

**WATER USE LICENCE
APPLICATION
SUMMARY REPORT
FOR
KANGRA COAL (PTY) LTD
BALLENGEICH COLLIERY**



M²ENCO

Title Page:

Water Use Licence Application Report for the Rehabilitation of Ballengeich Colliery and Associated Water Uses on Portions 10, 11, 14, 19 and 25 of the Farm Ballengeich 3299 HS, Newcastle, KwaZulu-Natal.

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Report no: WULA/ KC-BC /2026

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Date: April 2026

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WATER USE LICENCE APPLICATION SUMMARY REQUIREMENTS

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EXECUTIVE SUMMARY

Kangra Coal (Pty) Ltd hereby submits this Water Use Licence Application Summary Report (WULAR) to the Department of Water and Sanitation (DWS) in terms of Section 40 of the National Water Act, 1998 (Act 36 of 1998) (NWA), read together with the Water Use Licence Application and Appeals Regulations promulgated under GN 267 of 24 March 2017 and GN 4167 of 8 December 2023.

The Ballengeich Colliery is a defunct coal mine located approximately 15 km south of Newcastle in the KwaZulu-Natal Province, situated at the confluence of the Horn River (V31F) and the Ngagane River (V31G/V31K) within the Pongola-Mtamvuna Water Management Area (WMA 4). Mining operations ceased in the early 1990s without formal closure. Since cessation, uncontrolled decant of Acid Mine Drainage (AMD) from flooded underground workings, opencast spoil areas, and an unrehabilitated discard dump has progressively degraded water quality in the Horn River. The site is subject to a Section 19 Directive (*Ref: 16/2/7/V301/A/1, August 2013*) issued by DWS and remains in a state of regulatory non-compliance.

This WULAR applies for authorisation of 60 definitive water use entries across Section 21(c) & (i), (d), (f), (g), and (j) of the NWA, covering the full operational footprint of the Ballengeich Colliery including the proposed passive AMD treatment system, existing pollution control infrastructure, the Quantum Crushing and Screening operations, and the Ballengeich Siding (15-year operational life). Section 21(a) does not apply — no groundwater abstraction takes place on site (confirmed May 2026). The DWS WULA reference number is WU33839.

The proposed rehabilitation programme centres on the implementation of a passive AMD treatment train designed to a capacity of 1,000 m³/day, comprising two Anoxic Limestone Drains (ALDs), a Successive Alkaline Producing System (SAPS), a Sedimentation/Oxidation Pond, and two Aerobic Wetland units. This system will treat AMD from the old underground workings (pH <4.5; SO₄ >4,000 mg/L; Fe 189 mg/L; Mn 4.0 mg/L) to within the Resource Quality Objectives (RQOs) established for the V31K catchment in GN 1873 (March 2022) before discharge to the Horn River.

A comprehensive Stormwater Management Plan (SWMP), designed and signed off by GFK Consulting Engineers and finalised in March 2026, achieves full GN 704 compliances through clean/dirty water separation, five HDPE-lined PCDs, a flood protection berm (1:100-year design), and a mechanical evaporator for surplus water management. The IWWMP (MENCO, January 2025, updated March 2026) recommends a WUL period of 20 years, consistent with the design service life of the GFK-engineered passive treatment infrastructure and PCDs. The 20-year WUL period comprises the 15-year operational and rehabilitation implementation period for the Ballengeich Siding and passive AMD treatment system, plus a 5-year post-

implementation monitoring and compliance verification period to confirm sustained achievement of the GN 1873 RQOs before formal closure of WUL conditions.

Key Findings of Specialist Studies

Specialist Study	Key Finding	Reasoned Opinion
Wetland Delineation (MENCO, March 2025)	Two wetland systems: CVB (PES C; EIS Moderate; REC C) and Floodplain (PES C; EIS High; REC C). AMD decant point within floodplain wetland. V31K = FEPA. 500 m wetland buffer and 100 m NFEPA river buffer triggered.	WUL S21(c)&(i) should be granted with mitigation measures.
Geohydrology (EWS, April 2025)	Three aquifer systems. Groundwater flow 0.001–0.38 m/day (very slow). SO ₄ plume: 4,000 mg/L at source to 1,000 mg/L Horn River. Aquifer unstressed (stress index 0.00). Losing rivers confirmed.	Activity should be authorised.
Hydropedology (EWS, April 2025)	One PED-HRU identified. No impact on hydropedological flow functions. Current PES and EIS will likely be maintained. Marginal improvement expected with treatment.	Activity should be authorised.
Hydrology (EWS, April 2025)	MAP 739 mm/yr; MAR 104 mm/yr. Total water into mine 333,994 m ³ /yr. Site within 1:100-yr floodline — GN 704 exemption required. AMD decant ≈200 L/min.	GN 704 exemption required. Treatment system compliant.
Assimilative Capacity (MENCO, February 2025)	Sufficient assimilative capacity confirmed in the Ngagane River system. PES Class C maintained with treatment. 41% improvement in watercourse impact with passive treatment.	Passive treatment sufficient to maintain PES Class C.
Aquatic Ecology (MENCO, November 2023)	Ngagane: Health Class D. Horn River: Health Class D/E; Toxicity Class IV at decant point. SASS5 48 at Horn DS1. 100% ostracod mortality; 70% phytotox inhibition at decant.	Passive treatment system to be constructed urgently.

In conclusion, Kangra Coal has engaged substantively with DWS since the issuance of the Section 19 Directive in 2013, has invested substantially in specialist studies and monitoring, and has proposed a scientifically defensible, cost-effective and sustainable passive AMD treatment solution. All specialist assessors have provided a reasoned opinion that the proposed activities should be authorised. It is respectfully requested that DWS issue the Water Use Licence for the Ballengeich Colliery for a period of 20 years, subject to the conditions of the IWWMP and this WULAR.

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LIST OF ACRONYMS

Acronym	Description
ALD	Anoxic Limestone Drain
AMD	Acid Mine Drainage
ASPT	Average Score Per Taxon
BA	Basic Assessment
BID	Background Information Document
BPG	Best Practice Guideline
CBA	Critical Biodiversity Area
CMA	Catchment Management Agency
CQA	Construction Quality Assurance
CRR	Comments and Response Report
DARDLR	Department of Agriculture, Land Reform and Rural Development
DFFE	Department of Forestry, Fisheries and the Environment
DMRE	Department of Mineral Resources and Energy
DWS	Department of Water and Sanitation
EA	Environmental Authorisation
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EIS	Ecological Importance and Sensitivity
ELWU	Existing Lawful Water Use
EMPr	Environmental Management Programme
EWR	Ecological Water Requirements
EWS	Elemental Water Services (Pty) Ltd
FEPA	Freshwater Ecosystem Priority Area

GA	General Authorisation
GFK	GFK Consulting Engineers CC
GN	Government Notice
HEC-RAS	Hydrologic Engineering Centre – River Analysis System
HDPE	High-Density Polyethylene
IHAS	Invertebrate Habitat Assessment System
IWULA	Integrated Water Use Licence Application
IWWMP	Integrated Water and Waste Management Plan
KZN	KwaZulu-Natal Province
MAE	Mean Annual Evaporation
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
MENCO	M2 Environmental Connections (Pty) Ltd
MPRDA	Mineral and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act 10 of 2004)
NFEPA	National Freshwater Ecosystem Priority Areas
NLM	Newcastle Local Municipality
NWA	National Water Act, 1998 (Act 36 of 1998)
NWRS	National Water Resources Strategy
PCD	Pollution Control Dam
PES	Present Ecological State
PPP	Public Participation Process
RAM	Risk Assessment Matrix
REC	Recommended Ecological Category
RQO	Resource Quality Objective
RWQO	Resource Water Quality Objectives
SACNASP	South African Council for Natural Scientific Professions
SANBI	South African National Biodiversity Institute
SANS	South African National Standard
SAPS	Successive Alkaline Producing System

SASS5	South African Scoring System Version 5
SEIR	Scoping and Environmental Impact Reporting
SFRA	Stream Flow Reduction Activity
SLP	Social and Labour Plan
SQR	Sub-Quaternary Reach
SWMP	Stormwater Management Plan
TDS	Total Dissolved Solids
TEC	Target Ecological Category
TWQR	Target Water Quality Range
WCS	West Containment Sump
WMA	Water Management Area
WULA	Water Use Licence Application
WULAR	Water Use Licence Application Summary Report
WUL	Water Use Licence
WWTW	Wastewater Treatment Works

1. INTRODUCTION

1.1 Applicant Details (Water User)

The registered applicant for this Water Use Licence Application is Kangra Coal (Pty) Ltd, a subsidiary of the Menar Group. The applicant's contact details as registered on the eWULAAS system are set out in **Table 1** below.

Table 1: Applicant Details

Name of Applicant:	Kangra Coal (Pty) Ltd: Ballengeich Colliery
Applicant Representative:	Ms. LM Monareng (Mahlatse Monareng)
Postal Address:	PO Box 745, Piet Retief, 2830, Mpumalanga
Physical Address (Head Office):	Driefontein Farm, Mpumalanga
Physical Address (Site):	Farm Ballengeich 3299, Newcastle, KwaZulu-Natal
Telephone (Office):	017 730 6000
Cellular:	079 897 9464
Email:	Mahlatse.Monareng@kangracol.co.za; Paul.Redelinghuys@kangracol.co.za

1.2 Person Submitting Application

This WULAR has been compiled and submitted on behalf of Kangra Coal (Pty) Ltd by M2 Environmental Connections (Pty) Ltd (MENCO), an independent environmental consultancy. The registered professionals responsible for compilation and review are registered with the South African Council for Natural Scientific Professions (SACNASP).

Table 2: Consultant Details

Compiled by:	M2 Environmental Connections (Pty) Ltd (MENCO)
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Johan Maré	Managing Director
Abraham Smit:	Project Coordinator — EIA and WULA Process

2. BACKGROUND AND PURPOSE

2.1 Purpose and Rationale

Kangra Coal (Pty) Ltd hereby submits this WULAR to the Department of Water and Sanitation (DWS) in terms of Section 40 of the National Water Act, 1998 (Act 36 of 1998) (NWA), read together with the Water Use Licence Application Regulations (GN 267, 24 March 2017) and GN 4167 (8 December 2023). The application pertains to all water uses associated with the Ballengeich Colliery site on Portions 10, 11, 14, 19, and 25 of the Farm Ballengeich 3299 HS, Newcastle, KwaZulu-Natal.

This is a new Water Use Licence Application. A previous Integrated Water Use Licence Application (IWULA) was submitted by GCS (Pty) Ltd in 2015 in respect of a phytoremediation-based approach. That application was declined by DWS on 29 April 2019. The current application represents a fundamentally revised approach incorporating a passive AMD treatment system, comprehensive GN 704-compliant stormwater management, and rehabilitation measures across the full site footprint.

2.2 Background and Historical Context

The Ballengeich Colliery, formerly known as the Natal Cambrian Colliery, operated via underground bord-and-pillar and opencast roll-over mining methods from the early 1960s until the early 1990s. At cessation of operations, the mine was not formally closed and no closure certificate was obtained. AMD from flooded underground workings has decanted continuously at the Horn River bank west of the N11 bridge at approximately 1,000 m³/day (pH <4.5; SO₄ >4,000 mg/L; Fe 189 mg/L; Mn 4.0 mg/L) for over three decades, causing progressive deterioration of the Horn River (Health Class D/E).

Table 3: Chronological Summary of the Project

Year / Date	Event / Milestone
1960s – 1990s	Active underground (bord-and-pillar) and opencast (roll-over) coal mining at Natal Cambrian Colliery / Ballengeich Colliery.
Early 1990s	Mining ceased. Mine not formally closed. No closure certificate issued. AMD decant begins to impact Horn River. Kangra Coal inherits site.
Late 1980s	Horn River diverted away from opencast toe during mining, creating AMD seepage pathway.
2013	Section 19 Directive issued by DWS (Ref: 16/2/7/V301/A/1, August 2013). Directive remains in force.
2015	IWULA submitted by GCS (Pty) Ltd for phytoremediation approach.

29 April 2019	GCS IWULA declined by DWS. Phytoremediation approach found insufficient.
October 2022	Amended Action Plan submitted to DWS.
3 July 2023	DWS site inspection conducted. Non-compliances confirmed.
24 August 2023	DWS formal letter (Ref: 16/2/7V301/C/4): (a) expedite WULA within 3 months; (b) continue monitoring; (c) pilot wetland system requires WUL. DWS approves pilot passive wetland approach in principle.
October 2024	GN 4167 Risk Assessment Matrix (RAM) applied for immediate low-significance activities.
14 November 2024	Phase 1 of eWULAAS submitted (Ref: WU33839/Phase 1).
17 December 2024	DWS Acknowledgement Letter received (WUL Manager: Shaun Oeveshen Naidoo; Ref: WU33839) — 30 requirements listed. GN 704 Exemption Application submitted (14 December 2024).
February – April 2026	GFK SWMP Final (24 March 2026) and Master Layout Plan Rev 2 (9 April 2026) signed by B.D. Muhl Pr.Eng. Civil (ECSA 202604247). All specialist studies completed.
June 2026	WULAR compiled and submitted.

2.3 Existing Authorisations

The following authorisations and directives are relevant to this application:

- Mining Right: An approved Mining Right was issued by the DMRE to Kangra Coal (Pty) Ltd for coal mining activities on Portion 19 (Remaining Extent) of the Farm Ballengeich 3299 HS. Historical documentation has not been fully retrieved; an EMPr from the mining period has been submitted in lieu (Phase 1 Motivation Letter, 13 November 2024).
- Section 19 Directive (Ref: 16/2/7/V301/A/1, August 2013): Issued by DWS directing Kangra to address AMD pollution. The Directive remains in force until all instructions are carried out.
- Environmental Authorisation (EA): No EA is currently in place. A Basic Assessment (BA) process has been initiated with the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN EDTEA).
- Previous WULA (Declined 29 April 2019): The WULA submitted by GCS was declined. This application supersedes that submission.
- GN 704 Exemption Application: Submitted 14 December 2024. DWS receipt confirmation awaited.
- Environmental Authorisation for Quantum Crushing and Screening (Pty) Ltd: KZN/EIA/0000004/2015.

3. LOCATION OF WATER USES

3.1 Geographic Location and Access

The Ballengeich Colliery is located approximately 15 km south of Newcastle, within the Newcastle Local Municipality (NLM) in the Amajuba District Municipality (ADM), KwaZulu-Natal Province. The site is situated at the confluence of the Horn River (flowing west to east) and the Ngagane River (flowing south to north), immediately adjacent to the N11 national road on the eastern boundary. The central coordinates of the site are: Latitude 27°53'23.97"S; Longitude 29°58'15.56"E (WGS84 datum).

Access to the site is obtained directly via the N11 highway. The Kilbarchan residential area is located to the east of the property. The broader surrounding land use is predominantly agricultural with numerous operational and defunct coal mines in the catchment. All infrastructure is shown on Master Layout Plan G2025/06/338-100 Rev 2 (GFK, April 2026) submitted as a separate document to eWULAAS.

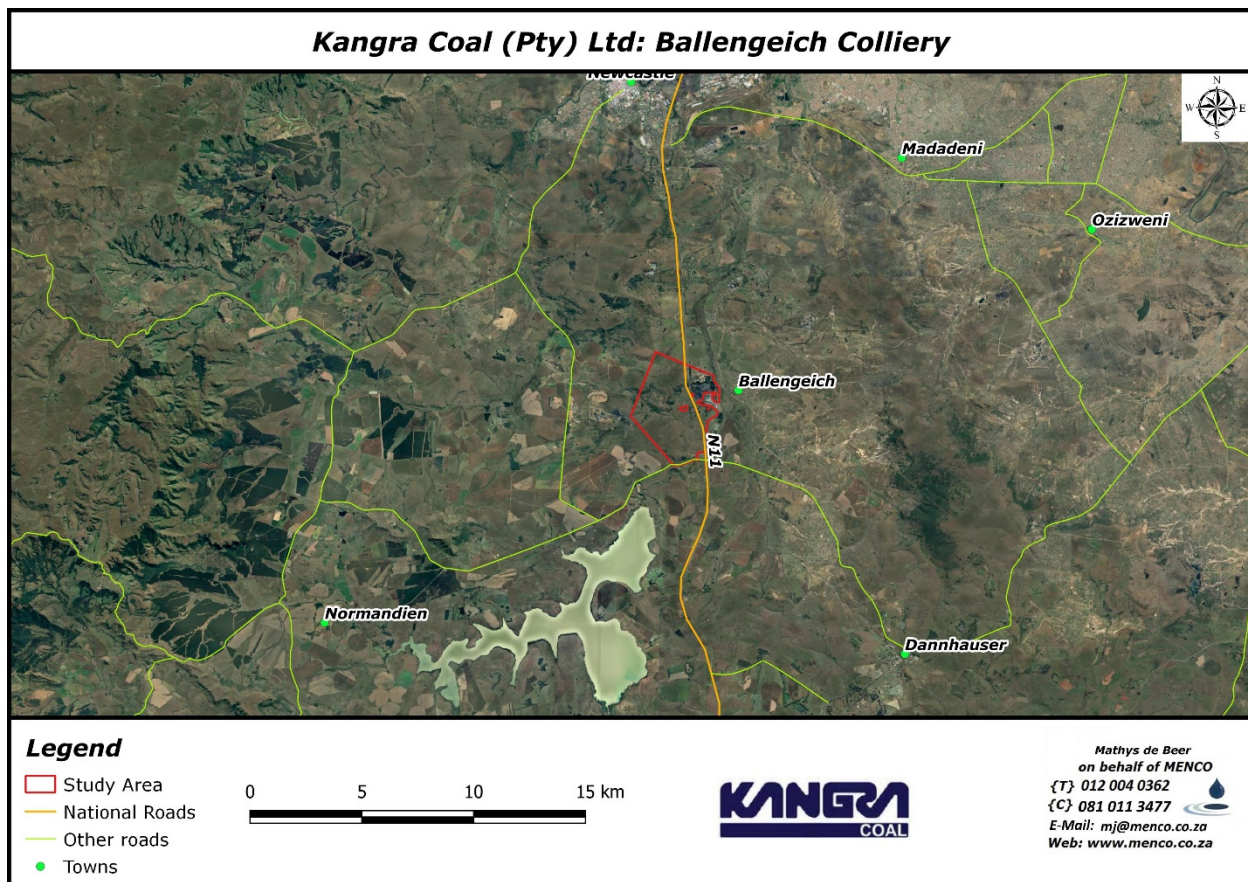


Figure 1: Regional Setting of Ballengeich Colliery

3.2 Water Management Area and Quaternary Catchments

The Ballengeich Colliery is situated within the Pongola-Mtamvuna Water Management Area (WMA 4) at the confluence of the Horn River (Quaternary Catchment V31F) and the Ngagane River (Quaternary Catchment V31G/V31K). Understanding the hydrological setting of the site is fundamental to assessing the potential water resource impacts associated with the proposed activities and informing the water management approach adopted for this application. The table below provides an overview of the regional hydrological characteristics and catchment parameters relevant to the Ballengeich Colliery.

