63 Wessel Road, Rivonia, 2128 PO Box 2597, Rivonia, 2128 South Africa
Tel: +27 (0) 11 803 5726 **Fax:** +27 (0) 11 803 5745 **Web:** www.gcs-sa.biz

The Block Meat Company Water Use Licence Application Technical Report

Report

Version - Final

14 October 2026

GCS Project Number: 24-0773

Client Reference: The Block Meat Company



GCS Environment South Africa (Pty) Ltd **Reg No:** 2002/028494/07
Offices: **Johannesburg**
Directors: AC Johnstone | W Sherriff | T Isaac | A Theunissen

The Block Meat Company Water Use Licence Application Technical Report

Report

Version – Final

14 October 2026

DOCUMENT ISSUE STATUS

Report Issue	Final		
GCS Reference Number	24-0773		
Client Reference	The Block Meat Company		
Title	The Block Meat Company Water Use Licence Application Technical Report		
	Name	**Signature**	**Date**
Author	Marandela Muzhambi	Marandela Muzhambi Digitally signed by Marandela Muzhambi Date: 2026.10.14 15:25:28 +02'00'	14 October 2026
Document Reviewer	Paula Tolksdorff	Paula Tolksdorff Digitally signed by Paula Tolksdorff Date: 2026.10.14 15:17:10 +02'00'	14 October 2026
Unit Manager			
Director	Andrew Johnstone	Andrew Johnstone Digitally signed by Andrew Johnstone Date: 2026.10.14 16:51:49 +02'00'	14 October 2026

LEGAL NOTICE

This report or any proportion thereof and any associated documentation remain the property of GCS until the mandator effects payment of all fees and disbursements due to GCS in terms of the GCS Conditions of Contract and Project Acceptance Form. Notwithstanding the aforesaid, any reproduction, duplication, copying, adaptation, editing, change, disclosure, publication, distribution, incorporation, modification, lending, transfer, sending, delivering, serving or broadcasting must be authorised in writing by GCS.

EXECUTIVE SUMMARY

Introduction

The Block Meat Company (Pty) Ltd (Block Meat Company), a subsidiary of the Shoprite Group, operates a wholesale meat processing and distribution facility located at Erf 451, Apex Extension 0, in Benoni, Gauteng Province. The facility forms part of Shoprite's national agri-processing and food distribution network and requires a reliable and continuous water supply to meet stringent food safety, hygiene and operational requirements.

To supplement municipal water supply and ensure operational resilience during periods of municipal interruption, Block Meat has developed an on site borehole (BH2). The abstraction of groundwater from this borehole constitutes a water use in terms of Section 21(a) of the National Water Act, 1998 (Act No. 36 of 1998) (NWA) and therefore requires authorisation under that Act.

This Technical Report supports the Water Use Licence Application (WULA) and demonstrates that the proposed water use is sustainable, manageable and in the public interest.

Water Use Applied For

The application seeks authorisation for the abstraction of up to 5,000 cubic metres per annum (m^3/a) of groundwater from borehole BH2 in terms of Section 21(a) of the NWA. The groundwater abstraction will be used solely to supplement municipal supply for operational purposes.

Environmental Baseline and Hydrogeological Context

The site is located within quaternary catchment C21D in the Upper Vaal sub-catchment, which forms part of the Vaal-Orange Water Management Area under the jurisdiction of the Vaal-Orange Catchment Management Agency (VOCMA). Although the broader catchment experiences moderate levels of water stress, the groundwater resource assessment indicates that sufficient groundwater is available to support the proposed abstraction of 5,000 m^3/a, subject to appropriate monitoring and management measures.

Groundwater abstraction is proposed from borehole BH2, which intersects a deep, confined fractured aquifer at depths exceeding 150 metres below ground level (mbgl). The hydrogeological assessment estimated a radius of influence of approximately 8.6 metres under the assessed pumping conditions. No neighbouring groundwater users were identified within a 2.5-kilometre radius of the site. Groundwater quality assessment results identified elevated turbidity and manganese concentrations, which require appropriate treatment and monitoring to ensure suitability for the intended use. The aquifer is classified as Class II in terms of the hydrogeological assessment, indicating moderate aquifer protection and utilisation characteristics. This aquifer classification is distinct from the statutory water

resource classification under the National Water Act, 1998 (Act No. 36 of 1998)..

Key Risks and Impacts Identified

The impact and risk assessment indicates that potential impacts associated with the proposed groundwater abstraction are low. Key risks relate to the potential for over abstraction and the protection of groundwater quality. These risks are considered manageable due to the conservative abstraction volume, the confined nature of the aquifer and the absence of nearby groundwater users or groundwater-dependent surface water features.

Mitigation and Management Measures

A comprehensive management plan has been developed to ensure sustainable groundwater use. Key measures include limiting abstraction to the licenced volume, continuous monitoring through calibrated flow meters, regular groundwater level and quality monitoring, protection of borehole infrastructure, effective stormwater management rigorous effluent control and disposal and implementation of spill prevention and response procedures at the processing facility. An adaptive management approach will be applied should monitoring indicate any emerging risks.

Conclusion and Recommendation

The specialist investigations confirm that the proposed abstraction of 5,000 m^3/a of groundwater can be undertaken sustainably and with negligible risk to the groundwater resource or to other water users. The abstraction volume is conservative and well within the available groundwater reserves of the sub-catchment. On this basis, and subject to compliance with the proposed monitoring and management measures, it is concluded that the proposed water use is environmentally acceptable, technically feasible and in the public interest. Granting the Water Use Licence (WUL) in terms of Section 21(a) of the NWA is therefore recommended.

CONTENTS PAGE

EXECUTIVE SUMMARY ..... **III**
1 INTRODUCTION **10**
1.1 ACTIVITY BACKGROUND 10
1.1.1 Regional Setting and Location of Activity *10*
1.1.2 Property Description *13*
1.1.3 Purpose of this Report *13*
1.2 CONTACT DETAILS 13
1.2.1 Details of the Applicant *13*
1.2.2 Environmental Consultant *13*
2 CONTEXTUALISATION OF ACTIVITY **13**
2.1 DESCRIPTION OF ACTIVITY 13
2.2 EXTENT OF THE ACTIVITY 14
2.3 KEY ACTIVITY RELATED PROCESSES AND PRODUCTS 14
2.4 ACTIVITY LIFE DESCRIPTION 16
2.5 KEY WATER USES 16
2.6 ORGANISATIONAL STRUCTURE OF ACTIVITY 17
2.7 BUSINESS AND CORPORATE POLICIES 18
2.7.1 Corporate Governance Framework *18*
2.7.2 Ethical Conduct and Organisational Ethics *19*
2.7.3 Social and Ethics Oversight *19*
2.7.4 Environmental Responsibility *20*
2.7.5 Compliance and Risk Management *20*
2.7.6 Stakeholder Engagement and Reporting *20*
3 REGULATORY WATER FRAMEWORK **20**
3.1 SUMMARY OF ALL WATER USES 20
3.2 EXISTING LAWFUL WATER USES 21
3.3 RELEVANT EXEMPTIONS 21
3.4 GENERALLY AUTHORISED WATER USES 21
3.5 NEW WATER USES TO BE LICENCED 21
3.6 OTHER AUTHORISATIONS 22
4 PRESENT ENVIRONMENTAL SITUATION **22**
4.1 CLIMATE 22
4.2 TOPOGRAPHY 23
4.3 LOCAL GEOLOGY 23
4.4 SOCIO-ECONOMIC ENVIRONMENT 25
4.4.1 Population Characteristics *25*
4.4.2 Economic Activities *25*
4.4.3 Education *25*
4.4.4 Employment *26*
5 SPECIALIST FINDINGS **26**
5.1 GROUNDWATER ASSESSMENT 26
5.1.1 Aquifer Characteristics, Classification and Groundwater Recharge *26*
5.1.2 Depth to Groundwater *27*
5.1.3 Groundwater Quantity *31*
5.1.4 Groundwater Quality *34*
5.2 SITE CONCEPTUAL MODEL 36
6 RISK ASSESSMENT/BEST PRACTICE ASSESSMENT **36**
6.1 IMPACT / RISK ASSESSMENT METHODOLOGY 36
6.2 IMPACT/ RISK ASSESSMENT OUTCOMES 39
6.2.1 Impacts on the Groundwater Reserve *39*
6.3 IMPACT/ RISK ASSESSMENT MATRIX 42
6.4 ASSESSMENT OF LEVEL AND CONFIDENCE OF INFORMATION 44

7 WATER MANAGEMENT PLAN 44
7.1 Organisational Structure 44
7.2 Resources and Competence 44
7.3 Education and Training 44
7.4 Internal and External Communication 44
7.5 Awareness Raising 45
7.6 Water Balance 45
7.7 Stormwater Management 48
7.8 Water Use and Environmental Management Plan 48
7.9 Monitoring and Control 51
7.9.1 Groundwater Monitoring 51
7.9.2 Waste Monitoring 51
7.10 Auditing and Reporting 53
8 PUBLIC PARTICIPATION 53
8.1 Stakeholder Engagement Undertaken 53
8.1.1 Authority Pre-Application Consultation 53
8.1.2 Stakeholder Database 53
8.1.3 Distribution of Notification Letters and Background Information Document 54
8.1.4 Site Notice Placements 54
8.1.5 Newspaper Advertisements 54
8.1.6 Public Comment Period on the Draft WULA Technical Report 54
8.1.7 Availability of the Final WULA Technical Report 54
8.2 Issues and Responses from Public Consultation Process 55
9 MOTIVATION IN TERMS OF SECTION 27(1) OF THE NATIONAL WATER ACT, 1998 ... 55
9.1 Section 27 (a): Existing Lawful Water Use 55
9.2 Section 27 (b): The Need to Redress the Results of Past Racial and Gender Discrimination 55
9.2.1 Broad-Based Black Economic Empowerment Status 55
9.3 Section 27 (c): Efficient and Beneficial Use of Water in the Public Interest 56
9.3.1 Water Use Efficiency 56
9.3.2 Public Benefit of the Water Use 57
9.3.3 Sustainable Resource Management 57
9.4 Section 27 (d): The Socio-Economic Impact of the Water Use or Uses if Authorised 58
9.4.1 Of The Water Use or Uses if Authorised 58
9.4.2 Or the Failure to Authorise the Water Use or Uses 59
9.5 Section 27 (e): Any Catchment Management Strategy Applicable to the Relevant Water Resource 59
9.6 Section 27 (f): The Likely Effect of the Water Use to be Authorised on the Water Resource and on Other Water Users 60
9.6.1 Groundwater 60
9.6.2 Risk Mitigation Measures 61
9.7 Section 27 (g): The Class and the Resource Quality Objectives of the Water Resource 62
9.8 Section 27 (h): Investments Already made and to be made by the Water User in Respect to the Water Use in Question 64
9.9 Section 27 (i): The Strategic Importance of the Water Uses to Be Authorised 64
9.10 Section 27 (j): The Quality of Water in the Water Resource Which May Be Required for the Reserve and for Meeting International Agreements 65
9.11 Section 27 (k): The Probable Duration of Any Undertaking or which a Water Use is to be Authorised 66
10 CONCLUSION 66
11 REFERENCES 68

LIST OF FIGURES

Figure 1-1: Regional Location and Geological Context of the Block Meat Company 11
Figure 1-2: Site Location of the Block Meat Company 12
Figure 2-1: Process Flow Diagram of the Borehole and Municipal Water Supply and Treatment System 16
Figure 4-1: Rainfall and Temperatures (source www.meteoblue.com) (GCS, 2023) 23
Figure 4-2: Regional Setting and Local Geology (GCS, 2023) 24
Figure 5-1: Groundwater Elevation: Surface Elevation Correlation (GCS, 2023)..... 28
Figure 5-2: Local Hydrogeology (GCS, 2023) 29
Figure 5-3: Boreholes within a 5 km radius of the Project Site, Estimated Groundwater Elevation and Flow Direction Map (GCS, 2023) 30
Figure 7-1: Site Water Balance Diagram illustrating Water Inputs, Usage, Treatment and Discharge 47

LIST OF TABLES

Table 1-1: Property Details 13
Table 1-2: Applicant Details 13
Table 1-3: Details of the Water Use Licence Consultant 13
Table 2-1: Section 21 Water Use to be included in the Water Use Licence Application 17
Table 3-1: Water Use being Applied For 21
Table 5-1: Boreholes within a 5 km Radius of the Project Site (GCS, 2023)..... 27
Table 5-2: Quaternary Catchment C21D Groundwater Reserve (GCS, 2023) 31
Table 5-3: Delineated Sub-catchment Information Summary (GCS, 2023)..... 31
Table 5-4: Delineated Sub-catchment Recharge Summary (GCS, 2023)..... 32
Table 5-5: Delineated Sub-catchment Groundwater Contribution to Baseflow Summary ... 33
Table 5-6: Delineated Sub-catchment Groundwater Balance and Reserve Determination .. 34
Table 5-7: Groundwater Quality Results 35
Table 6-1: Proposed Criteria and Rating Scales to be used in the Assessment of the Potential Impacts 37
Table 6-2: Explanation of Assessment Criteria 38
Table 6-3: Summary of the radius of influence for borehole BH2 (GCS, 2023)..... 40
Table 6-4: Guide for Determining the Level of Stress of a Groundwater Resource Unit (GCS, 2023)..... 41
Table 6-5: Potential Impacts in the Operational Phase and Proposed Mitigation Measures . 43
Table 7-1: Water Use and Environmental Management Plan 49
Table 7-2: Proposed Monitoring Frequency (GCS, 2023) 51
Table 9-1: Quaternary catchment C21D groundwater reserve (GCS, 2023) 61
Table 9-2: Groundwater sampling was undertaken from BH2 (GCS, 2023) 63

LIST OF APPENDICES

APPENDIX A: CURRICULUM VITAE AND QUALIFICATIONS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER 69
APPENDIX B: HYDROGEOLOGICAL ASSESSMENT REPORT 70
APPENDIX C: PUBLIC PARTICIPATION REPORT 71
APPENDIX D: CITY OF EKURHULENI MUNICIPAL APPROVAL 72

LIST OF ABBREVIATIONS

Abbreviation	Description
B-BBEE	Broad-Based Black Economic Empowerment
BH	Borehole
BHN	Basic Human Needs
CMS	Catchment Management Strategy
CSI	Corporate Social Investment
DTM	Digital Terrain Model
DWS	Department of Water and Sanitation
ELWU	Existing Lawful Water Use
EWR	Ecological Water Requirements
GA	General Authorisations
GCS	GCS Environment South Africa (Pty) Ltd
GRDM	Groundwater Resource Directed Measures
IWRM	Integrated Water Resource Management
MAE	Mean Annual Evaporation
MAP	Mean Annual Precipitation
NGA	National Groundwater Archive
NGO	Non-Governmental Organisations
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PPP	Public Participation Process
SCM	Site Conceptual Model
SDG	Sustainable Development Goals
SMME	Small, Medium and Micro Enterprises
SRTM	Shuttle Radar Topography Mission
UV	Ultraviolet
VOCMA	Vaal-Orange Catchment Management Agency
WARMS	Water Authorisation Registration and Management System
WMA	Water Management Area
WUL	Water Use Licence
WULA	Water Use Licence Application

UNITS OF MEASUREMENT

Unit of Measure	Description
ha	Hectares
km	Kilometres
kl	Kilolitre
l	Litres
m	Metres
m^3	Cubic metres
m^3/a	Cubic metres per annum (per year)
mamsl	metres above mean sea level
mbgl	metres below ground level

Unit of Measure	Description
mm	Millimetres
mm/a	Millimetres per annum
%	Percentage
°C	Degrees Celsius

1 INTRODUCTION

1.1 Activity Background

The Block Meat Company (Pty) Ltd (Block Meat), a subsidiary of the Shoprite Group, operates a 24-hour meat processing facility in Apex, Benoni, within the City of Ekurhuleni in the Gauteng Province. As a food-for-human-consumption processing facility, Block Meat is legally obliged to comply with strict food safety regulations. To ensure uninterrupted processing, sanitation and hygiene, the facility requires a reliable and continuous water supply. In addition to municipal water, the applicant has developed a borehole on site to supplement municipal supply and to maintain operations during periods of municipal service interruption.

The Block Meat Company therefore seeks to apply for a new Water Use Licence (WUL) to authorise the abstraction of groundwater as a supplementary water source. This is critical to sustaining operational continuity, particularly in view of increasing municipal service delivery challenges that result in regular water supply disruptions.

The proposed water use involves the abstraction of groundwater from an existing borehole located on site at the Block Meat Company facility. Two boreholes (BH1 and BH2) have been drilled on site; however, BH1 is dry, while BH2 is equipped and operational. Block Meat proposes to use groundwater abstracted from BH2 to supplement the processing plant's existing water supply.

The abstraction of groundwater from a borehole constitutes a water use in terms of Section 21(a) of the National Water Act, 1998 (Act No. 36 of 1998) (NWA). The Block Meat Company has therefore appointed GCS Environment South Africa (Pty) Ltd (GCS) to prepare this Technical Report in support of the Water Use Licence Application (WULA).

1.1.1 Regional Setting and Location of Activity

The application area is situated approximately 15 kilometres (km) north-east of the town of Benoni, within the Apex Industrial Area in the City of Ekurhuleni Metropolitan Municipality, Gauteng Province. The regional (and geological) setting and site location of the Project area are illustrated respectively in Figure 1-1 and Figure 1-2.

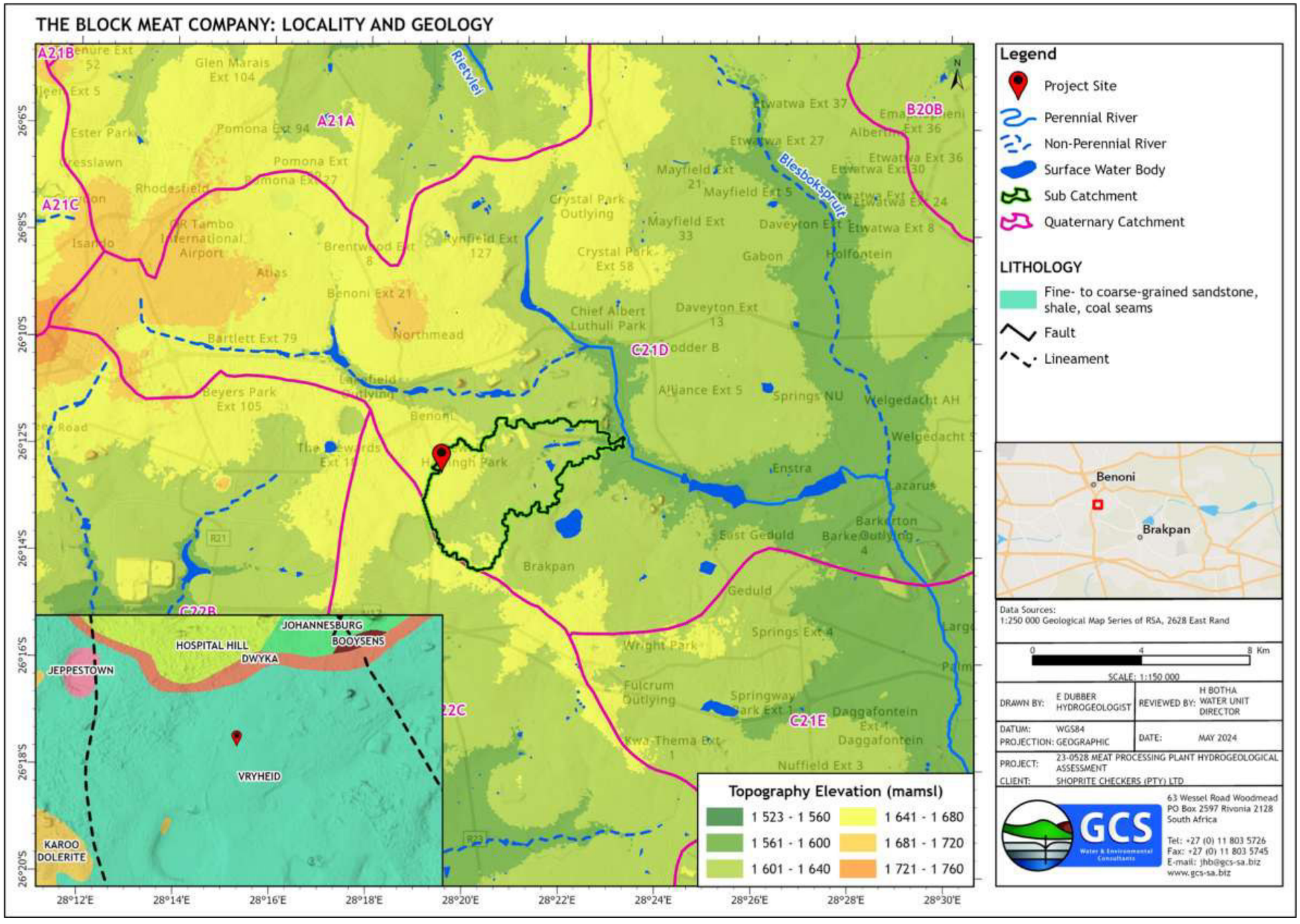


Figure 1-1: Regional Location and Geological Context of the Block Meat Company



Figure 1-2: Site Location of the Block Meat Company

1.1.2 Property Description

The Project is located on Erf 451 Portion 0 Apex Extension 0. The cadastral details of the properties where the water uses will take place are listed in Table 1-1.

Table 1-1: Property Details

Farm Name	ERF 451 Portion 0 IR
Application Area (ha)	~2.99
Magisterial District	City of Ekurhuleni Metropolitan Municipality
Distance and Direction from Nearest Town	15 km to the northeast of the town of Benoni
Title Deed Number	T14705/2015
21 Digit Surveyor	T0IR00190000045100000

1.1.3 Purpose of this Report

A WUL Technical Report is prepared to support an application under the NWA. Its purpose is to demonstrate that proposed water uses are lawful, sustainable, and will be well-managed. The report outlines the current condition of surface and groundwater resources, assesses potential impacts, and applies risk tools to identify and mitigate threats to water quality and quantity. It also shows alignment with national and catchment strategies while addressing socio-economic benefits. The report provides the Department of Water and Sanitation (DWS) with the technical evidence needed to make an informed licensing decision.

1.2 Contact Details

The contact details of the applicant, Block Meat Company, and the appointed water use consultant, GCS, are provided in Table 1-2 and Table 1-3.

1.2.1 Details of the Applicant

Table 1-2: Applicant Details

Company Name	The Block Meat Company
Telephone Number	011 741 3008
Contact Person	Lance Van Der Sandt
Email Address	lvdsandt@shoprite.co.za
Physical Address	20 Dunedin Street, Apex, Benoni, 1501

1.2.2 Environmental Consultant

Table 1-3: Details of the Water Use Licence Consultant

Company Name	GCS Environment South Africa (Pty) Ltd
Telephone Number	011 803 5726
Contact Person	Paula Tolksdorff
Email Address	paulat@gcs-sa.biz
Postal Address	PO Box 2597, Rivonia,2128
Physical Address	63 Wessel Road, Rivonia, 2128

The Curriculum vitae and qualifications of the Environmental Assessment Practitioner is attached as APPENDIX A.

2 CONTEXTUALISATION OF ACTIVITY

2.1 Description of Activity

Block Meat is a wholesale meat supplier based in Apex, Benoni, Gauteng. The company

specialises in the large-scale distribution of various meat products to retailers, restaurants, butcheries, and catering businesses. Operating within the wholesale trade sector, Block Meat focuses on sourcing, processing, and supplying quality meat products in bulk rather than direct retail sale to consumers. The operations are designed to ensure a consistent supply of fresh and processed meats to commercial clients across the region.

As part of the Shoprite Group, Africa's largest supermarket retailer and South Africa's largest private sector employer, Block Meat plays a vital role in supporting the Group's food processing and distribution network. Groundwater abstraction from this on site borehole will underpin the facility's ability to maintain high hygiene standards, ensure food safety and sustain uninterrupted production, particularly in a region where municipal water supply is subject to periodic challenges. This ensures operational resilience while reducing dependence on municipal infrastructure.

The lawful registration of this borehole aligns with Shoprite's broader sustainability strategy, which integrates resource efficiency, risk mitigation and environmental stewardship. By securing a reliable groundwater supply, the facility contributes to alleviating pressure on public water infrastructure, thereby supporting both corporate operational continuity and the sustainability of the wider community.

From an economic perspective, the continued lawful use of the borehole is essential for maintaining employment, supporting local procurement, and strengthening the regional food value chain. The facility's uninterrupted operation safeguards jobs, supports inclusive economic growth and ensures the stability of supply within the food processing sector.

Beyond operational and economic benefits, the authorised groundwater use supports Shoprite's Corporate Social Investment (CSI) initiatives, including hunger relief programmes, youth employment projects and small business development. These initiatives contribute to national development priorities and advance several United Nations Sustainable Development Goals (SDGs), including SDG 2 (Zero Hunger), SDG 6 (Clean Water and Sanitation) and SDG 8 (Decent Work and Economic Growth).

2.2 Extent of the Activity

The Block Meat Company covers an operational footprint of approximately 2.99 hectares (ha).

