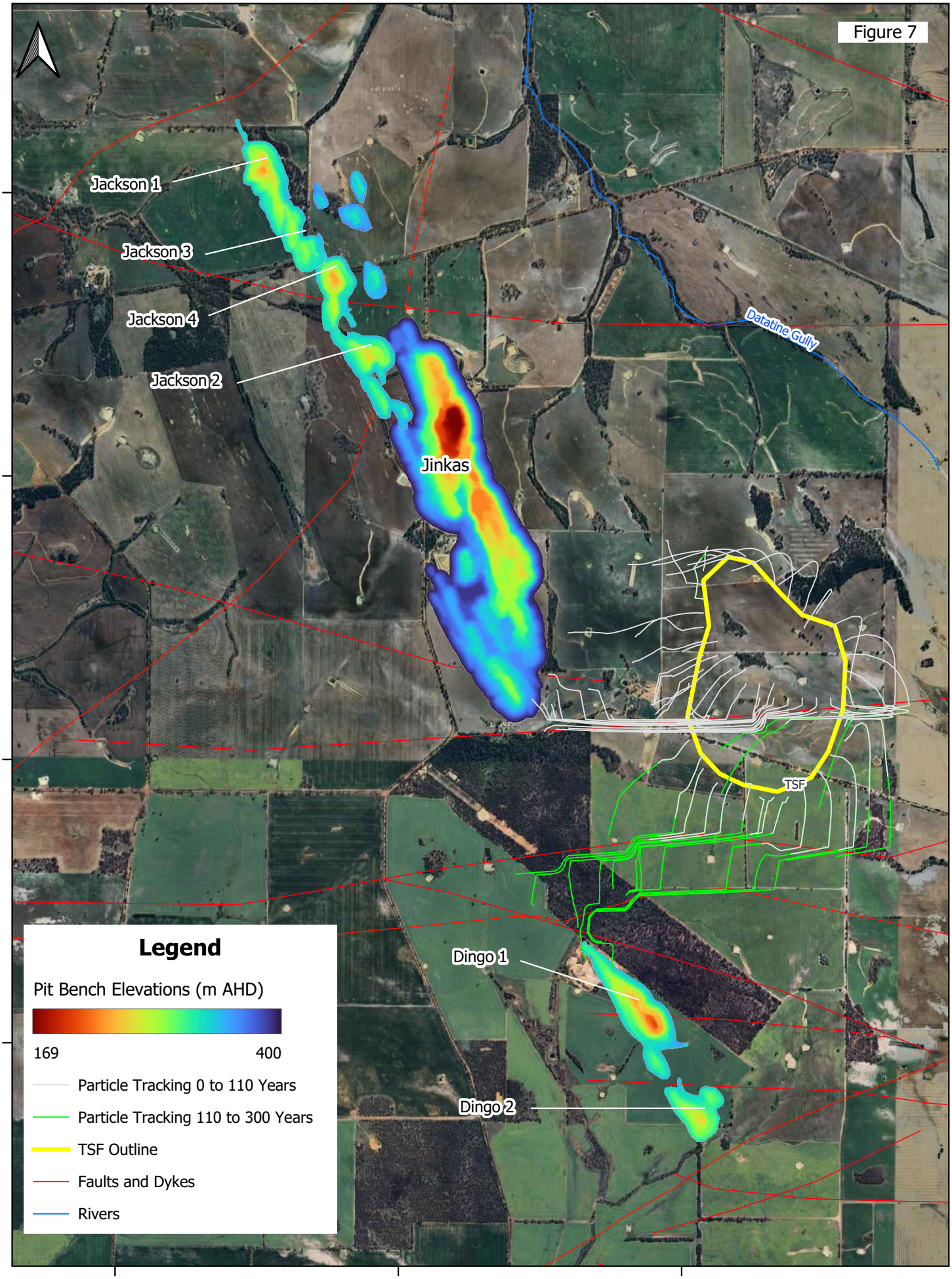
Project	Katanning Gold Project
Client	AUSGOLD
Date	May 2026
Figure Number	72-262/26-01/6

Simulated Water Levels
Scenario 2 (10 years)

Figure 7



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Rockwater HYDROGEOLOGICAL + ENVIRONMENTAL