Table 4: Regional Characteristics of the Site

Water Management Area:	Pongola-Mtamvuna Water Management Area (WMA 4)
Sub-WMA:	Upper Buffalo River Sub-Catchment
Primary Catchment:	V (Thukela)
Quaternary Catchments (surface):	V31F (Horn River); V31G (confluence area); W31G (surface operations)
Quaternary Catchments (underground):	V31F and V31K
FEPA Status:	V31K is a Freshwater Ecosystem Priority Area (FEPA) — SANBI Atlas, 2011
MAP (CHIRPS 2010–2024):	739 mm/yr (EWS, April 2025); 822 mm/yr (WR2012 station V3E002, GFK March 2026)
MAE:	1,200 – 1,448 mm/yr
MAR (Horn River, V31F):	104 mm/yr
Target Ecological Category:	Class C (Horn River at Ngagane confluence, per GN 1873, March 2022)
Key Downstream User:	Newcastle WTP — abstracts up to 220 Ml/day from Ngagane River (Umgeni Water)

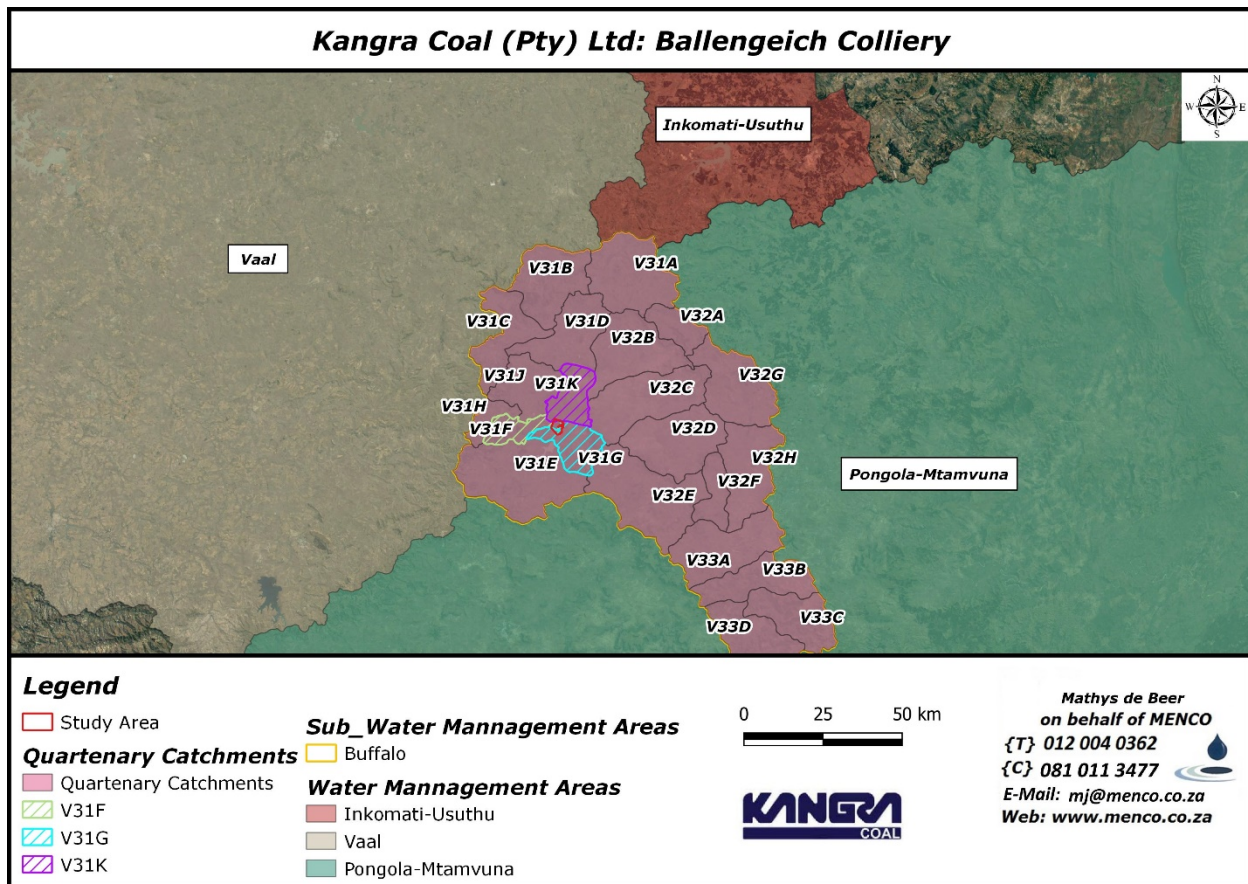


Figure 2: Water Management Area and Quaternary Catchments

3.3 Property Details

The water uses covered by this application take place on the following farm portions. Title deeds and WinDeed reports for all portions are submitted as part of the administrative package.

Table 5: Property Details

Property Description	Farm Name & Number	Title Deed	Extent (ha)	Registered Owner
Portion 19 (Sub 1 & Remaining Extent)	Ballengeich 3299 HS	T19913/1994	1,406	Kangra Coal (Pty) Ltd
Portion 25	Ballengeich 3299 HS	To be confirmed	TBC	Kangra Coal (Pty) Ltd
Portion 10	Ballengeich 3299 HS	To be confirmed	TBC	Kangra Coal (Pty) Ltd
Portion 11	Ballengeich 3299 HS	To be confirmed	TBC	Kangra Coal (Pty) Ltd

Portion 14	Ballengeich 3299 HS	To be confirmed	TBC	Kangra Coal (Pty) Ltd
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The site rehabilitation area covers approximately 95 ha, representing less than 7% of Portion 19. The full site includes: an unrehabilitated discard dump (approximately 14 ha; maximum height 55 m; approximately 2 million tonnes of coal waste); nine unlined PCDs; old underground workings (approximately 405 ha beneath the surface); opencast spoil areas (Spoils Block I — 34 ha west of N11; Spoils Block II — 45 ha east of N11); Quantum Screening and Crushing operations; the Ballengeich Siding; and associated road and railway infrastructure

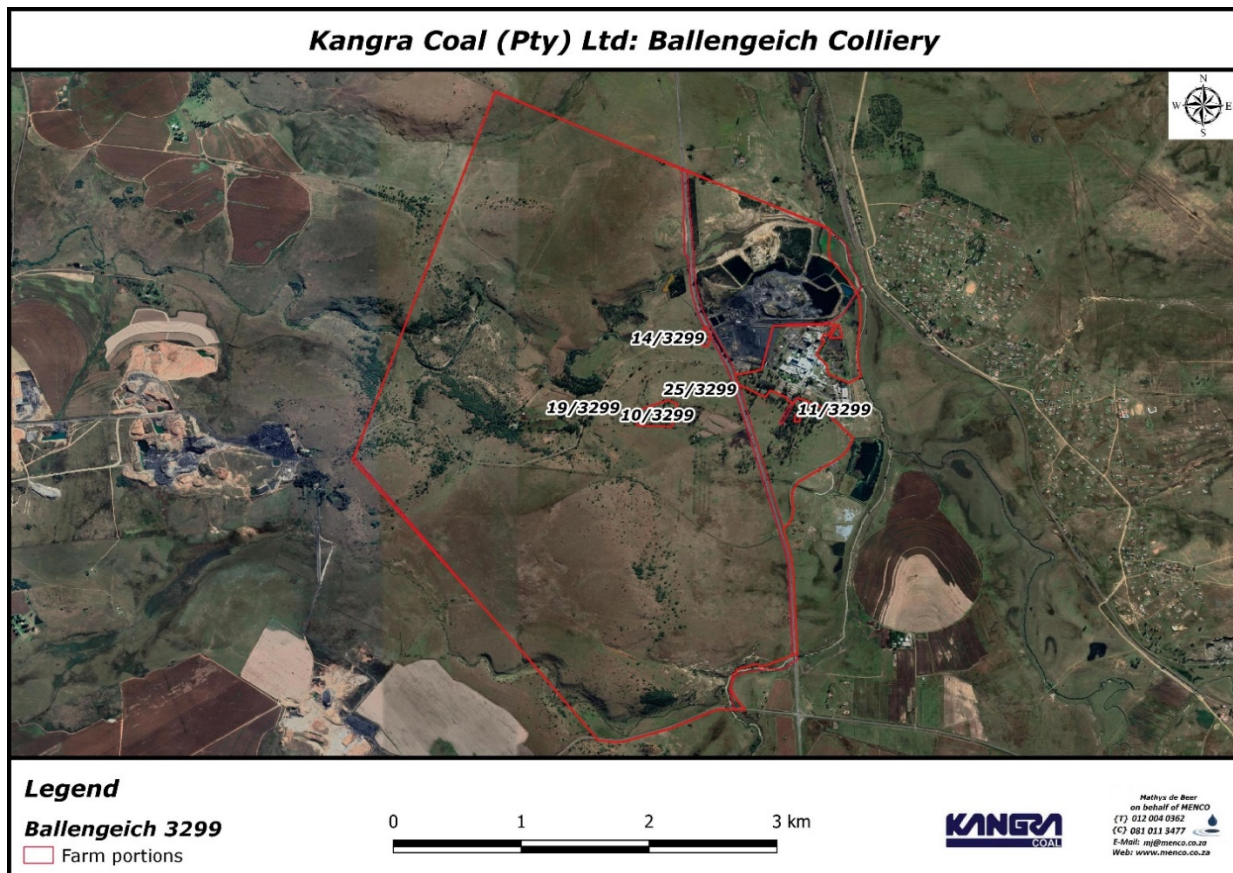


Figure 3: Farm Portions Related to Ballengeich Colliery

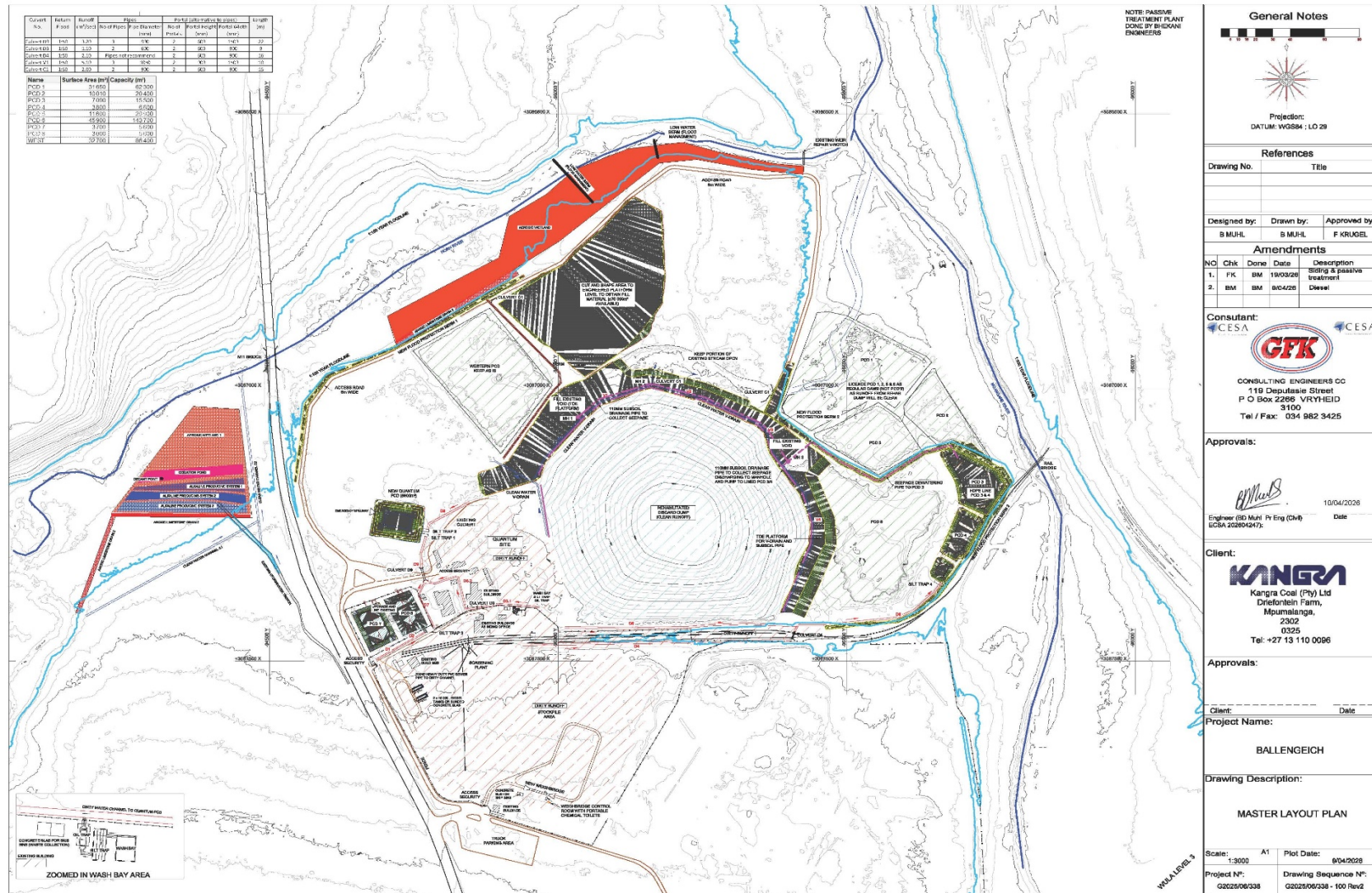


Figure 4: Master Layout Plan Rev 2 — GFK Drawing G2025/06/338-100 (April 2026)



4. ADMINISTRATIVE DOCUMENTS AND TECHNICAL REPORTS

4.1 Administrative Documents

The following administrative documents form part of the WULA submission uploaded to eWULAAS. Outstanding items are flagged for action by Kangra Coal prior to final submission.

Table 6: Supporting Administrative Documents

No.	Administrative Document	Status
1	Certified copy of Applicant's Identity Document (Ms. LM Monareng)	Received
2	Company Registration Certificate – Kangra Coal (Pty) Ltd (CIPC)	Received
3	Title Deeds – Portions 10, 11, 14, 19 and 25, Farm Ballengeich 3299 HS	Portion 19 received; Ptns 10, 11, 14, 25
4	Property Zoning Certificate – Newcastle Local Municipality	Received
5	DRDLR Clearance Letter (no registered land claims)	To be obtained
6	Proof of BBEEE Status (certificate or sworn affidavit)	Received
7	eWULAAS Licence Application Forms (signed by applicant)	Submitted electronically (Phase 1, 14 November 2024)
8	DW902 Form (property owner consent)	Not applicable — Kangra Coal is registered owner
9	Mining Right and signed Social and Labour Plan (MPRDA)	Historical EMPr submitted in lieu (Phase 1 Motivation Letter, Nov 2024)
10	Service Level Agreements – ECO and sanitation services	SLA received
11	Financial Provision Letter (covering S19 and S20 NWA obligations)	Received

4.2 Technical and Specialist Reports Submitted

The following specialist technical reports have been compiled by registered professionals and are submitted as separate documents to eWULAAS in fulfilment of the 30 requirements listed in the DWS Acknowledgement Letter (Ref: WU33839, 17 December 2024).



Table 7: List of Technical Documents and Specialist Reports

No.	DWS Req.	Report Title	Compiled By	Date	Status
1	Req. 1	Integrated Water and Waste Management Plan (IWWMP)	MENCO (Johan Maré)	Jan 2025 / Mar 2026	Final
2	Req. 13	Rehabilitation Plan and EMPr	MENCO (Johan Maré)	Nov 2024	Final
3	Req. 14	Wetland Delineation and Assessment	MENCO (J. Maré; SACNASP 400092/91)	Mar 2025	Final — signed 17 March 2025
4	Req. 18	Geohydrological Assessment	EWS (H. Botha; SACNASP 400139/17)	Apr 2025	Final
5	Req. 18b	Hydropedological Assessment	EWS (H. Botha; SACNASP 400139/17)	Apr 2025	Final
6	Req. 19	Hydrology Assessment (incl. flood line and water balance)	EWS (H. Botha; SACNASP 400139/17)	Apr 2025	Final
7	Req. 17	Aquatic Ecological Assessment	MENCO (MJ de Beer)	Nov 2023	Final
8	Req. 22	Water and Stormwater Management Report (SWMP)	GFK Consulting Engineers (B.D. Muhl, Pr.Eng.)	Mar 2026	Final
9	Req. 23	PCD Civil Engineering Design Drawing (Class C HDPE liner)	GFK (B.D. Muhl, Pr.Eng.)	Mar 2026	Final — signed 24 March 2026
10	Req. 10	Master Layout Plan Rev 2 (G2025/06/338-100)	GFK (B.D. Muhl, Pr.Eng.)	Apr 2026	Final
11	Req. 22b	Preliminary Civil Engineering Design – AMD Passive Treatment	Bhekhani (Pty) Ltd (T. Matendawafa)	Feb 2023	Rev 00 Preliminary — superseded by GFK SWMP
12	Req. 20	Assimilative Capacity / Waste Load Allocation Study	MENCO (Johan Maré)	Feb 2025	Final



13	Req. 28	GN 704 Exemption Application	MENCO	Dec 2024	Final — submitted 14 Dec 2024
14	Req. 11	Alternatives Report	MENCO	2026	Final
15	Req. 21	Method Statement (incl. RSIP)	MENCO	2026	Final
16	Req. 25	Contingency Plans	MENCO	2026	Final
17	Req. 24	Monitoring Programme	MENCO / EWS	2025/2026	Final (IWWMP Tables 7-10 and 7-12)
18	Req. 15	Section 27 Motivation Report	MENCO	Aug 2024	Final
19	Req. 12	Environmental Authorisation (Basic Assessment (BA) process)	MENCO	In progress	BA initiated with KZN EDTEA/DFFE
20	Req. 27	Public Participation Report	MENCO	Pending PPP	PPP to be initiated
21	Admin	Water Uses Register (Rev 5, June 2026)	MENCO	Mar 2026	Final — 60 individual water uses
22	Admin	Listing Notice Activities Table	MENCO	Mar 2026	Final



5. PROJECT DESCRIPTION

5.1 Overview of Proposed Activities

The proposed project entails the implementation of a comprehensive passive AMD treatment and site rehabilitation programme at the defunct Ballengeich Colliery. The project addresses two distinct areas of AMD generation, two operational activities, and the full range of existing site infrastructure within the site footprint on Portions 10, 11, 14, 19, and 25 of the Farm Ballengeich 3299 HS.

The Ballengeich Siding is planned to operate for 15 years at a throughput of 95,000 tonnes per month. The passive AMD treatment system and PCDs have been designed for a minimum service life of 18–20 years, consistent with the IWWMP recommendation of a 20-year WUL period. The overarching objective is to reduce the AMD waste load to the Horn River by constructing a passive treatment system while improving stormwater management across the full site footprint, rehabilitating the discard dump, and restoring the riparian environment of the Horn River.

5.2 Pollution Sources and Contributions

The Ballengeich Colliery presents multiple, well-documented sources of AMD and contaminated run-off that have contributed to the progressive degradation of the Horn River and surrounding water resources over several decades. An understanding of each pollution source, its relative contribution to the overall AMD load, and its relationship to the proposed management infrastructure is essential to justify the scope of the water uses applied for and the adequacy of the proposed mitigation measures. The pollution sources identified at the site and their respective contributions to the total AMD salt load are summarised in Table 8 below.

Table 8: Pollution Sources at Ballengeich Colliery

Pollution Source	Contribution	Proposed Treatment / Mitigation
Old Opencast Mining Area (east of N11; Spoils Block II)	55%	Improved stormwater management; seepage interception via 110 mm perforated toe drain to lined PCDs 3 & 4; progressive spoil stabilisation; clay capping of pyrite-bearing material.
Old Underground Mine Workings (AMD artesian decant, west of N11)	30%	Full passive treatment train: decant captured → West Decant PCD → ALD 1 → SAPS → Oxidation Pond → Aerobic Wetland Unit 1 → discharge to Horn River.
Discard Dump Seepage and Runoff	15%	Dump rehabilitation (reshaping; min. 600 mm cover; indigenous grass) OR full reprocessing and removal (Scenario 2). Seepage collection 110 mm perforated



		HDPE drain at toe → solar-powered pumps → lined PCDs 3 & 4.
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5.3 AMD Characterisation

The AMD decanting at the Horn River bank west of the N11 bridge has the following characterisation based on combined monitoring data from quarterly water quality monitoring, the EWS Hydrogeology Assessment (EWS24-12_GW, April 2025), and the Bhekani Civil Design Report (B120, February 2023):

Table 9: AMD Discharge Characterisation

Parameter	AMD Decant Value	RQO (GN 1873, V31K)	Unit
pH	<4.5	6.5 – 9.0	pH units
Total Dissolved Solids (TDS)	7,260	≤350	mg/L
Sulphate (SO ₄)	>4,000	≤165 (Horn, V31F)	mg/L
Iron (Fe total)	189	≤0.1	mg/L
Manganese (Mn)	4.0	≤0.15	mg/L
Aluminium (Al)	Elevated	≤0.105	mg/L
Chloride (Cl)	143	≤120	mg/L
Sodium (Na)	841	≤115 (TWQR)	mg/L
Dissolved Oxygen (DO)	>5	>5	mg/L
AMD decant flow rate (design)	200 L/min (1,000 m ³ /day)	—	m ³ /day
Average SO ₄ salt load to West Decant Sump	122,859 kg/yr	—	kg/yr

In order to achieve the RQO for treated discharge (SO₄ < 500 mg/L for the Horn River as per the IWWMP treatment target — RQO Class III), the passive treatment system must remove approximately 515,440 kg/year of sulphate. With full implementation of the passive treatment system, a 41% improvement in watercourse impact is estimated (EWS Hydrology, EWS24-12_SW, April 2025).