2.3 Key Activity Related Processes and Products

The proposed water supply and treatment system comprises several integrated components designed to ensure a reliable and continuous supply of potable-quality water to the processing plant. The system begins with a single borehole drilled to a depth of approximately 160 metres (m) below ground level that serves as a primary groundwater abstraction point. Abstracted borehole water is initially conveyed to four 20 000 litre (l) storage tanks, which provide bulk raw water storage and buffer capacity to accommodate fluctuations in

abstraction rates and operational demand.

Municipal water and borehole (BH) 2 water are incorporated into the system to supplement supply resilience. Both municipal water and borehole water undergo treatment through a duplex water softening system, which operates in parallel to remove hardness-causing minerals, protect downstream infrastructure and ensure uninterrupted operation during maintenance or regeneration cycles.

Following softening, the treated borehole and municipal water is stored in a second set of four 20 000 l tanks, allowing for blending, operational flexibility and adequate reserve capacity. Prior to distribution to the processing plant, the stored water is passed through two G-Chem ultraviolet (UV) treatment systems, which provide final disinfection by destroying microbial contaminants and other impurities.

The combined treatment process improves overall water quality and ensures the supply of water that is suitable for safe consumption, hygiene and food processing requirements. The fully treated water is then supplied directly to the processing plant, supporting continuous operations, sanitation and hygiene requirements essential for a 24-hour meat processing facility. Figure 2-1 provides the key components and process flow of the proposed water supply and treatment system, from groundwater abstraction and storage through to treatment and final supply to the processing plant.

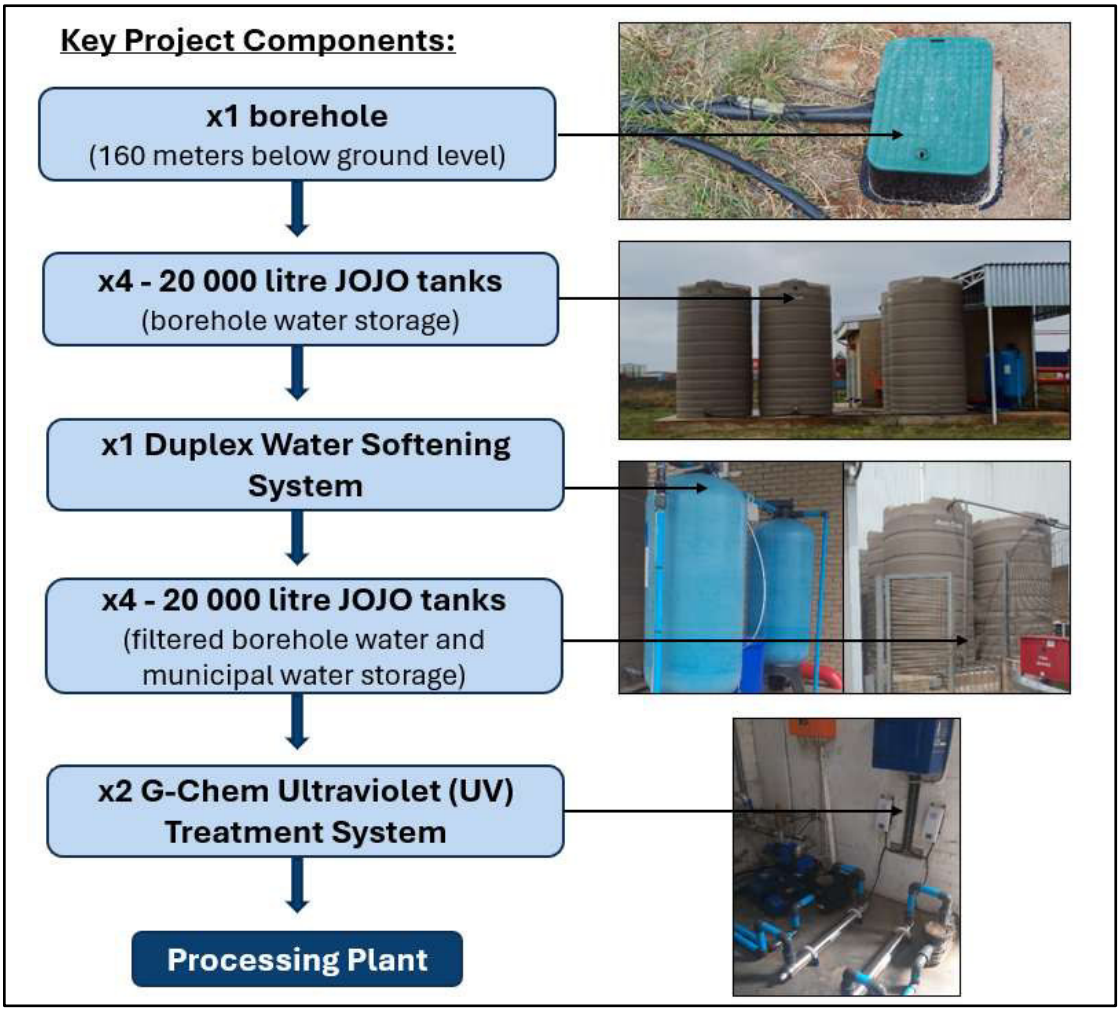


Figure 2-1: Process Flow Diagram of the Borehole and Municipal Water Supply and Treatment System

2.4 Activity Life Description

The anticipated operational lifespan of the borehole will extend until such time the Block Meat Company ceases its operations at the present location.

2.5 Key Water Uses

The key proposed water uses at the Block Meat Company comprise only Section 21(a) water use in terms of NWA.

Groundwater is abstracted from an existing borehole on the property to support the operational water requirements of the wholesale meat processing facility. Wastewater generated during meat processing activities is directed through fat traps to remove fats, oils and grease prior to discharge into the municipal sewage reticulation network for further treatment at the municipal wastewater treatment works.

The proposed WULA is limited to the Section 21(a) water use identified inTable 2-1. The discharge of wastewater into the municipal sewage reticulation network does not constitute

a separate Section 21 water use, provided that the discharge is undertaken in accordance with the applicable municipal requirements and approvals.

Table 2-1: Section 21 Water Use to be included in the Water Use Licence Application

Water Use	Description
Section 21 (a) Taking water from a water resource.	Groundwater is abstracted from a borehole on the property for use in supporting the food processing facility.

2.6 Organisational Structure of Activity

Block Meat bears ultimate responsibility for the implementation of the Water Management Plan and for ensuring compliance with all conditions set out in the WUL. Within this framework, Block Meat has established a clear operational management structure to ensure accountability, efficiency and effective communication across all functional areas. The structure is summarised below.

Top-Level Governance

- Board of Directors
    - Responsible for the Group's strategic direction and corporate governance.
- Independent Chairman
    - Leads the Board.
    - Currently Wendy Lucas-Bull.
- Board Committees
    - Audit and Risk Committee.
    - Remuneration Committee.
    - Nomination Committee.
    - Social and Ethics Committee.

Executive Management Team

- Group Chief Executive Officer – Pieter Engelbrecht.
    - Overall leadership and accountability for organisational performance.
- Chief Financial Officer – Anton de Bruyn.
    - Financial planning, reporting and risk management.
- Chief Operating Officer
    - Oversight of day-to-day operations and supply chain management.
- Chief People Officer – Athene Van Mazijk.

- Human resources management and employment equity.

- Chief Marketing Officer
  - Brand management and marketing strategy.

Divisional and Regional Management

- Divisional Managers
  - Supermarkets (South Africa).
  - Supermarkets (Non–South Africa).
  - OK Franchise.
  - Furniture Division (currently held for sale).
- Regional Managers
  - Supervise multiple stores within defined geographic regions.
  - Ensure operational efficiency, compliance and performance alignment.

Operational Level

- Store Managers
  - Responsible for daily operations of individual stores.
  - Staff management and customer service oversight.
- Department Managers
  - Supervision of specific in-store departments, including:
    - Deli.
    - Bakery.
    - Money Market.
- Front-line Employees
  - Cashiers.
  - Shelf-packers.
  - Customer service staff.

2.7 Business and Corporate Policies

2.7.1 Corporate Governance Framework

The organisation operates within a structured corporate governance framework that is aligned with the principles of the King IV™ Report on Corporate Governance for South Africa

(Shoprite Holdings Ltd, 2025a). This approach is informed by the documented application of King IV principles (Shoprite Holdings Ltd, 2025a) by the organisation, which emphasises ethical leadership, accountability, transparency and responsible corporate citizenship.

The Board of Directors is the highest governing body and is responsible for setting the strategic direction of the organisation, ensuring ethical and effective leadership and overseeing compliance with applicable legislation, regulations and non-binding codes, as outlined in the King IV governance framework (Shoprite Holdings Ltd, 2025a). Formal board charters, policies and delegation-of-authority frameworks are in place to define roles, responsibilities and accountability across the organisation, as described in the Application of the King IV™ Code Principles (Shoprite Holdings Ltd, 2025b).

2.7.2 Ethical Conduct and Organisational Ethics

The organisation is committed to maintaining high standards of ethical conduct and integrity in all its activities. This commitment is guided by an organisation-wide Code of Ethics, as referenced in the Application of the King IV™ Code Principles (Shoprite Holdings Ltd, 2025a) which applies to all employees and members of the Board and provides guidance on ethical behaviour, decision-making and compliance with legal and internal policy requirements.

Ethical governance is further supported through formal oversight structures, including mechanisms for monitoring ethical performance and managing ethical risks such as fraud, corruption and misconduct, as described under the organisational ethics principles of King IV. Confidential reporting mechanisms are in place to allow employees and third parties to report unethical or unlawful behaviour, with appropriate investigation and corrective action undertaken where necessary (Shoprite Holdings Ltd, 2025b).

2.7.3 Social and Ethics Oversight

A formally constituted Social and Ethics Committee assists the Board in overseeing social, ethical, environmental and sustainability-related matters. The committee is established in terms of Section 72(4) of the Companies Act, 2008 and operates in accordance with the approved Social and Ethics Committee Charter (Shoprite Holdings Ltd, 2025b).

As outlined in the Social and Ethics Committee Charter Shoprite Holdings Ltd (2025b), the committee's mandate includes oversight of the organisation's performance and compliance in relation to:

- Social and economic development.
- Good corporate citizenship.
- Environmental responsibility.
- Health and public safety.

- Labour and employment practices.
- Transformation and equality.
- Ethical governance.
- Sustainability and stakeholder engagement.

2.7.4 Environmental Responsibility

Environmental stewardship forms part of the organisation's commitment to responsible corporate citizenship, as articulated in both the Application of the King IV™ Code Principles (Shoprite Holdings Ltd, 2025a) and the Social and Ethics Committee Charter (Shoprite Holdings Ltd, 2025b). Oversight structures are in place to monitor compliance with applicable environmental legislation and to assess the environmental impacts of business activities.

In accordance with the Social and Ethics Committee Charter (Shoprite Holdings Ltd, 2025b) the organisation monitors environmental compliance and the impacts of its operations on natural resources, including water resources. Measures are implemented to minimise adverse environmental impacts, promote sustainable resource use and ensure appropriate disclosure of environmental performance.

2.7.5 Compliance and Risk Management

The organisation maintains formal compliance and risk governance frameworks, as described in the Application of the King IV™ Code Principles (Shoprite Holdings Ltd, 2025a; Shoprite Holdings Ltd, 2025b) to ensure adherence to applicable laws, regulations and standards. The Board retains ultimate responsibility for compliance governance, with oversight of risk management and regulatory compliance delegated to relevant board committees.

Compliance risks, including those associated with water use, groundwater abstraction and environmental authorisations, are identified, monitored and managed through internal controls, reporting mechanisms and enterprise risk management processes aligned with King IV principles (Shoprite Holdings Ltd, 2025a).

2.7.6 Stakeholder Engagement and Reporting

A stakeholder-inclusive approach is adopted in line with the principles set out in the Application of the King IV™ Code Principles (Shoprite Holdings Ltd, 2025a). The organisation seeks to balance the needs and expectations of regulators, employees, surrounding communities and other interested and affected parties (I&APs) through transparent and effective communication (Shoprite Holdings Ltd, 2025b).

3 REGULATORY WATER FRAMEWORK

3.1 Summary of all Water Uses

Water resources in the Republic of South Africa are regulated under the NWA. The Minister

of Water and Sanitation is the custodian of all water resources in the country, acting on behalf of the people of South Africa.

Under the NWA, it is an offence to pollute any water resource or render it unfit for use, including rainwater, seawater and groundwater. Additionally, all water uses identified under Section 21 must be authorised in accordance with Section 40 of the Act. Details of the applicable water use requiring authorisation are provided in Table 3-1.

Table 3-1: Water Use being Applied For

The Block Meat Company - Water Uses					
Water uses	**Description**	**Coordinates**		**Property Details**	**Volume/Capacity Applied (m^3/a)**
		Latitude	**Longitude**		
Section 21 (a): Taking water from a water resource					
1	Abstraction of groundwater from a borehole	26° 12' 36.64" S	28° 19' 28.38" E	Town Apex Ext 4, Erf 451, Ptn 0	5,000 m^3/a

3.2 Existing Lawful Water Uses

Existing Lawful Water Use (ELWU) is defined in Section 32 of the NWA as any water use that occurred during the two years immediately preceding the commencement of the Act (1 October 1998), or which has subsequently been declared lawful under Section 33 and which was authorised by or under any previous legislation.

The water use associated with Block Meat does not constitute an ELWU in terms of Section 32. Accordingly, Block Meat Company is applying for a new WUL to authorise water use that supplements the municipal supply. This is critical to ensuring a reliable supply of water for food processing, sanitation and hygiene particularly in light of increasing municipal service delivery challenges leading to regular water supply disruptions

3.3 Relevant Exemptions

No exemptions are applicable to this application.

3.4 Generally Authorised Water Uses

General Authorisations (GAs) permit certain low impact water uses to be undertaken without a licence, provided all specified conditions are met. These serve as conditional exemptions from licensing. The water uses associated with the borehole do not meet the requirements of any applicable GA and, as such, will require a WUL.

3.5 New Water Uses to be Licenced

The water use triggered for the Block Meat Company require authorisation in terms of Section 21 (a) of the NWA. The following water use has been identified for authorisation:

- Section 21(a) – Taking water from a water resource:
    - Abstraction of water from a borehole. The total abstraction from the borehole is 5,000 m^3/a.

3.6 Other Authorisations

The Block Meat Company has obtained written approval from the City of Ekurhuleni Water and Sanitation Department for the use of the borehole at Erf 451, 20 Dunedin Street, Apex, Benoni. The approval, dated 18 August 2026 and formally endorsed on 4 September 2026, is subject to conditions including biannual groundwater quality monitoring, restrictions on potable use and prevention of cross-connections with the municipal water supply system.

The municipal approval does not replace the requirement for water use authorisation in terms of Section 21(a) of the NWA.

A copy of the municipal approval is included in APPENDIX D.

4 PRESENT ENVIRONMENTAL SITUATION

This information is sourced from the Geohydrological Assessment compiled by GCS (GCS, 2023), attached in APPENDIX B.

4.1 Climate

The Köppen Climate classification suggests the Project site is situated in an oceanic subtropical highland climate (Cwb) area that receives rainfall in the summer months (December until March). The site falls within rainfall area C2A, which has a Mean Annual Precipitation (MAP) of 697.98 millimetres per annum (mm/a). Precipitation is the lowest in July with an average of 2 mm, with the highest rainfall occurring during the summer months peaking at 142 mm during December. At a mean daily maximum temperature of 27 °C, November, December, January and February are the hottest months of the year. June and July are the coldest months of the year with a mean daily maximum temperature of 18 °C. The Mean Annual Evaporation (MAE) is in the order of 1,625 mm/a(S-Pan) for the catchment. Temperature and rainfall distribution for the area is shown in Figure 4-1.

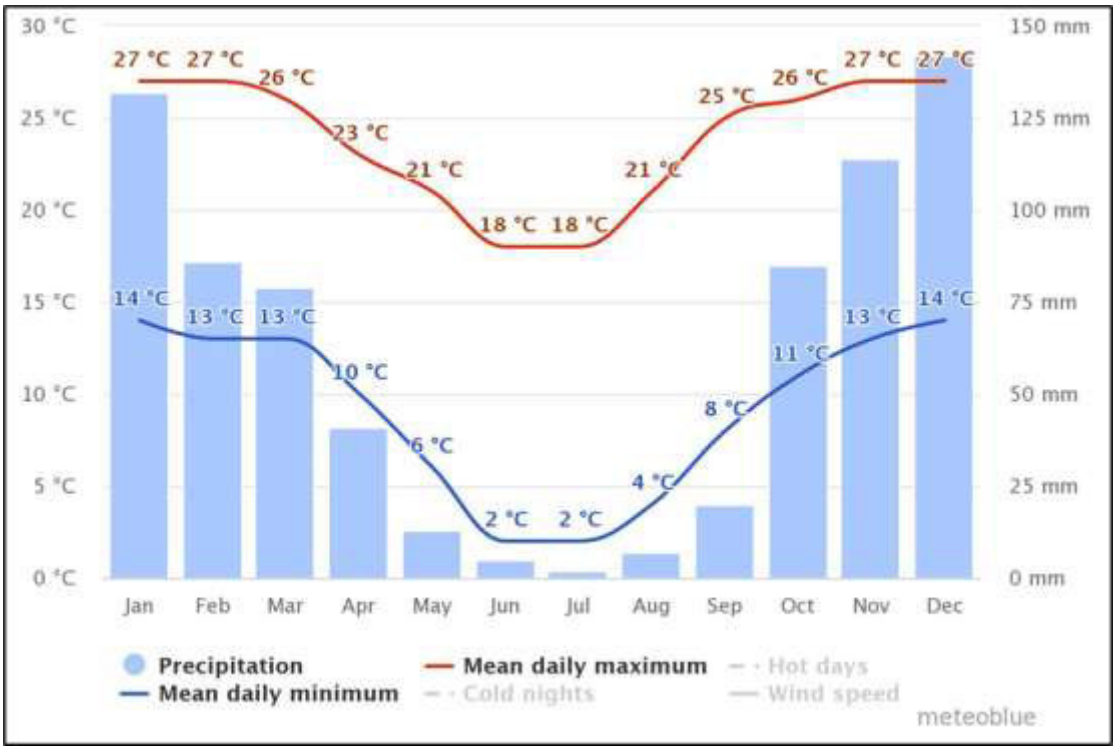


Figure 4-1: Rainfall and Temperatures (source www.meteoblue.com) (GCS, 2023)

4.2 Topography

The site is located along the eastern boundary of quaternary catchment C21D within the Upper Vaal Water Management Area. The surface topography indicates slightly undulating plains that drain towards the east. The regional surface elevation ranges from 1,760 metres above mean sea level (mamsl) in the west to 1,561 mamsl in the east, while locally it ranges from 1,656 and 1,655 mamsl.

Surface drainage from the site is towards the Blesbokspruit in the east, which drains south until it joins with the Suikerbosrand River, a tributary of the Vaal River. The Block Meat site falls well outside of any 500 m buffers around surface water bodies.

4.3 Local Geology

The 2628 East Rand – 1:250 000 Geological map series (Department of Mineral and Environmental Affairs [DMEA], 1998) and the 2628AB Benoni – 1:50 000 Geological Series (Council for Geoscience, 2007) indicate the local geology is characterised by fine- to coarse-grained sandstone and shale of the Vryheid Formation in the Ecca Group of the Karoo Sequence (refer Figure 4-2). The geophysical surveys and hydrogeological drilling confirmed that at the Block Meat Company, the sandstones are overlain by ~100 m thick Quartzite.

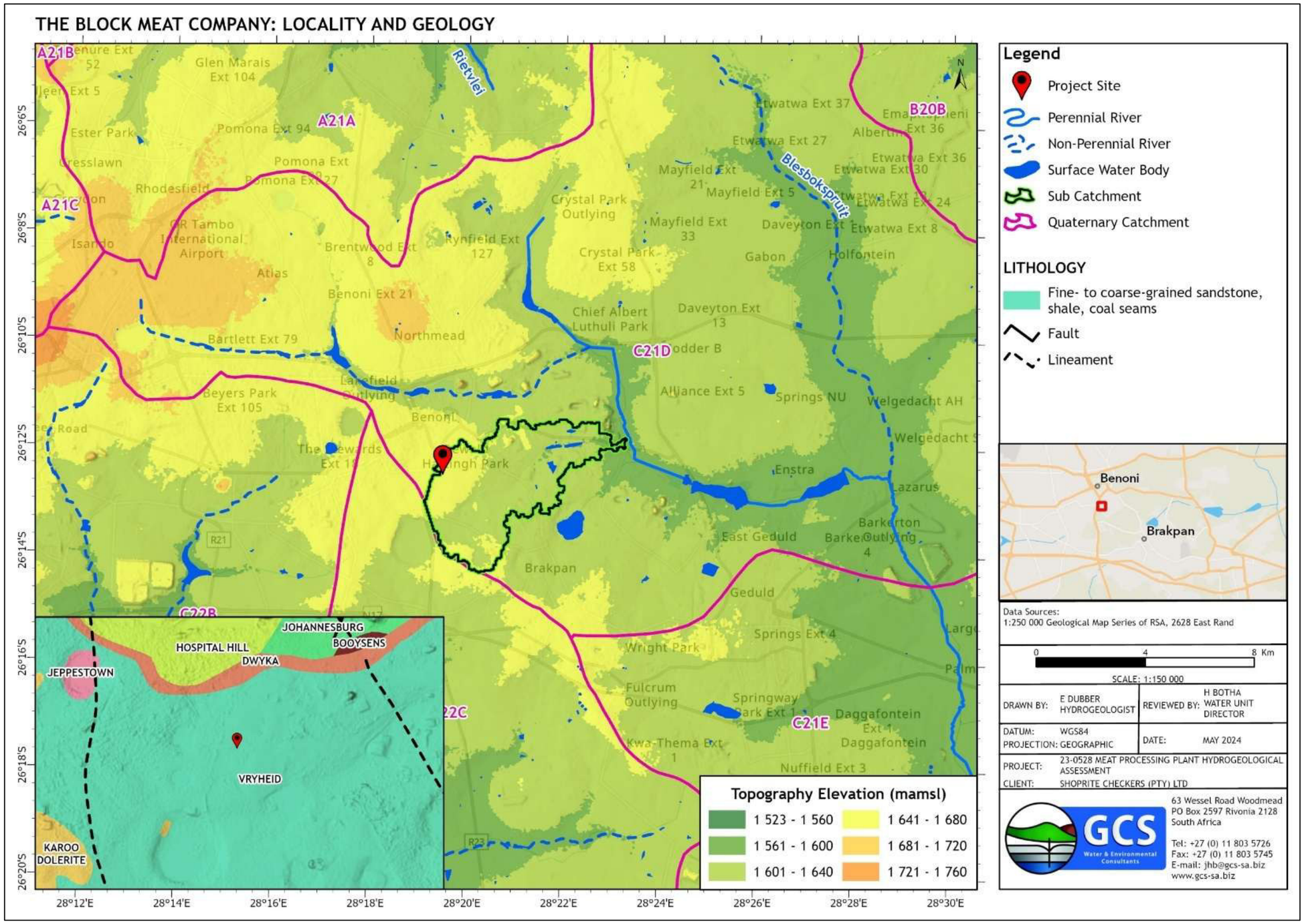


Figure 4-2: Regional Setting and Local Geology (GCS, 2023)

4.4 Socio-Economic Environment

The Block Meat Company is located within the City of Ekurhuleni Metropolitan Municipality in Gauteng, South Africa. Ekurhuleni forms part of the Gauteng City Region and is an important industrial, manufacturing, commercial and logistics centre. Its strategic location and established transport infrastructure support industrial development, freight movement and access to regional and national markets. The municipality's economic development planning prioritises inclusive economic growth, investment, industrial development and job creation (City of Ekurhuleni, 2021); (City of Ekurhuleni, 2025).

4.4.1 Population Characteristics

According to Census 2022, the City of Ekurhuleni had a population of approximately 4,066,691 people living in 1,421,003 households. The municipality covers approximately 1,975 km^2 and has a population density of about 1,609 people per km^2. These figures indicate that Ekurhuleni is a densely populated metropolitan area with substantial demand for housing, municipal services, transport and employment opportunities (Statistics South Africa, 2023); (City of Ekurhuleni, 2024).

The municipal population includes communities with different socio-economic circumstances, ranging from established suburban and industrial areas to densely populated townships and informal settlements. Population and household characteristics vary considerably across the municipality (City of Ekurhuleni, 2024).

4.4.2 Economic Activities

The economy of Ekurhuleni is strongly associated with manufacturing, industrial production, logistics, trade and business services. The municipality benefits from its location within Gauteng and its established road, freight and aviation infrastructure. Manufacturing and related industrial activities remain important contributors to economic output and employment, while the City continues to promote investment, enterprise development, skills development and job creation (City of Ekurhuleni, 2021); (City of Ekurhuleni, 2025).

Benoni forms part of this wider metropolitan economy. The Apex industrial area contains industrial properties and businesses, reflecting its role in accommodating industrial and commercial land uses. The location of the Block Meat Company within this setting is consistent with the area's established industrial character. The meat processing and associated activities at the facility form part of the broader food supply and commercial value chain.