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Coordinate System: GDA 2020
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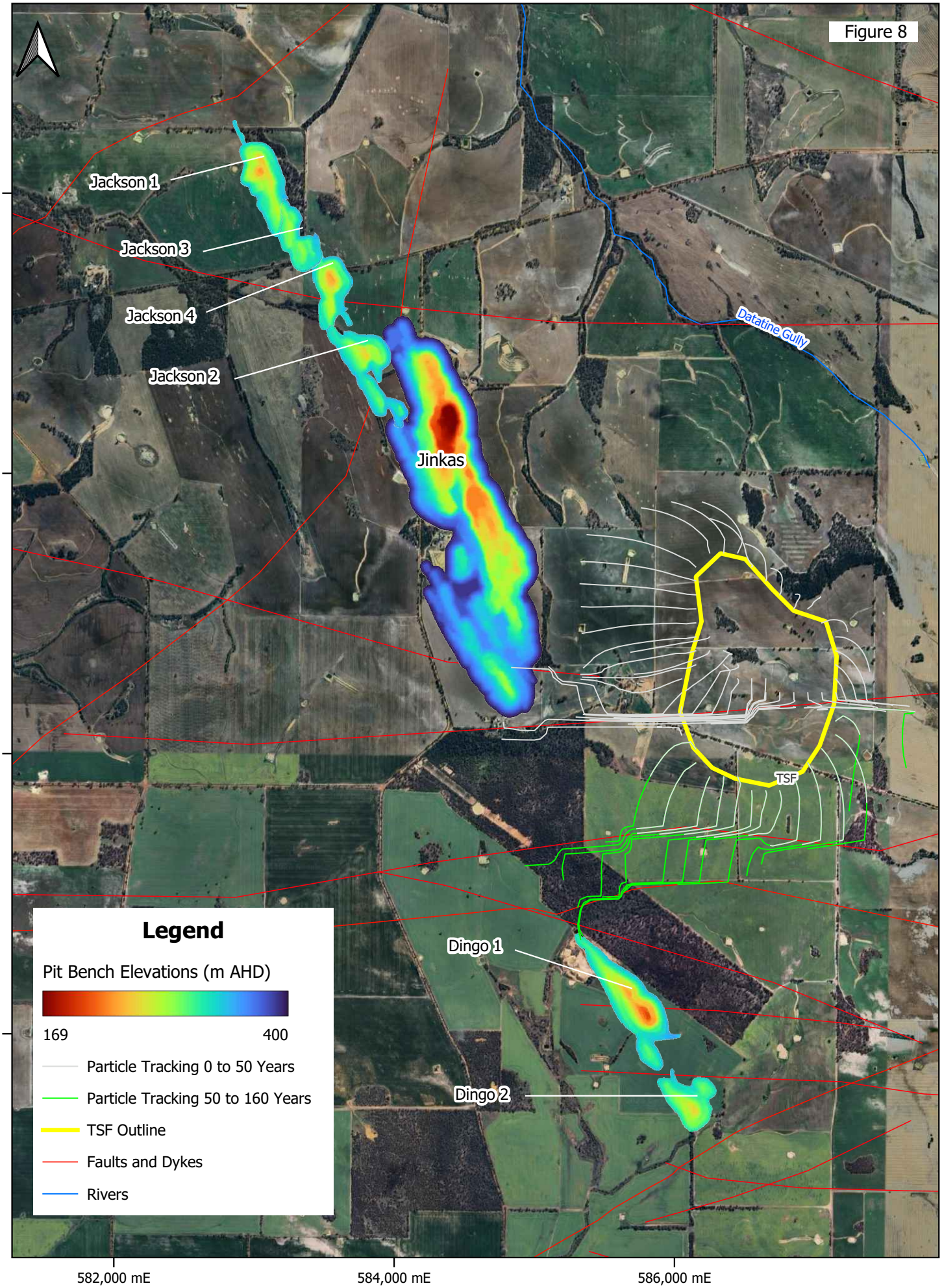
Project	Katanning Gold Project
Client	AUSGOLD
Date	May 2026
Figure Number	72-262/26-01/7