5.4 Passive Treatment System Design

A passive AMD treatment system is proposed comprising the following components in series, designed to a treatment capacity of 1,000 m³/day. The system requires no external electricity, no continuous chemical inputs (limestone only), and has a design life exceeding 30 years for



the wetland components and 20–30 years for the SAPS (*Bhekhani, February 2023*). The Master Layout Plan Rev 2 (GFK, April 2026) shows the confirmed positions of all treatment components.

Table 10: Passive AMD Treatment System Design

Component	Coordinates	Design Parameters	Location
ALD 1	27°53'33.43"S; 29°57'41.38"E	Length 420 m; buried HDPE-lined trench; limestone layer 2,000 mm; 14-hr retention time; 0.6 m compacted impermeable cover. Alkalinity generation.	Ptn 25
ALD 2	27°53'16.05"S; 29°58'3.72"E	Length 230 m; same specification as ALD 1; treats West Decant area seepage.	Ptn 19
SAPS	27°53'27.58"S; 29°57'45.68"E	Min. area 18,900 m ² ; retention time 15 hrs; compost layer 600 mm; limestone depth 2,000 mm; 3.3 m deep ponds; 800 mm freeboard; HDPE Class C (SANS 1526:2015). Design life 20–30 years.	Ptn 25
Sedimentation / Oxidation Pond	27°53'27.86"S; 29°58'30.75"E	Total area 670 m ² ; 24-hr retention; depth 1,500 mm; 600 mm freeboard; min. 2 ponds; L:B max 3:1; side slopes 1:2; scour valves; 2 mm HDPE (SANS 10409) over A4 geotextile.	Ptn 25
Aerobic Wetland Unit 1	27°53'22.97"S; 29°57'47.24"E	Area 1.3 ha; soil depth 400 mm; water depth 1.0 m + 600 mm freeboard; 2 mm HDPE; reeds at 3–4 plants/m ² (<i>Typha capensis</i> , <i>Phragmites australis</i>). Discharge only after pH >5.5 and Fe <10 mg/L confirmed. Design life >30 years.	Ptn 25
Aerobic Wetland Unit 2	27°53'16.84"S; 29°57'58.77"E	Area 4.4 ha; cut-off system; same specification as Unit 1; intercepts West Decant and old Horn River seepage; stormwater berm along Ngagane River (1:100-yr design) constructed simultaneously.	Ptn 19

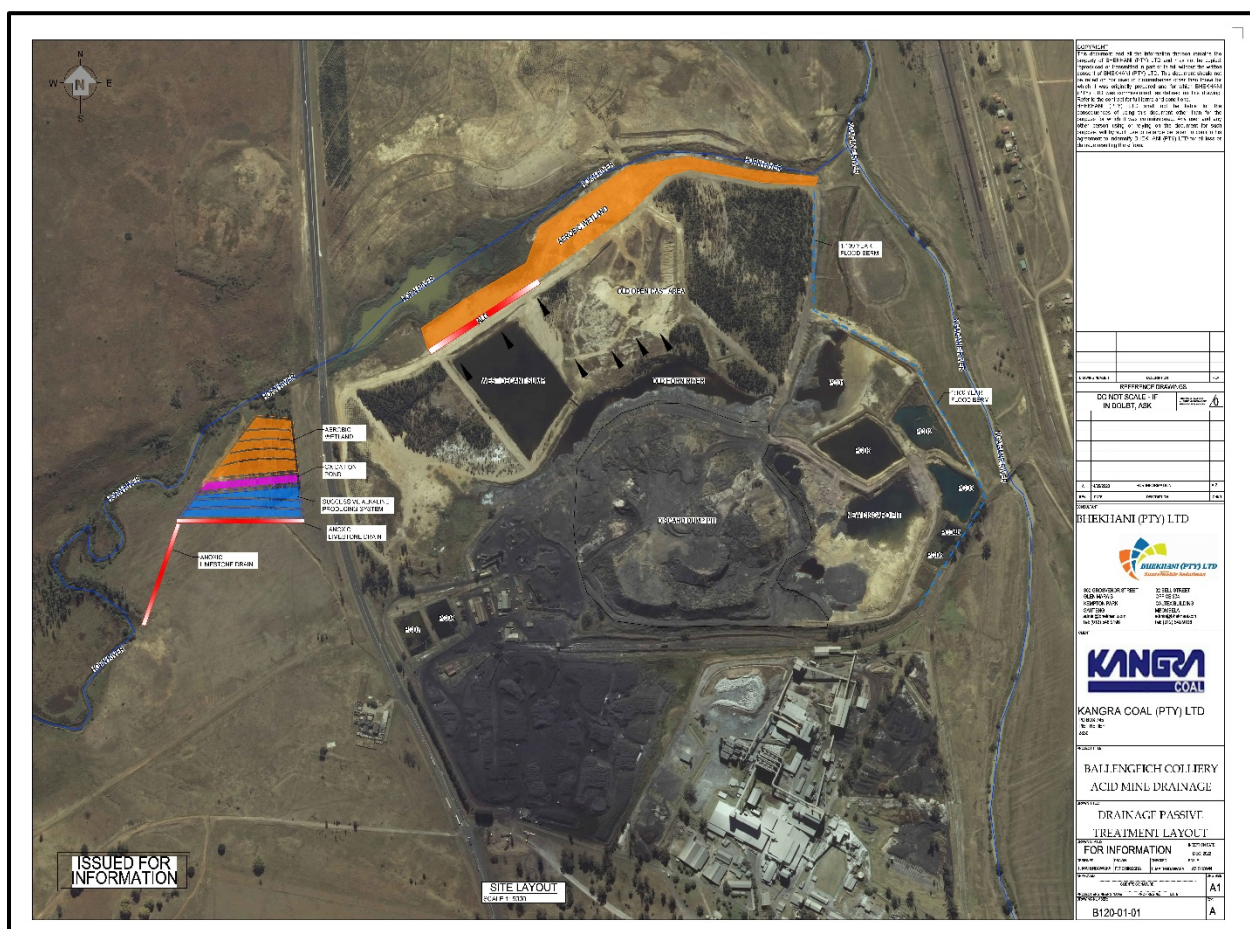


Figure 5: Passive AMD Treatment System Layout

5.5 Stormwater Management

A comprehensive Water and Stormwater Management Report (SWMP) was designed by GFK Consulting Engineers CC (Report No. G2025/06/338(1), signed 24 March 2026). The SWMP achieves complete clean/dirty water separation across the full site footprint, ensuring compliance with GN 704 Regulation 6. Key elements include:

- Complete clean/dirty water separation across the full site footprint, as shown on Master Layout Plan G2025/06/338-100 Rev 2.
- Concrete-lined dirty water channels (trapezoidal section; velocities up to 4.4 m/s; Manning's $n = 0.017$; sized to 1:50-year SCS return flows) draining to lined PCDs via concrete silt traps.
- Grass-lined V-drains on the rehabilitated discard dump toe platform (1:50-yr design; velocities 1.0–1.5 m/s; Manning's $n = 0.035$). Outlet via riprap scour apron to toe water body.
- All lined PCDs confirmed to spill less than once in 50 years (89-year Pitman/WRSM2000 simulation; station V3E002).
- Flood protection berm (~20,400 m³ fill; crest 1,183.1 m amsl; min. 0.8 m freeboard; geocell/soilcrete river-facing slope; HEC-RAS 2D 1:100-yr design).



- New Quantum PCD (8,600 m³; Class C HDPE liner) containing all Quantum operational runoff.
- Mechanical evaporator (22 kW; 45 m³/hr) to manage Scenario 1 surplus water (max 1,333 m³/annum, December–March); positioned over lined PCD at all times.

Table 11: Key SWMP Hydrological Parameters

MAP (GFK station V3E002):	822 mm/yr
MAP (CHIRPS 2010–2024, EWS):	739 mm/yr
MAE (S-Pan, V3E002):	1,448 mm/yr
1:100-yr Ngagane River peak flow:	1,660 m ³ /s (SDF; HEC-RAS 2D verified)
1:100-yr Horn River peak flow:	418 m ³ /s (SDF; HEC-RAS 2D verified)
Total water into/onto mine:	333,994 m ³ /yr (EWS Hydrology, April 2025)
Dust suppression demand:	38,400 m ³ /annum
Hydrological simulation:	89 years (1920–2009; Pitman/WRSM2000; station V3E002)
GN 704 spill compliance:	All lined PCDs confirmed <1 spill in 50 years (Scenarios 1 and 2)

5.6 Pollution Control Dams — GN 704 Compliance

A total of nine existing earth-lined PCDs and the West Containment Sump are present on the site. None have been designed, sized, or certified to GN 704 requirements. The following five PCDs will be lined with Class C HDPE geomembrane (GNR 636).

Table 12: PCD Specifications (GFK SWMP, March 2026)

PCD	Capacity (m ³)	Notes	Status
PCD 1	62,300 (existing)	Retained existing; GN 704 Reg. 4 exemption applied for	Existing; unlined
PCD 2	20,400 (existing)	Retained existing; GN 704 Reg. 4 exemption	Existing; unlined
PCD 3	15,500	Class C HDPE liner (GNR 636); dump seepage (Sc. 1); spillway to PCD 4; leakage detection	To be lined
PCD 4	6,800	Class C liner; linked to PCD 3 via spillway; siding area runoff	To be lined
PCD 5	20,900 (existing)	Retained existing; GN 704 exemption	Existing; unlined



PCD 6	143,700 (existing)	Retained (old Horn River Dam); GN 704 exemption	Existing; unlined
PCD 7	5,600	Class C liner; Quantum and siding runoff; concrete silt trap	To be lined
PCD 8	5,600	Class C liner; linked to PCD 7 via spillway; silt trap	To be lined
West Decant Sump	86,400 (existing)	Receives AMD decant (to be redirected to passive treatment train)	Existing; unlined
New Quantum PCD	8,600 (new)	New construction; Class C liner; replaces previous 2,500 m ³ design; concrete silt trap	New — to construct

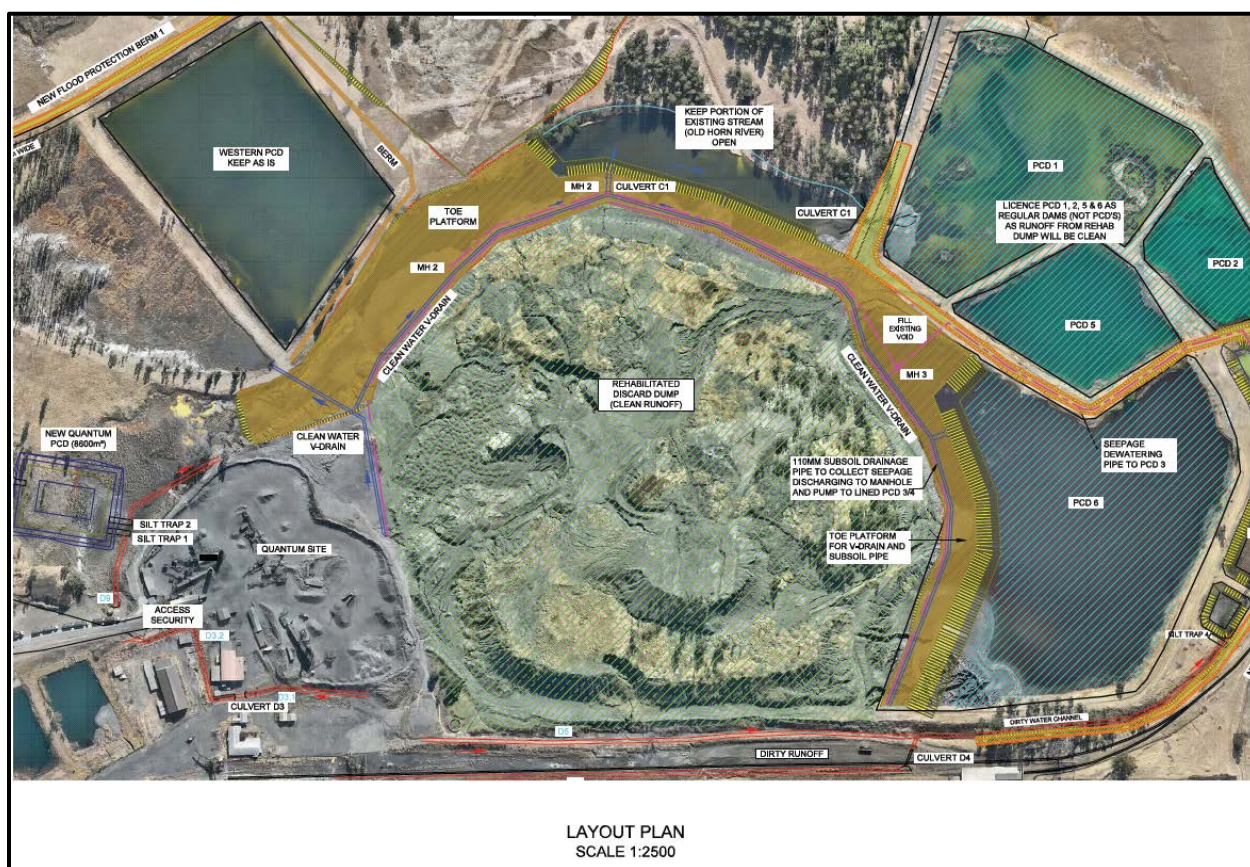


Figure 6: Pollution Control Dam Layout and Catchments

5.7 Flood Protection Berm

The 1:100-year base flood line for both the Horn River and the Ngagane River overtops all existing site infrastructure, necessitating a flood protection berm with the following specifications (GFK SWMP, March 2026):

- General Notes and Specifications**

References

Drawing No.	Title
02/05/2008-100	LAYOUT PLAN

Amendments

Date	Created	Drawn	Description

Approval:

Client: KANGRA
Kangra Coal (Pty) Ltd
Crestbrook Farm
Murrumbidgee
2502
Tel: +27 13 110 0008

Project Name: BALLENGEICH

Drawing Description: FLOOD PROTECTION BERM 2

Scale: AS INDICATED AT 1:1000

Plot Date: 9 Mar 2008

Drawing Sequence: 1/10

General Notes and Specifications

References

Drawing No.	Title
02/05/2008-100	LAYOUT PLAN

Amendments

Date	Created	Drawn	Description

Approval:

Client: KANGRA
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Tel: +27 13 110 0008

Project Name: BALLENGEICH

Drawing Description: FLOOD PROTECTION BERM 2

Scale: AS INDICATED AT 1:1000

Plot Date: 9 Mar 2008

Drawing Sequence: 1/10

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5.8 Discard Dump Rehabilitation

The discard dump (approximately 14 ha; max height 55 m; approximately 2 million tonnes of coal waste; confirmed active spontaneous combustion) constitutes the primary long-term residual pollution risk. Two rehabilitation scenarios have been assessed (*GFK SWMP, March 2026; Rehabilitation Plan EMP/2024/086, November 2024*):

Table 13: Discard Dump Rehabilitation Scenarios

Scenario	Description	Key Requirements
Scenario 1: Rehabilitation In Situ	Reshape to stable 1:2.5 side slopes with benched terraces. Cap with min. 600 mm softs cover + 150 mm topsoil. Seed with indigenous grass. Total rehabilitated area: 164,120 m ² .	Toe platform fill: ~103,000 m ³ ; 110 mm perforated seepage drain at toe → solar pumps → lined PCDs 3 & 4; infra-red drone survey mandatory before access; spontaneous combustion clearance certificate required. Max Scenario 1 surplus: 1,333 m ³ /annum (Dec–Mar) — managed by 22 kW mechanical evaporator.
Scenario 2: Reprocessing and Removal	Full removal via Prosizer crusher/screener. Approx. 60% (1.2 Mt) removed as saleable product to Springlake, Newcastle. Remaining 40% (~800,000 t, Type 3 GNR 635) to new Class C-lined facility. Duration: approx. 2 years.	Final footprint shaped free-draining (Type 4 softs cover, indigenous grass). No seepage management infrastructure required. No Scenario 1 surplus water. Dust suppression shortfall: 16,310 m ³ /annum.

**No person, vehicle, or plant may access the dump surface until: (a) a specialist infra-red thermal drone survey has been completed over the full dump surface; (b) all hot spots have been extinguished and confirmed cold by repeat survey; and (c) a qualified geotechnical engineer has provided written clearance.*



A new 3.57 ha Eucalyptus spp. plantation (Item 23; S21(d) Streamflow Reduction Activity) will be established adjacent to the West Decant Sump on Portion 19 as part of the rehabilitation and AMD impact mitigation programme. The plantation reduces streamflow contributions from the western decant area to the Horn River during the passive treatment system implementation phase. The existing Eucalyptus plantation on Portion 19 will be decommissioned to make space for the construction of the passive wetland treatment infrastructure, with felled material composted on site for a minimum of 90 days before use as the organic carbon source layer in the SAPS.

Quantum Screening and Crushing (Pty) Ltd operates under a lease arrangement with Kangra Coal on Portion 19. A new Quantum PCD (8,600 m³; Class C HDPE liner) has been designed by GFK to contain all stormwater runoff and process water from the Quantum operational area. A new wash bay (5,000 L/day) has been designed at coordinates 27°53'33.19"S; 29°58'9.53"E.



The Ballengeich Siding has been included as a new water use in the Rev 2 Water Uses Schedule (March 2026) under Section 21(c) & (i) (coal stockpile: Item 32; dust suppression: Item 33). The siding operates for 15 years at 95,000 tonnes per month.

6. METHOD STATEMENT

6.1 Legislative Basis and Context

A Method Statement is required in terms of the DWS WULA template for all Section 21(c) and (i) water uses under the NWA. A comprehensive standalone Method Statement has been compiled by MENCO in accordance with GN 267 (March 2017), GN 4167 (December 2023), GN 704 (June 1999), and Best Practice Guidelines H4 (Water Treatment) and G1 (Stormwater Management). All the proposed works are referenced on the Master Layout Plan G2025/06/338-100 Rev 2 (GFK, April 2026).

The Ballengeich Colliery has operated without valid water use authorisations for over three decades. All existing site infrastructure constitutes currently unauthorised water uses in terms of the NWA. The Section 19 Directive (Ref: 16/2/7/V301/A/1, August 2013) remains in force.

6.2 Summary of Section 21(c) and (i) Construction Activities

Table 14: Section 21(c) and (i) Construction Activities

No.	Activity	S21 Use	Sensitive Area Interaction	Key Protective Measure
2	ALD 1 — 420 m, Ptn 25	S21(c)&(i)	Within 100 m NFEPA buffer; floodplain wetland	Sub-surface buried trench; HDPE 'burrito' liner; no surface flow diversion required.
3	ALD 2 — 230 m, Ptn 19	S21(c)&(i)	Within 100 m NFEPA buffer; 500 m wetland buffer	Sub-surface buried; HDPE-lined; trench dewatering pumped to West Decant PCD.
4	SAPS — 1.2 ha, Ptn 25	S21(c)&(i)	Within 500 m wetland buffer; disturbed footprint	Fully HDPE-lined; no watercourse crossing.
5	Sedimentation / Oxidation Pond — 670 m ² , Ptn 25	S21(c)&(i)	Within floodplain wetland; 100 m NFEPA buffer	Fully HDPE-lined; min. 2 cells; scour valves; sludge characterised per GNR 635.
6	Aerobic Wetland Unit 1 — 1.3 ha, Ptn 25	S21(c),(i)&(f)	Within floodplain wetland (PES C;	HDPE-lined; riprap scour apron; discharge only after pH >5.5 and



			EIS High); 100 m NFEPA buffer	Fe <10 mg/L confirmed.
7	Aerobic Wetland Unit 2 — 4.4 ha, Ptn 19	S21(c)&(i)	Within 100 m NFEPA buffer; 500 m wetland buffer	HDPE-lined; cut-off system intercepting seepage before reaching Horn River.
8	PCD Lining — PCDs 3, 4, 7, 8 (Class C GNR 636)	S21(c)&(i)	Within 1:100-yr floodline; 500 m wetland buffer	Phased dewatering; CQA plan required; sludge disposed per GNR 635.
9	New Quantum PCD — 8,600 m ³	S21(c)&(i)	Within 500 m wetland buffer; 1:100-yr floodline	New construction on disturbed footprint; Class C liner; concrete silt traps.
10	Flood Protection Berm — ~20,400 m ³ ; crest 1,183.1 m amsl	S21(c)&(i)	Parallel to Ngagane River; 100 m NFEPA buffer in sections	Geocell/soilcrete river-facing slope; HEC-RAS 1:100-yr design.
11	Discard Dump Rehabilitation — 164,120 m ²	S21(c)&(i)	Within 500 m wetland buffer; dump toe adjacent to Dam 6	Infra-red drone survey mandatory before any works; combustion clearance certificate required.
12	Stormwater channels, culverts and silt traps	S21(c)&(i)	Traverse drainage lines; culvert D4 under railway	Concrete-lined dirty channels to lined PCDs; Transnet approval for culvert D4.
13	Riparian rehabilitation — Horn River, 740 m	S21(c)&(i)	Directly within watercourse and riparian zone (NFEPA)	Dry Season Only (May–September); gabions; living fascines; indigenous revegetation; erosion pins.