4.4.3 Education

Education and skills development are important components of the socio-economic development priorities of the City of Ekurhuleni. The municipality identifies skills development, enterprise support and employment creation as measures intended to improve

livelihoods and promote inclusive economic growth (City of Ekurhuleni, 2025).

Census 2022 provides information on educational attainment across the municipality, including school attendance and the highest level of education completed. These indicators provide a broad understanding of the potential labour force and skills base available within the metropolitan area (Statistics South Africa, 2023). The presence of manufacturing, logistics, commercial and food-related businesses in the wider metropolitan economy creates demand for a range of skills, including technical, administrative, operational and production-related competencies.

4.4.4 Employment

Employment creation is a key socio-economic priority for the City of Ekurhuleni. The municipality's economic development programmes focus on promoting investment, supporting small businesses, developing skills and addressing unemployment. These priorities reflect the importance of strengthening the local economy and expanding access to employment opportunities (City of Ekurhuleni, 2025).

The metropolitan economy includes employment opportunities in manufacturing, logistics, trade, business services and other industrial activities. Businesses operating in established industrial areas such as Apex contribute to the wider production and commercial economy. Nevertheless, the extent to which individual businesses support local employment depends on their workforce size, recruitment practices and operational requirements. Census 2022 provides a baseline for assessing employment and labour-market conditions across Ekurhuleni (Statistics South Africa, 2023).

5 SPECIALIST FINDINGS

5.1 Groundwater Assessment

This information is sourced from the Geohydrological Assessment compiled by GCS (GCS, 2023), attached in APPENDIX B.

5.1.1 Aquifer Characteristics, Classification and Groundwater Recharge

The 1:500,000 Hydrogeological map series 2526 Johannesburg (Figure 5-2) was reviewed to present the hydrogeological characterisation of the Project area. The map indicates that the aquifer underlying the Block Meat site can be regarded as a low to moderate-yielding intergranular and fractured aquifer, with reported yields ranging from 0.1 to 0.5 l/sec - Class D2 aquifer. Groundwater occurrence is typically associated with weathered and fractured sedimentary rocks (Vegter, J.R., Ward, S. & Winter, P.R, 1968).

Recharge to the underlying aquifer is estimated to be in the order of 2.8% of the MAP (698 mm) that falls within quaternary catchment C21D (DWS, 2020). The aquifer is considered an important contributor to groundwater baseflow to streams and rivers (Barnard H.C, 2000).

5.1.2 Depth to Groundwater

A field hydrocensus was conducted within 2.5 km of the Project site and no boreholes were located on site. This is because most households and industries around this area are dependent on municipal water supply. A review of the National Groundwater Archive (NGA) database indicated that 10 registered boreholes are situated within a 5 km radius of the Project site, of which six are located within quaternary catchment C21D (Figure 5-2). Only four of the available 10 boreholes have water level information and Table 5-1 lists the available information on the boreholes in the area according to the NGA.

Table 5-1: Boreholes within a 5 km Radius of the Project Site (GCS, 2023)

Borehole ID	Latitude	Longitude	Farm Name	Water Level (mbgl)	Quaternary Catchment
2628AB00038	-26.19027	28.30803	Benoni	-	C21D
2628AB00040	-26.19028	28.30803	Benoni	-	C21D
2628AB00041	-26.19027	28.30805	Moreshoff School	18.28	C21D
2628AB00480	-26.18138	28.36108	New Modder Ptn Benoni	-	C21D
2628AB00484	-26.19499	28.32914	Van Ryn Landbouhoewes.Ptn Benoni	-	C21D
2628AB00039	-26.19027	28.30804	Benoni	18.28	C21D
2628AB00094	-26.21027	28.28581	Boksburg Ptn Dunswart Wasery	3.6	C22B
2628AB00442	-26.22757	28.28311	Boksburg	10	C22B
2628AB00439	-26.2286	28.29997	Wattville Ptn Ethomeleng	-	C22C
2628AB00440	-26.22138	28.29942	Wattville Ptn Bopanang	-	C22C

The regional groundwater levels range from 3.6 metres below ground level (mbgl) and 18.28 mbgl (average 12.54 mbgl). These shallow groundwater levels indicate the NGA boreholes are drilled into the regional weathered aquifer. Whereas the deep-water level of BH2 on site (120 mbgl) indicates BH2 is drilled into a confined, fractured aquifer (Figure 5-2).

The spatial distribution of the existing boreholes as well as the estimated groundwater elevation in the weathered aquifer around the site is shown in Figure 5-3.Figure 5-1 plots available groundwater elevation data for the area. There is a good relationship (R = 85 %), between groundwater level and surface elevation which suggests that the regional groundwater table mimics the topography. The data suggest that groundwater levels are shallower close to non-perennial and perennial streams, where groundwater contributes to streamflow as baseflow seepage. These areas are typically prominent groundwater-surface water interaction areas. Bayesian interpolation of available groundwater level data was applied to the area to conceptualise the groundwater flow (Figure 5-3).

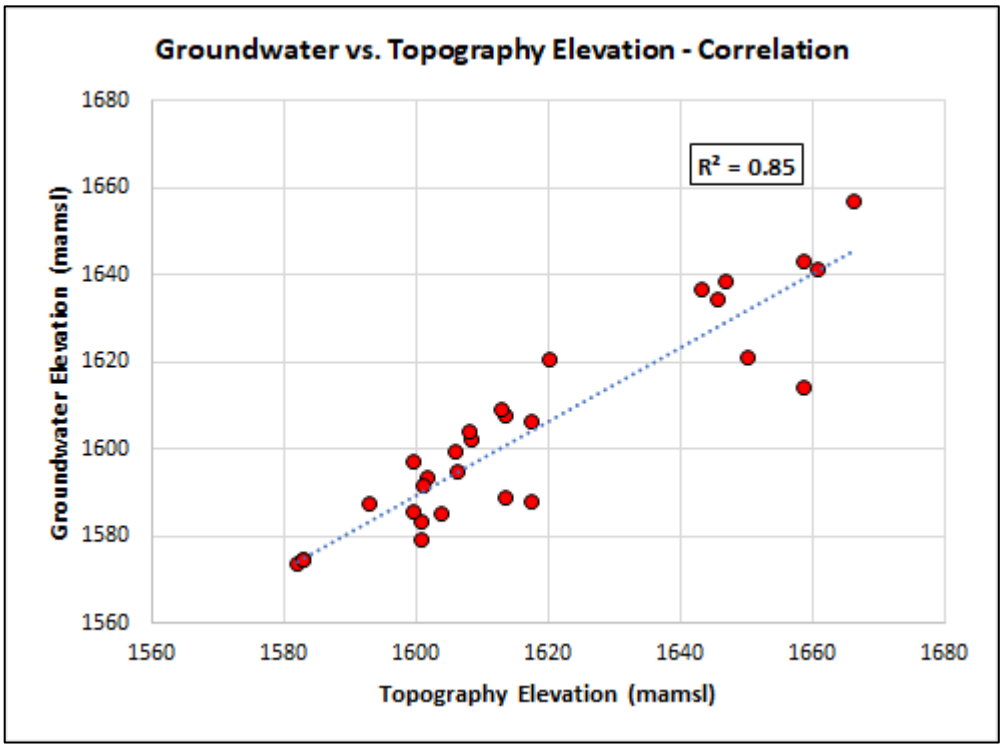


Figure 5-1: Groundwater Elevation: Surface Elevation Correlation (GCS, 2023)

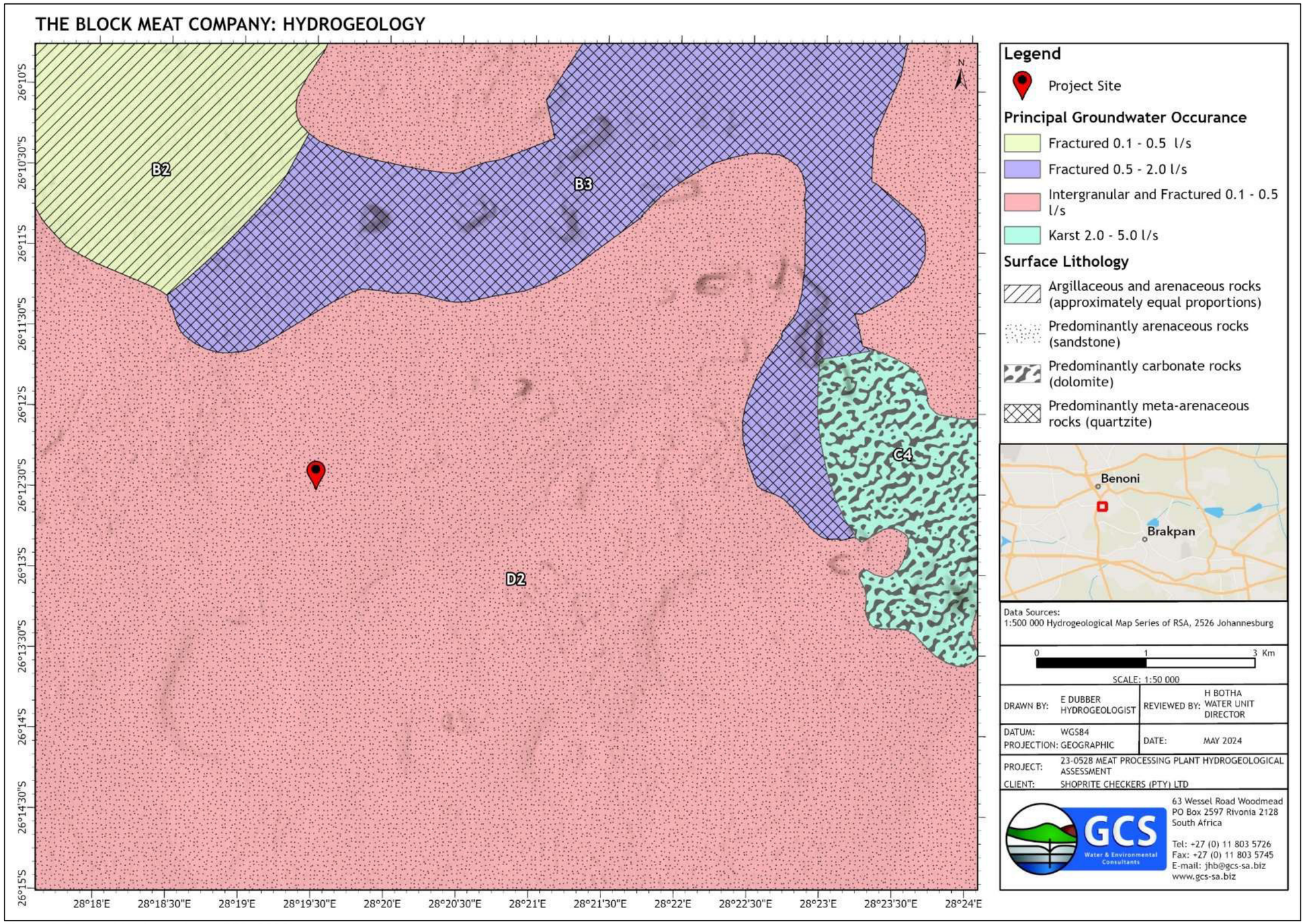


Figure 5-2: Local Hydrogeology (GCS, 2023)

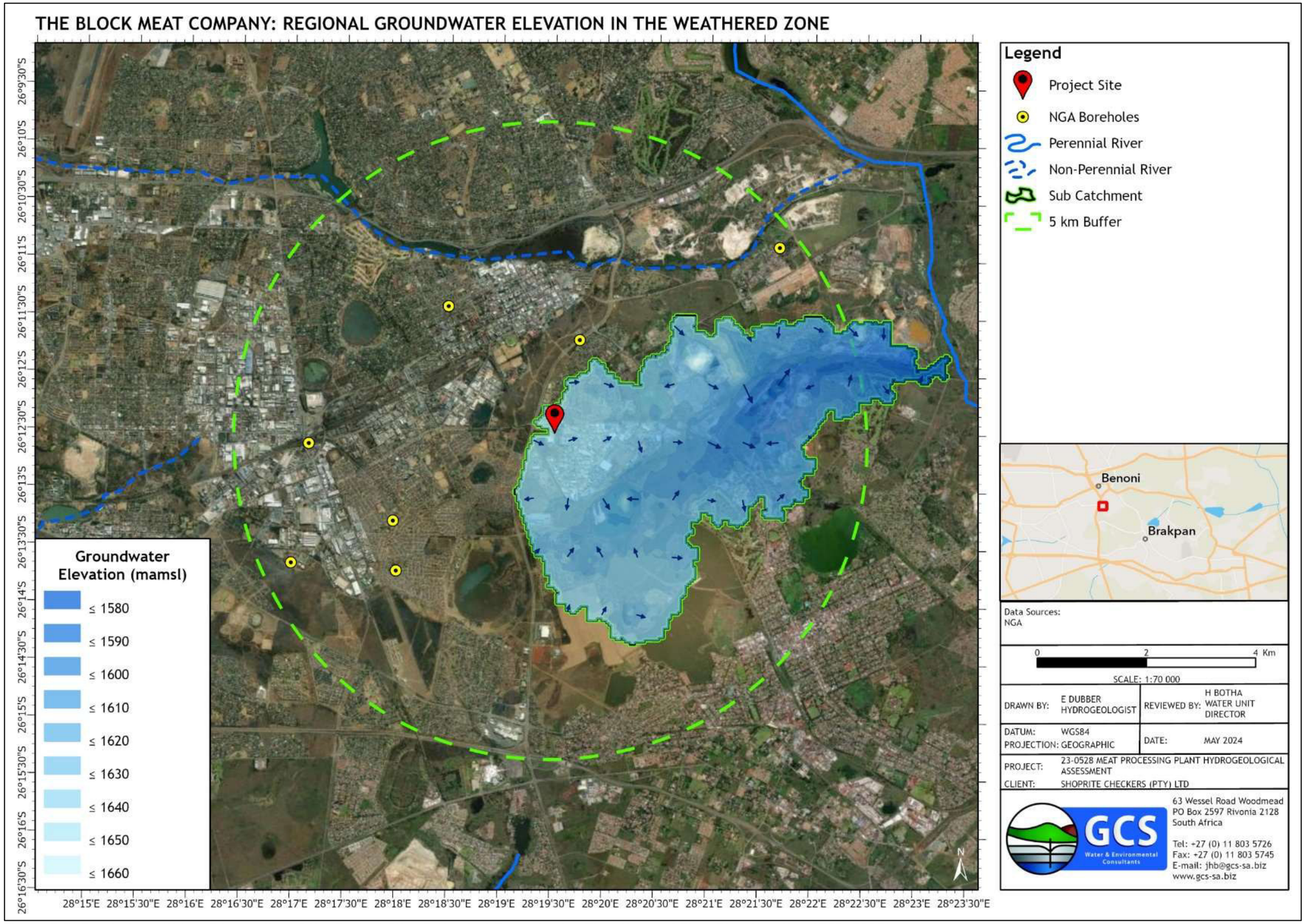


Figure 5-3: Boreholes within a 5 km radius of the Project Site, Estimated Groundwater Elevation and Flow Direction Map (GCS, 2023)

5.1.3 Groundwater Quantity

The DWS conducted a reserve determination for the water resources of the Vaal Water Management Area in terms of Section 16(1) of the NWA (DWS, 2020). The proposed groundwater reserve for quaternary C21D is summarised in Table 5-2. The groundwater reserve for quaternary catchment C21D consists of the volume of groundwater required to satisfy basic human needs and to meet the ecological water requirements through groundwater contribution to baseflow.

Table 5-2: Quaternary Catchment C21D Groundwater Reserve (GCS, 2023)

Quaternary Catchment	Area (km^2)	Mean Annual Precipitation (mm)	Recharge (m^3/a)	Population (minimum level)	Basic Human Needs (m^3/a)	Groundwater Component of Baseflow (m^3/a)	Total Reserve (m^3/a)	Groundwater Use (WARMS, 2024) (m^3/a)	Allocable Groundwater Total (m^3/a)
C21D	446	698	8,560,000	180,660	1,650,000	4,200,000	5,850,000	1,005,735	1,704,265

5.1.3.1 Sub-catchment Delineation

A sub-catchment was delineated with Global Mapper. A 3 Arc Second Resolution Shutter Radar Topography Mission (SRTM) Digital Elevation Model (DTM) was used as input and the drainage systems were delineated for the local area (1:10,000 stream count, with 30 m DEM fill).

The delineated sub-catchment is indicated in Figure 4-2. The total sub-catchment area is 17.91 km^2.

The groundwater reserve determination calculation, scale of abstraction and stress index will focus on the delineated sub-catchment. Table 5-3 presents a summary of the hydrogeological information for the delineated sub-catchment.

Table 5-3: Delineated Sub-catchment Information Summary (GCS, 2023)

Description	Delineated Sub-Catchment	
Surface Area	17.91	[km^2]
Recharge	343,743.50	[m^3/a]
Population	7,254.75	people
Basic Human Need	66,258.97	[m^3/a]
Baseflow	168,659.19	[m^3/a]
Groundwater Use	40,387.25	[m^3/a]
Reserve	234,918.16	[m^3/a]
Reserve as % of Recharge	68%	[%]

Note/s:

[km^2] - squared kilometres

[m^3/a] - cubic metres per annum

[%] – percentage

5.1.3.2 Groundwater Recharge

The effective groundwater recharge from precipitation is the portion of precipitation that reaches the groundwater. The remainder of the precipitation comprises surface water runoff, evapotranspiration and soil moisture. The effective recharge is dependent on the geology, soils, surface runoff and stream morphology but, most importantly for the study area, the effective storage.

Based on values sourced from the Vaal Water Management Area groundwater reserve determination (DWS, 2020), a recharge of 2.8% (8,560,000 m^3/a) of the annual precipitation is estimated. Higher recharge is however expected along geological structural features due to their increased permeability and associated storage. Recharge data used in this study is potential direct recharge only and significant lateral or indirect recharge may occur. The precipitation recharge for the delineated sub-catchment area is described below and is summarised in Table 5-4.

$$\mathbf{Re}_{Catchment\ Area} = \mathbf{Re}_{\%MAP} \times \mathbf{Area}_{Catchment\ Area}$$

Where:

- $Re_{\%MAP}$ = Recharge (2.8 % of MAP) [mm/a] for the delineated catchment area
- $Area_{Catchment\ Area}$ = Area [m^2]

Table 5-4: Delineated Sub-catchment Recharge Summary (GCS, 2023)

Description	Delineated Sub-Catchment	
Total Recharge (~2.8% of MAP)	8,560,000	[m^3/a]
Delineated Catchment Area	17,910,000	[m^2]
Delineated Catchment Recharge	343,743.50	[m^3/a]

Note/s:

MAP - Mean Annual Precipitation

[m^2] - squared metres

[m^3/a] - cubic metres per annum

5.1.3.3 Existing Groundwater Usage

According to the latest available information from the Water Authorisation Registration and Management System (WARMS) database (May 2024), the volume of groundwater allocated within quaternary catchment C21D is in the order of 1,005,735 m^3/a (NIWIS, 2024). This equates to a calculated 40,387.25 m^3/a existing groundwater usage within the delineated sub-catchment.

5.1.3.4 Basic Human Needs

According to the Government Gazette no 46798 of 26 August 2022, the Basic Human Needs (BHN) reserve provides for the essential needs of individuals served by the water resource in question and includes water for drinking, food preparation and personal hygiene. BHN is set

by the Water Service Act (Act No. 108 of 1997) at 25 l per person per day (l/d). The reserve is calculated by multiplying the number of people living within the confines of a source unit by 25 l/d. The estimated BHN of quaternary catchment C21D is 1 650 000 m^3/a, which equates to 66,258.97 m^3/a for the delineated sub-catchment.

5.1.3.5 Proposed Groundwater Usage

Based on the recommended abstraction time of 8 hours, a sustainable yield of 33 408 l/d (12,193.92 m^3/a) for borehole BH2 is recommended to meet the water demand for the meat processing plant.

5.1.3.6 Groundwater Contribution to Baseflow

Baseflow is the low flow in a river during dry or fair-weather conditions, but not necessarily all contributed by groundwater, baseflow includes contributions from delayed interflow and groundwater discharge. Because of the contribution of groundwater to surface water flow in certain circumstances, the volume of groundwater that could be abstracted without impacting the ability of the groundwater to sustain or contribute to the surface water reserve has to be taken into account.

The baseflow of groundwater into surface water bodies in the quaternary catchment is 4,200,000 m^3/a (DWS, 2020). The groundwater contribution to baseflow of the delineated sub-catchment is described below and summarised in Table 5-5.

$$\mathbf{Baseflow}_{Catchment\ Area} = \mathbf{Baseflow}_{\ Catchment\ Area} \mathbf{\ x\ Area}_{\ Catchment}$$

Where:

- $Baseflow_{Catchment\ Area}$ = value for baseflow in quaternary catchment C21D (DWS, 2020) [m^3/a]
- $Area_{Catchment\ Area}$ - Delineated catchment area [m^2]

Table 5-5: Delineated Sub-catchment Groundwater Contribution to Baseflow Summary

Description	Delineated Sub-Catchment	
Baseflow for Quaternary Catchment	4,200,000	[m^3/a]
Delineated Catchment Area	17,910,000	[m^2]
Delineated Catchment Areas Baseflow	168,659.19	[m^3/a]

Note/s:

[m^3/a] - cubic metres per annum

[m^2] - squared metres

5.1.3.7 Groundwater Balance

The groundwater balance and the reserve determination on a sub-catchment scale are presented in Table 5-6 and summarised below:

- $GW_{available}$ = (Re) - (EU + BHN + BF + PU)

Where:

- $Gw_{available}$ = Available groundwater for use.
- Re = Effective recharge to the aquifer.
- BF = Baseflow to surface water streams.
- EU = Existing Groundwater abstraction/use (identified on sub-catchment, excluding applicant).
- BHN = Basic Human Needs.
- PU = Proposed Use.

Table 5-6: Delineated Sub-catchment Groundwater Balance and Reserve Determination

Description	Delineated Sub-Catchment	
Recharge through Precipitation	343,743.50	[m^3/a]
Groundwater Reserve	234,918.16	[m^3/a]
Total Available Groundwater	108,825	[m^3/a]
Existing GW Use (WARMS, 2024)	40,387.25	[m^3/a]
Remaining Available Groundwater	68,438.09	[m^3/a]
Proposed Abstraction	12,193.92	[m^3/a]
Surplus Groundwater Available	56,244.17	[m^3/a]

Note/s:

[m^3/a] - cubic metres per annum

The groundwater balance indicates there's approximately 68,438.09 m^3/a groundwater available for abstraction on a sub-catchment scale and a surplus value of approximately 56,244.17 m^3/a will be available after the proposed abstraction of 12,193.92 m^3/a.

5.1.4 Groundwater Quality

Groundwater sampling was undertaken from BH2 by the client and the results were provided to GCS. The analysis of the laboratory results is shown in Table 5-7 below and the laboratory certificate of the results can be seen in the Geohydrological Assessment report (GCS, 2023), attached in APPENDIX B.

The results showed that all chemical parameters fall within the SANS241:2015 water standards for domestic use, except for turbidity and manganese. Manganese is naturally abundant in rocks, soil and groundwater. The elevated manganese concentration in BH2 is potentially sourced from the sedimentary host rock and is therefore naturally occurring. Manganese supports the growth of certain nuisance organisms in water distribution systems, giving rise to taste, odour and turbidity problems.

Turbidity in water is caused by the presence of suspended matter which usually consists of a mixture of inorganic matter, such as clay and soil particles and organic matter. The elevated turbidity in the water pumped from BH2 is most likely associated with the elevated manganese concentration as well as suspended soil particles.