Scenario 1
TSF Particle Tracking

Figure 8



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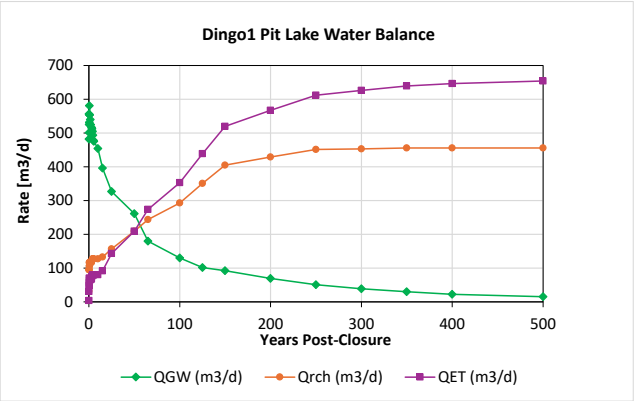
Coordinate System: GDA 2020
MGA Zone 50

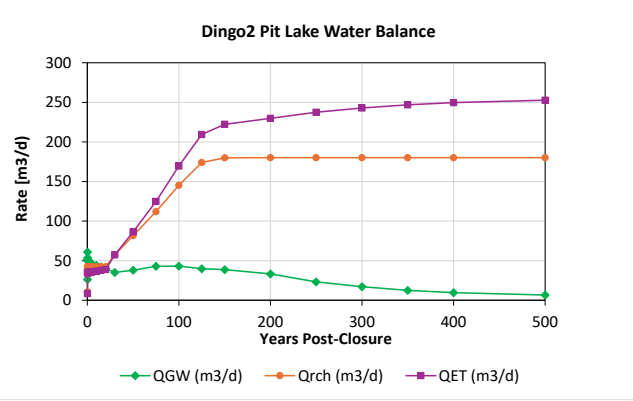
Project	Katanning Gold Project
Client	AUSGOLD
Date	May 2026
Figure Number	72-262/26-01/8

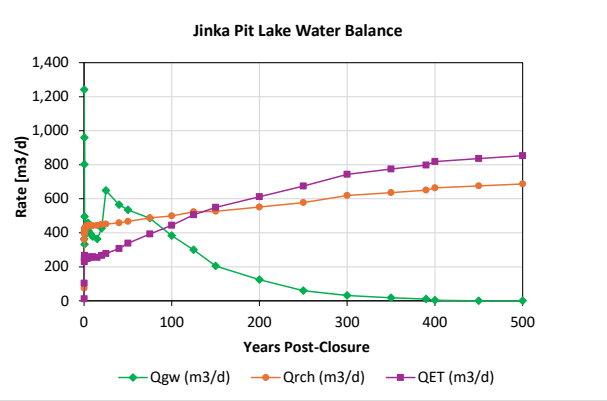
Scenario 2
TSF Particle Tracking

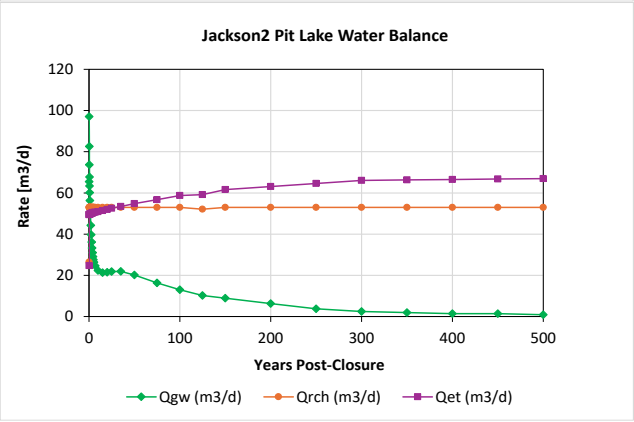
APPENDICES

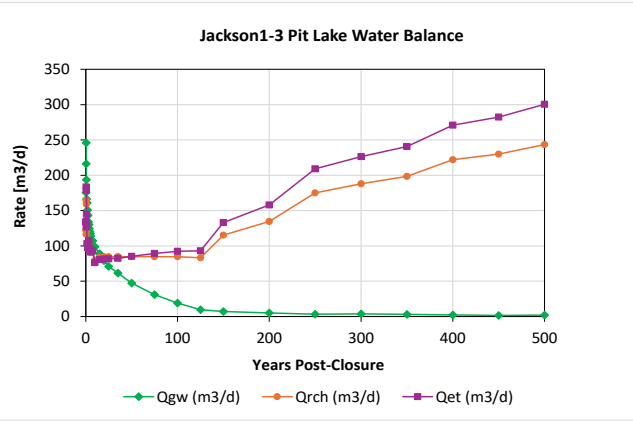
Appendix 1 – Simulated Pit Lakes Water Balance (Scenario 1)