6.3 Non-Negotiable Construction Constraints

- AMD containment first: All passive treatment infrastructure construction must be sequenced to ensure that AMD from the artesian decant point is directed to the West Decant PCD at all times. No construction activities may commence that would compromise the routing of AMD to the West Decant PCD — DWS requirement under Section 19 Directive.
- Infra-red drone survey: No access to discard dump surface until specialist thermal drone survey completed, all hot spots extinguished, and qualified geotechnical engineer issues written clearance.



- Seasonal restriction: All construction within floodplain wetland, 100 m NFEPA river buffer, and 500 m wetland buffer MUST be conducted during the dry season only (May to September).
- Environmental Control Officer (ECO): A registered ECO with full stop-work authority must be present during all construction activities within the wetland and riparian zone.
- Flood berm timing: Must be fully constructed and certified by the Principal Civil Engineer before the first wet season (October) following construction commencement.
- No-go zones: Channelled Valley Bottom Wetland (CVB) and its 100 m buffer; Ngagane River and 100 m NFEPA buffer (except for flood berm and culvert D4 works specifically authorised).
- Hydrocarbon management: All refuelling minimum 100 m from any watercourse. No concrete mixing or truck washout within 50 m of any watercourse. Spill kits on site at all times.



7. STORMWATER MANAGEMENT PLAN

7.1 Legislative Basis and Context

A Stormwater Management Plan (SWMP) is required in terms of GN 704 (June 1999) Regulations on the Use of Water for Mining and Related Activities, specifically Regulation 6 (controlled management of stormwater from mining areas) and Regulation 7 (containment of 1:50-year flood volume without spilling).

The current stormwater management at the Ballengeich Colliery is entirely non-compliant with GN 704. There is no functional separation of clean and dirty water. A Notice of Intent to Issue a Directive in terms of Section 19(3) of the NWA (issued April 2014) specifically cited that on-site stormwater management does not conform to the stipulations of GN 704.

7.2 Current Non-Compliant Stormwater Conditions

- No clean/dirty water separation: Contaminated runoff from the discard dump, Quantum site, and opencast areas mixes freely with clean stormwater across the site.
- All existing PCDs are unlined: PCDs 1–8 and the West Containment Sump are all unlined earthen dams. Average pH $\approx$ 2.5; SO₄ reaching 8,000 mg/L at SW7. All PCDs within the 1:100-year floodline.
- No functional flood protection: The 1:100-year flood line overtops all existing site infrastructure.
- No GN 704-compliant PCD design: No engineer's certificate exists for any PCD on the site.
- Silted and blocked drainage: Existing stormwater trenches are silted, blocked, and non-functional.
- No silt traps: No silt traps at any PCD inlet.

7.3 Site Hydrology and Design Rainfall

Table 15: Site Hydrology Characteristics

MAP (GFK station V3E002, Chelmsford Dam):	822 mm/yr
MAP (CHIRPS 2010–2024, EWS):	739 mm/yr
MAE (S-Pan):	1,448 mm/yr
Design rainfall station:	ID 0240185W (SDF method)
Peak flow method:	Rational Method (RM3), Midgley & Pitman, SDF
1:100-yr Ngagane River peak flow:	1,660 m ³ /s (SDF; HEC-RAS 2D verified)
1:100-yr Horn River peak flow:	418 m ³ /s (SDF; HEC-RAS 2D verified)



Site topography:	Flat to gently undulating (average west-to-east slope 0.5%)
Hydrological simulation period:	89 years (1920–2009, Pitman/WRSM2000)
Total water into/onto mine:	333,994 m ³ /yr (EWS Hydrology, April 2025)
GN 704 spill compliance:	Confirmed <1 spill in 50 years (both Scenario 1 and Scenario 2)

7.4 Proposed Stormwater Management System

7.4.1 Clean/Dirty Water Separation

The entire site is divided into clean water catchment areas and dirty water containment areas as shown on Master Layout Plan G2025/06/338-100 Rev 2 (GFK, April 2026). Clean water infrastructure includes the existing grass-lined channel parallel to the N11 (retained); new grass-lined V-drains on the rehabilitated dump toe platform; new concrete-lined clean water Channel C3 (velocity 4.4 m/s; flow 8.2 m³/s); and new clean water culverts V1 and C1.

Dirty water infrastructure includes: concrete-lined trapezoidal dirty water channels (velocities up to 4.4 m/s; Manning's $n = 0.017$; 1:50-year SCS design) routing contaminated runoff to lined PCDs via concrete silt traps (28-day cleaning intervals during October–April); and dirty water culverts D9, D3, D4 (culvert D4 under railway: SATS SAR-type portal culverts only; Transnet approval required).

7.4.2 Lined PCDs — GN 704 Compliance

Table 16: Lined PCD Summary (GN 704 Compliance)

PCD	Capacity (m ³)	Catchment and Function	GN 704 Status
PCD 3	15,500	Receives dump seepage (Sc. 1); overflow spillway to PCD 4; 110 mm perforated leakage detection pipe.	GN 704 Reg. 7 compliant after lining
PCD 4	6,800	Receives overflow from PCD 3; siding area runoff.	GN 704 Reg. 7 compliant after lining
PCD 7	5,600	Quantum site and N11 area runoff; concrete silt trap at inlet.	GN 704 Reg. 7 compliant after lining
PCD 8	5,600	Quantum/rail area runoff; linked to PCD 7 via spillway; silt trap.	GN 704 Reg. 7 compliant after lining
New Quantum PCD	8,600	New construction; all Quantum operational runoff; replaces previous 2,500 m ³ design; concrete silt trap.	GN 704 Reg. 7 compliant as designed



7.4.3 Water Balance Results

The water balance was modelled using the WRSM2000 (Pitman) model over the full 89-year rainfall record (1920–2009) for the V31F and V31G quaternary catchments, considering both Scenario 1 (discard dump rehabilitated) and Scenario 2 (discard dump removed). The model evaluates all inflows and outflows across the lined pollution control dams to confirm compliance with GN 704 of the NWA, which requires that a pollution control dam does not spill more than once in 50 years. The results of the water balance for both scenarios are presented in Table 17 below.

Table 17: Water Balance Results

Parameter	Scenario 1 (Dump Rehabilitated)	Scenario 2 (Dump Removed)
Total dust suppression demand (m ³ /a)	38,400	38,400
Supply from lined PCDs (m ³ /a)	24,800	22,090
Deficit from unlicensed dams (m ³ /a)	13,600	16,310
Peak surplus requiring management	Max 1,000 m ³ /month (Dec–Mar)	Nil
Surplus management method	22 kW mechanical evaporator (45 m ³ /hr; min. 8 hrs/day; over lined PCD)	Not required
GN 704 spill compliance	Compliant — all lined PCDs <1 spill in 50 yrs	Compliant — all lined PCDs <1 spill in 50 yrs
Reduced watercourse impact estimate	41% improvement with treatment system	41% improvement with treatment system

7.4.4 Flood Protection Berm

The flood protection berm encircles the dirty areas and critical lined PCDs. Specifications: crest 1,183.1 m amsl; min. 0.8 m freeboard; fill volume ~20,400 m³; geocell/soilcrete river-facing slope; HEC-RAS 2D 1:100-yr design (GFK Drawing G2025/06/338-100/09-01 to 09-03). Must be fully constructed and certified before October of the first year following construction commencement.



7.5 Ongoing Stormwater Maintenance Programme

The long-term effectiveness of the stormwater management system at the Ballengeich Colliery is dependent on the consistent implementation of a structured maintenance programme throughout the operational life of the site. Routine inspection and maintenance of all stormwater infrastructure including concrete-lined dirty water channels, concrete silt traps, grass-lined clean water channels, culverts and pollution control dam embankments is essential to ensure that design capacities are maintained, contamination is contained, and GN 704 compliance is upheld at all times. The minimum maintenance requirements and recommended intervals for each infrastructure component are set out in Table 18 below.

Table 18: SWMP Maintenance Programme

Activity	Frequency	Responsible Party
Silt trap cleaning at all lined PCD inlets	28-day intervals (Oct–Apr); extended (May–Sep)	Contractor / Kangra Coal Site Manager
PCD freeboard measurement and recording	Weekly during wet season (Oct–Apr)	ECO / Site Supervisor
Dirty water channel inspection and desilting	Monthly during wet season; bi-annual during dry season	Kangra Coal Site Manager
Flood berm inspection (crest levels; slope; toe drainage)	Annual (August, pre-wet season)	ECO; GFK Principal Civil Engineer
Grass cover maintenance on V-drains and berm slopes	As required; minimum annual mow	Kangra Coal Site Manager
Mechanical evaporator inspection and test run (Sc. 1)	Monthly (October–April)	Kangra Coal Site Manager
Passive treatment system performance monitoring	Weekly (pH, Fe, SO ₄ of outfall)	ECO / Site Supervisor
SWMP annual review and update	By 30 April each year	MENCO; GFK Consulting Engineers



8. REHABILITATION PLAN

8.1 Legislative Basis

A Rehabilitation Plan and EMP is required in terms of the NWA (Section 19), the MPRDA (Section 43), and NEMA (Section 28). A standalone Rehabilitation Plan and EMP (Report No. EMP/2024/086, November 2024) has been compiled by MENCO and is submitted as DWS Requirement 13.

8.2 Rehabilitation Objectives

The overarching rehabilitation objective is to achieve a condition where the Ballengeich Colliery is physically stable, chemically stable, non-polluting, safe, and capable of sustaining an agreed post-closure land use without ongoing intervention. Specific measurable outcomes include:

- Eliminating uncontrolled AMD discharge from the artesian decant point within 6 months of WULA issuance through the commencement of passive treatment infrastructure construction.
- Achieving treated AMD discharge quality meeting GN 1873 RQOs (pH 6.5–9; TDS ≤350 mg/L; SO₄ ≤165 mg/L; Fe ≤0.1 mg/L; Mn ≤0.15 mg/L) within 12 months of passive treatment system commissioning.
- Achieving minimum 70% indigenous vegetation cover on the rehabilitated dump surface within 18 months of rehabilitation commencement.
- Improving Horn River PES from current Class C/D toward the REC of Class C within 5 years of rehabilitation completion.
- Achieving groundwater quality targets for V31K (pH 6–9; EC <70 mS/m; SO₄ <200 mg/L) at all monitoring boreholes within the WUL period.

8.3 Rehabilitation Phasing and Timeline

The rehabilitation is a phased programme spanning the full operational and post-operational life of the site, with activities sequenced to ensure that pollution source control is achieved as early as possible and that all infrastructure is progressively brought into compliance with the requirements of the NWA, and the Section 19 Directive (Ref: 16/2/7/V301/A/1). The phasing has been designed to prioritise the passive treatment system as the first construction activity, followed by the PCD lining programme, discard dump rehabilitation, and long-term monitoring and closure. The rehabilitation phases, key milestones, and indicative timelines are set out in Table 19 below.



Table 19: Rehabilitation Phasing and Timeline

Phase	Key Activities	Target Timeline
Phase 1 — Immediate (0–6 months from WULA issuance)	Infra-red drone survey; flood protection berm (dry season); commence ALD/SAPS construction; line PCDs 7 and 8.	Before first wet season following WULA issuance
Phase 2 — Short term (6–18 months)	Complete passive treatment train; commission and verify performance against RQOs; line PCDs 3 and 4; construct New Quantum PCD; commence dump rehabilitation; install stormwater channels and culverts; wash bay construction.	18 months from WULA issuance
Phase 3 — Medium term (18 months – 5 years)	Full discard dump rehabilitation (Scenario 1 or 2); opencast spoil stabilisation; riparian rehabilitation (Horn River, 740 m); establishment of new Eucalyptus plantation (3.57 ha; Item 23; S21(d)) adjacent to West Decant Sump; decommissioning of existing plantation to make space for passive wetland infrastructure; progressive rehabilitation of redundant infrastructure.	5 years from WULA issuance
Post-closure monitoring	Monthly surface water quality (SW01–SW10); quarterly groundwater (UGBH1–GW23); bi-annual SASS5 biomonitoring; annual IWWMP update; erosion monitoring; passive treatment system performance review.	Minimum 5 years post-rehabilitation; until mine closure certificate issued

8.4 Current Environmental Conditions Requiring Rehabilitation

8.4.1 Discard Dump

The discard dump (approximately 14 ha; max height approximately 55 m above natural ground elevation; approximately 2 million tonnes of coal waste) has steep unengineered slopes, no engineered cover, no vegetation and no surface drainage. Active spontaneous combustion has been confirmed on the northern face. Waste characterisation confirms Type 3 waste (GNR 635), requiring a Class C liner for any new disposal facility. The dump contributes approximately 15% of the total AMD waste load.

8.4.2 Opencast Spoil Areas

Spoils Block I (approximately 34 ha west of N11) encompasses the original course of the Horn River, diverted through the spoils during mining operations, creating direct hydraulic connection between pyrite-bearing spoils and the river contributing approximately 55% of the total AMD load. Spoils Block II (approximately 45 ha east of N11) straddles the Horn River approaching the Ngagane confluence.



8.4.3 Underground Mine Workings — Artesian AMD Decant

Old bord-and-pillar workings extend across approximately 405 ha beneath the site. The workings are flooded under artesian pressure, decanting at the Horn River bank at approximately 1,000 m³/day (pH <4.5; Fe 189 mg/L; SO₄ >4,000 mg/L; Mn 4.0 mg/L). The artesian decant cannot be permanently stopped — it can only be captured and treated through the proposed passive AMD treatment system (EWS Hydrogeology, EWS24-12_GW, April 2025).

8.4.4 Unlined Pollution Control Dams

Nine unlined earth PCDs are present, all unauthorised. Average pH approximately 2.5; SO₄ reaching 8,000 mg/L at SW7. AMD infiltrates through dam floors into shallow groundwater, contributing to a sulphate plume extending toward the Horn River (SO₄: approximately 4,000 mg/L at source to approximately 1,000 mg/L at Horn River boundary; EWS Hydrogeology, April 2025).

8.4.5 Eucalyptus Plantation

A new 3.57 ha Eucalyptus spp. plantation (Item 23; S21(d) SFRA) will be established adjacent to the West Decant Sump on Portion 19 as part of the AMD mitigation programme. The existing Eucalyptus plantation on Portion 19 will be decommissioned to make space for the passive wetland infrastructure; felled material composted on site for 90 days before use as the SAPS organic carbon layer.

8.4.6 Horn River Riparian Zone

The natural Horn River course was diverted in the late 1980s. Approximately 740 m of Horn River bank is severely degraded by AMD seepage, physical bank erosion, invasive alien vegetation, and altered channel geomorphology. Biomonitoring at Horn DS1 recorded SASS5 48, ASPT 4.7, Health Class D/E in November 2023 (MENCO Aquatic Ecological Assessment). Sediment toxicity: Hazard Class IV (100% ostracod mortality; 70% phytotox growth inhibition at decant site).

8.5 Financial Provision

Financial provision in terms of Section 24P of NEMA, Section 41 of the MPRDA, and Sections 19 and 20 of the NWA covers:

- (i) passive treatment system construction (R4,079,750 excl. VAT; IWWMP Table 7-6);
- (ii) PCD lining programme;
- (iii) flood protection berm;
- (iv) discard dump rehabilitation (Scenario 1 or 2);



- (v) riparian rehabilitation;
- (vi) ongoing monitoring; and
- (vii) post-closure monitoring for minimum 5 years after closure.

9. WATER USES APPLIED FOR

9.1 Legislative Framework

Water uses are applied for in terms of Section 21 of the NWA. This application has been revised to incorporate additional water uses not previously included in earlier submissions. The Water Uses Register has been comprehensively updated following written confirmation received in May 2026 that no borehole abstraction takes place anywhere on the Ballengeich site or the Quantum Operations, and is incorporated into this WULAR.

The Water Uses Register has been cross-referenced against the final signed Master Layout Plan Rev 2, the GFK Water and Stormwater Management Report (G2025/06/338(1), and the GFK Civil Infrastructure Report (G2025/06/338(2). All key technical parameters, PCD capacities, liner specifications, flood berm design, siding infrastructure, and water balance are drawn from these signed engineering documents.

The following key changes were introduced in the revision:

- (i) S21(a) deleted entirely — no borehole abstraction on site confirmed;
- (ii) Quantum water supply corrected to external NCCA source;
- (iii) Quantum mobile toilets confirmed — Items 12.1 and 12.2 belong to Kangra siding operations only;
- (iv) Quantum diesel storage (2,500 L bunded tank) added under S21(g);
- (v) PCD capacities finalised per GFK Civil Report Table 10;
- (vi) EA process confirmed as Basic Assessment.

9.2 Summary of Water Uses by Section 21 Category

The Ballengeich Colliery WULA applies for 60 individual water use entries across five Section 21 categories. The following table provides the summary overview; full details of each water use are provided in Sections 9.3 to 9.8 below.

Table 20: Summary of Section 21 Water Uses Applied for

S21 Category	No. Entries	Item Numbers	Description
S21(c) & (i)	32	Items 1 - 22	Impeding or diverting flow; altering watercourse. Covers all rehabilitation,



			passive treatment, PCDs, stormwater, flood berm, siding, and 8 new items from MLP Rev 2.
S21(d)	1	Item 23	Streamflow Reduction Activity — new Eucalyptus plantation (3.57 ha) adjacent to West Decant Sump. Part of AMD rehabilitation and mitigation programme.
S21(f)	3	Items 24 - 26	Discharge of treated AMD and stormwater overflow to Horn River.
S21(g)	25	Items 27 - 40	Waste disposal impacting water resources — PCDs, dumps, workings, siding, wash bay, diesel storage.
S21(j)	1	Items 41	Removal/discharge of underground water — dust suppression and seepage dewatering.
TOTAL	60	—	60 definitive entries across 5 categories (Rev 5, June 2026).

9.3 Section 21(c) and (i) — Impeding or Diverting Flow; Altering Watercourse

Section 21(c) and (i) water uses are the primary applications in this WULA, covering 32 individual water use entries. These uses arise from the site's location at the confluence of the Horn and Ngagane Rivers and the presence of all existing and proposed infrastructure within the regulated buffer zones. Physical construction within the floodplain wetland, the 100 m river buffers, and the 1:100-year floodline is unavoidable given the need to apply the source-control principle, the brownfield nature of the site, and the pre-existing location of all infrastructure justified in detail in the Alternatives Report. **Figure 9** provides an overview of the applied water uses.