Table 5-7: Groundwater Quality Results

Parameter	Risk	Unit	Standard Limit	BH2
Physical and aesthetic determinants				
Colour	Aesthetic	mg/L Pt-Co	≤ 15	<5.00
Conductivity at 25 °C	Aesthetic	mS/m	≤ 170	97.5
pH at 25 °C	Operational	pH units	≥ 5 to ≤ 9.7	6.93
Total dissolved solids	Aesthetic	mg/l	≤ 1 200	846
Turbidity	Operational	NTU	≤ 1	**20.5**
Turbidity	Aesthetic	NTU	≤ 5	**20.5**
Chemical determinants – macro-determinants				
Ammonia as N	Aesthetic	mg/l	≤ 1.5	<0.005
Chloride as Cl-	Aesthetic	mg/l	≤ 300	119
Combined nitrate plus nitrite	Acute health	mg/l	≤1	<1.00
Fluoride as F-	Chronic health	mg/l	≤ 1.5	0.32
Free chlorine as Cl_2	Chronic health	mg/l	≤ 5	0.11
Monochloramine	Chronic health	mg/l	≤ 3	0.12
Nitrate as N	Acute health	mg/l	≤ 11	0.571
Nitrite as N	Acute health	mg/l	≤ 0.9	<0.06S
Sodium as Na	Aesthetic	mg/l	≤ 200	27.9
Sulphate as SO_4^{2-}	Acute health	mg/l	≤ 500	174
Sulphate as SO_4^{2-}	Aesthetic	mg/l	≤ 250	174
Zinc as Zn	Aesthetic	mg/l	≤ 5	<0.002
Chemical determinants – micro-determinants				
Aluminium as Al	Operational	mg/l	≤ 0.3	<0.002
Antimony as Sb	Chronic health	mg/l	≤ 0.02	<0.001
Arsenic as As	Chronic health	mg/l	≤ 0.01	<0.006
Barium as Ba	Chronic health	mg/l	≤ 0.7	0.04
Boron as B	Chronic health	mg/l	≤ 2.4	<0.013
Cadmium as Cd	Chronic health	mg/l	≤ 0.003	<0.002
Copper as Cu	Chronic health	mg/l	≤ 2	0.012
Cyanide (recoverable) as CN-	Acute health	mg/l	≤ 0.2	<0.005
Iron as Fe	Chronic health	mg/l	≤ 2	1.9
Iron as Fe	Aesthetic	mg/l	≤ 0.3	1.9
Lead as Pb	Chronic health	mg/l	≤ 0.01	<0.004
Manganese as Mn	Chronic health	mg/l	≤ 0.4	**1.07**
Manganese as Mn	Aesthetic	mg/l	≤ 0.1	**1.07**
Mercury as Hg	Chronic health	mg/l	≤ 0.006	<0.005
Nickel as Ni	Chronic health	mg/l	≤ 0.07	0.011
Selenium Se	Chronic health	mg/l	≤ 0.04	<0.002
Total chromium as Cr	Chronic health	mg/l	≤ 0.05	<0.010
Uranium as U	Chronic health	mg/l	≤ 0.03	<0.015
Chemical determinants – organic determinants				
Bromodichloromethane	Chronic health	mg/l	≤ 0.06	<0.002
Bromoform	Chronic health	mg/l	≤ 0.1	<0.020
Dibromochloromethane	Chronic health	mg/l	≤ 0.1	<0.002
Phenols	Aesthetic	mg/l	≤ 0.01	<0.01
Total microcystin	Chronic health	mg/l	≤ 0.001	<0.0005
Total organic carbon as C	Chronic health	mg/l	≤ 10	1.75
Trihalomethanes Chloroform	Chronic health	mg/l	≤ 0.3	<0.002

Note:

Red and Bold exceed the SANS 241:2015 Standard

5.2 Site Conceptual Model

The conceptual model for the Block Meat site comprises the following:

- Two aquifer systems: A regional upper weathered aquifer and a deeper confined fractured aquifer.
- The weathered aquifer has a low yield potential and the solid rock is not fissured to the extent to promote water movement.
- The production borehole (BH2) on site draws from the deeper fractured aquifer (>150 mbgl), with a static water level recorded at 120 mbgl and a yield of 1.16 l/s.

Due to the depth of the aquifer zone (>150 mbgl) the potential for pollution is low, except if poor quality runoff directly into or along the borehole casing takes place (i.e. from the site down via the weathered zone to the water table). Recharge in the confined zone will be subjected to transboundary inflows as well as recharge via the vadose and weathered zones. The extent of the fractured aquifer is however uncertain.

During the field hydrocensus, no groundwater users could be identified within a 2.5 km radius of BH2. The risk of having a potential impact on surrounding groundwater users is therefore also considered low to insignificant.

6 RISK ASSESSMENT/BEST PRACTICE ASSESSMENT

6.1 Impact / Risk Assessment Methodology

Possible impacts are identified through comments from I&APs, specialist reports and from water use consultants experience. The assessment process followed a structured approach comprising four key activities:

- Identification and assessment of potential impacts likely to result from the Project activities.
- Prediction of the nature, magnitude, extent and duration of these impacts, with specific focus on those that may be significant.
- Identification of appropriate mitigation measures to reduce, avoid, or manage the severity or significance of the potential impacts.
- Evaluation of residual impacts to determine the significance of the impact after implementation of mitigation measures.

The assessment of significance was guided by a set of criteria, including:

- Cumulative impacts in the broader environmental and social context.
- Nature of the impact, i.e., whether it is positive, negative, direct, or indirect.

- Extent of the impact, ranging from localised to regional or national scale.
- Probability of occurrence of the impact.
- Reversibility of the impact, i.e., whether it can be restored to pre-impact conditions.
- Irreplaceability of affected resources, considering whether resources lost can be substituted or recovered.
- Potential for mitigation, i.e., the extent to which the impact can be avoided, minimised, or offset.

The evaluation of significance followed a consequence–probability approach:

$$\textit{Consequence} = (\textit{Duration} + \textit{Extent} + \textit{Irreplaceability of resource}) \times \textit{Severity}$$

The overall significance of an impact was then determined using the formula:

$$\textit{Significance} = \textit{Consequence} \times \textit{Probability}$$

A summary of the criteria used to assess the significance of impacts is provided in Table 6-1, with detailed explanations presented in Table 6-2.

Table 6-1: Proposed Criteria and Rating Scales to be used in the Assessment of the Potential Impacts

Criteria	Rating Scales	Notes
Nature	Positive (+)	An evaluation of the effect of the impact related to the proposed development.
	Negative (-)	
Duration	Temporary (1)	The duration of the activity associated with the impact will last 0 - 6 months.
	Short-term (2)	The duration of the activity associated with the impact will last 6-18 months.
	Medium-term (3)	The duration of the activity associated with the impact will last 18 months - 5 years.
	Long-term (4)	The duration of the activity associated with the impact will last more than 5 years.
Extent	Footprint (1)	The impact only affects the area in which the proposed activity will occur.
	Site (2)	The impact will affect only the development area.
	Local (3)	The impact affects the development area and adjacent properties.
	Regional (4)	The effect of the impact extends beyond municipal boundaries.
	National (5)	The effect of the impact extends beyond more than 2 regional/ provincial boundaries.
	International (6)	The effect of the impact extends beyond country borders.
Severity	Low (1)	Where the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected.
	Moderate (2)	Where the affected environment is altered but natural, cultural and social functions and processes continue albeit, in a modified way and valued, important, sensitive, or vulnerable systems or communities are negatively affected.
	High (3)	Where natural, cultural, or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease and valued, important, sensitive, or vulnerable systems or communities are

Criteria	Rating Scales	Notes
		substantially affected.
Potential for impact on irreplaceable resources	No (0)	No irreplaceable resources will be impacted.
	Yes (1)	Irreplaceable resources will be impacted.
Consequence	Extremely detrimental (-25 to -33)	A combination of extent, duration, intensity and the potential for impact on irreplaceable resources.
	Highly detrimental (-19 to -24)	
	Moderately detrimental (-13 to -18)	
	Slightly detrimental (-7 to -12)	
	Negligible (-6 to 0)	
	Slightly beneficial (0 to 6)	
	Moderately beneficial (13 to 18)	
	Highly beneficial (19 to 24)	
	Extremely beneficial (25 to 33)	
Probability (the likelihood of the impact occurring)	Improbable (0)	It is highly unlikely or less than 50% likely that an impact will occur.
	Probable (1)	It is between 50 and 70% certain that the impact will occur.
	Definite (2)	It is more than 75% certain that the impact will occur or the impact will occur.
Significance	Very high – negative (-49 to -66)	A function of Consequence and Probability.
	High – negative (-37 to -48)	
	Moderate – negative (-25 to -36)	
	Low – negative (-13 to -24)	
	Neutral - Very low (0 to -12)	
	Low positive (0 to 12)	
	Moderate–positive (13 to 24)	
	High–positive (37 to 48)	
	Very high – positive (49 to 66)	

Table 6-2: Explanation of Assessment Criteria

Criteria	Explanation
Nature	This is an evaluation of the type of effect the construction, operation and management of the proposed development would have on the affected environment. Will the impact of change on the environment be positive, negative, or neutral?
Extent or Scale	This refers to the spatial scale at which the impact will occur. The extent of the impact is described as footprint (affecting only the footprint of the development), site (limited to the site) and regional (limited to the immediate surroundings and closest towns to the site). The extent of scale refers to the actual physical footprint of the impact, not to the spatial significance. It is acknowledged that some impacts, even though they may be of a small extent, are of very high importance, e.g., impacts on species of very restricted range. To avoid "double counting," specialists have been requested to indicate spatial significance under "intensity" or "impact on irreplaceable resources" but not under "extent" as well.

Criteria	Explanation
Duration	The lifespan of the impact is indicated as temporary, short, medium and long-term.
Severity	This is a relative evaluation within the context of all the activities and the other impacts within the framework of the Project. Does the activity destroy the impacted environment, alter its functioning, or render it slightly altered?
Impact on irreplaceable resources	This refers to the potential for an environmental resource to be replaced should it be impacted. A resource could be replaced by natural processes (e.g., by natural colonisation from surrounding areas), through artificial means (e.g., by reseeding disturbed areas or replanting rescued species) or by providing a substitute resource, in certain cases. In natural systems, providing substitute resources is usually not possible, but in social systems, substitutes are often possible (e.g., by constructing new social facilities for those who are lost). Should it not be possible to replace a resource, the resource is essentially irreplaceable, e.g., red data species that are restricted to a particular site or habitat to a very limited extent.
Consequence	The consequence of the potential impacts is a summation of the above criteria, namely the extent, duration, intensity and impact on irreplaceable resources.
Probability of occurrence	The probability of the impact occurring is based on the professional experience of the specialist with environments of a similar nature to the site and/or with similar projects. It is important to distinguish between the probability of the impact occurring and the probability that the activity causing a potential impact will occur. Probability is defined as the probability of the impact occurring, not as the probability of the activities that may result in the impact.
Significance	Impact significance is defined to be a combination of the consequence (as described below) and the probability of the impact occurring. The relationship between consequence and probability highlights that the impact (or impact significance) must be evaluated in terms of the seriousness (consequence) of the impact, weighted by the probability of the impact occurring. In simple terms, if the consequence and probability of an impact are high, then the impact will have a high significance. The significance defines the level to which the impact will influence the proposed development and/or environment. It determines whether mitigation measures need to be identified and implemented and whether the impact is important for decision-making.
Degree of confidence in predictions	Specialists and the environmental team were required to indicate the degree of confidence (low, medium, or high) that there is in the predictions made for each impact based on the available information and their level of knowledge and expertise. The degree of confidence is not considered in the determination of consequence or probability.
Mitigation measures	Mitigation measures are designed to reduce the consequence or probability of an impact or to reduce both consequence and probability. The significance of impacts has been assessed both with mitigation and without mitigation.

6.2 Impact/ Risk Assessment Outcomes

Information in the section below was taken from the Geohydrological Assessment (GCS, 2023) attached as APPENDIX B. The impact/risk assessment ratings are listed in Table 6-5.

6.2.1 Impacts on the Groundwater Reserve

The potential radius of influence of pumping for borehole BH2 (identified for groundwater use during the assessment study) was determined by applying the Cooper-Jacob equation (1):

$$\textbf{Radius of Influence } (r_e) = 1.5\sqrt{\frac{Tt}{S}}$$ **Equation 1**

Where:

T = aquifer transmissivity (m^2/day)

t = exploitation time/pumping time (days); and

S = aquifer storativity (no unit).

The estimated radius of influence for the borehole is listed in Table 6-3. The predicated pumping radius of influence for BH2 is of the order of 8.58 m. During pumping, no interference with BH1 was noted. It is therefore anticipated that BH2 is drawing from the fractured aquifer network or contact zone which are not connected.

Table 6-3: Summary of the radius of influence for borehole BH2 (GCS, 2023)

Parameter	Units	BH 13 (PV1)
T	m^2/day	2.35
t	days	121.67
s		8.71
Txt		285.32
Txt/s		32.75
Square Root (Tt)	m	5.72
The Radius of Influence	m	8.58

6.2.1.1 Scale of Abstraction

Based on the DWS Requirements for WULA: Groundwater Abstraction (S21(a)), the licence application must be evaluated in terms of three possible categories. Categories A, B and C, each have an applicable list of information requirements for the licence application. The categories are as follows:

- Small-scale abstractions (<60% recharge) Category A
- Medium scale abstractions (60-100% recharge) Category B
- Large-scale abstractions (>100% of recharge) Category C

Concerning the DWS scale of abstraction categories, the scale of abstraction after the proposed abstraction from the groundwater unit, relative to recharge across the delineated sub-catchment area, is 77% and is classified as Category B "Medium Scale" abstraction.

6.2.1.2 Water Quantity Stress Index

The status of a groundwater resource unit can be assessed in terms of sustainable use, observed ecological impacts, or water stress. As no ecological reserve is available for the affected catchment, the impact of the proposed abstraction on the ecological reserve cannot be determined.

The concept of stressed water resources is addressed by the NWA but is not defined. Part 8

of the Act gives some guidance by providing the following qualitative examples of water stress:

- Where water demands are approaching or exceed the available supply.
- Where water quality problems are imminent or already exist.
- Where water resource quality is under threat.

To provide a quantitative means of defining stress, a groundwater stress index was developed by dividing the volume of groundwater abstracted from a groundwater unit by the estimated recharge to that unit (Parsons & Wentzel, 2007). However, this concept does not take cognisance of the impact of other land use practices on groundwater and surface water resources. GCS therefore proposes to modify the stress index by taking the groundwater contribution to baseflow into account.

The modified stress index is as follows:

Stress Index = Proposed Abstraction / (Recharge – Baseflow)

= 52 581.17 m^3/a / (343 743.50 m^3/a – 168 659.19 m^3/a)

= 0.3

The stress index and classes described in Table 6-4 are a guide for determining the level of stress of a groundwater resource unit, based on abstraction, baseflow and recharge (modified after) (Parsons & Wentzel, 2007).

Table 6-4: Guide for Determining the Level of Stress of a Groundwater Resource Unit (GCS, 2023)

Present Status Category	Description	Stress Index
A	Unstressed or low level of stress	<0.05
B		0.05 - 0.2
C	Moderate levels of stress	0.2 - 0.5
D		0.5 - 0.75
E	Stressed	0.75 - 0.95
F	Critically stressed	>0.95

Based on the guide for determining the level of stress of the groundwater resource unit, the abstraction of 52,581.17 m^3/a across the delineated sub-catchment area is classified as status Category C. The aquifer unit will thus have a moderate level of stress after the proposed abstraction.

6.3 Impact/ Risk Assessment Matrix

The impact/risk assessment details are listed in Table 6-5.

Table 6-5: Potential Impacts in the Operational Phase and Proposed Mitigation Measures

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre- Mitigation							Recommended Mitigation Measures	Post Mitigation						
			Duration	Extent	Severity	Potential for Impact on Irreplaceable Resources	Consequence	Probability	Significance		Duration	Extent	Severity	Potential for Impact on Irreplaceable Resources	Consequence	Probability	Significance
Groundwater																	
Regional water table/ Groundwater aquifer.	Due to the depth of the aquifer zone (>150 mbgl) the potential for pollution is low, except if poor quality runoff directly into or along the borehole casing takes place (i.e. from the site down via the weathered zone to the water table).	Site activities.	4	2	-1	1	-16	1	Neutral – Very low (0 to -12) (-7)	• Visual soil assessments for signs of contamination. • Ensure adequate stormwater systems to manage runoff.	4	1	-1	1	-6	0	Neutral – Very low (0 to -6) 0
	Over abstraction and impact on the sub-catchment.	Abstracting groundwater from BH2.	4	3	2	1	-16	1	Low - negative (-13 to -24) -16	• Do not overproduce from borehole BH2. 8 hours of pumping per day is recommended. • Ensure routine water quality monitoring is undertaken.	2	1	4	1	12	2	Neutral – Very low (0 to -6) -6
Local Aquifer.	Vehicle Park area and driveway.	Oil and fuel spills and leakages at vehicle park areas and at the site may cause poor quality seepage and runoff.	4	3	3	1	-24	1	Low-negative (-13 to -24) -24	• Ensure that the borehole is properly cased and sealed. • Implement a quarterly monitoring programme to track changes in water levels and quality.	4	3	1	0	-7	0	Neutral – Very Low (0 to -12)
Socio-Economic																	
Economic Setting.	Continued operation of the Block Meat facility supports employment, local procurement and resilience of the agri-processing and food supply sector.	Block Meat Company.	4	3	3	0	21	2	High-positive (37 to 48) +42	• Maintain B-BBEE-compliant procurement to support local enterprises. • Prioritise local suppliers and service providers where feasible. • Ensure operational continuity to support food system resilience.	4	3	3	0	21	2	High-positive (37 to 48) +42
Social Setting.	Water security enables uninterrupted production, sustaining employment, skills development and community upliftment initiatives.	Block Meat Company.	4	5	2	0	16	2	Moderate-positive (13 to 24) +18	• Sustain and expand Corporate Social Investment programmes focused on food security and youth development. • Support skills transfer and on-the-job training for local employees. • Maintain engagement with surrounding communities to align support initiatives.	4	5	2	0	16	2	Moderate-positive (13 to 24) +18

6.4 Assessment of Level and Confidence of Information

All information contained in this Technical Report was sourced from the specialist study conducted for the Project area. The specialist appointed to undertake the various investigations are considered to be competent in their particular fields. The level of confidence within the information and report used to compile this document is therefore high.

7 WATER MANAGEMENT PLAN

7.1 Organisational Structure

The Block Meat Company bears ultimate responsibility for the implementation of the Water Management Plan and for ensuring compliance with all conditions set out in the WUL. Within this framework, Block Meat has established a clear operational management structure to ensure accountability, efficiency and effective communication across all functional areas.

7.2 Resources and Competence

Block Meat ensures that individuals appointed to key roles hold the appropriate qualifications, professional registrations and relevant experience required to fulfil their responsibilities effectively. The company is committed to maintaining a skilled and competent workforce by providing ongoing training and development opportunities tailored to the needs of each role. Training covers both regulatory requirements and site-specific procedures to ensure compliance, operational efficiency and continuous improvement in environmental and water management practices. Competence is reviewed regularly to confirm that employees remain suitably equipped to perform their duties to the required standard.

7.3 Education and Training

Block Meat places strong emphasis on education and training as part of its commitment to responsible water use, environmental stewardship and regulatory compliance. Employees are provided with ongoing training relevant to their roles, including water conservation practices, hygiene and sanitation requirements, spill prevention and emergency response procedures. This training is aligned with Shoprite Group’s broader skills development strategy, which prioritises capacity building, scarce and critical skills development and compliance with environmental and food safety standards. Through structured on-the-job training, induction programmes and refresher sessions, staff are equipped to understand the importance of sustainable water management and their responsibilities in protecting groundwater resources, thereby supporting long-term operational resilience and compliance with the NWA.

7.4 Internal and External Communication

Effective internal and external communication forms an integral part of the facility’s

environmental and water management approach. Internally, water use procedures, conservation measures and compliance requirements are communicated to employees through operational protocols, toolbox talks, training sessions and management briefings. This ensures that all staff are aware of water use controls, reporting obligations and emergency response measures. Externally, the Block Meat Company engages with relevant authorities, including the DWS, through statutory reporting, licence compliance submissions and monitoring reports as required under the WUL. Where necessary, communication with stakeholders and service providers is maintained to ensure transparency, accountability and alignment with catchment-level water resource management objectives.

7.5 Awareness Raising

Awareness raising is embedded within daily operations to foster a culture of responsible water use and environmental accountability at the facility. Employees are regularly reminded of the importance of water conservation, pollution prevention and adherence to operational controls designed to protect groundwater quality. Visual reminders, standard operating procedures and management oversight reinforce awareness of good water stewardship practices. In addition, the facility's alignment with the Shoprite Group's sustainability commitments and corporate social responsibility initiatives strengthens awareness of the broader socio-economic and environmental value of sustainable water management. This approach ensures that water use is not only legally compliant but also socially and environmentally responsible, in line with national development priorities and integrated water resource management principles.

7.6 Water Balance

The facility is supplied by two water sources, namely municipal water and groundwater abstracted from a borehole:

- The municipal water supply provides an average of 1,936 kl/month, equivalent to 23,232 kl/year.
- The borehole supply contributes approximately 350 kl/month, or 4,200 kl/year.
- Both water sources feed into a 100 000 l storage tank, providing operational buffering and supply security.
- Water from the storage tank is treated via an UV treatment plant before being distributed to the processing plant.
- The processing plant is the primary consumer of water, using approximately 1,737 kl/month (20,844 kl/year).
- Approximately 40% of the processing plant water use (about 695 kl/month or 8,340 kl/year) is incorporated into the product recipe and is therefore consumptively lost.

- The evaporator towers consume approximately 199 kl/month, equivalent to 2,388 kl/year, representing evaporative losses.
- Process wastewater is routed through fat traps, which are cleaned weekly, removing approximately 8,500 l of solids per week.
- Following treatment, approximately 1,008 kl/month of water is discharged to the municipal sewer system.
- Borehole water is stored in borehole tanks and treated via a water softening plant, with softening effluent directed to the municipal effluent system.

The water balance indicates a combination of consumptive use (product and evaporation) and controlled discharge to sewer, demonstrating structured water management at the facility. Figure 7-1 presents the site water balance, illustrating the sources of water supply, internal water use within the processing plant, treatment and storage infrastructure, consumptive losses and the discharge of treated effluent to the municipal sewer system.

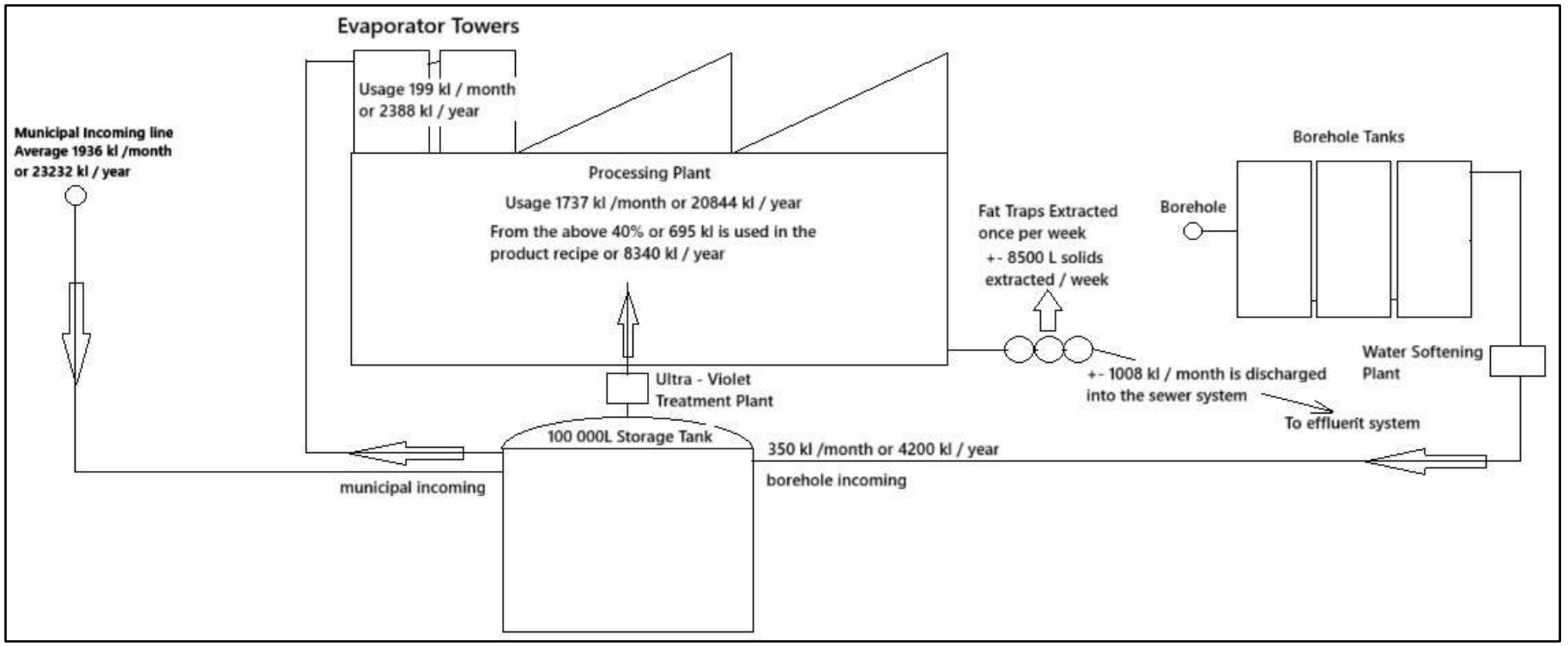


Figure 7-1: Site Water Balance Diagram illustrating Water Inputs, Usage, Treatment and Discharge

7.7 Stormwater Management

Stormwater on the site is directed toward a defined low point, where it is collected within a Löffel block-lined sump area. The sump is fitted with stormwater pipes and additional sumps at its base, which facilitate the controlled conveyance of accumulated runoff to the municipal stormwater system. This arrangement ensures that runoff from the site is managed in a formalised manner, reducing the risk of uncontrolled ponding, erosion, and localised flooding. The Löffel block lining provides erosion protection and structural stability within the collection area, while the pipe and sump system enables efficient drainage and transfer of stormwater off site. Overall, the infrastructure reflects an engineered stormwater management measure designed to collect, channel, and discharge stormwater in a controlled manner.