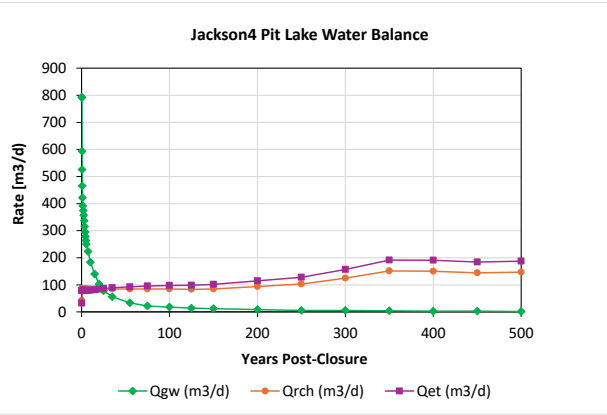




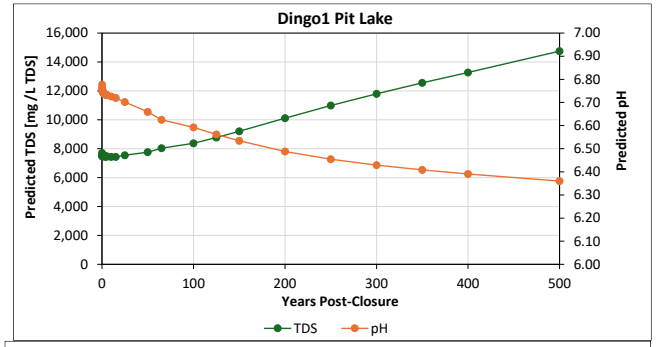


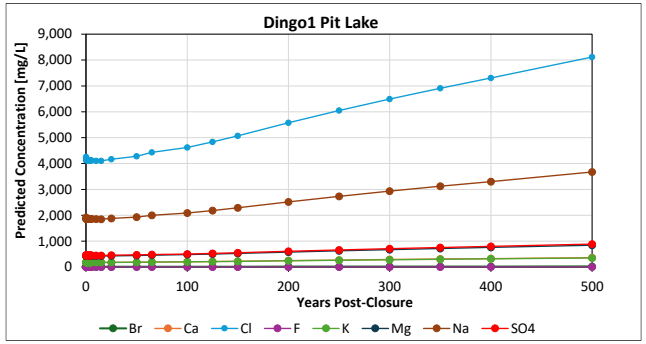


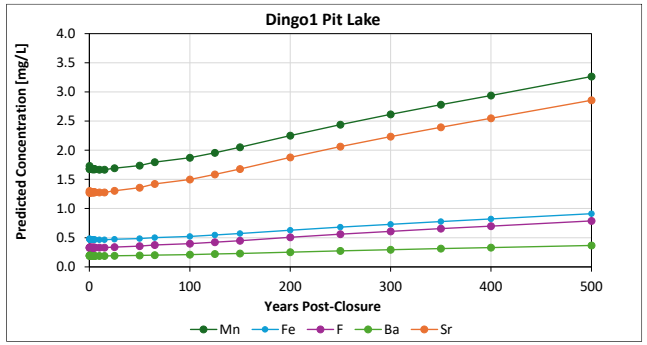


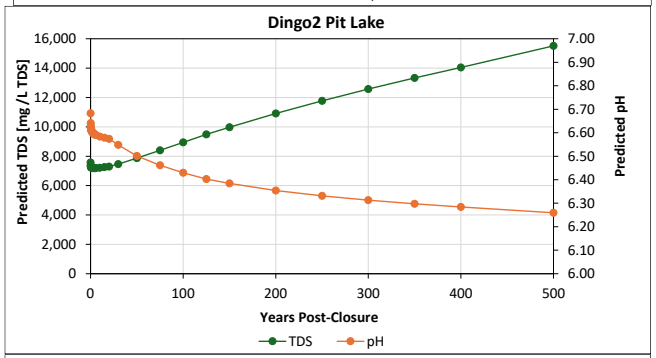


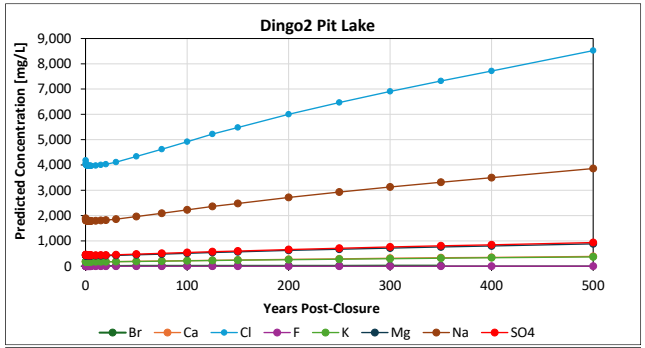
Appendix 2 – Simulated Pit Lake Water Quality