Table 21: Section 21(c) and (i) Water Uses

Water Use Number	Water use(s)	Purpose	Capacity / Volume (m ³ , tonnes and/or m ³ /annum)	Property Description	Co-ordinates
SECTION 21 (c) AND (i) – Impeding or Diverting the Flow of Water in a Watercourse					
1 – (c&i)	Impeding and diverting the natural flow	Discard Dump pit within 500m regulated wetland buffer area	12.2 ha	Portion 19	27°53'27.78"S 29°58'17.29"E
2 – (c&i)	Impeding and diverting the natural flow	Stormwater Management Complex — integrated dirty and clean water separation infrastructure associated with the discard dump rehabilitation and siding operations. Includes: discard dump toe platform, grass-lined V-drains on the rehabilitated dump surface, concrete-lined dirty water channels, and associated silt traps. All infrastructure is located within the 500 m regulated wetland buffer area and within the 1:100-year floodline.	367,500 m ³ (combined PCDs 1–8 and West Decant Sump). See Items 5.1–5.8 for individual PCD capacities.	Portion 19	Start: 27°53'25.39"S 29°58'6.49"E End: 27°53'25.19"S 29°58'40.44"E
3 – (c&i)	Impeding and diverting the natural flow	Old opencast area within 500m regulated wetland buffer area and within 100m of NFEPA River buffer.	43 200 m ³ /a	Portion 19	27°53'13.68"S 29°58'14.52"E
4 – (c&i)	Impeding and diverting the natural flow	The Oxidation Pond is part of passive wetland treatment process and situated within a current wetland and within 100m of NFEPA River buffer.	0.4 ha	Portion 25	27°53'25.08"S 29°57'48.32"E
5.1 – (c&i)	Impeding and diverting the natural flow	PCD 1 within 500m regulated wetland buffer area. Existing unlined earth dam. Retained as regular dam — GN 704 Reg. 4 exemption applied.	31,650 m ² ; 62,300 m ³	Portion 19	27°53'18.51"S 29°58'29.89"E
5.2 – (c&i)	Impeding and diverting the natural flow	PCD 2 within 500m regulated wetland buffer area. Existing unlined earth dam. Retained as regular dam — GN 704 Reg. 4 exemption applied.	10,010 m ² ; 20,400 m ³	Portion 19	27°53'21.55"S 29°58'35.71"E
5.3 – (c&i)	Impeding and diverting the natural flow	PCD 3 within 500m regulated wetland buffer area. To be upgraded with Class C HDPE-Clay composite liner	7,090 m ² ; 15,500 m ³	Portion 19	27°53'25.39"S 29°58'38.07"E
5.4 – (c&i)	Impeding and diverting the natural flow	PCD 4 within 500m regulated wetland buffer area. To be upgraded with Class C HDPE-Clay composite liner (GNR 636).	3,800 m ² ; 6,800 m ³	Portion 19	27°53'28.28"S 29°58'37.38"E



5.4.1 – (c&i)	Impeding and diverting the natural flow	PCD 4 Silt Trap — inlet silt trap associated with PCD 4, located within the 500 m regulated wetland buffer area. Designed to capture sediment-laden stormwater runoff from an 8.8 ha catchment before discharge into PCD 4. Calculated total length: 16.2 m; overflow width: 4.5 m; depth below FSL: 1.5 m; cleaning interval: 28 days.	109 m ³ 14.9 m ³ per 28-day interval	Portion 19	27°53'28.28"S 29°58'37.38"E
5.5 – (c&i)	Impeding and diverting the natural flow	PCD 5 within 500m regulated wetland buffer area. Existing unlined earth dam. Retained as regular dam — GN 704 Reg. 4 exemption applied.	11,600 m ² ; 20,900 m ³	Portion 19	27°53'22.59"S 29°58'31.31"E
5.6 – (c&i)	Impeding and diverting the natural flow	PCD 6 (Old Horn River Dam) within 500m regulated wetland buffer area. Largest on-site PCD. Existing unlined. Retained as regular dam — GN 704 Reg. 4 exemption applied.	45,900 m ² ; 143,700 m ³	Portion 19	27°53'28.54"S 29°58'31.90"E
5.7 – (c&i)	Impeding and diverting the natural flow	PCD 7 within 500m regulated wetland buffer area. To be upgraded with Class C HDPE-Clay composite liner (GNR 636).	3,700 m ² ; 5,600 m ³	Portion 19	27°53'34.07"S 29°57'59.87"E
5.8 – (c&i)	Impeding and diverting the natural flow	PCD 8 within 500m regulated wetland buffer area. To be upgraded with Class C HDPE-Clay composite liner (GNR 636).	3,000 m ² ; 5,600 m ³	Portion 19	27°53'33.35"S 29°58'1.97"E
6 – (c&i)	Impeding and diverting the natural flow	Successive Alkaline Producing System (SAPS) used during passive wetland treatment. Located within a wetland system and within a 100m NFEPA River buffer.	1.2 ha	Portion 25	27°53'26.39"S 29°57'47.61"E
7 – (c&i)	Impeding and diverting the natural flow	Anoxic Limestone Drain (ALD 1) used to treat net-acidic, anoxic mine drainage of low to moderate flow. Located within a wetland system and within a 100m NFEPA River buffer.	Length = 420 m	Portion 25	Start: 27°53'33.43"S 29°57'41.38"E End: 27°53'27.63"S 29°57'52.17"E
8 – (c&i)	Impeding and diverting the natural flow	Anoxic Limestone Drain (ALD 2) used to treat net-acidic, anoxic mine drainage of low to moderate flow. Located within a wetland system and within a 100m NFEPA River buffer.	Length = 230 m	Portion 19	Start: 27°53'17.33"S 29°58'1.35"E End: 27°53'12.99"S 29°58'8.95"E
9 – (c&i)	Impeding and diverting the natural flow	Aerobic Wetland 1 collects AMD water and provides time for metals and sediments to precipitate. Located within a wetland system and within a 100m NFEPA River buffer.	1.3 ha	Portion 25	27°53'23.00"S 29°57'49.07"E
10 – (c&i)			4.4 ha	Portion 19	Start:



	Impeding and diverting the natural flow	Aerobic Wetland 2 collects AMD water and provides time for metals and sediments to precipitate. Located within a wetland system and within a 100m NFEPA River buffer.			27°53'16.64"S 29°58'1.01"E End: 27°53'6.79"S 29°58'27.02"E
11 – (c&i)	Impeding and diverting the natural flow	West Decant PCD ensures that groundwater rebound and decant from mine openings take place in the form of surface water discharge. Located within 500m regulated wetland buffer area.	32,700 m ² ; 86,400 m ³	Portion 19	27°53'19.06"S 29°58'6.84"E
12 – (c&i)	Impeding and diverting the natural flow	Screening and Crushing plant area associated with Quantum's operations. Located within 500m of regulated wetland area.	2.93 ha	Portion 19	27°53'29.72"S 29°58'7.89"E
13.1 – (c&i)	Impeding and diverting the natural flow	Septic Tank 1 — grey water (Kangra/siding operations only). Quantum uses mobile toilets. Located within 500m of regulated wetland area.	10 000 L	Portion 19	27°53'31.03"S 29°58'5.70"E
13.2 – (c&i)	Impeding and diverting the natural flow	Septic Tank 2 — toilet waste (Kangra/siding operations only). Quantum uses mobile toilets. Located within 500m of regulated wetland area.	5 000 L	Portion 19	27°53'31.40"S 29°58'7.59"E
14 – (c&i)	Impeding and diverting the natural flow	New Quantum PCD — newly constructed pollution control dam (Class C HDPE-Clay composite liner; GNR 636) for stormwater/dirty water management at the Quantum operations area. Located within 500m regulated wetland buffer area.	1.8 ha 8,600 m ³	Portion 19	27°53'27.65"S 29°58'0.59"E
15 – (c&i)	Impeding and diverting the natural flow	Sharp crested V-Drain weir located directly within the Horn River close to the Ngagane River confluence.	Flow: 8.3 Mm ³ /a	Portion 19	27°53'5.99"S 29°58'26.89"E 27°53'6.53"S 29°58'15.04"E)
16 – (c&i)	Impeding and diverting the natural flow; altering the bed, banks, course or characteristic of a watercourse	Riverbank and riparian rehabilitation along a significant portion of the Horn River on the northern and southern banks.	740 m	Portion 19	Start: 27°53'18.21"S 29°57'54.11"E End: 27°53'4.83"S 29°58'30.03"E
17 – (c&i)	Impeding and diverting the natural flow	Siding & Coal stockpile at Ballengeich Siding within 500m regulated area.	540 000 tonnes/a	Portion 19	27°53'39.19"S 29°58'11.20"E
18 – (c&i)		Flood Protection Berms —	Berm 1	Portion 19	Berm 1



	Impeding and diverting the natural flow	Berm 1 along Horn River;			Start: 27°53'24.01"S 29°58'8.13"E End: 27°53'14.57"S 29°58'6.95"E
19 – (c&i)	Impeding and diverting the natural flow	Berm 2 along Ngagane River (western side of rail line).	Berm 2	Portion 19	Berm 2 Start: 27°53'33.96"S 29°58'28.68"E End: 27°53'18.21"S 29°58'26.36"E
20 – (c&i)	Impeding and diverting the natural flow	Emergency Spillway — overflow structure associated with the western PCD/dam, designed to discharge excess water during storm events. Located within 500m wetland buffer.	—	Portion 19	27°53'27.26"S 29°58'0.06"E
21	Impeding and diverting the natural flow	New Instream Flow Gauging Weir 2 — located in the Horn River downstream of passive treatment system. Used for flow measurement and compliance monitoring	Flow gauging structure	Portion 19	Start: 27°53'4.65"S 29°58'17.44"E End: 27°53'6.07"S 29°58'17.78"E
22	Impeding and diverting the natural flow	New Instream Flow Gauging Weir 1 — located in the Horn River downstream of passive treatment system. Used for flow measurement and compliance monitoring	Flow gauging structure	Portion 19	Start: 27°53'6.29"S 29°58'11.18"E End: 27°53'8.74"S 29°58'13.67"E

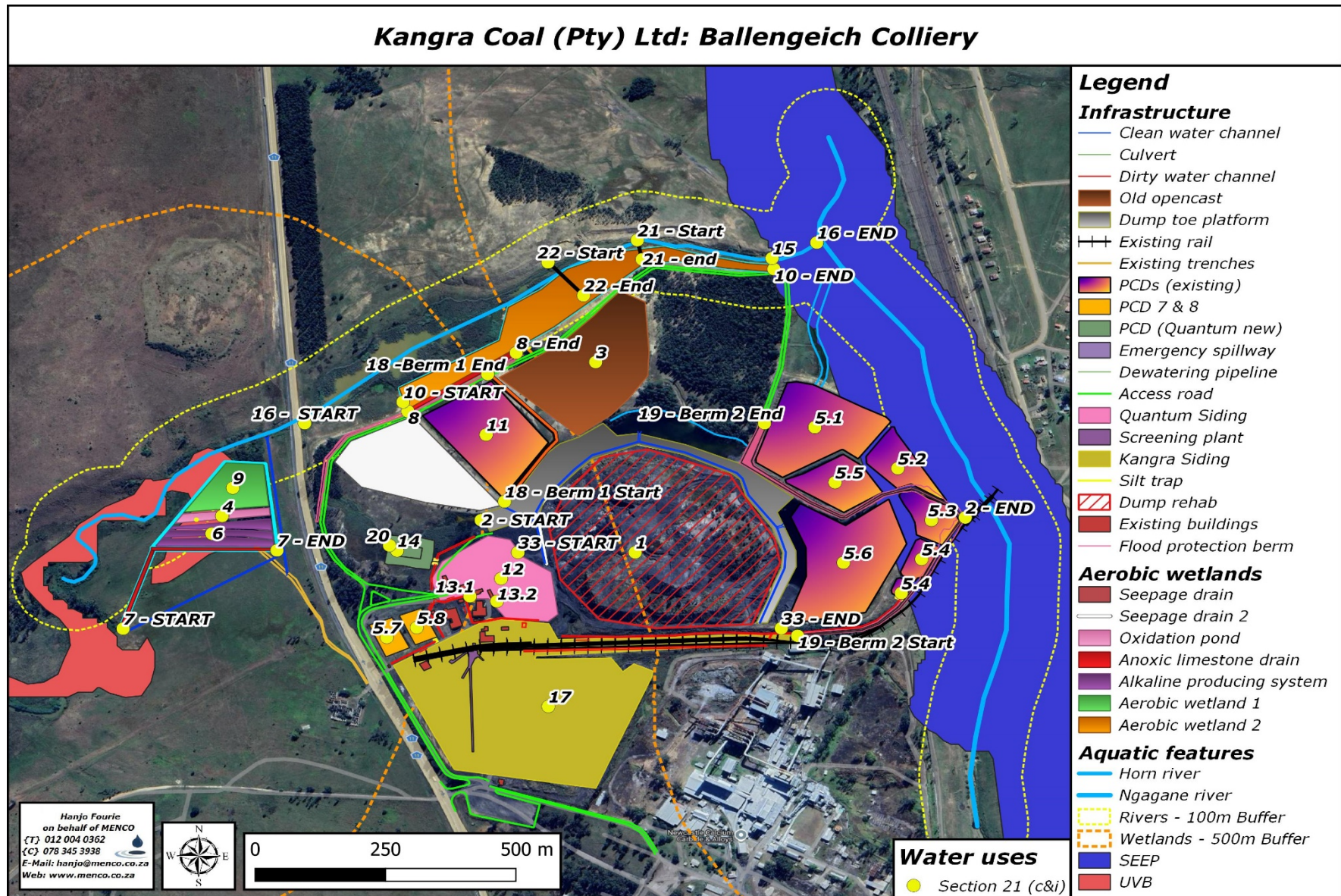


Figure 9: Section 21 c & i Water Uses



9.4 Section 21(d) — Stream Flow Reduction Activity

One Stream Flow Reduction Activity (SFRA) is registered under Section 21(d) of the NWA — a new 3.57 ha Eucalyptus spp. plantation (Item 23) to be established adjacent to the West Decant Sump on Portion 19 as part of the rehabilitation and AMD impact mitigation programme. The plantation functions to reduce streamflow contributions from the western decant area to the Horn River during the passive treatment system implementation phase. The existing Eucalyptus plantation on Portion 19 will be decommissioned to make space for the construction of the passive wetland treatment infrastructure, with felled material composted on site for use as the organic carbon layer in the SAPS treatment system. **Figure 11** provides an overview of the water uses and location.

Table 22: Section 21(d) Water Uses

Water Use Number	Water use(s)	Purpose	Capacity / Volume (m ³ , tonnes and/or m ³ /annum)	Property Description	Co-ordinates
SECTION 21 (d) – Engaging in Stream Flow Reduction Activities					
23 – (d)	Engaging in stream flow reduction activity	Eucalyptus Tree Plantation — AMD Decant Stream Flow Reduction	3.57 ha	Portion 19	27°53'21.91"S 29°58'1.27"E

9.5 Section 21(f) — Discharging Waste or Water Containing Waste into a Watercourse

Three water use entries are applied for under Section 21(f), all relating to the discharge of treated AMD from the passive treatment system into the Horn River. Discharge is subject to strict water quality conditions. The commissioning phase interim standard is pH ≥5.5 and Fe ≤10 mg/L on three consecutive weekly samples before any discharge may commence. Full GN 1873 Resource Quality Objectives must be achieved within 12 months of commissioning: pH 6.5–9.0; TDS ≤350 mg/L; SO₄ ≤165 mg/L; Fe ≤0.1 mg/L; Mn ≤0.15 mg/L. The assimilative capacity of the Ngagane River (including Ntshingwayo Dam dilution releases) is confirmed as sufficient to accommodate treated AMD discharge without exceeding downstream RQOs at the compliance monitoring point SW10 (MENCO Assimilative Capacity Study, February 2025). **Figure 11** provides an overview and location of the water uses.



Table 23: Section 21(f) Water Uses

Water Use Number	Water use(s)	Purpose	Capacity / Volume (m ³ , tonnes and/or m ³ /annum)	Property Description	Co-ordinates
SECTION 21 (f) – Discharging Waste or Water Containing Waste into a Watercourse					
24 – (f)	Discharging of effluent from mine related infrastructure into a watercourse	Aerobic Wetland 1 — final passive treatment step receiving treated AMD from the Bhekhani Passive Treatment Plant. Treated effluent discharges to Horn River. GN 1873 RQOs required within 12 months of commissioning.	1.3 ha Design Flow: 1,000m ³ /d Annual: 365,000m ³	Portion 25	27°53'22.97"S 29°57'47.24"E
25 – (f)	Discharging of effluent from mine related infrastructure into a watercourse	Aerobic Wetland 2 collects AMD water and provides time for metals and sediments to precipitate. West decant sump and old opencast area contribute to these contaminated effluents.	4.4 ha Approximately 178–255 m ³ /day	Portion 19	Start: 27°53'16.77"S 29°58'1.12"E End: 27°53'6.78"S 29°58'27.02"E
26 – (f)	Discharging of effluent from mine related infrastructure into a watercourse	Overflow structures associated with lined PCDs and western dam — excess water discharges via overflow weirs during high rainfall events.	Overflow weirs <i>Intermittent storm event discharge only. Spill frequency <1 in 50 years (GN 704 compliant)</i>	Portion 19	27°53'15.27"S 29°58'30.30"E

9.6 Section 21(g) — Disposing of Waste in a Manner Which May Detrimentially Impact a Water Resource

Twenty-five water use entries are applied for under Section 21(g), covering all infrastructure where waste, mine effluent, domestic sewage, or hydrocarbons are managed in a manner that creates a potential pathway to water resource degradation. This category covers all PCDs (including the PCD 4 Silt Trap), the discard dump, underground workings, the Quantum and siding operational footprints, dust suppression, the wash bay, and the Quantum diesel storage facility. Key updates in the revision include the correction of the wash bay water source (NCCA external supply, not borehole GWO), the addition of Quantum's diesel storage, and the revision of the dust suppression volume to 38,400 m³/annum per the GFK SWMP Pitman model water balance. **Figure 10** provides an overview of the Section 21 -g water uses.