7.8 Water Use and Environmental Management Plan

The operation of the facility has the potential to impact groundwater resources, as well as the surrounding socio-economic and social environment. To ensure compliance with the NWA and to promote sustainable operations, a comprehensive management plan has been developed. This plan identifies potential impacts, the activities that may give rise to them and the recommended mitigation measures to avoid, minimise, or manage risks. The management plan integrates surface water, groundwater, ecological, socio-economic and community aspects into a single framework, thereby ensuring that water use remains within authorised limits and supports both environmental integrity and social well-being.

The table below outlines the Environmental Management Plan, providing a consolidated overview of potential impacts and the corresponding measures required to mitigate or manage these impacts.

Table 7-1: Water Use and Environmental Management Plan

Environmental Component	Activity Causing Impact	Detailed Management and Mitigation Measures	Rationale / Expected Outcome
Groundwater	Abstraction from borehole for operational water supply.	• Install and maintain calibrated flow meters on borehole abstraction points. • Record abstraction volumes monthly and compare against authorised limits. Implement routine groundwater level monitoring using dipper tubes. • Conduct annual groundwater quality monitoring (EC, pH, nitrates, chlorides, microbiological indicators). • Implement abstraction reduction measures if declining trends are observed. • Ensure borehole headworks are sealed and protected against surface contamination. • Annual groundwater quality monitoring, with biannual testing to meet municipal approval conditions.	Prevents over abstraction, protects aquifer sustainability and safeguards groundwater quality.
Water Supply	Use of water for the facility.	• Monitor water consumption through monthly metre readings. • Implement water efficiency measures (leak detection, low flow fixtures). • Maintain adequate storage capacity to manage peak demand without excessive abstraction. • Reuse water where feasible and compliant with hygiene standards.	Promotes efficient water use, reduces pressure on supply and supports water conservation objectives.
Consumptive Water Losses	Product formulation and evaporative losses from evaporator towers.	• Quantify consumptive water use as part of the site water balance. • Optimise evaporator efficiency to reduce unnecessary losses. • Regular maintenance of cooling and evaporator systems. • Incorporate consumptive losses into water use reporting and licence compliance.	Ensures transparent accounting of water losses and supports realistic water balance management.
Wastewater and Effluent	Generation of process wastewater and domestic effluent.	• Route all wastewater through fat traps prior to discharge. • Implement weekly fat trap inspections and scheduled cleaning by licenced contractors. • Maintain records of waste removal and disposal certificates.	Prevents sewer blockages, limits organic loading and protects downstream wastewater infrastructure.

Environmental Component	Activity Causing Impact	Detailed Management and Mitigation Measures	Rationale / Expected Outcome
		• Discharge treated effluent to municipal sewer in accordance with municipal by-laws and licence conditions.	
Stormwater Management	Runoff from roofs, paved areas and operational surfaces.	• Maintain separation of clean and dirty stormwater systems. • Direct clean stormwater away from contaminated areas. • Inspect and clean stormwater drains regularly. • Implement erosion protection at discharge points. • Prevent stormwater contact with waste, chemicals or effluent systems.	Reduces pollution risk, erosion and sediment transport to surrounding environments.
Chemical and Hydrocarbon Management	Storage and handling of fuels, oils and cleaning chemicals.	• Store chemicals and hydrocarbons in bunded areas with impermeable floors. • Maintain spill kits at all storage and handling areas. • Train staff in spill prevention and emergency response. • Immediately clean and remediate spills and contaminated areas.	Prevents contamination of soil, groundwater and stormwater systems.
Solid Waste and Sludge	Removal of fats, oils, grease and sludge from fat traps.	• Remove solids routinely by licenced waste contractors. • Store waste temporarily in sealed containers. • Dispose of waste at authorised disposal facilities only. • Maintain waste manifests and contractor records.	Prevents secondary pollution and ensures legal waste disposal.
Monitoring and Reporting	Compliance with water use authorisation and reporting requirements.	• Maintain water use records for abstraction, consumption and discharge. • Compile annual water balance updates. • Submit monitoring results and compliance reports to DWS as required. • Undertake internal audits to verify compliance with licence conditions.	Ensures regulatory compliance, transparency and early identification of risks.

7.9 Monitoring and Control

7.9.1 Groundwater Monitoring

BH2 is equipped with a flow meter that will be used to monitor the meat processing plant's daily groundwater abstraction. Regular visual assessments of sewer infrastructure (i.e., hydraulic monitoring), parking and service areas should be adequate to monitor for obvious signs of pollution in the environment.

Monitoring the groundwater quality and quantity at BH2 should be sufficient to determine the impact on the local aquifer system. No other monitoring boreholes are proposed at this stage, but can be considered if there are noted operational issues associated with the existing borehole.

7.9.1.1 Monitoring Parameters and Frequency

The groundwater quality and quantity monitoring frequency are summarised in Table 7-2 and should include the following for the abstraction borehole BH2:

- Monitoring of abstraction volumes from the borehole, with an installed automated flow meter.
- Monitoring of water level responses (use and/or rest periods) in the production borehole (water level devices or permanently installed data loggers).
- Water quality analysis once a year.

Table 7-2: Proposed Monitoring Frequency (GCS, 2023)

Monitoring Point	Interval	Purpose
BH2	Monthly	Abstraction volumes – flow meter readings
	Monthly	Water level measurement
	Annual	Sampling for water quality analysis

It is recommended that a qualified hydrogeologist evaluate the data and make the necessary adjustments to the monitoring programme after the first year's monitoring data is available.

7.9.2 Waste Monitoring

Waste monitoring associated with site activities is informed by the organisation's broader environmental management and sustainability framework, as described in the Sustainability Report 2025 (Shoprite Holdings Ltd, 2025c). Although waste generation associated with borehole abstraction activities is limited in nature and volume, monitoring measures are applied to ensure that waste is managed responsibly and does not pose a risk to soil or groundwater resources.

7.9.2.1 Waste Streams Associated with Borehole Operations

Waste streams potentially associated with the borehole operation include general operational waste, hydrocarbon-related waste from equipment maintenance, empty chemical or lubricant containers and domestic waste generated during routine site activities. These waste streams are managed in line with the organisation's standard environmental management practices and sustainability commitments (Shoprite Holdings Ltd, 2025c).

7.9.2.2 Monitoring Measures

In line with the environmental monitoring and reporting practices outlined in the Sustainability Report (2025c), waste monitoring focuses on compliance, risk prevention and accountability rather than intensive sampling or testing. Monitoring measures include:

- Routine inspection of waste storage areas to prevent leaks, spills, or uncontrolled disposal.
- Verification that waste is segregated and stored appropriately prior to removal.
- Monitoring of contractor compliance where third-party service providers are used for waste collection and disposal.
- Record-keeping of waste disposal activities, including the use of licenced waste service providers where applicable.

7.9.2.3 Environmental Compliance and Risk-Based Approach

Waste monitoring is implemented using a risk-based approach consistent with the organisation's sustainability and environmental governance framework. Greater attention is given to waste streams that may pose a potential risk to groundwater quality, particularly hydrocarbons or hazardous substances. Any non-compliance or identified risk is addressed through corrective actions to prevent recurrence (Shoprite Holdings Ltd, 2025c).

7.9.2.4 Incident Reporting and Corrective Action

The Sustainability Report (2025c) confirms that environmental incidents, including those related to waste management, are subject to internal reporting, investigation and corrective action processes. In the context of the borehole operation, any waste-related incidents such as spills, improper disposal, or containment failures will be recorded, investigated and remediated promptly to prevent contamination of soil and groundwater resources (Shoprite Holdings Ltd, 2025c).

7.9.2.5 Reporting and Continuous Improvement

Waste monitoring outcomes are incorporated into the organisation's broader environmental performance reporting and continuous improvement processes. This approach supports ongoing improvement in waste management practices (Shoprite Holdings Ltd, 2025c).

7.10 Auditing and Reporting

Annual review and auditing are essential to ensure that management systems remain current, effective and relevant to prevailing conditions. These processes verify the appropriateness and suitability of the systems by measuring actual performance against the objectives set.

Where reviews or audits identify shortcomings or gaps, changes or adjustments to the systems will be implemented to address these issues. Performance will consistently be assessed in relation to the established objectives.

Auditing will be undertaken as follows:

- Internal audits: Annually.
- External audits: Annually.
- Reporting to the DWS: Annually.

8 PUBLIC PARTICIPATION

The sections below provide a summary of the stakeholder consultation activities that have been and will be undertaken for the Project.

8.1 Stakeholder Engagement Undertaken

8.1.1 Authority Pre-Application Consultation

A pre-application meeting with DWS was held on 19 February 2025. The purpose of the meeting was to engage with the relevant DWS officials to discuss the water uses and to determine the appropriate type of water use authorisation required for the Project. In addition, the meeting served to clarify the information requirements, outline the application process and ensure alignment with the regulatory expectations prior to the formal submission of the WULA.

8.1.2 Stakeholder Database

A Project-specific stakeholder database was compiled for the purposes of this application. The following sectors of society are included within the database which will be used to notify stakeholders of this application:

- National, provincial and local government and tribal authorities.
- Landowners and neighbouring landowners.
- Agriculture, water bodies and farmers' organisations.
- National and local media.
- Neighbouring industry and mining, business and commerce.
- Conservation and environmental bodies, both as authorities and Non-Governmental

Organisations.

- Community representatives, Community-Based Organisation, development bodies.
- Representatives for disadvantaged people, women and youth.

8.1.3 Distribution of Notification Letters and Background Information Document

A Background Information Document (BID), which contained Project details such as location and operational activities and environmental regulatory processes, was distributed on 05 February 2026 via email to registered I&APs. A Registration and Comment Form accompanied the BID to facilitate stakeholder registration and feedback.

8.1.4 Site Notice Placements

Site notices, in English, were erected on 09 February 2026 at two locations around the Project area, to inform and encourage I&APs to register and comment on the Draft Technical Report. Notices were placed at the following locations:

- Benoni City Centre Library
    - Elston Ave, Benoni, 1500.
- The Block Meat facility
    - 20 Dunedin Street, Apex, Benoni, 1501 - On the security gate at the main entrance.

8.1.5 Newspaper Advertisements

Newspaper advertisement in English was published in the Benoni City Times Newspaper in on 06 February 2026. This local publication, distributed to the surrounding areas, notified the public of the opportunity to comment on the Draft WULA Technical Report.

8.1.6 Public Comment Period on the Draft WULA Technical Report

The Draft WULA Technical Report was made available for a 60-day public review and commenting period from 09 February 2026 to 13 April 2026 at the following places:

- Benoni City Centre Library: Elston Ave, Benoni, 1500
- GCS Website: https://www.gcs-sa.biz/public-documents/

8.1.7 Availability of the Final WULA Technical Report

Once all comments received during the public participation period had been reviewed and responded to, the Comment and Response Report (CRR) was updated, and the Draft WULA Technical Report was finalised. The Final WULA Technical Report was made available to stakeholders via the GCS Website.

8.2 Issues and Responses from Public Consultation Process

Stakeholders have been afforded the opportunity to provided comments, raised issues of concern, and offered suggestions. These have been documented in the CRR, along with responses to all comments from the Project team

The CRR has been included as a table in APPENDIX C.

9 MOTIVATION IN TERMS OF SECTION 27(1) OF THE NATIONAL WATER ACT, 1998

In terms of Section 27 of the NWA, a responsible authority must take into account all the relevant factors including:

9.1 Section 27 (a): Existing Lawful Water Use

ELWU is defined in Section 32 of the NWA as any water use that occurred during the two years immediately preceding the commencement of the Act (1 October 1998), or which has subsequently been declared lawful under Section 33 and which was authorised by or under any previous legislation.

The water use associated with the Block Meat Company does not constitute an ELWU in terms of Section 32. Accordingly, Block Meat Company is applying for a new WUL to authorise water use that supplements the municipal supply. This is critical to ensuring a reliable supply of water for food processing, sanitation and hygiene particularly in light of increasing municipal service delivery challenges and intermittent water supply disruptions

9.2 Section 27 (b): The Need to Redress the Results of Past Racial and Gender Discrimination

Broad-Based Black Economic Empowerment (B-BBEE) is a key driver of inclusive growth and socio-economic transformation in South Africa. Block Meat Company, a subsidiary of the South African-based retail company Shoprite and the largest supermarket retailer in Africa. Block Meat Company demonstrates its commitment to South Africa's transformation objectives through tangible empowerment practices and strategic alignment with national policies (DTIC, 2015).

9.2.1 Broad-Based Black Economic Empowerment Status

The Block Meat Company currently holds a Level 6 B-BBEE contributor status, enabling its clients and supply chain partners to claim up to 100% procurement recognition (AQRate, 2023). This rating confirms Shoprite's compliance with the Codes of Good Practice and enhances its eligibility for public procurement and private sector opportunities where transformation credentials are a key consideration.

9.2.1.1 Shoprite's Contribution to Socio-Economic Transformation

Shoprite demonstrates a strong commitment to transformation and inclusive development

through a wide range of initiatives across four core focus areas:

- Community Development:
    - Shoprite supported Suikerbossie Park in Cape Town, managed by the non-profit Apple Tree, where community gardens with a mushroom farm and medicinal garden (Shoprite, 2024).
- Skills Development
    - Shoprite prioritises the training and upskilling of South African employees, particularly from historically disadvantaged backgrounds, through on-the-job learning and mentorship. The focus areas include business critical skills, scarce and critical roles, economic empowerment, building leadership capabilities, business growth and continuity.
- Enterprise and Supplier Development
    - The company is committed to sourcing from local, black-owned and small-, medium- and micro-enterprise suppliers, thereby promoting local economic development. The Shoprite enterprise and supplier development programme, Shoprite Next Capital, is dedicated to nurturing small business growth. This programme focuses on empowering black- and women-owned businesses and supporting small and emerging suppliers with financial support (Shoprite, 2024).
- Socio-Economic Developments
    - Shoprite has committee focuses on the Group's delivery of its societal responsibilities, including overseeing CSI programmes that focus on hunger relief, food security, youth unemployment and enterprise and supplier development. Shoprite reviews CSI spending and progress to ensure that the Group's efforts address immediate needs while fostering long-term socio-economic growth and community resilience (Shoprite, 2024).

9.3 Section 27 (c): Efficient and Beneficial Use of Water in the Public Interest

The water uses associated with the development and operation of the Block Meat factory are aligned with the principles of efficiency, sustainability and public benefit as required in terms of Section 27(1)(c) of the NWA.

9.3.1 Water Use Efficiency

Recognising water as a finite and strategic national resource, particularly within the water-scarce Gauteng region, Block Meat Company has committed to responsible water use practices that prioritise efficiency and demand management.

Water will be abstracted solely from an existing on site borehole, with volumes strictly managed to meet essential domestic and operational requirements, namely:

- Hygienic water supply for processing and sanitation.
- Supplementing municipal supply to ensure business continuity during water outages.

Importantly, no groundwater will be allocated for high-consumption activities such as dust suppression or vehicle washing underscoring Block Meat Company's conservation ethos. Water-saving fixtures, leak detection systems and routine consumption monitoring will further reduce unnecessary usage and wastage.

9.3.2 Public Benefit of the Water Use

The groundwater use provides clear public benefits and is in alignment with both South Africa's development priorities and global sustainability frameworks such as the United Nations SDGs, specifically SDG 6 (Clean Water and Sanitation) and SDG 8 (Decent Work and Economic Growth).

Key benefits include:

- Operational Resilience: Ensuring the facility can continue operations during municipal supply interruptions supports national water security objectives and reduces dependency on already strained public infrastructure (DWS, 2013).
- Infrastructure Relief: By responsibly utilising a private borehole, the facility decreases demand on local municipal water networks, which is critical in high-demand, low-supply areas such as Gauteng.
- Socio-Economic Contribution: Reliable water access enables uninterrupted operations, thereby safeguarding jobs, supporting local suppliers and advancing B-BBEE transformation goals (Shoprite, 2024).

These outcomes contribute to the broader public interest by promoting economic continuity while ensuring responsible water use.

9.3.3 Sustainable Resource Management

The Block Meat Company's approach is underpinned by a broader commitment to environmental stewardship and the sustainable management of shared water resources. This is consistent with the objectives of the National Water Act and the integrated water resource management principles embedded in the National Water Resource Strategy, Second Edition (NWRS II).

To ensure the long-term viability of the borehole and surrounding aquifer, the following sustainability measures will be implemented:

- Controlled abstraction volumes, guided by hydrogeological assessments, to prevent over-extraction and preserve aquifer integrity.
- Ongoing groundwater monitoring, including periodic assessment of water levels and quality, to ensure the water use remains within environmentally sustainable limits.

- Maintenance of borehole infrastructure, to prevent contamination and promote operational efficiency.
- Implementation of water conservation technologies, such as low flow fixtures, to minimise consumption and wastage.

Compliance with licence conditions and reporting requirements, as determined by the DWS, to ensure full transparency and regulatory oversight.

9.4 Section 27 (d): The Socio-Economic Impact of the Water Use or Uses if Authorised

9.4.1 Of The Water Use or Uses if Authorised

9.4.1.1 Economic Impact

Authorisation of the water use will enable the continued operation and resilience of a key facility within South Africa's agri-processing and food production sector. Located in Benoni, 40 km east of Johannesburg, the facility contributes to local and regional economic development through employment, procurement and long-term investment in the food value chain.

As part of the Shoprite Group, Africa's largest supermarket retailer and South Africa's largest private sector employer, the Block Meat facility benefits from the Group's robust socio-economic footprint. Shoprite employs over 163,000 people across the continent and is committed to upskilling and retaining its workforce as a core part of its values and operating model (Shoprite, 2024).

The facility contributes to food system resilience and business continuity in a critical supply sector. In doing so, it supports downstream industries, supplier networks, transport logistics and food retail, particularly in times of municipal infrastructure strain or service delivery interruptions.

9.4.1.2 The Social Impact

The continued operation of the Block Meat Company also enables the Shoprite Group to maintain and expand its CSI programmes, which target vulnerable and underserved communities. These initiatives focus on:

- Hunger relief and food security;
- Youth employment and skills development;
- Promotion of local entrepreneurship through supplier development.

By supporting water security at the facility, the licence will help ensure uninterrupted production, which directly sustains employment and indirectly strengthens livelihoods in surrounding communities. Skills transfer and on-the-job training also enhance long-term employability for local staff, aligning with national development priorities and labour equity

objectives (Shoprite, 2024).

9.4.2 Or the Failure to Authorise the Water Use or Uses

Failure to authorise the water use would significantly undermine the viability of the Block Meat Company. Operational disruptions resulting from unreliable water supply would threaten business continuity, compromising food safety, hygiene and production schedules.

The broader impacts of non-authorisation would include:

- Loss of employment and income for workers, many of whom are from historically disadvantaged communities.
- Missed opportunities for local procurement, supplier growth and skills development.
- Reduced investment attractiveness of the region for agri-industrial facilities.
- Inability to implement CSI programmes that address hunger, food insecurity and unemployment.

This outcome would also directly hinder South Africa's progress toward several of the United Nations SDGs to which Shoprite contributes through its operations, including:

- SDG 2: Zero Hunger.
- SDG 8: Decent Work and Economic Growth.
- SDG 12: Responsible Consumption and Production (Shoprite, 2024).

The cumulative socio-economic cost of non-authorisation would therefore be material, both for the business and for the communities that benefit from its activities.

9.5 Section 27 (e): Any Catchment Management Strategy Applicable to the Relevant Water Resource

Block Meat Company's operations in Benoni, Gauteng, fall within quaternary catchment C21D, part of the Upper Vaal sub-catchment, which is nested within the broader Vaal-Orange Water Management Area (WMA). This locates the operations within the jurisdiction of the Vaal-Orange Catchment Management Agency (VOCMA); a statutory body responsible for implementing integrated water resource management in line with Chapter 7 of the NWA.

According to the VOCMA Annual Performance Plan 2025–2028 (VOCMA, 2025), a Catchment Management Strategy (CMS) is currently under development. This strategy will serve as the primary planning and implementation framework for water resource protection, use, development, conservation and management across the Vaal-Orange WMA. Key objectives of the CMS include:

- Reducing pollution from industrial, mining, urban and agricultural sources through coordinated water quality management;

- Strengthening water use authorisation by improving the validation, registration and enforcement processes;
- Promoting infrastructure alignment with national projects such as Phase II of the Lesotho Highlands Water Project;
- Enhancing climate resilience via water conservation and demand-side interventions.

A central tenet of the CMS is stakeholder participation, with efforts underway to establish inclusive catchment forums that promote transparency, trust and participatory governance. This aligns with the principles outlined in the National Water Resource Strategy, 2nd Edition (DWS, 2013).

Key Targets for the 2025–2028 Implementation Period:

- Finalisation of a draft CMS by the 2025/26 financial year;
- Rollout of the River Eco-status Monitoring Programme across 11 rivers in the catchment;
- Registration of 75% of authorised waste-related discharges on the WARMS by 2025/26, increasing to 85% by 2027/28;
- Response to at least 80% of reported pollution incidents within 78 hours;
- Annual verification and validation of existing water users across the WMA.

To mitigate risks such as unlawful water abstraction, return flow contamination and institutional capacity constraints, VOCMA is prioritising:

- Capacity building and institutional development;
- Improved intergovernmental coordination mechanisms;
- Deployment of robust Information and Communication Technology systems for real-time monitoring and improved data integrity.

The CMS is further designed to support South Africa's transboundary water obligations and reinforces VOCMA's statutory mandate to manage water equitably, sustainably and resiliently in accordance with the NWA and international agreements such as the Southern African Development Community Revised Protocol on Shared Watercourses.

9.6 Section 27 (f): The Likely Effect of the Water Use to be authorised on the Water Resource and on Other Water Users

9.6.1 Groundwater

The water use entails the abstraction of groundwater from an existing borehole located on site at the Block Meat Company facility. To support this application, a detailed hydrogeological assessment was undertaken by GCS Water and Environment Consultants (Pty)

Ltd in August 2023. This assessment evaluated the sustainability of groundwater abstraction and the potential impact on local water resources and lawful water users.

The groundwater reserve analysis was based on a delineated sub-catchment area of 17.91 km^2, with the following key findings:

- Estimated groundwater recharge: 343,743.50 m^3/a.
- Current abstraction within sub-catchment: 40,387.25 m^3/a.
- Remaining water availability: 68,438.09 m^3/a.
- Proposed annual abstraction (Block Meat): 12,193.92 m^3/a.
- Resulting surplus after proposed use: ±56,244.17 m^3/a.

The DWS conducted a reserve determination for the water resources of the Vaal WMA in terms of Section 16(1) of the NWA (DWS, 2020). The proposed GRD for quaternary C21D is summarised in Table 9-1.

Table 9-1: Quaternary catchment C21D groundwater reserve (GCS, 2023)

Parameter	Value
Quaternary Catchment	C21D
Area (km^2)	446
Mean Annual Precipitation (mm)	698
Recharge (m^3/a)	8,560,000
Population (minimum level)	180,660
Basic Human Needs (m^3/a)	1,650,000
Groundwater Component of Baseflow (m^3/a)	4,200,000
Total Reserve (m^3/a)	5,850,000
Groundwater Use (WARMS, 2024) (m^3/a)	1,005,735
Allocable Groundwater Total (m^3/a)	1,704,265

Despite the broader catchment experiencing some water resource constraints, the localised reserve determination supports the viability of the proposed abstraction volume. The low impact risk rating is conditional on implementation of appropriate risk mitigation and groundwater management strategies.

9.6.2 Risk Mitigation Measures

To ensure the sustainable use of groundwater resources and to mitigate potential environmental and operational risks, the following precautionary measures are recommended:

9.6.2.1 Groundwater Management

- Regular monitoring of groundwater levels in the abstraction borehole and surrounding observation boreholes to detect any trends indicating over abstraction.
- Implementation of a strict abstraction schedule, aligned with hydrogeological recommendations, to ensure that pumping rates remain within the sustainable yield of the aquifer.

- Annual reporting of abstraction volumes and water level trends to the DWS as part of compliance obligations.

9.6.2.2 Site Design and Borehole Protection

- Surface grading around the borehole head to direct stormwater and runoff away from the casing and wellhead area, thereby preventing infiltration of contaminants and physical damage to infrastructure.
- Securing of borehole infrastructure to prevent unauthorised access and potential misuse.

9.6.2.3 Spill Response and Hazardous Material Management

Development and implementation of a site-specific Spill Response Plan, including:

- Routine training for all operational staff on spill response protocols.
- Provision of readily accessible spill kits near storage and handling areas.
- Clear labelling and storage of hazardous materials in compliance with relevant health, safety and environmental legislation.

Procedures for immediate containment, clean-up and disposal of any spilled substances to avoid groundwater contamination.

9.7 Section 27 (g): The Class and the Resource Quality Objectives of the Water Resource

Impact of groundwater abstraction on surface water is moderate protection and moderate utilisation, indicating groundwater water quality reserve specification Class II (GCS, 2023).