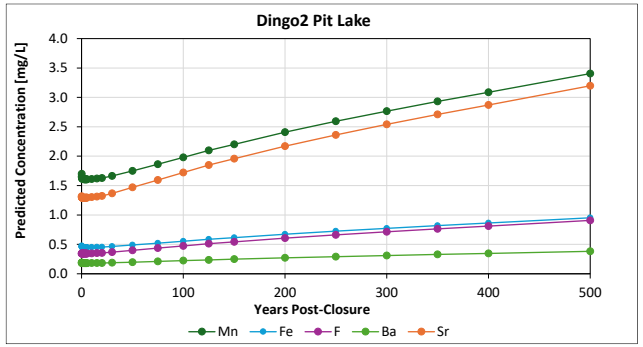


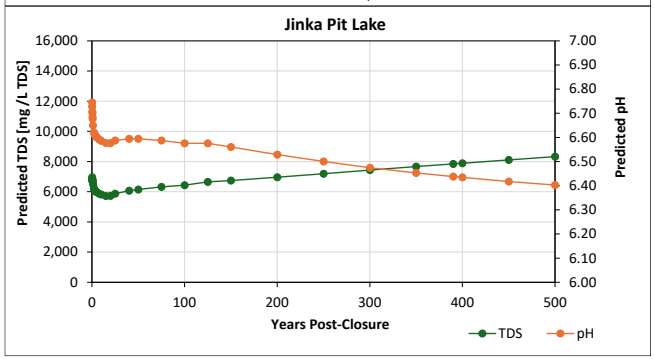


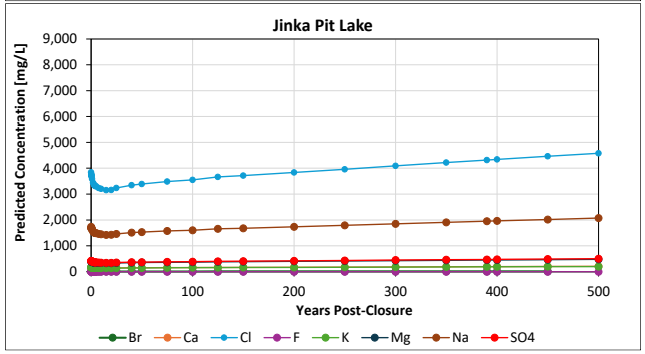


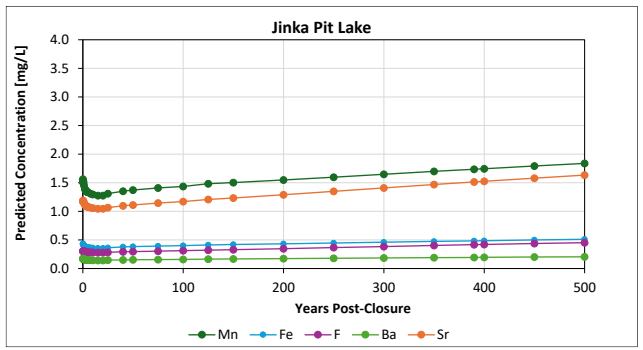


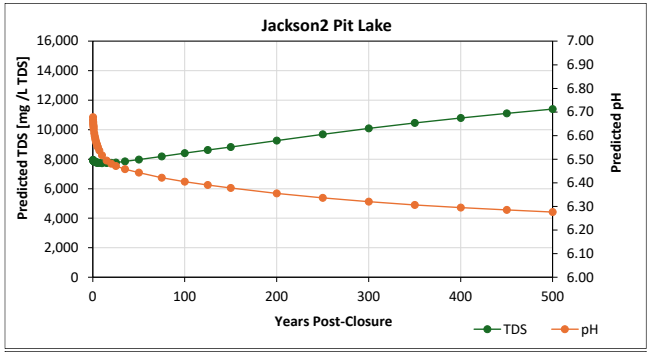


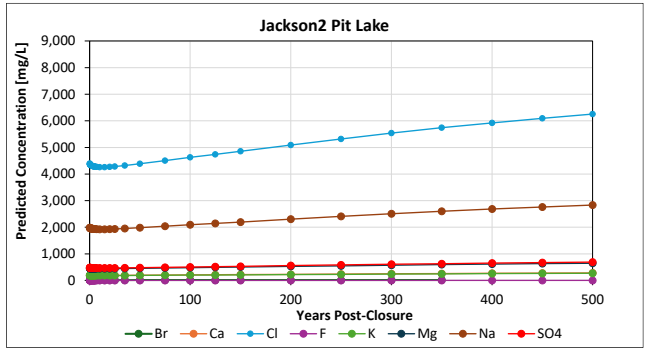


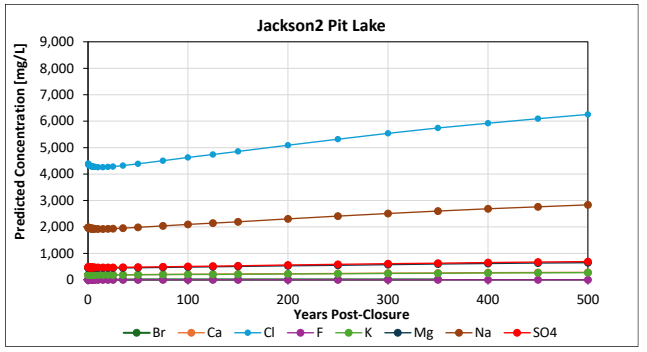


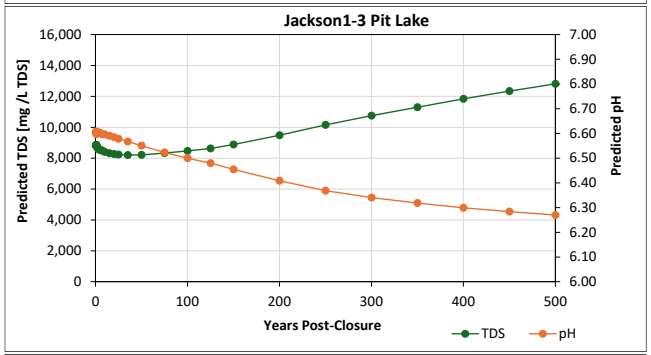


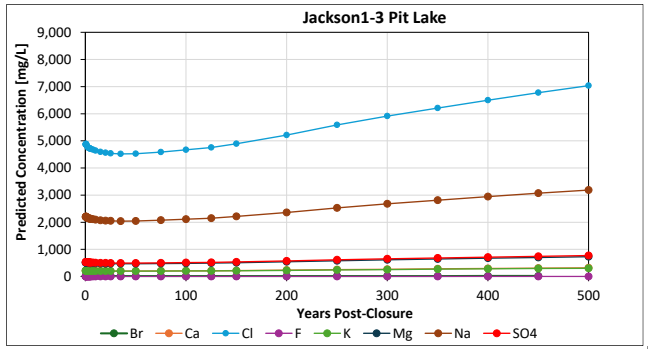


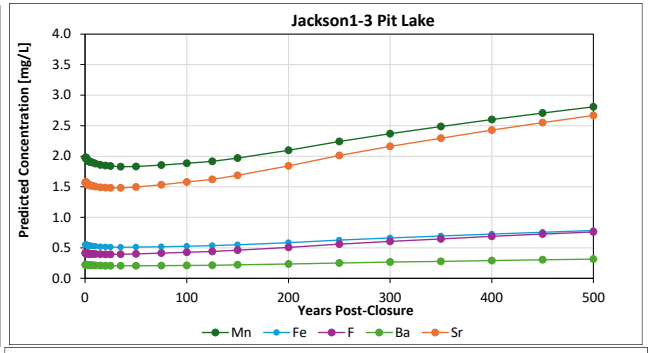

Jackson2 Pit Lake