Table 24: Section 21(g) Water Uses

Water Use Number	Water use(s)	Purpose	Capacity / Volume (m ³ , tonnes and/or m ³ /annum)	Property Description	Co-ordinates
SECTION 21 (g) – Disposing of Waste in a Manner Which May Detrimentially Impact on a Water Resource					
27 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Discard Dump within 500m regulated wetland buffer area. Active spontaneous combustion confirmed on northern face.	12.2 ha	Portion 19	27°53'27.78"S 29°58'17.29"E
28 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Old opencast area located close to the Horn River and within the regulated area. Mining material remnants continue to leach AMD into the system.	43 200 m ³ /a	Portion 19	27°53'13.68"S 29°58'14.52"E
29.1 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	PCD 1 within 500m regulated wetland buffer area. Existing unlined earth dam. Retained as regular dam — GN 704 Reg. 4 exemption applied.	31,650 m ² ; 62,300 m ³	Portion 19	27°53'18.51"S 29°58'29.89"E
29.2 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	PCD 2 within 500m regulated wetland buffer area. Existing unlined earth dam. Retained as regular dam — GN 704 Reg. 4 exemption applied.	10,010 m ² ; 20,400 m ³	Portion 19	27°53'21.55"S 29°58'35.71"E
29.3 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	PCD 3 within 500m regulated wetland buffer area. To be upgraded with Class C HDPE-Clay composite liner	7,090 m ² ; 15,500 m ³	Portion 19	27°53'25.39"S 29°58'38.07"E
29.4 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	PCD 4 within 500m regulated wetland buffer area. To be upgraded with Class C HDPE-Clay composite liner (GNR 636).	3,800 m ² ; 6,800 m ³	Portion 19	27°53'28.28"S 29°58'37.38"E
29.4.1 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	PCD 4 Silt Trap — inlet silt trap associated with PCD 4. Captures and retains sediment-laden stormwater from an 8.8 ha catchment. Accumulated sediment (14.9 m ³ per 28-day cleaning interval) to be characterised and managed per GNR 635. Located within 500 m regulated wetland buffer area.	109 m ³ silt volume 14.9 m ³ per cleaning cycle	Portion 19	27°53'28.28"S 29°58'37.38"E
29.5 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	PCD 5 within 500m regulated wetland buffer area. Existing unlined earth dam. Retained as regular dam — GN 704 Reg. 4 exemption applied.	11,600 m ² ; 20,900 m ³	Portion 19	27°53'22.59"S 29°58'31.31"E



29.6 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	PCD 6 (Old Horn River Dam) within 500m regulated wetland buffer area. Largest on-site PCD. Existing unlined. Retained as regular dam — GN 704 Reg. 4 exemption applied.	45,900 m ² ; 143,700 m ³	Portion 19	27°53'28.54"S 29°58'31.90"E
29.7 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	PCD 7 within 500m regulated wetland buffer area. To be upgraded with Class C HDPE-Clay composite liner (GNR 636).	3,700 m ² ; 5,600 m ³	Portion 19	27°53'34.07"S 29°57'59.87"E
29.8 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	PCD 8 within 500m regulated wetland buffer area. To be upgraded with Class C HDPE-Clay composite liner (GNR 636).	3,000 m ² ; 5,600 m ³	Portion 19	27°53'33.35"S 29°58'1.97"E
30 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Aerobic Wetland 1 collects AMD water and provides time for metals and sediments to precipitate. Iron hydroxide sludge accumulates — characterised per GNR 635 annually.	1.3 ha Iron hydroxide sludge accumulation approximately 50–100 mm/yr. Desludging every 5–7 years via scour valve.	Portion 25	27°53'22.97"S 29°57'47.24"E
31 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Aerobic Wetland 2 collects AMD water and provides time for metals and sediments to precipitate. Same sludge management obligations as Item 30.	4.4 ha Approximately 178–255 m ³ /day	Portion 19	27°53'9.66"S 29°58'11.51"E
32 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	West Decant PCD. — receives AMD decant from underground workings via existing surface drainage.	32,700 m ² ; 86,400 m ³	Portion 19Di	27°53'19.06"S 29°58'6.84"E
33 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Quantum Operations Screening, Crushing and Stockpile area. Dirty footprint — full operational area inclusive of screening plant, crusher, coal stockpiles and associated hardstand	2.93 ha	Portion 19	27°53'29.72"S 29°58'7.89"E



34.1 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Septic Tank 1 — Sewage storage (Kangra/siding operations only). Quantum uses mobile toilets.	10 000 L	Portion 19	27°53'31.03"S 29°58'5.70"E
34.2 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Septic Tank 2 — Sewage storage (Kangra/siding operations only). Quantum uses mobile toilets.	5 000 L	Portion 19	27°53'31.40"S 29°58'7.59"E
35 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Quantum PCD — disposal of dirty stormwater into a water containment facility. (New Quantum PCD).	1.8 ha 8,600 m ³	Portion 19	27°53'27.65"S 29°58'0.59"E
36 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Kangra Siding & Coal stockpile at Ballengeich Siding. 15-year operational life at 95,000 t/month.	540 000 tonnes/a	Portion 19	27°53'39.19"S 29°58'11.20"E
37 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Dirty water from PCDs used for dust suppression. (Haul Roads, Discard Dump, Siding)	38,400 m ³ /a	Portion 19	27°53'26.28"S 29°58'16.82"E
38 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Passive Treatment Plant (Bhekhani) — treated/partially-treated AMD disposal from passive treatment infrastructure. Iron hydroxide sludge classified per GNR 635.	1,000 m ³ /day. Iron hydroxide sludge precipitate generated	Portion 25	27°53'24.16"S 29°57'48.81"E
39 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Wash Bay — wash bay generates oily/contaminated wash water collected via silt and oil traps → dirty channel → New Quantum PCD.	5,000 L/day (150 m ³ /month)	Portion 19	27°53'33.19"S 29°58'9.53"E
40 – (g)	Disposing of waste in a manner which may detrimentally impact on a water resource.	Quantum Diesel Storage — 2,500 L fully bunded diesel tank on site.	2,500 L (fully bunded)	Portion 19	27°53'29.72"S 29°58'7.89"E

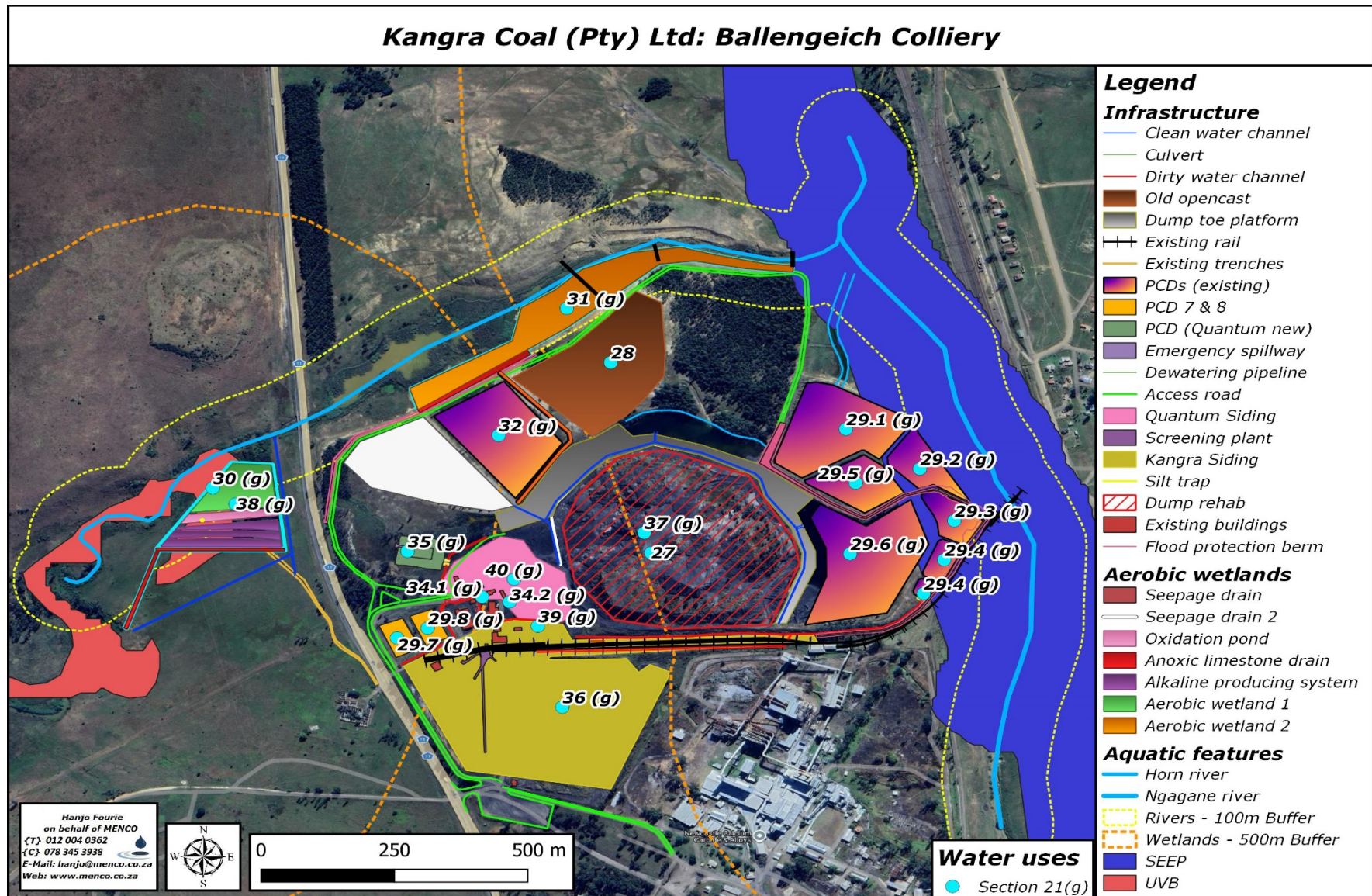


Figure 10: Section 21 g Water Uses



9.7 Section 21(j) — Removing, Discharging or Disposing of Water Found Underground

One water use entry is applied for under Section 21(j). Item 41 covers the pumped removal of seepage collected by the subsoil drainage system at the discard dump toe, discharged to lined PCDs 3 and 4 under the Scenario 1 (dump rehabilitated) operational approach.

Table 25: Section 21(j) Water Uses

Water Use Number	Water use(s)	Purpose	Capacity / Volume (m ³ , tonnes and/or m ³ /annum)	Property Description	Co-ordinates
SECTION 21 (j) – Removing, Discharging or Disposing of Water Found Underground					
41 – (j)	Removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of the people.	Seepage Dewatering Pipeline — 110mm subsoil drainage pipes collect seepage from discard dump toe, discharge to manholes and pump to lined PCDs 3 and 4. Scenario 1 (dump rehabilitated) only.	Subsoil pipe perimeter; pipeline ~200m to PCDs	Portion 19	27°53'24.10"S 29°58'26.19"E

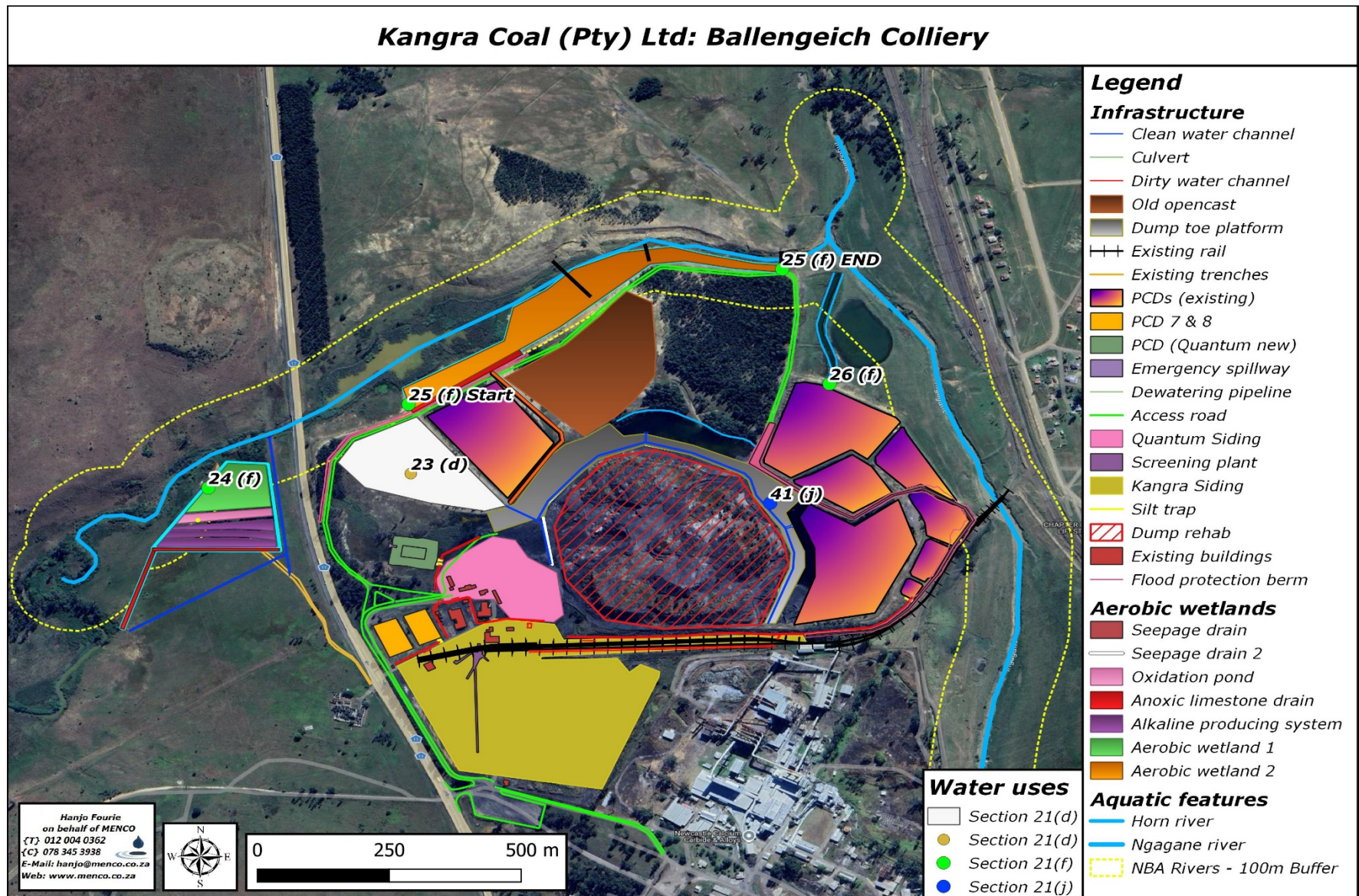


Figure 11: Section 21 d, f and j Water Uses



9.8 Existing Lawful Water Uses (ELWU) and General Authorisations

The only identifiable Existing Lawful Water Use (ELWU) applicable to the Ballengeich Colliery is the historical diversion of the Horn River (Item 3; Old Horn River Diversion; 2.2 ha), which was established under the authority of an approved Environmental Management Plan in terms of the Minerals Act, 1991, during active mining operations. No water use permits were issued under the Water Act, 1956 for any other water use on the site.

None of the water uses applied for qualify for General Authorisation (GA) due to the following:

- (i) all activities are located within a 500-metre radius from a delineated National Freshwater Ecosystem Priority Area (NFEPA) wetland, which falls outside the scope of GA (GN 1199, Clause 6); and
- (ii) the activities involve rehabilitation of a wetland, which is explicitly excluded from GA. A Water Use Licence in terms of Section 40 of the NWA is therefore required for all listed water uses, as confirmed by the Wetland Delineation (MENCO, WET/KANGRA/03/25, March 2025).



10. DESCRIPTION OF THE ENVIRONMENT

10.1 Climate

The Ballengeich Colliery is situated in the upper catchment of the Horn River (V31F) in the KwaZulu-Natal Midlands. The climate is classified as warm and humid (Köppen-Geiger classification Cfb — warm temperate, fully humid, warm summers) based on the WR2012 study (Schulze & Smithers, 2002) and CHIRPS rainfall data (2010–2024). The following climatic parameters apply to the site:

Table 26: Climatic Parameters (Ballengeich Colliery)

MAP (CHIRPS 2010–2024, EWS):	739 mm/yr
MAP (WR2012 station V3E002, GFK):	822 mm/yr
MAP (station 0370863_W, Bhekhani):	858.5 mm/yr
MAE (WR2012, EWS):	1,200 mm/yr
MAE (S-Pan, station V3E002, GFK):	1,448 mm/yr
MAR (Horn River, V31F):	104 mm/yr
Rainfall seasonality:	Summer rainfall region; peak rainfall October–March
Vegetation biome:	Eastern Mountain Grassland
Average temperature range:	3.8°C (July minimum) to 27.4°C (November maximum) (Meteoblue, 2025)
Thunder/storm days per year:	Average 36 days (World Bank Portal 2.0, 1962–1990)

10.2 Groundwater

The geohydrological conditions have been comprehensively assessed by Elemental Water Services (Pty) Ltd (EWS) in the Final Hydrogeology Assessment (Report No. EWS24-12_GW, 22 April 2025). The assessment comprised a field hydrocensus (15 boreholes), slug testing, geophysical investigation (magnetic and ERT surveys), hydrochemical sampling, and a calibrated numerical groundwater flow and solute transport model.

10.2.1 Aquifer Systems

- Unconfined floodplain aquifer: Associated with unconsolidated sands along the Horn and Ngagane River floodplains. Highly connected to the surface water system.



- Shallow weathered zone aquifer: Associated with weathered Eccra Group sedimentary rock (sandstone and shale). Weathered zone estimated at 5–28 m thickness. Groundwater levels average 5.7 m below ground level. Perched water tables occur due to restricting layers.
- Deeper confined fractured aquifer: Associated with Dwyka Group Tillite. Lower permeability and storage potential.
- Old underground mine workings constitute a fourth hydrogeological unit with significantly higher hydraulic conductivity. The flooded workings are in a pseudo-steady state and decanting artesianly at the Horn River bank.

10.2.2 Groundwater Flow and Chemistry

Groundwater table mimics topography and flows south-west toward the river systems. Groundwater flow velocities range from 0.001 to 0.38 m/day (very slow moving; EWS, April 2025). Three hydrochemical types are identified: Na-Cl (GW16 — natural background); Ca-HCO₃ (UGBH5 — deep ancient groundwater); and Ca-SO₄ (GW12, GW6, GW1 — AMD-impacted groundwater).

10.2.3 Groundwater Model Outputs

A calibrated transient numerical flow and transport model was developed. Key outputs: SO₄ plume gradient from 4,000 mg/L at source to 50 mg/L toward the Ingagane River and 1,000 mg/L toward the Horn River. The Horn and Ingagane Rivers exhibit attributes of losing rivers: groundwater plumes pass beneath the rivers, confirming limited direct AMD impact on the Ingagane from the groundwater pathway. The aquifer is unstressed (stress index 0.00; scale of abstraction 0.23).

10.2.4 Groundwater Resource Quality Objectives (V31K)

Table 27: Groundwater Resource Quality Objectives (V31K; GN 1873, March 2022)

Parameter	Class 0	Class I	Class II	Unit
pH	6 – 9	4.5 – 10	4 – 10.5	pH units
EC	<70	70 – 150	150 – 370	mS/m
SO ₄	<200	200 – 400	400 – 600	mg/L
Ca	<80	80 – 150	150 – 300	mg/L
Mg	<70	70 – 100	100 – 200	mg/L
Na	<100	100 – 200	200 – 400	mg/L
Cl	<100	100 – 200	200 – 600	mg/L
NO ₃ as N	<6	6 – 10	10 – 20	mg/L



10.2.5 Proposed Monitoring Boreholes

Two additional groundwater monitoring boreholes are proposed by EWS to fill identified gaps in the monitoring network: EWS BH1 (−27.888936°; 29.977264°; 30 m depth) and EWS BH2 (−27.886541°; 29.976321°; 30 m depth), both upstream of the Ingagane River. Quarterly hydrochemical sampling is required for all 23 existing boreholes (UGBH1–GW23) plus the two proposed additional boreholes.

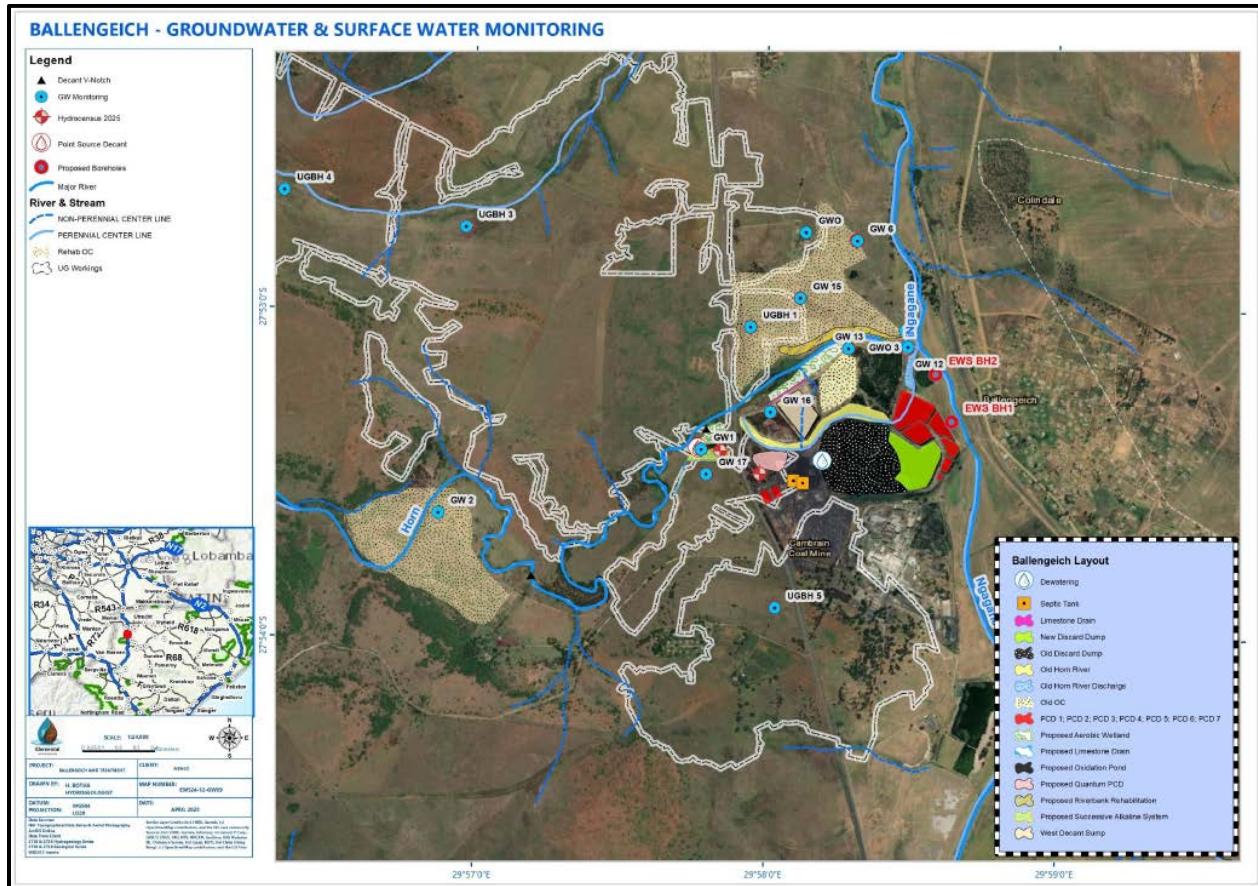


Figure 12: Groundwater Monitoring Network



10.3 Wetlands

A Wetland Delineation and Assessment was conducted by MENCO. Field surveys were conducted on 5 March 2022, 3 June 2022, and 5 December 2024. Two wetland systems were delineated:

Table 28: Wetland Delineation Results (MENCO, WET/KANGRA/03/25, March 2025)

Wetland Type	Coordinates	Linked To	PES	EIS	REC	Notes
Channelled Valley Bottom (CVB)	27°53'25.42"S; 29°57'46.40"E	Ngagane River system (V31K FEPA)	Class C	Moderate	C	Hydrofunctional importance: Moderate. Direct Human Benefits: Class D.
Floodplain Wetland	27°53'27.56"S; 29°57'44.18"E	Horn River (V31F)	Class C	High	C	AMD decant point situated WITHIN floodplain wetland footprint. Wetland of artificial origin (river diversion, late 1980s).