Table 9-2: Groundwater sampling was undertaken from BH2 (GCS, 2023)

Parameter	Risk	Unit	Standard Limit	BH2
Physical and aesthetic determinants				
Colour	Aesthetic	mg/L Pt-Co	≤ 15	<5.00
Conductivity at 25 °C	Aesthetic	mS/m	≤ 170	97.5
pH at 25 °C	Operational	pH units	≥ 5 to ≤ 9.7	6.93
Total dissolved solids	Aesthetic	mg/l	≤ 1 200	846
Turbidity	Operational	NTU	≤ 1	**20.5**
Turbidity	Aesthetic	NTU	≤ 5	**20.5**
Chemical determinants — macro-determinants				
Ammonia as N	Aesthetic	mg/l	≤ 1.5	<0.005
Chloride as Cl^-	Aesthetic	mg/l	≤ 300	119
Combined nitrate plus nitrite	Acute health	mg/l	≤1	<1.00
Fluoride as F^-	Chronic health	mg/l	≤ 1.5	0.32
Free chlorine as Cl_2	Chronic health	mg/l	≤ 5	0.11
Monochloramine	Chronic health	mg/l	≤ 3	0.12
Nitrate as N	Acute health	mg/l	≤ 11	0.571
Nitrite as N	Acute health	mg/l	≤ 0.9	<0.06S
Sodium as Na	Aesthetic	mg/l	≤ 200	27.9
Sulphate as SO_4^{2-}	Acute health	mg/l	≤ 500	174
Sulphate as SO_4^{2-}	Aesthetic	mg/l	≤ 250	174
Zinc as Zn	Aesthetic	mg/l	≤ 5	<0.002
Chemical determinants — micro-determinants				
Aluminium as Al	Operational	mg/l	≤ 0.3	<0.002
Antimony as Sb	Chronic health	mg/l	≤ 0.02	<0.001
Arsenic as As	Chronic health	mg/l	≤ 0.01	<0.006
Barium as Ba	Chronic health	mg/l	≤ 0.7	0.04
Boron as B	Chronic health	mg/l	≤ 2.4	<0.013
Cadmium as Cd	Chronic health	mg/l	≤ 0.003	<0.002
Copper as Cu	Chronic health	mg/l	≤ 2	0.012
Cyanide (recoverable) as CN^-	Acute health	mg/l	≤ 0.2	<0.005
Iron as Fe	Chronic health	mg/l	≤ 2	1.9
Iron as Fe	Aesthetic	mg/l	≤ 0.3	1.9
Lead as Pb	Chronic health	mg/l	≤ 0.01	<0.004
Manganese as Mn	Chronic health	mg/l	≤ 0.4	**1.07**
Manganese as Mn	Aesthetic	mg/l	≤ 0.1	**1.07**
Mercury as Hg	Chronic health	mg/l	≤ 0.006	<0.005
Nickel as Ni	Chronic health	mg/l	≤ 0.07	0.011
Selenium Se	Chronic health	mg/l	≤ 0.04	<0.002
Total chromium as Cr	Chronic health	mg/l	≤ 0.05	<0.010
Uranium as U	Chronic health	mg/l	≤ 0.03	<0.015
Chemical determinants — organic determinants				
Bromodichloromethane	Chronic health	mg/l	≤ 0.06	<0.002
Bromoform	Chronic health	mg/l	≤ 0.1	<0.020
Dibromochloromethane	Chronic health	mg/l	≤ 0.1	<0.002
Phenols	Aesthetic	mg/l	≤ 0.01	<0.01
Total microcystin	Chronic health	mg/l	≤ 0.001	<0.0005
Total organic carbon as C	Chronic health	mg/l	≤ 10	1.75
Trihalomethanes Chloroform	Chronic health	mg/l	≤ 0.3	<0.002

Note:

Red and Bold exceed the SANS 241:2015 Standard

9.8 Section 27 (h): Investments Already made and to be made by the Water User in Respect to the Water Use in Question

To date, substantial investments have already been made by the applicant to support the proposed water use. These include the completion of all required environmental and technical studies, such as the hydrogeological assessment and associated impact evaluations, as well as engagement with relevant regulatory authorities to facilitate compliance with the NWA and associated licensing requirements.

In addition, the necessary water-related infrastructure has been installed on site, including the borehole development, pump installation and reticulation systems, thereby enabling operational readiness in accordance with engineering specifications and environmental authorisations.

Future investments will focus on:

- The operation of the installed infrastructure.
- Ongoing monitoring, reporting and compliance aligned with the approved WUL conditions.
- Maintenance and optimisation of water use systems to ensure continued efficiency and alignment with sustainability goals.
- These past and future investments demonstrate the applicant's commitment to responsible water use, legal compliance and the long-term viability of operations.

9.9 Section 27 (i): The Strategic Importance of the Water Uses to Be Authorised

The groundwater use is of strategic importance to the continued operation and long-term viability of the Block Meat Company facility in Benoni, Gauteng. As part of the Shoprite Group (Africa's largest supermarket retailer and South Africa's largest private sector employer) this facility plays a critical role in supporting the Group's food processing and distribution network. Ensuring a reliable and sustainable water supply is essential for maintaining hygiene standards, food safety and uninterrupted production, particularly in a region prone to municipal water supply challenges.

The water use directly supports Shoprite's sustainability strategy, which integrates resource efficiency, risk mitigation and operational resilience across its business activities. By abstracting groundwater from an authorised on site borehole, the facility reduces its dependence on municipal supply, alleviating pressure on public infrastructure while safeguarding its own operational continuity. This approach is consistent with Shoprite's broader adoption of water-efficient processes, energy-saving technologies and environmentally responsible practices that collectively enhance sustainability and reduce resource consumption.

Economically, the water use enables the facility to retain jobs, support local procurement and contribute to regional economic development. Continued operations strengthen the food value chain, ensuring supply stability and market responsiveness, particularly during times of infrastructure failure or service interruption. The licence also supports the Group's commitment to transformation and inclusive growth through supplier development and B-BBEE targets.

In addition to these operational and economic benefits, the authorised water use underpins Shoprite's CSI initiatives, which focus on hunger relief, youth employment and small business support. These programmes, which depend on the uninterrupted functioning of the facility, contribute directly to national development priorities and align with several of the United Nations SDG, including SDG 2 (Zero Hunger), SDG 6 (Clean Water and Sanitation) and SDG 8 (Decent Work and Economic Growth). Failure to authorise the water use would undermine these benefits, posing risks to jobs, livelihoods, food security and sustainability outcomes.

Accordingly, the water use is not only a legal and operational necessity but also a strategic enabler of Shoprite's environmental, social and economic commitments and is therefore clearly in the public interest.

9.10 Section 27 (j): The Quality of Water in the Water Resource Which May Be Required for the Reserve and for Meeting International Agreements

The water quality of the borehole presented above displays generally excellent water quality that would in no way present any threats to the groundwater reserve in the quaternary sub-catchment and beyond.

However, the decline in general water quality within the Vaal-Orange River WMA is largely due to irrigation runoff, industrial and urban development and the effects of mining (VOCMA, 2025). To tackle these issues, the VOCMA must formulate and execute a comprehensive Integrated Water Quality Plan. This plan will engage a broad range of stakeholders such as local communities, affected entities and industry to ensure that the water discharged back into the system by industrial users aligns with future water supply needs. VOCMA's strategy will address all stages of the water cycle, including drinking water safety, quality monitoring, groundwater, rural land use, stormwater, sewage infrastructure, wastewater treatment returns and industrial effluent regulation, all underpinned by a strong communication and stakeholder engagement framework (VOCMA, 2025).

While the Vaal River catchment is itself fully contained within South Africa, it is a major tributary of the Orange River that forms the border between South Africa and Namibia. However, the minor extraction that this Project represents will have no impact on any international commitments South Africa might have concerning the Orange River basin.

9.11 Section 27 (k): The Probable Duration of Any Undertaking or which a Water Use is to be Authorised

The water use for which authorisation is sought is intended to support Block Meat Company's ongoing operational activities in Benoni for the full remaining life of the undertaking. At present, there is no defined end date for Block Meat's operations in the region and activities are expected to continue for the foreseeable future in line with long-term business strategies and sustained demand in the food production sectors.

Accordingly, the water use authorisation is expected to remain valid until such time as Block Meat Company ceases its operations at the Benoni operations.

10 CONCLUSION

The Block Meat Company facility located in Apex, Benoni requires authorisation for water use in terms of Section 21(a) of the NWA, relating to the abstraction of groundwater from an existing on site borehole (BH2) to supplement municipal water supply and ensure operational continuity during periods of municipal service interruption. The applied for abstraction volume of 5,000 m^3/a is conservative and well below the hydrogeologically determined sustainable yield of the borehole.

The hydrogeological assessment confirms that groundwater abstraction occurs from a deep, confined fractured aquifer, with a calculated radius of influence of approximately 8.6 m. No neighbouring groundwater users were identified within a 2.5 km radius of the borehole and no hydraulic interference with other boreholes was observed during testing. When managed within the proposed abstraction limits, the potential impact on the groundwater resource and any hydraulically connected surface water systems is considered negligible.

Potential water-related risks associated with the operation are limited to groundwater abstraction management, process water use and effluent discharge to the municipal sewer system. These risks are adequately addressed through the Environmental Management Plan, which prescribes abstraction controls, preventative maintenance of water infrastructure, separation of clean and dirty water systems and routine fat trap management prior to sewer discharge. The proposed monitoring programme includes continuous abstraction monitoring via installed flow meters, routine groundwater level measurements and annual groundwater quality analysis, providing an effective early warning mechanism and enabling adaptive management should any adverse trends be detected.

From a socio-economic perspective, the facility forms an integral component of the Shoprite Group's food processing and distribution network, supporting employment, local procurement and regional economic activity. A reliable and resilient water supply is essential to maintaining food safety standards, safeguarding jobs and ensuring uninterrupted operations in a context of increasing municipal water supply challenges. Authorisation of the

proposed water use will therefore support economic stability, food security and responsible industrial development within the region.

On the basis of the specialist investigations, risk assessments, and the integrated mitigation measures proposed, authorisation of the groundwater abstraction is recommended, subject to the following key conditions:

- Groundwater abstraction shall be limited to the licenced volume of 5,000 m^3/a and used solely for authorised operational purposes.
- Continuous abstraction monitoring shall be maintained through calibrated flow meters, with records retained for compliance auditing and reporting to the DWS.
- Groundwater level and quality monitoring shall be undertaken in accordance with the approved monitoring programme, with results reviewed annually to confirm the absence of adverse trends.
- Water use efficiency and preventative maintenance measures shall be implemented to minimise unnecessary water losses.
- Effluent and wastewater management measures, including routine fat trap maintenance and compliance with municipal sewer discharge requirements, shall be strictly adhered to.
- An adaptive management approach shall be applied, with operational controls reviewed and adjusted if monitoring results indicate potential risks to the groundwater resource.

With these conditions in place, the proposed water use is considered environmentally acceptable, technically sound and socio-economically beneficial, and it can proceed in a manner that protects groundwater resources while supporting sustainable industrial activity and inclusive economic growth in the local area.

11 REFERENCES

AQRate. (2023). *B-BBEE Certificate* .

Barnard H.C. (2000). *An explanation for the 1:500 000 hydrogeological map of Johannesburg 2526*. Pretoria, Johannesburg, RSA.: Department of Water Affairs and Forestry .

City of Ekurhuleni. (2021). *A City to Live, Play and Invest. Available at: https://www.ekurhuleni.gov.za/business-with-ekurhuleni/invest/a-city-to-live-play-and-invest/*.

City of Ekurhuleni. (2024). *2023/24 Annual Report*.

City of Ekurhuleni. (2025). *Annexure A: 2022/23-2026/27 Amended Integrated Development Plan (2025/26)*.

DTIC. (2015). *B-BBEE Codes of Good Practice*. Pretoria: Department of Trade, Industry and Competition (DTIC).

DWS. (2013). *National Water Resource Strategy: Second Edition (NWRS II)*. Pretoria.

DWS. (2020). *Reserve Determination for Water Resources for the Vaal Catchment. Government Notice No. 1019, Government Gazette No. 43734, 25 September 2020*. Pretoria: Department of Water and Sanitation (DWS).

GCS. (2023). *Shoprite Meat Processing Plant – The Block Meat Hydrogeological Assessment*. Johannesburg.

Parsons, R., & Wentzel, J. (2007). *Groundwater Resource Directed Measures Manual, WRC Report No TT 299/07*. DWAF.

Shoprite. (2024). *Sustainability Report*. Cape Town.

Shoprite Holdings Ltd. (2025a). *Application of the King IV Code Principles*. SHOPRITE HOLDINGS LTD.

Shoprite Holdings Ltd. (2025b). *Social and Ethics Committee Charter*. Shoprite Holding Ltd.

Shoprite Holdings Ltd. (2025c). *Sustainability Report 2025*. Shoprite Holdings Ltd.

Statistics South Africa. (2023). *Census 2022 Municipal Fact Sheet. Report No. 03-01-82*. Pretoria: Statistics South Africa.

Vegter, J.R., Ward, S. & Winter, P.R. (1968). *Groundwater occurrence in South Africa: Weathered and fractured sedimentary rocks*. Pretoria: Geological Survey of South Africa.

VOCMA. (2025). *Vaal-Orange Catchement Management Agency* . Pretoria.

APPENDIX A: CURRICULUM VITAE AND QUALIFICATIONS OF ENVIRONMENTAL ASSESSMENT PRACTITIONER

Paula Tolksdorff

SENIOR TECHNICAL MANAGER

CORE SKILLS

- Environmental Legislation
- Equator Principles, IFC Performance Standards, World Bank EHS Guidelines
- Environmental and Social Impact Assessments
- Stakeholder Engagement and Management
- Environmental Management Programmes
- Operation and Construction Environmental Management Plans and Procedures
- Management Systems and Frameworks incl. ISO 14001
- Compliance Auditing, Due Diligence & Project Management
- Waste & Water Management

DETAILS

Academics

- Baccalaureus Technologiae (B-Tech), Engineering Civil, Urban and Rural Development, University of the Witwatersrand, 1997
- National Higher Diploma: Civil Engineering, University of the Witwatersrand, 1994
- National Diploma: Civil Engineering, University of the Witwatersrand, 1993
- MSc. Environmental Management, University of North West (two years course work complete 2011/2012)

Short Courses

- Certificate in Public Participation, International Association of Public Participation
- Centre of Environmental Management SAATCA approved course in Implementing Environmental Management Systems (ISO 14001)
- IEMA Approved Foundation course in Environmental Auditing
- IEMA Approved Carbon Footprint Management Course
- CESA, Developing Mentorship Skills for Management and Professionals
- Water Governance Course, Carin Bosman Sustainable Solutions

Languages

- English
- Afrikaans

Countries Worked In

Botswana, Democratic Republic of the Congo, Guinea, Liberia, Mozambique, Russia, Saudi Arabia, South Africa, Tanzania, Zambia and Zimbabwe

PROFILE

Paula brings over 30 years of specialised experience in the environmental sector, working across various industries, including global industrial and mining clients, as well as commercial developments. Her career has taken her through significant projects across Africa, where she has gained a deep understanding of how environmental and social licenses to operate impact both operations and project outcomes.

With a strong foundation in sustainability, Paula applies her expertise to integrate and maintain effective, sustainable practices across a wide range of operational contexts. As an Environmental Assessment Practitioner and Professional Natural Scientist, her skills are both robust and multifaceted. She excels in conducting environmental and social (E&S) impact assessments and in developing comprehensive E&S management programs tailored to the specific needs of each project. Her work includes crafting and implementing E&S management systems for both construction and operational phases, ensuring they adhere to international standards, as well as local regulatory requirements.

Paula is also highly experienced in stakeholder engagement, ensuring clear communication and collaboration across all parties involved in a project. Her capabilities extend to due diligence and compliance auditing, where she provides critical oversight to ensure regulatory compliance and operational integrity. Additionally, she has extensive experience managing water and waste resources, promoting responsible and sustainable practices.

Through her well-honed project management skills, Paula effectively leads complex projects, consistently ensuring that sustainability goals are met. Her career and diverse background demonstrate a deep commitment to advancing environmental stewardship and sustainable development across challenging and diverse environments.to advancing environmental stewardship and sustainable development across challenging and diverse environments.

Professional Affiliations:

- Environmental Assessment Practitioners Association of South Africa (2019/509)
- South African Council for Natural Scientific Professions (152904)
- International Association for Impact Assessment South Africa (1745)
- International Association Public Participation (IAP2SA014)

Period	Employer	Position	Role/ Responsibility
Oct 24 – Current	GCS	Senior Technical Manager – Environmental Group	As Technical Manager, Paula is responsible for overseeing the development and growth of environmental services. She leads business development efforts, builds and maintains client relationships, and develops and implements business strategies to drive the organisation's success. Paula manages a wide range of responsibilities, including overall project management, team leadership, and financial oversight, ensuring that projects are delivered on time and within budget while aligning with the organisation's long-term goals. In her technical capacity, Paula conducts environmental and social impact assessments, designs and implements environmental management programmes, and develops operational and construction environmental management plans and procedures. She plays a key role in establishing environmental management systems and engages with stakeholders to foster collaboration and ensure compliance. Her duties also include conducting compliance audits, due diligence assessments, and managing water and waste programs. Additionally, Paula provides environmental training and oversees project management from inception to completion. Her combined experience in technical and managerial roles equips her with a deep understanding of environmental practices and strategic leadership in various operational contexts.
Sep 2023 – Jun 2024	OMI Solutions (Pty) Ltd, Pretoria	Principal Environmental Assessment Practitioner	As a Principal Environmental Assessment Practitioner, Paula was responsible for leading business development efforts, managing client relationships, and developing business strategies to ensure the growth and success of the environmental services offered. She oversaw project management, guiding teams through the delivery of projects, and maintained financial oversight to ensure budgets and timelines were adhered to. In her technical capacity, Paula's role as an Environmental Assessment Practitioner and Professional Natural Scientist involved conducting environmental and social impact assessments, designing environmental management programmes, and developing both operational and construction environmental management plans. She was also responsible for implementing environmental management systems, managing stakeholder engagement, conducting compliance audits, performing due diligence assessments, and overseeing water and waste management. Her work included delivering environmental training and managing projects through their entire lifecycle, providing strategic guidance and ensuring regulatory compliance throughout.
Nov 2022 – Aug 2023	Digby Wells Environmental (Pty) Ltd	Principal Environmental Assessment Practitioner	

Period	Employer	Position	Role/ Responsibility
Nov 2019-Aug 2022	Current Hatch Africa (Pty) Ltd, Johannesburg	Regional Director Africa for the Environmental Services Group	As Regional Director, Paula was tasked with leading the development and growth of the Environmental Services Group across Africa. This role involved overseeing business development efforts, building and maintaining client relationships, and developing and implementing the business strategy to drive the organisation's success in the region. She managed a broad spectrum of responsibilities, including overall project management, team leadership, and financial oversight, ensuring that projects were delivered on time and within budget, while aligning with the group's long-term goals. In her role as an Environmental Practitioner, Paula was deeply involved in conducting environmental and social impact assessments, designing and implementing environmental management programmes, and developing operational and construction environmental management plans and procedures. She also played a key role in establishing environmental management systems and engaging with stakeholders to foster collaboration and ensure compliance. Her duties further extended to conducting compliance audits, due diligence assessments, and managing water and waste programs. Paula's work also encompassed delivering environmental training and overseeing the management of various projects from inception to completion. Her experience in both technical and managerial capacities equipped her with a comprehensive understanding of environmental practice and strategy in diverse operational contexts.
2005-2019	Terra Pacis Environmental (Pty) Ltd	Managing Director (founding member)	As a Director of Terra Pacis, Paula was responsible for the development of the Environmental Impact Assessment discipline, the management of business development, client relationship management, the development of the business strategy, overall project management, team management and financial management. As an Environmental Practitioner, Paula duties included: environmental and social impact assessments, environmental management programmes, operation and construction environmental management plans and procedures, environmental management systems, stakeholder engagement and stakeholder management, compliance auditing, due diligence, water and waste management, environmental training and project management.
2006-2009	Cymbian Environmental and Social Consulting Services	Director (founding member)	As a Director of Cymbian, Paula was responsible for the development of the Environmental Impact Assessment discipline, the management of

Period	Employer	Position	Role/ Responsibility
			business development, client relationship management, the development of the business strategy, overall project management, team management and financial management. As an Environmental Practitioner, Paula duties included: environmental and social impact assessments, environmental management programmes, operation and construction environmental management plans and procedures, environmental management systems, stakeholder engagement and stakeholder management, compliance auditing, due diligence, water and waste management, environmental training and project management.
2005-2008	Contract to: Golder Associates Africa Pty Ltd	Environmental Consultant	Paula assisted on environmental and social impact assessments and environmental management programmes.
2005	ERM Southern Africa, Johannesburg	Snr Environmental Consultant	As an Environmental Practitioner, Paula duties included: environmental and social impact assessments, environmental management programmes, operation and construction environmental management plans and procedures, environmental management systems, stakeholder engagement and stakeholder management, compliance auditing, due diligence, water and waste management, environmental training and project management.
1998-2005	Contract to Anglo Gold Ashanti Limited, Johannesburg	Environmental Consultant	As an Environmental Practitioner, Paula duties included: environmental and social impact assessments, environmental management programmes, operation and construction environmental management plans and procedures, environmental management systems, stakeholder engagement and stakeholder management, compliance auditing, due diligence, water and waste management, environmental training and project management.
1996–1998	Anglo American, Johannesburg	Civil Engineering Technician and Environmental Consultant	As an Environmental Practitioner, Paula duties included: environmental and social impact assessments, environmental management programmes, operation and construction environmental management plans and procedures, environmental management systems, stakeholder engagement and stakeholder management, compliance auditing, due diligence, water and waste management, environmental training and project management.
1996–1996	Hamilton Associates, Rosebank	Civil Engineering Technician	Assisted civil engineers plan, design, and build residential development projects including services (access roads/ water/sewage/stormwater).

Period	Employer	Position	Role/ Responsibility
1990-1996	Stuart Scott Incorporated, Sandton	Civil Engineering Technician	Assisted civil engineers plan, design, and build highways, bridges, and services (water/sewage/stormwater). Worked on the site of a large highway construction project and a infrastructure development project.

Key Experience

Environmental and social impact assessments (including the development of environmental and social management programmes/plans/systems)

- Environmental Management Plan Update for North Mara Gold Mine Limited, Tanzania, Barrick Gold Corporation.
- Environmental Impact Study and Management Plan Kisanfu Project, Democratic Republic of the Congo, Phelps Dodge Congo SPRL.
- Environmental and Social Impact Assessment for the Proposed Chirundazi Dam and Associated Supporting Infrastructure, Karo Platinum, Zimbabwe.
- Environmental and Social Impact Assessment for the Opencast Expansion Project, Karo Platinum, Zimbabwe.
- Scoping and Environmental Impact Assessment for the Sasol Destoning Project, Mpumalanga Province, South Africa.
- Scoping and Environmental Impact Assessment for the Sasol Syferfontein Tweedraai Expansion, Mpumalanga Province, South Africa.
- Scoping and Environmental Impact Assessment for the 100 MW Namane Solar PV Plant, South Africa, Namane Generation (Pty) Ltd.
- Environmental Authorisation and Atmospheric Emissions Licence for the Copper Nickel Recovery Plant, Rand Refinery Limited, South Africa.
- Environmental Authorisation and Water Use Licence (by way of a Basic Assessment) for the Light Industrial Development on proposed Kya Sand Extension 104, Randburg, South Africa.
- Environmental Authorisation and Atmospheric Emissions Licence (by way of Scoping and Environmental Impact Assessment) for Mamatwan Mine New Sinter Plant, Samancor Manganese (Pty) Limited (BHP Billiton), South Africa.
- Environmental Authorisation, Waste Management Licence and Atmospheric Emissions Licence (by way of Scoping and Environmental Impact Assessment) for the M14 Furnace, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton), South Africa.
- Environmental Authorisation and Waste Management Licence (by way of Scoping and Environmental Impact Assessment) for the upgrade of the existing Pelletising Plant to an Agglomeration Plant, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton), South Africa.
- Environmental Authorisation and Atmospheric Emissions Licence (by way of Scoping and Environmental Impact Assessment) for the Medium Carbon Ferro Manganese Converter Project, Transalloys (Pty) Ltd, South Africa.
- Environmental Authorisation and Atmospheric Emissions Licence (by way of Scoping and Environmental Impact Assessment) for the Construction and Operation of Two Furnaces and Associated Infrastructure, Transalloys (Pty) Ltd.
- Environmental Authorisation and Atmospheric Emissions Licence (by way of Scoping and Environmental Impact Assessment) for Proposed Phosphoric Acid Plant, Hi-Fos (Pty) Ltd, South Africa.
- Waste Management Licence (by way of a Basic Assessment) for the Refurbishment of West Plant Sludge Dam 3 and Associated Mixing facility, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton).
- Water Use Licences for the Nyakallong and Virginia Wastewater Treatment Works Upgrade, Matjhabeng Local Municipality, Free State, South Africa.
- Water Use License Application, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton), South Africa.

Risk assessments

- Environmental Risk Assessment for the Hard Ice Plant at Mponeng Mine, AngloGold Ashanti, South Africa.
- Environmental Risk Assessment for the Surface Cooling System Expansion for Ventersdorp Contact Reef B120 Level Project, West Wits Mponeng Mine, AngloGold Ashanti, South Africa.
- Dam Risk Assessment Goedgevonden Colliery, Xstrata Coal, South Africa.
- Environmental Risk Assessment for the Coal fired boilers, Newlands, SAB Miller, South Africa.