Predicted TDS [mg /L TDS]
Predicted pH
Years Post-Closure
TDS
pH

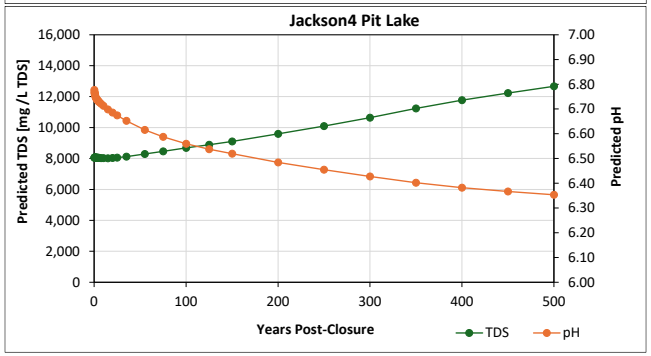

Jackson2 Pit Lake
Predicted Concentration [mg/L]
Years Post-Closure
Br
Ca
Cl
F
K
Mg
Na
SO4

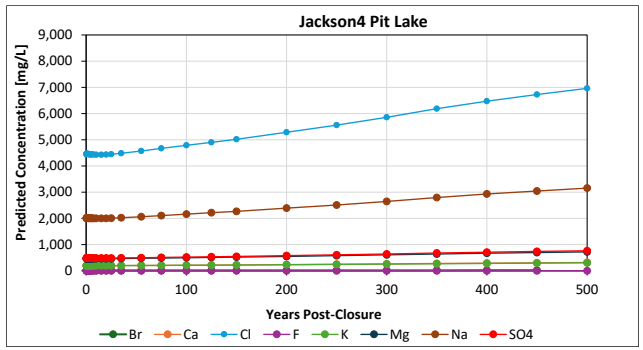

Jackson2 Pit Lake
Predicted Concentration [mg/L]
Years Post-Closure
Br
Ca
Cl
F
K
Mg
Na
SO4

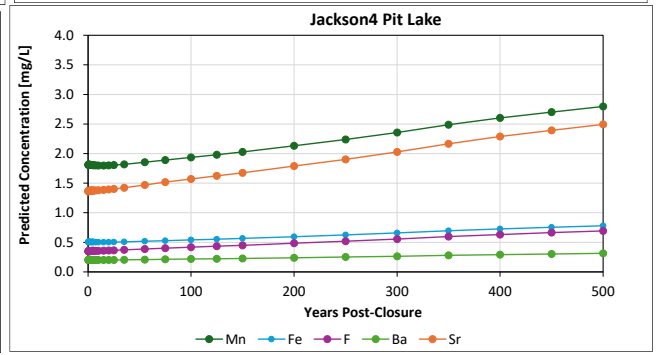

Jackson1-3 Pit Lake
Predicted TDS [mg /L TDS]
Predicted pH
Years Post-Closure
TDS
pH


Jackson1-3 Pit Lake
Predicted Concentration [mg/L]
Years Post-Closure
Br
Ca
Cl
F
K
Mg
Na
SO4


Jackson1-3 Pit Lake
Predicted Concentration [mg/L]
Years Post-Closure
Mn
Fe
F
Ba
Sr


Jackson4 Pit Lake
Predicted TDS [mg /L TDS]
Predicted pH
Years Post-Closure
TDS
pH


Jackson4 Pit Lake
Predicted Concentration [mg/L]
Years Post-Closure
Br
Ca
Cl
F
K
Mg
Na
SO4


Jackson4 Pit Lake
Predicted Concentration [mg/L]
Years Post-Closure
Mn
Fe
F
Ba
Sr