The V31K quaternary catchment is a FEPA (SANBI Atlas, 2011). The Target Ecological Category (TEC) for the Horn River at the confluence with the Ngagane River is Class C per GN 1873 (March 2022). All proposed rehabilitation works are within the 500 m protective wetland buffer zone. General Authorisation under GN 1199 does not apply (Clause 6 — activities within 500 m of a wetland). NEMA Listing Notice 3 (GN 324) Activities 12(d)(v) and 14(d)(vii) are triggered (CBA 2, KZN C-Plan).

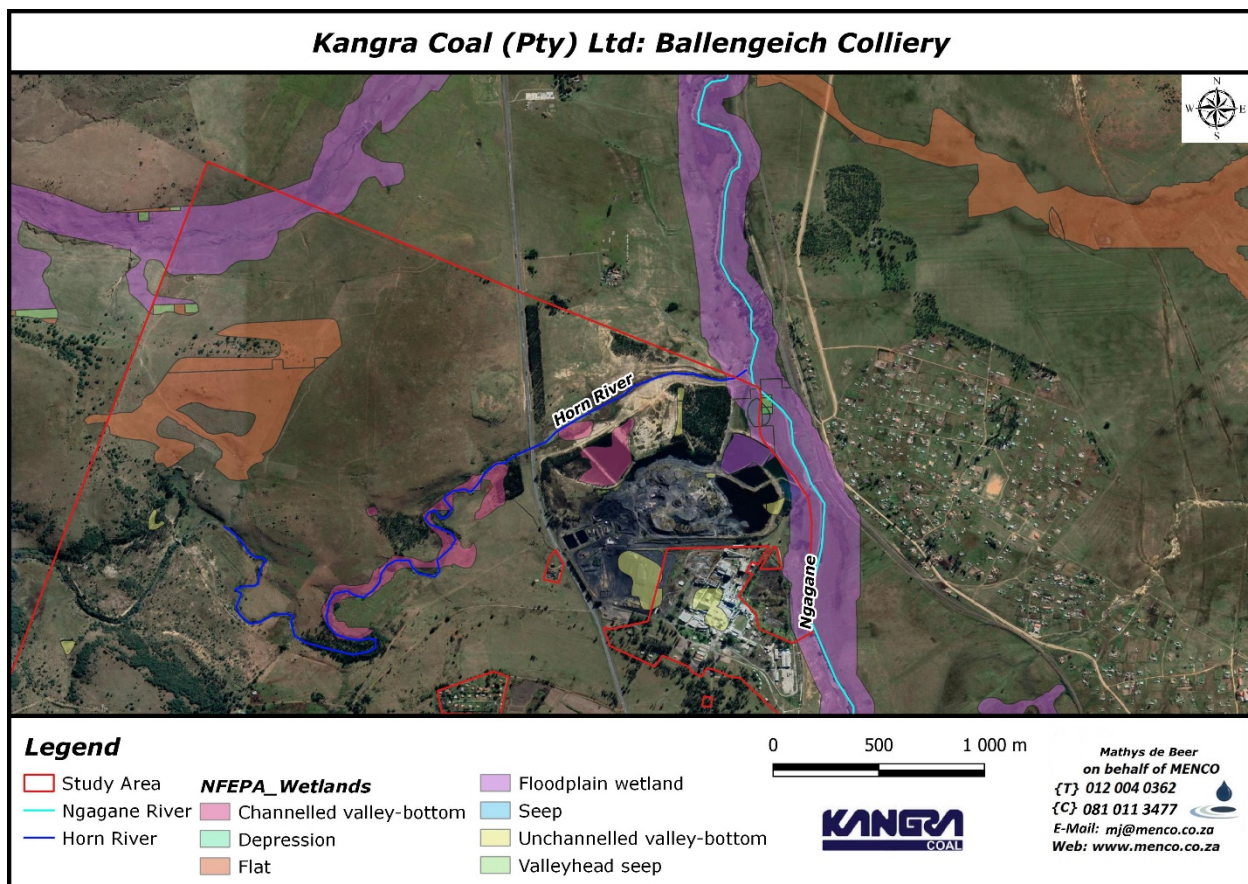


Figure 13: Wetland Delineation Map (MENCO, March 2025)

10.4 Surface Water

The surface water environment has been assessed through the EWS Hydrology Assessment (EWS24-12_SW, April 2025), the MENCO Assimilative Capacity Study (ACD/Kangra/2025/02/21, February 2025), and the MENCO Aquatic Ecological Assessment (November 2023).

10.4.1 Resource Classification and RQOs

The DWS Resource Quality Objectives for the V31K catchment are set in GN 1873 (11 March 2022). The Ballengeich Colliery falls within Integrated Unit Analysis (IUA) 2: Ngagane River. The following surface water RQOs apply:

Table 29: Surface Water RQOs (GN 1873, March 2022 — IUA 2: Ngagane River)

Parameter	Horn River (V31F)	Ngagane River (V31K)	Percentile / Context
pH	6.5 – 9.0	6.5 – 9.0	5th to 95th percentile
TDS	≤350 mg/L	≤350 mg/L	95th percentile



Sulphate (SO ₄)	≤165 mg/L	≤200 mg/L	95th percentile
Iron (Fe)	≤0.1 mg/L	≤0.1 mg/L	95th percentile
Manganese (Mn)	≤0.15 mg/L	≤0.15 mg/L	95th percentile
Aluminium (Al)	≤0.105 mg/L	≤0.105 mg/L	95th percentile
Chloride (Cl)	≤120 mg/L	≤120 mg/L	95th percentile
Ortho-phosphate (PO ₄ as P)	≤0.02 mg/L	≤0.05 mg/L	50th percentile
TIN	≤1.0 mg/L	≤2.0 mg/L	50th percentile

10.4.2 Present Ecological State and Resource Health

Table 30: River Classification (MENCO Assimilative Capacity, February 2025)

Resource	Quaternary	PES	EIS	EWR %MAR	REC	NMAR (10 ⁶ m ³)
Ngagane River	V31E	Class C	Moderate	30.38%	C	110.827
Horn River	V31F	Class C	Moderate	20.09%	C	25.045
V31K (FEPA)	V31K	Class C/D	—	—	C	—

10.4.3 Current Water Quality at Monitoring Points (November 2023)

Table 31: Surface Water Quality Results (MENCO Aquatic Ecological Assessment, November 2023)

Parameter	Decant	Horn US	Horn DS1	Horn DS2	Ngagane US	Ngagane DS	RQO (GN 1873)
pH	3.3	7.6	7.1	6.3	7.4	7.3	6.5 – 9.0
EC (mS/m)	735	80.6	87.7	115	36.2	34.7	<70
TDS (mg/L)	7,260	204	268	288	298	252	≤350
SO ₄ (mg/L)	4,379	300	334	509	69	88	≤165 (Horn)
Fe (mg/L)	8.83	<0.025	<0.025	0.042	0.167	0.237	≤0.1
Mn (mg/L)	4.22	0.735	0.882	1.84	0.132	0.136	≤0.15
Al (mg/L)	0.568	<0.1	<0.1	0.148	0.498	0.582	≤0.105



10.5 Aquatic Ecology and Biomonitoring

Two aquatic ecological assessments were conducted by MENCO: a baseline in June 2022 (dry season) and a comparative assessment in November 2023 (wet season). Additionally, GCS (Pty) Ltd conducted biomonitoring in High Flow Summer 2024 and Low Flow Winter 2024 (Report No. 22-0801). Five monitoring sites were assessed: Horn US (upstream reference); Horn DS1 (200 m downstream of decant); Horn DS2 (700 m downstream); Ngagane US (100 m upstream of confluence); and Ngagane DS (140 m downstream of confluence).

Table 32: Biomonitoring Results

Site	SASS5 (2022)	Health (2022)	SASS5 (2023)	Health (2023)	IHAS (2023)	Notes
Ngagane US	85 (ASPT 5.0)	Class C	71 (ASPT 4.9)	Class D	58	Upstream reference; sampling limitations due to deep channel.
Ngagane DS	89 (ASPT 5.5)	Class C	73 (ASPT 5.2)	Class D	66	No significant additional AMD impact at Ngagane scale.
Horn US	112 (ASPT 6.6)	Class B	64 (ASPT 5.1)	Class D/E	52	Reference site; upstream impacts from other sources.
Horn DS1	73 (ASPT 4.87)	Class D	48 (ASPT 4.7)	Class D/E	54	Directly downstream of AMD decant point. AMD impact confirmed.
Horn DS2	83 (ASPT 5.5)	Class C	52 (ASPT 5.2)	Class D/E	58	Orange ferric iron precipitate on rocks; benthic invertebrate smothering.

Overall ecological status: Ngagane River — Health Class D (Largely Impacted); no significant AMD impact attributable to Ballengeich detectable at the Ngagane scale. Horn River — Health Class D/E (Largely to Severely Impacted); Toxicity Class IV (100% ostracod mortality; 70% phytotox growth inhibition at decant site).

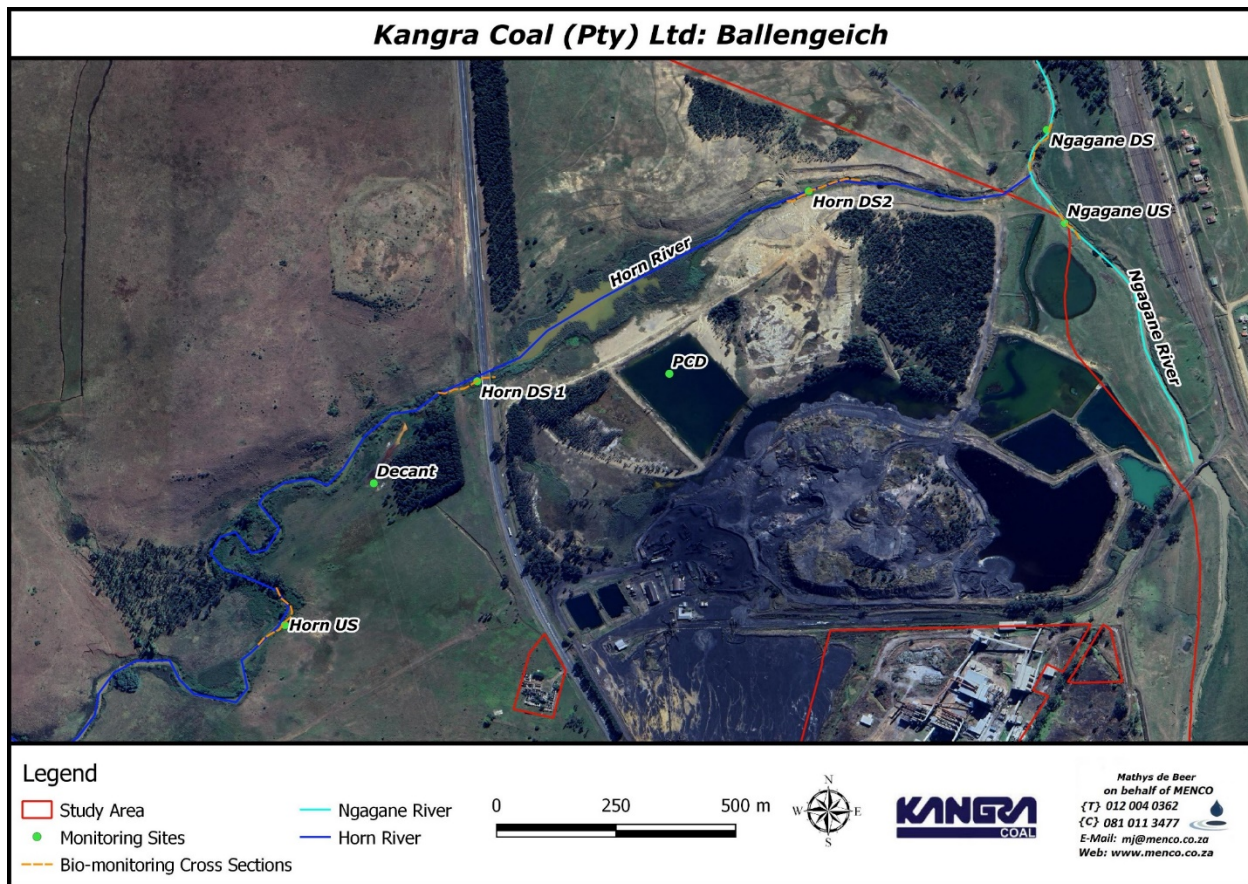


Figure 14: Surface Water & Aquatic Monitoring Points

10.6 Hydropedology

A Desktop Hydropedology Assessment was conducted by EWS (Report No. EWS24-12_GW, 23 April 2025). Key findings include:

- One hydropedological response unit (PED-HRU) identified, mimicking the groundwater resource unit due to interflow characteristics.
- Land types Bb54 and Bb53 (KZN highland soils). Restricting rock and soil layers cause perched water tables and lateral seepage zones.
- Predicted impact on hydropedological flow functions: No-impact. Slight improvement expected over time as passive treatment reduces salts and metals and stabilises pH.
- No hydropedological buffers or offsets required. Reasoned opinion: Activity should be authorised.



11. IMPACTS AND MITIGATION MEASURES

11.1 Impact Assessment Methodology

The impact assessment methodology follows the GN 4167 (8 December 2023) Risk Assessment Matrix (RAM) approach as applied in the IWWMP (MENCO, January 2025) and the Wetland Delineation Report (MENCO, March 2025). Significance ratings are determined on a scale of 1–100, classified as Low Risk (1–29), Moderate Risk (30–60), and High Risk (61–100), with positive ratings for beneficial impacts.

11.2 Summary of Key Impacts and Mitigation

Table 33: Summary of Impacts and Mitigation Measures

Phase	Impact	Pre-Mit. Rating	Post-Mit. Rating	Mitigation Measures
Planning / Current	Ongoing uncontrolled AMD decant to Horn River (pH <4.5; SO ₄ >4,000 mg/L; Fe 189 mg/L)	HIGH (85)	MODERATE (41.6) with treatment	Passive treatment train (ALD, SAPS, Oxidation Pond, Aerobic Wetland) at 1,000 m ³ /day.
Construction	Physical disturbance of floodplain wetland and riparian zone	MODERATE (50)	LOW (24)	Dry season construction only (May–September); ECO with stop-work authority; minimum footprint; immediate revegetation; erosion pins installed.
Construction	ALD construction in NFEPA buffer and wetland	HIGH (80)	LOW (24)	Sub-surface HDPE-lined trench; no surface flow diversion; trench dewatering to West Decant PCD.
Construction	Spontaneous combustion hazard (discard dump)	VERY HIGH	MODERATE	Infra-red thermal drone survey MANDATORY before access. All hotspots extinguished. Geotechnical engineer written clearance required.
Construction	Hydrocarbon and chemical spillage	LOW (18)	LOW (18)	Drip trays under all plant; refuelling minimum 100 m from watercourses; spill kits on site; monthly soil inspections.



Construction	Uncontrolled stormwater runoff during construction	MODERATE (33.6)	LOW (26.4)	Temporary silt berms and sandbag barriers; stormwater trenches operational as built.
Operational	Passive treatment system discharge to Horn River	MODERATE (56)	MODERATE-POSITIVE (56)	Weekly monitoring of outfall pH and Fe; discharge only if treated water meets RQO targets.
Operational	Residual seepage from unlined PCDs (PCDs 1, 2, 5, 6)	VERY HIGH (–56)	HIGH (–42) with monitoring	Quarterly groundwater monitoring at 23 boreholes; annual review; PCDs decommissioned as AMD sources eliminated.
Operational	Discard dump seepage (Scenario 1)	HIGH (80)	MODERATE (41.6)	Toe drain (110 mm perforated HDPE); solar pumps to lined PCDs 3 & 4; seepage monitoring.
Operational	Disturbance to V31K FEPA ecological integrity	HIGH (>60)	MODERATE (<40)	Maintain PES Class C via treated discharge; SASS5 biomonitoring bi-annual; RQO compliance monitoring monthly.
Closure / Post-closure	Long-term seepage from tailings and spoil	MODERATE (40)	LOW (24)	Spoil capping (300 mm clay + 150 mm topsoil; indigenous grass); groundwater monitoring 5 years post-closure; annual IWWMP update.
All phases	Impact on Newcastle WTP potable supply (220 ML/day from Ngagane)	HIGH (no treatment)	LOW-POSITIVE (with treatment)	Passive treatment reduces AMD load to Ngagane; improves WTP water quality; reduces WTP treatment costs.

11.3 Cumulative Impacts

The Ballengeich Colliery is one of several defunct and operational coal mines in the V31K/V31F catchment. Other proximate mines include the non-operational Kilbarchan Colliery 2, Durnacoal, CBR, and Witklip. The cumulative AMD load represents a significant regional water quality challenge. The assimilative capacity modelling confirmed that the Ngagane River



system has sufficient dilution capacity to assimilate the treated AMD discharge without detrimentally impacting the PES Class C catchment, and the Ballengeich pilot passive wetland approach is highlighted as a potential precedent for similar rehabilitation strategies at other abandoned mines in the region (IWWMP, MENCO, January 2025).



12. WATER DEMAND AND WATER SUPPLY ANALYSIS

12.1 Water Demand

The application does not include a Section 21(a) water use for large-scale abstraction of fresh water. Water demand on site is limited to:

- Dust suppression on haul roads and operational areas: 38,400 m³/annum. Sourced entirely from lined PCDs containing AMD-impacted decant water — no potable or fresh water used.
- Domestic use (Quantum site personnel): Limited supply from external water supply sourced from NCCA (Northern Coal Alliance) by water cart to 2 × 5,000 L JoJo tanks at the wash bay (985 m³/yr; S21(a), Item 0; IWWMP Table 2-3). Water quality tested quarterly against SANS 241.
- Wash bay (vehicle and plant washing): 5,000 L/day; supplied from external water supply sourced from NCCA (Northern Coal Alliance) by water cart to 2 × 5,000 L JoJo tanks at the wash bay via 2 × 5,000 L JoJo tanks (GFK SWMP, March 2026).
- Reed irrigation for constructed wetland establishment (construction phase only): sourced from treated AMD outflow.
- Concrete mixing (temporary, construction phase only): sourced from PCD water or licensed water tanker supply.