Feasibility studies

- Zimplats Selous Base Metals Refinery (BMR) Feasibility Study; Supporting Environmental Studies (environmental legal opinion and permitting requirements, environmental impact analysis, energy management and GHG emissions reduction study, water management study), Zimplats, Zimbabwe.
- Water Supply Feasibility Study (environmental legal opinion and permitting requirements), for Mondi South Africa (Pty) Ltd, South Africa.
- Port Durnford Prefeasibility Study Project, Tronox KZN Sands (Pty) Ltd, Richards Bay, South Africa.
- Prefeasibility study for the construction of a new converting facility, (environmental design criteria, regulatory review and permitting requirements, emissions

modelling for technology selection, opportunities to improve GHG emissions and energy management), Confidential Project, South Africa.
- Establishment of an Aluminium Recycling Plant (site sensitivity analysis, regulatory review and permitting requirements, provision of cost estimates to obtain environmental permits and licences), (Confidential Project), South Africa.
- Feasibility study for the processing of a by-product in the platinum industry, (environmental design criteria, environmental legal opinion and permitting strategy, environmental legal register, environmental and human health impact analysis, water management, contractor social management plan, construction environmental management plan), Confidential Project, South Africa.

Environmental engineering and monitoring

- Review of Environmental Design Criteria for the Development of an Iron Ore Mine in Mauritania, El Aouj Mining Company, Northern Africa.
- Review of the Environmental Protection Measures developed for the construction and operation of a Gold Mine in Russia with particular focus on identifying relevant monitoring requirements, Kinross Gold.
- Environment Design Criteria for an SO2 Abatement Plant, Anglo American Platinum, South Africa.
- Sustainable design options study for the Nimba Iron Ore Project, Société des Mines de Fer de Guinée (SMFG) Guinea and Liberia.
- Onshore and offshore environmental baseline studies, compilation of environmental monitoring/management plans and procedures, and environmental compliance monitoring for the construction of a LNG plant in the Afungi Peninsula in the Palma District of Cabo Delgado Province, CCSJV, Mozambique.
- Product and waste storage areas upgrade project at the Port of Durban, Bidvest Tank Terminals, KwaZulu-Natal, South Africa.
- Salvage Yard Layout, Detailed Design and Stormwater Management, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton), South Africa.
- Development of Water Balances for 1) Free State Operations, 2) Vaal River Operations and 3) West Wits Operations, AngloGold Ashanti, South Africa.
- Clean and Dirty Water Separation Studies for 1) Vaal River Operations (Mines and Processing Plants) and 2) West Wits Operations (Mines and Processing Plants), AngloGold Ashanti, South Africa.

Circular economy

- Scoping exercise to develop and Extended Producer Responsibility Scheme for a multi-national drink and brewing company (Confidential Project), South Africa.
- Concept Study for the Hillside Used Beverage Can (UBC) Recycling Project, South32, South Africa.

Environmental management systems and auditing

- Development of an Environmental Management System at Lumwana Mine, Zambia, Barrick Gold Corporation.
- Development of an Environment Management System (ISO 14001) including assurance of certification for ERGO, Anglogold Ashanti
- Environmental Management System (ISO 14001) development for Scaw Metals.
- Development of an Environment Management System (ISO 14001), Kimberley Mines, De Beers Consolidated Mines.
- Review and updating of the Environmental Management System (ISO 14001) at Newlands, SAB Miller.
- The Development and Implementation of processes and tools to comply with conditions defined in the Waste Management Licences, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton).
- Vegetation Control Procedure; Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton).
- The Development of Standard Operating Procedures for the Materials Management Department, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton).
- Admox Bagging Plant, Admox Bagging Plant, Admox Pelletising Plant and OBC Fume Extraction Operation Environmental Management Plan; Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton).
- Internal ISO 14001 Audit, Venetia Mine, De Beers Consolidated Mines.
- Internal ISO 14001 Audit, Voorspoed Mine, De Beers Consolidated Mines.
- Internal ISO 14001:2015 Audit Report for Harmony Central Gold Plant in the Free State Province.
- Internal ISO 14001:2015 Audit Report for Harmony One Gold Plant in the Free State Province.

Environmental policy and legislation
• Review the NEOM Environmental Standards and Policies, Saudi Arabia. • Developing a Greenhouse Gas reporting framework for Department of Mineral Resources and the Department of Energy, Northern Cape Province, South Africa. • Legal Opinion on Requirement for Environmental Authorisation of the Proposed Emergency Diesel Power Generation Project at Wessels Mine, Samancor Manganese (Pty) Limited (BHP Billiton), South Africa. • Environmental Legal Opinion Proposed Soya and Sunflower Bean Operations, Boksburg, South Africa. • Strategic Planning on New Furnace Location, Samancor Manganese (Pty) Ltd (BHP Billiton), South Africa.
Due diligence and technical advisory
• Independent Expert Report Roggeveld Wind Farm Phase 1 And Associated Infrastructure, South Africa. • Technical Advisory services for a Power Purchase Agreement (PPA) for a gas to power plant near Maputo, Mozambique (Confidential Project). • Environmental Due Diligence for an in-land and port side bauxite facility, Republic of Guinea (Confidential Project). • Environmental Due Diligence for the Brush-Arc UG2 Smelting at Richards Bay Alloys, Anglo American Marketing Ltd. • Environmental component of the Independent Engineering Review, for the New Generation Capacity Under the Risk Mitigation IPP Procurement Program (Confidential Project).
Auditing
• Bi-annual Environmental Performance Assessment Audit of the Tailings Facility and associated infrastructure at Harmony Kareerand Operations, Harmony Gold Mining. • Water Use Licence Compliance Audit at Farms K/Kraal 342 JQ, Rooikoppies 297 JQ and Elandsdrift 467 JQ, south of Marikana in the North West Province, Tharisa Minerals (Pty) Ltd. • Peer Review of Audits on the Construction Environmental Management Programme for Anglo American Platinum's Polokwane Metallurgical Complex within the province of Limpopo. • Audit of the Waste Management Practice at Mponeng and Kopanang Mine, AngloGold Ashanti. • External Audit Reports for the Waste Management Licences, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton). • Audit of the Water Use Licence held by Goedgevonden Colliery, Xstrata Coal South Africa. • Annual Internal Audit of the Water Use Licence for Xstrata Coal South Africa (Pty) Ltd Tweefontein Division. • Annual External Water Use Licence Audit, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton). • Annual Audit of the Record of Decision and Environmental Management Plan for the Fouriespruit Stream Diversion and Old Slag Area, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton). • Annual Environmental Performance Audit for the Pelletising Plant, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton). • Environmental Legal Compliance Assessment for the Construction Phase of the M14 Furnace Project Environmental Authorisation, Metalloys Samancor Manganese (Pty) Ltd (BHP Billiton). • Waste Management License Audit for the Slagment Operation, AfriSam Southern Africa (Pty) Ltd. • Environmental-Legal Compliance Assessment Report SCE Ashman (Proprietary) Limited: Vanderbjilpark Plant. • Environmental-Legal Compliance Assessment of the Waste Management Licence and Atmospheric Emission Licence for A-Thermal Retort Technologies (Pty) Ltd.

DECLARATION

I, Paula Tolksdorff hereby declare that the details furnished above are true and correct to the best of my knowledge and belief and I

undertake to inform you of any changes therein, immediately. In case any of the above information is found to be false or untrue or misleading or misrepresenting, I am aware that I may be held liable for it.

Signature:  Date: 17 March 2025

Environmental Assessment Practitioners Association of South Africa

Registration No. 2019/509

Herewith certifies that

PAULA JANE TOLKSDORFF

is registered as an

Environmental Assessment Practitioner

Registered in accordance with the prescribed criteria of Regulation 15. (1) of the Section 24H Registration Authority Regulations (Regulation No. 849, Gazette No. 40154 of 22 July 2016, of the National Environmental Management Act (NEMA), Act No. 107 of 1998, as amended).

Effective: 01 April 2026

Expires: 31 March 2027

Chairperson

Registrar

SAQA
SOUTH AFRICAN QUALIFICATIONS AUTHORITY

SACNASP

South African Council for Natural Scientific Professions

herewith certifies that

Paula Jane Tolksdorff

Registration Number: 152904

is a registered scientist

in terms of section 20(3) of the Natural Scientific Professions Act, 2003
(Act 27 of 2003)
in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **12 June 2024** Expires **31 March 2027**

President of Council

Chief Executive Officer

To verify this certificate scan this code

TECHNIKON WITWATERSRAND

BACCALAUREUS TECHNOLOGIAE

ENGINEERING: CIVIL (URBAN)

INGENIEURSWESE: SIVIEL (STEDELIK)

is awarded to / word toegeken aan

PAULA-JANE LEWIS

Date of Birth / Geboortedatum

1971-01-24

Student Number / Studentenommer

8913463

with effect from / met ingang van

1997-07-01

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Currie

ID No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

Vice-Chancellor & Principal
Visekanselier & Prinsipaal

Deputy Vice-Chancellor & Vice-Principal
Adjunkvisekanselier & Viseprinsipaal

Issued with the approval of the Certification Council for Technikon Education (SERTEC) in terms of section 9 of The Certification Council for Technikon Education Act 1986 (Act 88 of 1986)
Uitgereik met die goedkeuring van die Sertifiseringsraad vir Technikononderwys (SERTEC) ingevolge artikel 9 van die Wet op die Sertifiseringsraad vir Technikononderwys, 1986 (Wet 88 van 1986)

No. / Nr. B 0524

NORTH-WEST UNIVERSITY ®
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS

Private Bag X6001, Potchefstroom
South Africa, 2520

Tel: (018) 299-1111/2222
Web: http://www.nwu.ac.za

MRS PJ TOLKSDORFF
P O BOX 41409
CRAIGHALL
2024

2011/12/14

23119128 - 2011

Dear MRS TOLKSDORFF

EXAMINATION RESULTS

Web address: http://www.nwu.ac.za/admin/index.html

NB Any errors and/or omissions on your 2011 record must be reported before 17 February 2012.

Herewith the results of the past examination. We trust that you were rewarded for your effort and hard work.

Qualification : 2181061 M IN ENVIRON MAN
Curriculum Code : N824P ENVIRONMENTAL ANALYSIS AND MANAGEMENT

Date	Module Name	Module Code	Module Type	Mark	Result
201111	ENVIRONMENTAL MANAGEMENT II	OMBO 8 78	Core module	69	Passed

2012 Graduate students: In the case of an exception, if we have to re-schedule your ceremony, we will inform you in February per SMS and letter.

DIRECTOR : ACADEMIC ADMINISTRATION

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Currie

ID No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

NORTH-WEST UNIVERSITY ®
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT
POTCHEFSTROOM CAMPUS

Private Bag X6001, Potchefstroom
South Africa, 2520

Tel: (018) 299-1111/2222
Web: http://www.nwu.ac.za

MRS PJ TOLKSDORFF
P O BOX 41409
CRAIGHALL
2024

2012/12/11

23119128 - 2011

Dear MRS TOLKSDORFF

EXAMINATION RESULTS

Web address for examination results: http://www.nwu.ac.za/content/exam-results

Herewith the results of the past examination. We trust that you were rewarded for your effort and hard work.

Qualification : 2181061 M IN ENVIRON MAN
Curriculum Code : N824P ENVIRONMENTAL MANAGEMENT
Method of Delivery : PART TIME

Date	Module Name	Module Code	Module Type	Mark	Result
201211	ENIVORMENT ANALYSIS 2	OMBO 8 79	Core module	75	Distinction

Registration schedule 2013:
Undergraduate and Honours students see :
http://www.nwu.ac.za/content/nwu-potchefstroom-campus-current-students-intranet-and-portal

NB: Any errors and/or omissions on your 2012 record must be reported before 18 January 2013.

CAMPUS REGISTRAR

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Currie

CO No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

NORTH-WEST UNIVERSITY
YUNIBESITI YA BOKONE-BOPHIRIMA
NOORDWES-UNIVERSITEIT

CEM

SAATCA D15

Centre for Environmental Management

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Currie

ID No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

This is to certify that

PJ TOLKSDORFF
7101240049089

successfully completed and
passed SAATCA approved examination

Implementing Environmental Management Systems (ISO 14001)

CEM-03.1/0117/2011

22-24 June 2011

NQF Level: 7

Prof. JG Nel
Executive Manager:
Centre for Environmental Management
Course Leader

Prof. JJ Pienaar
Dean Faculty of Natural Science

Carin Bosman
Sustainable Solutions

This Certificate is issued to
certify that

Paula Tolksdorff

has attended a 3 day Training Workshop entitled

Water Governance in South Africa

held on

9-11 May 2023

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Curtis

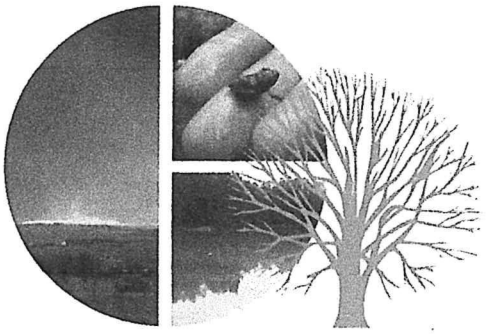
ID No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

WISA

Water Institute of Southern Africa

Carin Bosman, Director: CBSS
SACNASP: WISA2023-0412-002542
ECSA: WISA2023-0412-002542 (3pt)



Our environmental- and water governance solutions help you to take sustainable management decisions

PO Box 26442 ♦ Gezina ♦ 0031 ♦ http://www.cbosss.com/training/

CESA

Consulting Engineers South Africa

This is to acknowledge that

Paula Tolksdorff

Attended the Online

Developing Mentorship Skills for

Management and Professionals

On 21-22 February 2022

This qualifies for 2 CPD Points
for Continuing Professional Development
CESA-2049-11/2024

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Currie

No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

Chris Campbell
School of Consulting Engineering
Signed on 22 February 2022
Certificate number 29764

NETWORX
For Career Development

Certificate of Competence

This is to certify that

Paula Jane Tolksdorff

ID Number: 7101240049089

Has successfully completed the

Assessor Course

115753 Conduct outcomes-based assessment NQF Level 5 Credits 15

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Curtis

ID No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

Mylet Ursula Bhengu
Chief Executive Officer

29 November 2019

Date

ETDP SETA SAQA

Certificate Number: NETW/00001902/2019

ETDP SETA Accreditation Number: 10222

LEGISLATIVE COMPLIANCE SPECIALISTS

REG NO. 2006/014854/07

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Curtis

ID No: 38272 Date: 15 Sept 2021

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

This is to certify that

P. Tolksdorff

Name

710124 0049 089

ID Number

Has successfully completed the following LCS course

Legal Liability

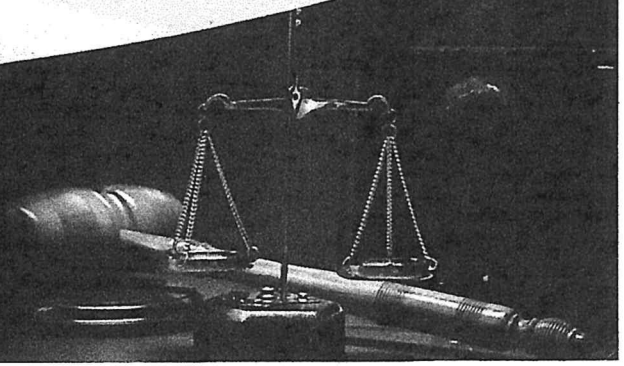
31 May 2021

Date

Facilitator / Assessor

ETDP SETA, SOR No: 61101, US Code: 7978, Endorsement No: US-10

OHS-ACT No. 85 of 1993



Aspects International

IEMA Approved Foundation Course in Environmental Auditing (South Africa)

This is to certify that

Paula Tolksdorff

Attended and Successfully Completed
the above Training Programme on
19 - 23 October 2009
and achieved 87% at Examination

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Currie

BD No: 38232 Date: 7/9/2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

Signed ..... Chief Examiner

Certificate No: SA/0911/9
Issue Date 05/11/09

iema Approved Training Provider

Signed ..... Course Tutor

ASP/FLEA/01109/SOUTH AFRICA

Aspects International Ltd. Trelawna, Daleside Park, Darley, Harrogate, North Yorkshire, HG3 2PX. United Kingdom. T: +44 (0)1423 781 218 E: info@aspexint.com W: www.aspexint.com

Aspects International

IEMA Approved Carbon Footprint Management Course : An Introductory Programme

This is to certify that

Paula Jane Tolksdorff

Attended and Successfully Completed the above Training Programme on

6-7 July 2009

Certificate No: PubCF2/SA/0907/23

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Curtis

ID No: 38232 Date: 25 sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

Signed .....

Chief Examiner

iema Approved Training Provider

Signed .....

Course Tutor

Aspects International Ltd. Trelawna, Dalside Park, Darley, Harrogate, North Yorkshire, HG3 2PX. United Kingdom. T: +44 (0)1423 781 218 E: info@aspexint.com W: www.aspexint.com

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Curtis

ID No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

The International Association for Public Participation

Certificate in Public Participation awarded to

Paula Tolksdorff

October 2009

iap2

International Association for Public Participation

President, IAP2

Training Committee Chair, IAP2

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Curtis

BD No: 38232 Date: 9 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

The International Association for Public Participation

Paula Tolksdorff

has completed IAP2's

Communication for Effective Public Participation

October 2009

iap2

International Association for Public Participation

President, IAP2

Training Committee Chair, IAP2

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Curtis

ID No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

The International Association for Public Participation

Paula Tolksdorff

has completed IAP2's

Techniques for Effective Public Participation

October 2009

International Association for Public Participation

President, IAP2

Training Committee Chair, IAP2

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Currie

ID No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

The International Association for Public Participation

Paula Tolksdorff

has completed IAP2's

Planning for Effective Public Participation

October 2009

International Association for Public Participation

President, IAP2

Training Committee Chair, IAP2

Certificate of Attendance

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold C...

No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

Faculty of Engineering and the Built Environment
(School of Mining Engineering)

This is to certify that

P Tolksdorff

during the period

16 January 2007

has attended and participated in the course

1 Day Report Back from the 1st International Seminar on Mine Closure, Perth Australia 2006

Huw R Phillips

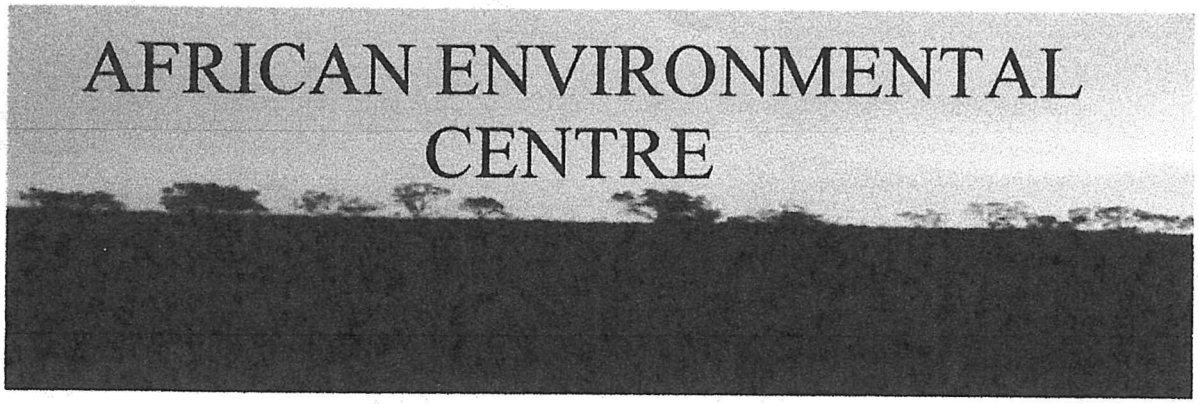
Head, School of Mining Engineering

B M Macquet

Dean, Faculty of Engineering & the Built Environment

Date of Issue: 16th January 2007

AFRICAN ENVIRONMENTAL CENTRE



This is to certify that

Paula Tolksdorff

has successfully completed
the following short course

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Currie

SD No: 38232 Date: 7 Sept 2024

New Life Church, 1 Grosvenor Road, Bryanston, Johannesburg, 2191

NEMA EIA Regulations

on the

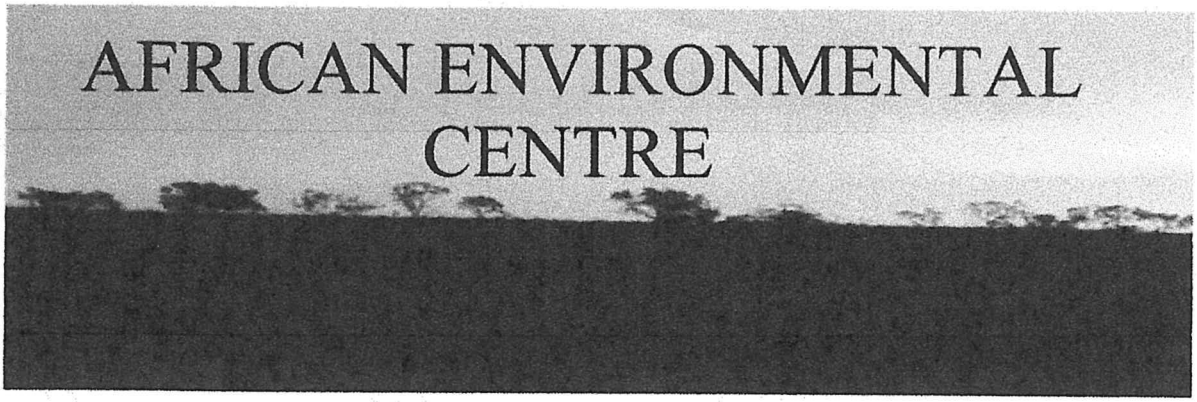
23 October 2006

Director

AFRICAN ENVIRONMENTAL CENTRE
certificate number
2006/10/001/008
FOR TRAINING RESEARCH AND CONSULTING

CC reference number 2006/212059/23

AFRICAN ENVIRONMENTAL CENTRE



This is to certify that

Paula Tolksdorff

has successfully completed
the following short course

NEMA EIA Regulations

on the

23 October 2006

I certify that this document is a true copy of the original which was examined by me and that, from my observations, the original has not been altered in any manner.

SIGNATURE

Commissioner of Oaths - Ryan Harold Currie

No: 38232 Date: 7 Sept 2024

New Life Church. 1 Grosvenor Road, Bryanston, Johannesburg, 2191

Director

AFRICAN ENVIRONMENTAL CENTRE FOR TRAINING RESEARCH AND CONSULTING

certificate number

2006/10/001/008

CC reference number 2006/212059/23

APPENDIX B: HYDROGEOLOGICAL ASSESSMENT REPORT

63 Wessel Road, Rivonia, 2128 PO Box 2597, Rivonia, 2128 South Africa
Tel: +27 (0) 11 803 5726 **Fax:** +27 (0) 11 803 5745 **Web:** www.gcs-sa.biz

Shoprite Meat Processing Plant – The Block Meat Company: Hydrogeological Assessment

Report

Version – FINAL

10 June 2024

GCS Project Number: 23-0528

Client Reference: The Block Meat Company Hydrogeological Assessment



Shoprite Meat Processing Plant – The Block Meat Company: Hydrogeological Assessment

Report
Version – Final

10 June 2024

The Block Meat Company

23-0528

DOCUMENT ISSUE STATUS

Report Issue	**Final**		
GCS Reference Number	GCS Ref – 23-0528		
Client Reference	The Block Meat Company Hydrogeological Assessment		
Title	Shoprite Meat Processing Plant – The Block Meat Company: Hydrogeological Assessment		
	Name	**Signature**	**Date**
Author 1 (Hydrogeologist)	Esmeralda Dubber (BSc, Hons. CanSciNat)	07/06/2024 – 12:13 pm Cand.Sci.Nat.: 148656	10 June 2024
Technical Director	Hendrik Botha (MSc, PriSciNat)	10/06/2024 5:18:09 Pr.Sci.Nat (400139/17)	10 June 2024

LEGAL NOTICE

This report or any proportion thereof and any associated documentation remain the property of GCS until the mandator effects payment of all fees and disbursements due to GCS in terms of the GCS Conditions of Contract and Project Acceptance Form. Notwithstanding the aforesaid, any reproduction, duplication, copying, adaptation, editing, change, disclosure, publication, distribution, incorporation, modification, lending, transfer, sending, delivering, serving, or broadcasting must be authorized in writing by GCS.

EXECUTIVE SUMMARY

GCS was appointed by Shoprite Checkers (Pty) Ltd to conduct a hydrogeological assessment. The hydrogeological assessment will form a component of a Water Use Licence Application (WULA) for Shoprite's meat processing plant - The Block Meat Company. The project site is located at 20 Dunedin Street, Apex, Benoni, Ekurhuleni Local Municipality, in the Gauteng Province.

Based on the average monthly water consumption for June, July and August 2023, the meat processing plant has an estimated water demand of ~11 104 m^3/a. There is currently one (1) borehole on site, that is equipped, and it is proposed that the water from the borehole will be used to supplement the processing plant's current water supply. Abstraction of water from the borehole will require a water use license in terms of Section 21(a) of the National Water Act, 2998 (No.36 of 1998) (NWA). The authorisation process requires that an application in the form of a Water Use License Application (WULA) be undertaken and submitted to the Department of Water and Sanitation (DWS) for approval.