12.2 Water Supply and Water Balance

The Ballengeich site operates as a largely closed hydrological system. All process water originates within the site. A comprehensive water and salt balance was compiled by GFK Consulting Engineers using the Pitman/WRSM2000 model with an 89-year simulation period (1920–2009, station V3E002). Key results are summarised in Table 17 (Section 7). Under Scenario 1, a surplus of approximately 1,333 m³/annum (December–March) will be managed via the 22 kW mechanical evaporator positioned over lined PCDs.

12.3 Monitoring Programme

A comprehensive monitoring programme is established in the IWWMP (MENCO, January 2025). The compliance monitoring point is SW10 (Ngagane River, approximately 700 m downstream of the Horn/Ngagane confluence, at coordinates –27.879667°; 29.973981°).

12.3.1 Surface Water Monitoring

Table 34: Surface Water Monitoring Points (IWWMP, Table 7-12)

Point	Description	Coordinates
SW01	Horn River, upstream of the western opencast area (upstream reference).	–27.894065°; 29.941769°
SW02	Horn River — DWS gauging station V3H009, downstream of western opencast.	–27.893050°; 29.947676°



SW03	Horn River — Final void of the western opencast area.	–27.896465°; 29.952660°
SW04	Horn River — Beneath the N11 bridge, west of the eastern opencast.	–27.888620°; 29.964843°
SW05	Horn River — Approximately 400 m from N11, downstream of SW04.	–27.884836°; 29.970750°
SW06	Horn River — Downstream of eastern opencast, at the weir before Ngagane confluence.	–27.885113°; 29.974442°
SW07	Final void of the eastern opencast (old Horn River Dam — Dam 6).	–27.886036°; 29.972135°
SW08	Old Horn River channel below the discard dump.	–27.888897°; 29.973335°
SW09	Ngagane River at the SAR railway bridge (upstream of confluence reference).	–27.897850°; 29.978596°
SW10 (COMPLIANCE POINT)	Ngagane River, ≈700 m downstream of Horn/Ngagane confluence. COMPLIANCE MONITORING POINT.	–27.879667°; 29.973981°

Monthly surface water quality parameters (IWWMP Table 7-11): pH; TDS; EC; Cl; NO₃ as NO₂; Fluoride; SO₄; Ca; Mg; Na; Fe; Mn.

12.3.2 Groundwater Monitoring

Twenty-three groundwater monitoring boreholes (UGBH1–GW23) form the existing monitoring network, with two additional boreholes (EWS BH1 and EWS BH2) proposed upstream of the Ingagane River. Quarterly sampling is required. Minimum parameters: pH; EC; TDS; Al; Ca; Cl; Cu; F; Fe; K; Mg; Mn; Na; NO₃; SO₄; Zn. Groundwater RWQO targets (V31K): pH 6–9; EC <70 mS/m; SO₄ <200 mg/L (Class 0). Monitoring continues for up to 5 years post-closure.

12.3.3 Biomonitoring

Bi-annual SASS5 biomonitoring at five established monitoring sites (Horn US, Horn DS1, Horn DS2, Ngagane US, Ngagane DS) is required. Results must be reported in the semi-annual monitoring report. The current Health Class D/E for the Horn River is the primary rehabilitation target.



12.3.4 Passive Treatment System Performance Monitoring

Weekly monitoring of treated AMD outfall quality from Aerobic Wetland Unit 1 is required. Minimum parameters: pH; Fe (total); SO₄; Mn; Al. Discharge to the Horn River is only permitted if pH >5.5 and Fe <10 mg/L are confirmed. Results must be recorded in a site register and reported in the semi-annual monitoring report.

12.3.5 Reporting Obligations

- Submit six-monthly monitoring reports to the DWS Provincial Head (KZN).
- Submit an annual IWWMP update report (by 30 April each year) to DWS.
- Provide written notification to the DWS Provincial Head prior to commencement and after completion of all proposed activities.
- Notify DWS in writing within 24 hours of any water pollution incident, PCD spill, passive wetland failure, or discard dump combustion event (Contingency Plans, MENCO, 2026).



13. PUBLIC PARTICIPATION

13.1 Legislative Basis

A Public Participation Process (PPP) is required in terms of Section 41(4)(a) of the NWA and Regulation 17(2) of GN 267 (March 2017). A minimum 60-day public participation period must be completed. The PPP must include preparation and distribution of a Background Information Document (BID), erection of site notices, publication of newspaper advertisements in at least one English newspaper circulating in the Newcastle area, and registration of all Interested and Affected Parties (IAPs).

13.2 Current PPP Status

The PPP for the current application has not yet been initiated. A previous PPP was conducted in 2012 by GCS (Pty) Ltd for the phytoremediation IWULA submission. The current application covers a materially revised and substantially expanded scope (60 water use entries across five S21 categories passive AMD treatment replacing phytoremediation and therefore a new PPP must be conducted in its entirety.

MENCO has formally requested from DWS that the WULA submission timeline be extended given that: (i) 60 of the 90-day submission period are required solely for the mandatory PPP comment period; and (ii) the DWS Phase 2 site inspection has not yet been completed.

13.3 Planned PPP Process

Table 35: Planned Public Participation Process

PPP Step	Description	Timing
Step 1: IAP Database Compilation	Compile database of all registered IAPs including national and provincial government departments; KZN EDTEA; DWS; DMRE; Amajuba District Municipality; Newcastle Local Municipality; adjacent landowners; Kilbarchan community; Umgeni Water; environmental NGOs.	Prior to BID distribution
Step 2: BID Preparation	Compile project Background Information Document in English and isiZulu summarising project description, proposed water uses, environmental setting, and participation process.	Concurrent with IAP database
Step 3: Site Notice Erection	Erect site notices at minimum three prominent locations: N11 roadside entrance; Kilbarchan residential area entrance; Newcastle CBD notice board.	Day 1 of PPP period
Step 4: Newspaper Advertisement	Place advertisements in the Newcastle Gazette (English) newspaper circulating in the Amajuba District.	Day 1 of PPP period



Step 5: 60-Day Comment Period	Allow a minimum 60-day public comment period as required by GN 267 Regulation 17(2). All comments formally captured and acknowledged.	Days 1–60 of PPP period
Step 6: Comments and Response Report	All comments collated, categorised, and responded to in a formal Comments and Response Report (CRR) compiled by MENCO.	Within 30 days of close of comment period
Step 7: Public Meeting (if required)	If required by DWS or requested by IAPs, a public meeting will be convened in Newcastle to present the project and address concerns.	As required
Step 8: PPP Report	Compile and submit a standalone Public Participation Report to DWS summarising the full PPP process, IAP register, all comments received, and MENCO's responses.	With final WULA submission



14. OTHER AUTHORISATIONS APPLICABLE TO THE ACTIVITY

14.1 NEMA Listed Activities Triggered

The proposed rehabilitation and passive AMD treatment activities trigger listed activities in terms of NEMA Regulations published in GN 327 (Listing Notice 1), GN 325 (Listing Notice 2), and GN 324 (Listing Notice 3) dated April 2017. A Basic Assessment process is required, as confirmed by the EAP of activities and the CBA 2 sensitivity classification in the KZN C-Plan.

Table 36: NEMA Listed Activities Triggered (MENCO, March 2026)

Listing Notice	Activity No.	Description as per Project
LN1 (GN 327)	Activity 12	Installation of two open ALDs. Construction of two oxidation/sedimentation ponds (670 m ² each). Construction of stormwater berm along Ngagane River. Construction of two additional weirs upstream of the existing weir in the Horn River, increasing water surface area by more than 100 m ² .
LN1 (GN 327)	Activity 19	Implementation of aerobic constructed wetland and ALD trenches for passive AMD treatment. Removing soil and infilling trenches with limestone (>10 m ² affected).
LN1 (GN 327)	Activity 25	Combined through-put capacity of both ALDs exceeds 2,000 m ³ /day. Clearance of 1 ha or more but less than 20 ha of indigenous vegetation for construction footprint.
LN1 (GN 327)	Activity 34	Expansion of / changes to existing facilities requiring a new or amended licence for effluent or pollution.
LN1 (GN 327)	Activity 48(i) and 48(ii)	Construction of two additional weirs upstream of the existing weir in the Horn River, increasing existing infrastructure footprint by more than 100 m ² (48i) and expanding the water surface area by more than 100 m ² (48ii).
LN2 (GN 325)	Activity 6	Development of facilities requiring a permit or licence for release of effluent — the passive wetland AMD treatment system constitutes an effluent treatment facility with daily through-put exceeding 2,000 m ³ /day.
LN2 (GN 325)	Activity 21	Activities associated with primary processing of a mineral resource including classifying, screening and washing — Quantum Screening and Crushing operations.
LN3 (GN 324)	Activity 12(d)(v)	KZN Critical Biodiversity Areas: Western passive wetland treatment system requires clearance of more than 300 m ² of vegetation within a CBA 2 area (KZN C-Plan).
LN3 (GN 324)	Activity 14(d)(vii)	Activities within a CBA 2 area as per KZN C-Plan.



Waste Management Activities (GN 921, 29 November 2013, National Environmental Management: Waste Act): Category A, Activity 5 (passive AMD treatment); Category B (disposal of coal waste from reworking discard dump >200 m²; >25,000 tonnes).

14.2 Status of Environmental Authorisation (BA)

A full Basic Assessment (BA) process has been initiated with the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN EDTEA) and the Department of Forestry, Fisheries and the Environment (DFFE) where required. The Consolidated EIA Project Plan confirms the full Basic Assessment (BA) process is underway. The Environmental Authorisation will be submitted to DWS concurrently with or in advance of the final WULA submission.

14.3 Mining Right and MPRDA Compliance

An approved Mining Right was issued by the DMRE to Kangra Coal (Pty) Ltd for coal mining activities on Portion 19 (Remaining Extent) of the Farm Ballengeich 3299 HS. Historical Mining Right documentation has not yet been fully retrieved. An EMPr from the mining operational period has been submitted to DWS together with the Phase 1 Motivation Letter (MENCO, 13 November 2024, Ref: WU33839/Phase 1). The current signed Social and Labour Plan (SLP) is submitted as part of the administrative package.



15. SECTION 27 MOTIVATION

15.1 Introduction

The requirements contained in Section 27(1) of the NWA have been considered in full. A comprehensive standalone Section 27 Motivation Report (MENCO, March 2026) is submitted separately as per DWS Requirement. The following table provides a consolidated summary. The WUL is applied for an initial period of 20 years, aligned with the minimum design service life of the GFK-engineered PCDs and passive treatment infrastructure (GFK SWMP, March 2026) and the IWWMP recommendation (MENCO, January 2025).

15.2 Section 27(1) Criteria Summary

Table 37: Section 27(1) Motivation Summary (NWA, 1998)

S27	Criterion	Summary Response
(a)	Existing Lawful Water Uses	The river diversion of the Horn River (installed in the late 1980s under an approved Environmental Management Plan; Minerals Act, 1991) constitutes the only applicable ELWU (Water Use Item 3; 2.2 ha). No water use permits were issued under the Water Act, 1956. No other ELWUs applicable.
(b)	Redress of Past Racial and Gender Discrimination	Rehabilitation addresses AMD impacts on historically disadvantaged communities dependent on the Horn and Ngagane Rivers. Kangra Coal commits to prioritising employment of PDIs and women from local communities. Community development programmes under Menar Group SLP.
(c)	Efficient and Beneficial Use of Water in the Public Interest	Passive AMD treatment prevents uncontrolled acidic decant (pH <4.5; SO ₄ >4,000 mg/L; Fe 189 mg/L) reaching the Horn and Ngagane Rivers, directly benefiting downstream agricultural users, the Newcastle WTP (220 MI/day from Ngagane), and aquatic ecosystems in the V31K FEPA. No potable or fresh water consumed.
(d)(i)	Socio-economic Impact if Authorised (POSITIVE)	POSITIVE: Cleaner water and reduced municipal treatment costs at Newcastle WTP; improved agricultural water quality; 6 direct and approximately 4 indirect employment opportunities; pilot wetland precedent for regional AMD management; riparian habitat restoration; improved eco-tourism potential (Amajuba District >400 bird species).
(d)(ii)	Socio-economic Impact if NOT Authorised (NEGATIVE)	NEGATIVE: Continued AMD discharge; escalating contamination of Newcastle potable supply; progressive deterioration of PES from Class C/D toward Class E; Kangra remains non-compliant with the Section 19 Directive; potential criminal prosecution under Section 151 NWA; no path to mine closure certificate.



(e)	Catchment Management Strategy	The site falls within the Pongola-Mtamvuna WMA (WMA 4). The NWRS-2 (2013) and Internal Strategic Perspective for the Thukela WMA (DWAf, 2004) provide the strategic framework. Management objectives include water quality protection, sustainable development, and improvement of the V31K PES from Class C/D toward the REC of Class C.
(f)	Likely Effect on Water Resource and Other Users	SURFACE WATER (POSITIVE): AMD neutralisation reduces SO ₄ from >4,000 to within RQO Class III; Fe, Al, Mn precipitation reduces toxicity; Horn River PES predicted to improve toward Class C. GROUNDWATER (POSITIVE): AMD source load reduced over time.
(g)	Class and Resource Quality Objectives	V31K PES Class C/D; REC Class C (GN 1873, March 2022). Key RQOs: pH 6.5–9.0; TDS ≤350 mg/L; SO ₄ ≤165 mg/L (Horn, V31F); Fe ≤0.1 mg/L; Mn ≤0.15 mg/L. Passive treatment system designed to achieve these RQOs. Assimilative capacity modelling (MENCO, February 2025) confirms sufficient capacity in the Ngagane River system.
(h)	Investments Already Made and to Be Made	Kangra Coal has invested substantially since 2013: PCD construction and maintenance; 16+ specialist studies; monitoring (surface water monthly; groundwater quarterly; biomonitoring bi-annual); multiple DWS engagements; West Decant Sump and ALD limestone trench construction. Passive treatment system capital cost: approximately R4,079,750 (excl. VAT; IWWMP Table 7-6).
(i)	Strategic Importance	The successful rehabilitation of Ballengeich is of regional and national strategic importance: (i) addresses legacy AMD impacts in V31K catchment (NWRS-2); (ii) contributes to State obligations for abandoned mine rehabilitation (MPRDA Section 107(1)(a)); (iii) serves as a demonstration pilot for passive AMD treatment in the Klip River Coalfield; (iv) supports long-term water security of the Newcastle industrial hub and 531,327 people in Amajuba District. DWS approved the pilot-scale passive wetland approach (Ref: 16/2/7V301/C/4, August 2023).
(j)	Quality of Water for the Reserve / International Obligations	The Ecological Reserve for V31K (Reserve study, DWS, December 2007) requires maintenance flows and specific water quality parameters. The passive treatment system contributes positively to Reserve protection by reducing AMD loads. The Newcastle WTP (220 Ml/day from Ngagane) is the most critical downstream user. No international obligations (trans-boundary rivers) are applicable.
(k)	Probable Duration of the Undertaking	The WUL is applied for a period of 20 years, covering the pilot-scale passive AMD treatment operation, stormwater



		management, discard dump rehabilitation, monitoring, and post-closure obligations, consistent with the GFK SWMP design service life (March 2026) and IWWMP recommendation (January 2025). The Ballengeich Siding operates for 15 years at 95,000 tonnes per month.
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16. CONCLUSIONS AND RECOMMENDATIONS

16.1 Conclusions

The Ballengeich Colliery is a defunct coal mine that has been in a state of advanced environmental degradation and regulatory non-compliance for over three decades. Uncontrolled AMD from flooded underground workings, opencast spoil areas, and an unrehabilitated discard dump has progressively deteriorated the water quality of the Horn River (currently Health Class D/E at Horn DS1) and poses a long-term risk to the Ngagane River and the Newcastle potable water supply.

Kangra Coal (Pty) Ltd has engaged substantively with DWS since the issuance of the Section 19 Directive in August 2013, has invested substantially in specialist studies, monitoring, and preliminary works, and has developed a scientifically defensible, cost-effective, and sustainable passive AMD treatment solution. All specialist assessors have provided reasoned opinions that the proposed activities should be authorised. The following key conclusions are drawn:

- The Ngagane River system has sufficient assimilative capacity to receive the treated AMD discharge without detrimentally impacting the PES Class C of the catchment (MENCO Assimilative Capacity Study, February 2025).
- The passive treatment system (ALD → SAPS → Oxidation Pond → Aerobic Wetland) is the Best Practicable Environmental Option (BPEO) for AMD treatment at the Ballengeich Colliery, endorsed by DWS in principle (Ref: 16/2/7V301/C/4, August 2023).
- The proposed stormwater management measures (GFK, March 2026) will achieve full GN 704 compliance with clean/dirty water separation, five HDPE-lined PCDs, and a flood protection berm designed to the 1:100-year return period.
- The two delineated wetland systems (CVB: PES C; EIS Moderate; Floodplain: PES C; EIS High) can recover to the REC of Class C with implementation of the proposed mitigation measures (MENCO Wetland Delineation, March 2025).
- The groundwater flow velocities (0.001–0.38 m/day) are very slow; the aquifer is unstressed (stress index 0.00); and the proposed activities will have a net positive impact on groundwater quality over time (EWS Hydrogeology, April 2025).
- The proposed 20-year WUL period is appropriate given the design service life of the passive treatment infrastructure and PCDs, and the need for sustained monitoring and adaptive management.



16.2 Recommendations

MENCO respectfully makes the following recommendations to DWS:

- That DWS issue the Water Use Licence for the Ballengeich Colliery for a period of 20 years, subject to the conditions of this WULAR, the IWWMP (MENCO, January 2025), and the standalone specialist reports.
- That DWS confirm acceptance of the GN 704 Exemption Application (14 December 2024), allowing existing PCDs and residue deposits to remain within the 1:100-year flood line subject to the flood protection berm and stormwater management measures.
- That DWS include as a WUL condition the requirement that passive AMD treatment infrastructure construction commences within six months of WULA issuance, and that AMD from the artesian decant point is at all times directed to the West Decant PCD during the construction period.
- It is recommended that the WUL, once issued, include a condition requiring that the specialists' studies (i.e. Aquatic Ecological Assessment, Rehabilitation Plan, etc.) be updated for compliance. Updated documents and studies must be submitted to the DWS within 12 months of the date of issue of the WUL.
- That DWS confirm inclusion of the two proposed additional groundwater monitoring boreholes (EWS BH1 and EWS BH2; EWS Hydrogeology, April 2025) as WUL conditions.



17. DECLARATION BY THE APPLICANT

17.1 Declaration by the Applicant

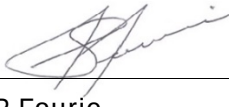
I, the undersigned, acting in my capacity as the duly authorised representative of Kangra Coal (Pty) Ltd, hereby declare under oath that:

- I am authorised to make this declaration on behalf of the Applicant.
- All information contained in this WULAR and supporting specialist reports is, to the best of my knowledge and belief, true, correct, and complete at the date of submission.
- The Applicant is aware of and accepts the requirements and conditions that may be imposed by DWS in the water use licence to be granted.
- The Applicant undertakes to implement all mitigation measures, management plans, and monitoring programmes as described in this WULAR upon issuance of the water use licence.
- The Applicant acknowledges that the Section 19 Directive (Ref: 16/2/7/V301/A/1, August 2013) remains in force until all its instructions are successfully carried out.

Signature:	
Name:	Ms. LM Monareng (Mahlatse Monareng)
Designation:	Kangra Coal (Pty) Ltd
Date:	17 June 2026

17.2 Declaration of Independence — Environmental Consultant

I, JP Fourie, acting as the independent Environmental Practitioner in this WULAR for Kangra Coal (Pty) Ltd, declare that I have the expertise to conduct the assessment and will comply with the NWA, its Regulations, and applicable legislation; that I do not have any financial interest in the undertaking other than remuneration for work performed; that I have no vested interest in the activity proceeding; and that I undertake to disclose to the competent authority all material information that may influence its decision or the objectivity of any report.

Signature:	
Name:	JP Fourie
Company:	M2 Environmental Connections (Pty) Ltd (MENCO)
Date:	June 2026



Signature:	
Name:	Johan Maré
Designation:	Managing Director, Menco
Date:	June 2026