This investigation comprised a desktop assessment, hydrocensus, borehole siting, hydrogeological exploration drilling and aquifer hydraulic testing to form part of a specialist report as input into a Water Use Licence Application.

Site Conceptualisation

The Block Meat Company property is situated along the eastern boundary of quaternary catchment C21D within the Upper Vaal Water Management Area at an altitude of between 1656 and 1655 mamsl.

The Block Meat Company property is underlain by low to moderate-yielding intergranular and fractured aquifer hosted within weathered and fractured Ecca Group sedimentary rocks.

The regional groundwater flow, assuming hydraulic connectivity across the aquifer system/s, is in an easterly direction, a subdued reflection of the surface topography, with groundwater levels ranging from 3.6 to 18.28 (average 12.54) mbgl. However, on a local scale, the flow is likely to be significantly more complex due to geological and structural controls resulting in potential groundwater barriers and discrete conduits to flow. Such as BH2 having a static water level of 120 mbgl which is likely due to semi-confined conditions caused by the Quartzite layer overlying the sedimentary aquifer.

The Turbidity and Manganese are the only constituents in the water pumped from BH2 that exceed the SANS241:2015 water standards for domestic use. Manganese is naturally abundant in rocks, soil and groundwater. The elevated manganese concentration in BH2 is potentially sourced from the sedimentary host rock and is therefore naturally occurring. Manganese supports the growth of certain nuisance organisms in water distribution systems, giving rise to taste, odour and turbidity problems.

Turbidity in water is caused by the presence of suspended matter which usually consists of a mixture of inorganic matter, such as clay and soil particles, and organic matter. The elevated turbidity in the water pumped from BH2 is most likely associated with the elevated manganese concentration as well as suspended soil particles.

The aquifer test results showed that BH2 has a transmissivity value of 2.35 m^2/d and a hydraulic conductivity of 0.05 m/d, indicating a relatively low to intermediate-yielding aquifer system.

Borehole-Specific Sustainable Abstraction Rate

Borehole-specific sustainable abstraction rate was calculated for BH2 as 1.11 l/s for a 24-hour daily pumping schedule, and 1.56 l/s for a 16-hour daily pumping schedule.

BH2 can therefore be pumped at a rate of 1.16 l/s for 8 hours per day and sufficiently recover for sustainable abstraction. This will result in a yield of 33 408 l/d and 12 193.92 m^3/a which is sufficient to satisfy the meat processing plant's estimated water demand of ~30 422 l/d and ~11 104 m^3/a.

Groundwater Reserve Determination:

With no significant geological and/or hydrogeological boundaries within quaternary catchment C21D, the groundwater reserve determination was based on a delineated sub-catchment area of ~ 17.91 km^2 with an estimated groundwater recharge of 343 743.50 m^3/a and an existing abstraction volume of 40 387.25 m^3/a, resulting in a groundwater resource water availability of 68 438.09 m^3/a.

This results in a surplus volume of ~ 56 244.17 m^3/a available water when the Block Meat Company's proposed annual water abstraction of 12 193.92 m^3 is considered.

The groundwater unit/s is considered to be at moderate levels of stress (Category C, 0.2 – 0.5 stress index) with Medium-scale abstraction (Category B, ~84% of recharge).

Based on the above, it is evident that groundwater can be abstracted as a viable source to meet the meat processing plant's proposed water demand requirements.

Hydrogeological Risk and Impact Assessment:

- I n the SCM, there are 2 aquifer systems: A regional upper weathered aquifer and a deeper confined fractured aquifer.
    - The weathered aquifer has a low yield potential, and the solid rock is not fissured to an extent to promote water movement.

- The production borehole (BH2) on site draws from the deeper fractured aquifer (>150 mbgl), with a static water level recorded at 120 mbgl and a yield of 1.16 l/s

Due to the depth of the aquifer zone (>150 mbgl) the potential for pollution is low, except if poor quality runoff directly into or along the borehole casing takes place (i.e. from the site down via the weathered zone to the water table). Recharge in the confined zone will be subjected to transboundary inflows as well as recharge via the vadose and weathered zones. The extent of the fractured aquifer is however uncertain.

During the field hydrocensus, no groundwater users could be identified within a 2.5 km radius of BH2. The risk of having a potential impact on surrounding groundwater users is therefore also considered low to insignificant.

CONTENTS PAGE

1 Introduction 1
1.1 Project background 1
1.2 Study relevance to the season in which it was undertaken 1
1.3 Objectives of this geohydrological study 1
1.4 The layout of this report 2
1.5 Gaps and study limitations 2
2 Geographical setting 3
2.1 Location 3
2.2 Topography and drainage 3
2.3 Climate 3
3 Scope of work 5
4 Methodology 7
4.1 Literature review and desktop study 7
4.2 *Desktop* hydrocensus 7
4.3 Field investigation 8
4.3.1 Hydrocensus / groundwater users in the area 8
4.3.2 Geophysical assessment findings 11
4.3.3 Drilling 14
4.3.4 Magnetotelluric (MT) Survey 16
4.3.5 Aquifer testing 18
4.4 Groundwater quantity/availability assessment 24
4.5 Hydrogeological risk assessment 26
4.6 Water monitoring plan 29
4.7 Groundwater management plan 29
5 Prevailing groundwater conditions 30
5.1 Local geology 30
5.2 Aquifer characteristics, classification, and groundwater recharge 30
5.3 Depth to groundwater 30
5.4 Groundwater quantity 34
5.4.1 Sub-catchment delineation 34
5.4.2 Groundwater recharge 35
5.4.3 Existing GW usage (EU) 35
5.4.4 Basic human needs (BHN) 36
5.4.5 Proposed GW usage (PU) 36
5.4.6 Groundwater contribution to baseflow 36
5.4.7 GW balance 37
5.5 Groundwater quality 37
6 Preliminary risk and impact assessment 40
6.1 Site conceptual model 40
6.2 Geohydrological impacts and mitigation measures 40
6.2.1 Impacts on the groundwater reserve 41
6.3 Geohydrological impacts and mitigation measures 43
7 Water Monitoring 46
7.1 Monitoring parameters and frequency 46
8 Conclusions 47
9 Recommendations 48
10 References 49

LIST OF FIGURES

Figure 2.1: Rainfall and temperatures (Meteoblue, 2024). 4
Figure 3.1: Regional setting & local geology. 6
Figure 4.1: Desktop hydrocensus boreholes situated within a 5 km radius of the project site. 10
Figure 4.2: Locality and orientation of ERT and EM traverses surveyed. 13
Figure 4.3: MT survey traverses and borehole BH1 location. 17
Figure 4.4: Borehole locality map. 19
Figure 4.5: BH2 CRT and recovery summary. 21
Figure 4.6: Aquifer hydraulic properties based on Cooper-Jacob unconfined aquifer analytical solution. 22
Figure 4.7: Aquifer hydraulic properties based on Theis unconfined aquifer analytical solution. 22
Figure 4.8: Monitoring process 29
Figure 5.1: Groundwater elevation vs topography elevation correlation. 31
Figure 5.2: Local hydrogeology. 32
Figure 5.3: Boreholes within a 5 km radius of the project site, estimated groundwater elevation and flow direction map. 33

LIST OF TABLES

Table 4-1 Groundwater users within a 2.5 km radius of the site 8
Table 4-2 Boreholes within a 5km radius of the project site 9
Table 4-3 Proposed drilling target 12
Table 4-4 Hydrogeological exploration drilling summary 15
Table 4-5 Aquifer hydraulic testing summary 20
Table 4-6 Calculated sustainable abstraction rate scenario summary 23
Table 4-7 Volume of water per day and per annum 24
Table 4-8 Proposed criteria and rating scales to be used in the assessment of the potential impacts 27
Table 4-9 Explanation of assessment criteria 28
Table 5-1 Quaternary catchment C21D groundwater reserve (DWS, 2020) 34
Table 5-2 Delineated sub-catchment information summary 34
Table 5-3 Delineated sub-catchment recharge summary 35
Table 5-4 Delineated sub-catchment groundwater contribution to baseflow summary . 36
Table 5-5 Delineated sub-catchment GW balance and reserve determination 37
Table 5-6 Groundwater quality results 39
Table 6-1 Risk rating scale 40
Table 6-2 Summary of the radius of influence for borehole BH2 41
Table 6-3 Guide for determining the level of stress of a groundwater resource unit 43
Table 6-4 Potential hydrogeological impacts and mitigation measures 45
Table 7-1 Proposed monitoring frequency 46

LIST OF APPENDICES

Appendix A: Hydrogeological Exploration Borehole Log 50
Appendix B: Magnetotelluric (MT) Geophysical Survey Results 51
Appendix C: Aquifer Hydraulic Testing Results 54
Appendix D: Water Quality Lab Certificate 56

LIST OF ACRONYMS

BF	**Baseflow**
BH	Borehole
BHN	Basic Human Needs
d	Day
DMEA	Department of Mineral and Environmental Affairs
DTM	Digital Terrain Model
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
E	East
G3	Best Practice Guidelines: Monitoring
G4	Best Practice Guidelines: Impact Prediction
GCS	GCS Water and Environment (Pty) Ltd
GPS	Global Positioning System
GRAII	Groundwater Resource Assessment Ver. 2
GRDM	Groundwater Resource Directed Measures
GRIP	Groundwater Resource Information Project
GW	Groundwater
IGRD	Intermediate Groundwater Reserve Determination
IWULA	Integrated Water Use License Application
K	Potassium
km	Kilometre
K-value	hydraulic conductivity
l	Litres
m	Metres
MAE	Mean Annual Evaporation
Mag	Magnetometer
mamsl	metres above mean sea level
MAP	Mean Annual Precipitation
mbgl	metres below ground level
nT	magnetic intensity
NWA	National Water Act, 1998
Re	Recharge
Rem	Remainder
SPR	Source-Pathway-Receptor Model/Principle
SRTM	Shuttle Radar Topography Mission
T	Transmissivity
W	West
WL	Water level

1 INTRODUCTION

GCS was appointed by Shoprite Checkers (Pty) Ltd to conduct a hydrogeological assessment. The hydrogeological assessment will form a component of a Water Use Licence Application (WULA) for Shoprite's meat processing plant - The Block Meat Company. The project site is located at 20 Dunedin Street, Apex, Benoni, Ekurhuleni Local Municipality, in the Gauteng Province.

Two (2) boreholes have been drilled on site, BH1 and BH2. BH1 is dry and BH2 is equipped. It is proposed that the water from BH2 will be used to supplement the processing plant's current water supply. Abstraction of water from the borehole will require a water use license in terms of Section 21(a) of the National Water Act, 2998 (No.36 of 1998) (NWA). The authorisation process requires that an application in the form of a Water Use License Application (WULA) be undertaken and submitted to the Department of Water and Sanitation (DWS) for approval.

This investigation comprised a desktop assessment, hydrocensus, borehole siting, hydrogeological exploration drilling and aquifer hydraulic testing to form part of a specialist report as input into a Water Use Licence Application.

1.1 Project background

Based on the average monthly water consumption for June, July and August 2023, the meat processing plant has an estimated water demand of ~11 104 m^3/a. A borehole was drilled for water supply, and it is proposed that the water from the borehole will be used to supplement the processing plant's current water supply.

It is understood that the hydrogeological assessment is required as part of the Water Use Licence Application (WULA) process for Shoprite's meat processing plant. This hydrogeological assessment report will therefor supplement the WULA associated with the site.

1.2 Study relevance to the season in which it was undertaken

This study was undertaken as a once-off study and relies on historical hydrogeological and climate data for the site, as well as recognized geological and water resource databases for South Africa. Data generated during the time of this study is not seasonally bound as average yearly data was applied where required and as scientifically acceptable.

1.3 Objectives of this geohydrological study

The hydrogeological study aimed to achieve the following objectives:

- Understand and characterize the geohydrological setting, to set a basis for evaluating potential impacts relating to the proposed activities.
- Produce a comprehensive geohydrological report which can be used for decision-making purposes, and input into the Water Use Licence (WUL) process.

1.4 The layout of this report

The report has been structured, as far as possible, as per *Annexure D of the Government Gazette (GN267 of 24 March 2017)* applicable to hydrogeological studies for water use license applications.

1.5 Gaps and study limitations

The following gaps and study limitations are recognized and not reported on:

- No numerical groundwater flow and transport model was construed for the development. GCS believes that groundwater impacts associated with the proposed activities were sufficiently evaluated via conceptual and analytical models. A numerical model will not add value to the investigation.

2 GEOGRAPHICAL SETTING

2.1 Location

Shoprite Checkers (Pty) Ltd.'s meat processing plant, The Block Meat Company, is located in Benoni in the Ekurhuleni Local Municipality, Gauteng Province (Figure 3.1). The project site is bordered to the north by a residential area, to the east and west by an industrial area and to the west by the R23 provincial road.

2.2 Topography and drainage

The site is located along the eastern boundary of quaternary catchment C21D within the Upper Vaal Water Management Area. The surface topography indicates slightly undulating plains which drain towards the east. The regional surface elevation ranges from 1 760 meters above mean sea level (mamsl) in the west to 1 561 mamsl in the east, while locally it ranges from 1656 and 1655 mamsl. Surface drainage from the site is towards the Blesbokspruit in the east, which drains south until it joins with the Suikerbosrand River, a tributary of the Vaal River.

2.3 Climate

The Köppen Climate classification suggests the project site is situated in an oceanic subtropical highland climate (Cwb) area that receives rainfall in the summer months (December until March). The site falls within rainfall area C2A, which has a mean annual precipitation (MAP) of 697.98 mm/a. Precipitation is the lowest in July with an average of 2 mm, with the highest rainfall occurring during the summer months peaking at 142 mm during December. At a mean daily maximum temperature of 27 °C, November, December, January and February are the hottest months of the year. June and July are the coldest months of the year with a mean daily maximum temperature of 18 °C. The Mean Annual Evaporation (MAE) is in the order of 1 625 mm/annum (S-Pan) for the catchment. Temperature and rainfall distribution for the area is shown in Figure 2.1.

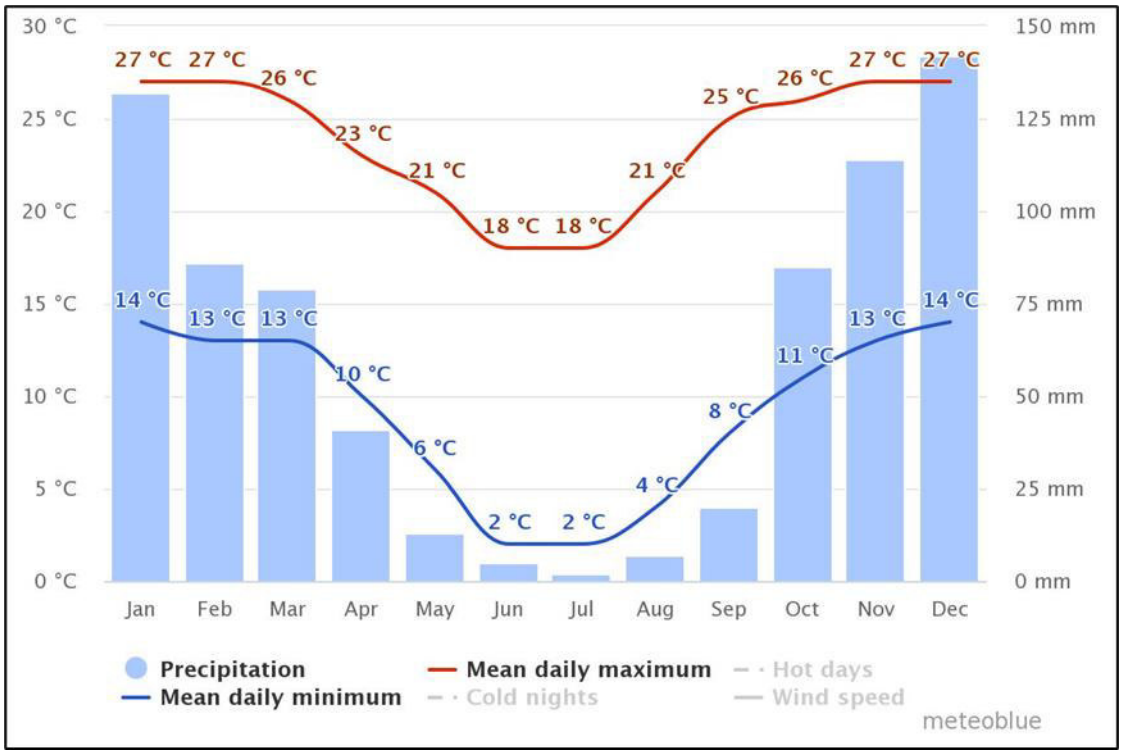


Figure 2.1: Rainfall and temperatures (Meteoblue, 2024).

3 SCOPE OF WORK

The scope of work included:

1. **Desktop assessment:**
    - All available reports relating to the site were assessed, including a review of all hydrogeology, hydrology, hydrochemistry, and geology literature data.
    - A desktop-level hydrocensus was conducted. The National Groundwater Archive (NGA, 2023), Groundwater Resource Information Project (GRIP, 2016) and the Southern African Development Community Groundwater Information Portal (SADEC GIP) databases were assessed to identify existing groundwater users in the area.
2. **Field investigation:**
    - A groundwater hydrocensus was conducted within a 2.5 km radius of the project site.
    - A geophysical survey with the use of the Electro-Magnetic (EM) and Electrical Resistivity Tomography (ERT) methods was conducted on-site.
    - Two (2) boreholes were drilled (BH1 and BH2). BH1 is dry and BH2 has water.
    - One (1) borehole (BH2) was subjected to a series of aquifer hydraulic tests.
    - Groundwater quality data for BH2 was provided by the client.
3. **Groundwater Reserve Determination:**
    - A desktop-level groundwater reserve determination was conducted based on the Intermediate reserve determination published by the DWS (2020).
4. **Hydrogeological risk and impact assessment:**
    - A preliminary risk assessment was conducted based on the source-pathway-receptor principle.
5. **Monitoring plan:**
    - A groundwater monitoring plan, with mitigation measures, was developed for the site based on the baseline assessment of the site conditions.
6. **Reporting:**
    - This hydrogeological report encompassing all work done as well as a groundwater risk assessment and monitoring plan was compiled.

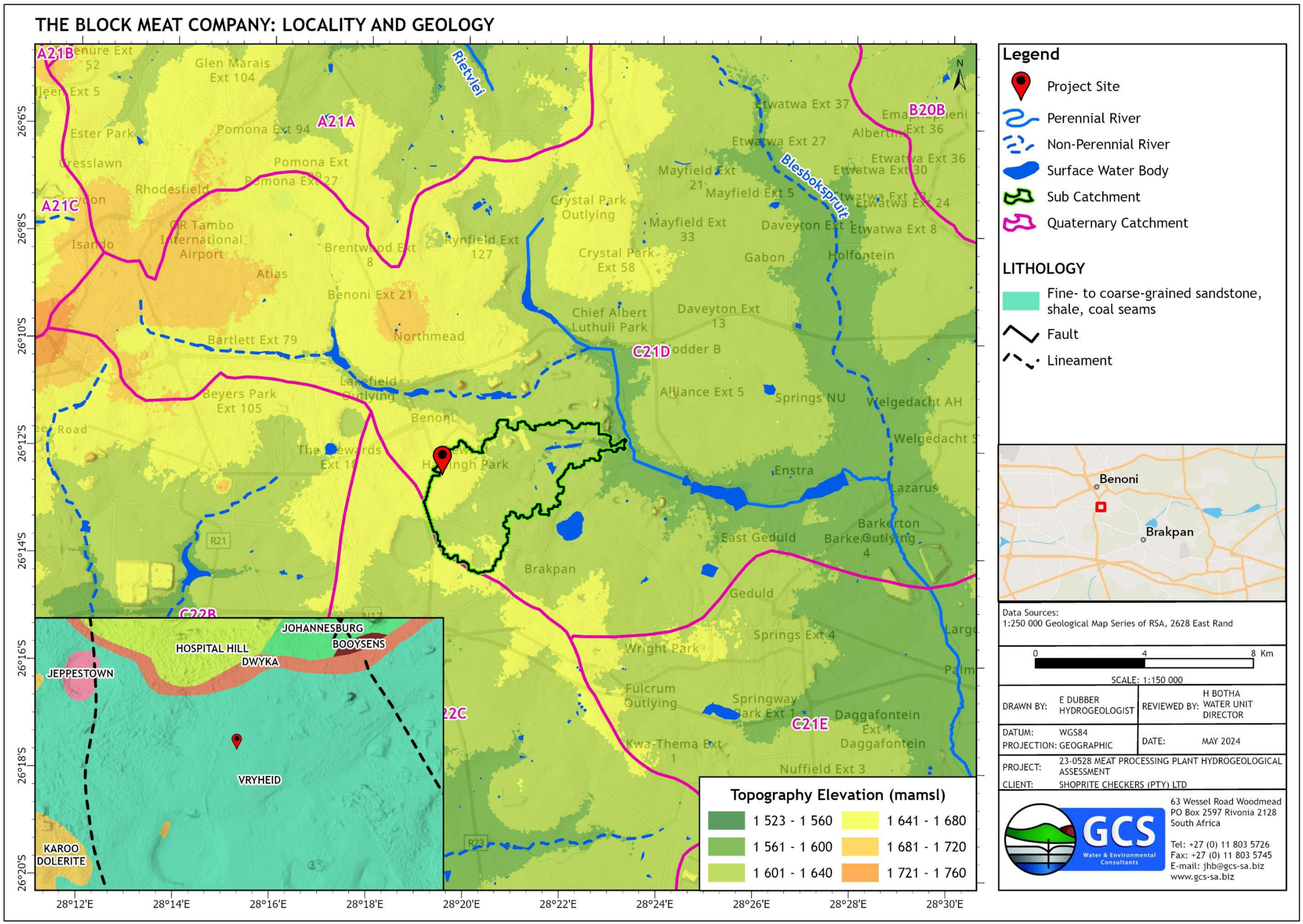
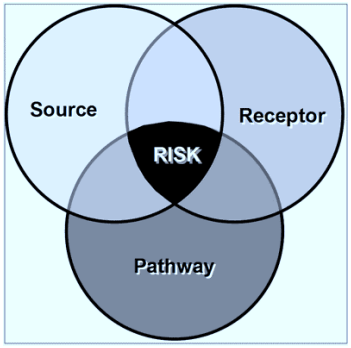


Figure 3.1: Regional setting & local geology.

4 METHODOLOGY

A logical and holistic approach was adopted to assess the study area. The Best Practice Guidelines for Impact Prediction (G4) (Department of Water Affairs and Forestry [DWAF], 2008), were considered to define and understand the three basic components of the geohydrological risk associated with the site activities:



- **Source term** - The source of the risk;
- **Pathway** - The pathway along which the risk propagates; and
- **Receptor** - The target that experiences the risk.

The approach was used to assess:

1. How the existing/proposed site activities could impact groundwater *Quality*; and
2. How the existing/proposed site activities could affect the groundwater *Quantity*.

4.1 Literature review and desktop study

The following sources supply an overview of the geohydrological conditions of the project area, as per the desktop information reviewed for this assessment:

- National Groundwater Database Archives (NGA, 2024) borehole data.
- 2526 Johannesburg – 1:500 000 Hydrogeological map series (Barnard, H.C., 2000)
- 2628 East Rand– 1:250 000 Geological map series
- Literature on similar geology and hydrogeology:
    - A South African Aquifer System Management Classification (Parsons, 1995);
    - Aquifer Classification of South Africa (DWA, 2012);
- GCS internal database and reports for the Gauteng area (refer to reference list).
- Site-specific field-gathered data.

4.2 *Desktop* hydrocensus

According to NGA data for the area, there is only one (1) borehole situated within a 2.5 km radius of the site. The spatial distribution of the borehole identified is shown in Figure 4.1. The borehole is situated in a different drainage area and the data suggest no other groundwater users within the sub-catchment associated with the site.

Table 4-1 Groundwater users within a 2.5 km radius of the site

Borehole ID	Latitude	Longitude	Farm Name	Water Level (mbgl)
2628AB00041	-26.19027	28.30805	MORESHOFF SCHOOL	18.28

4.3 Field investigation

The field investigation took place on the 4th of August 2023. The following summarises the findings and work completed:

- Geophysical traverses with the use of the Electro-Magnetic (EM) and Electrical Resistivity Tomography (ERT) methods were completed to locate potential groundwater flow paths and site potential drilling target areas.
- A field hydrocensus was conducted within a 2.5 km radius of the proposed development.
    - No groundwater users were identified in the surrounding area, and it appears as though residents surrounding the project site get water from the local municipality.
- A 24-hour constant rate pump test was performed on BH2 with the pump that is already installed, to determine the sustainable yield as well as the likely impact on the groundwater aquifer.

4.3.1 Hydrocensus / groundwater users in the area

A field hydrocensus was conducted within 2.5 km of the project site and no boreholes were located on-site. This is because most households and industries around this area are dependent on municipal water supply sources. A further review of the NGA database indicated that ten (10) registered boreholes are situated within a 5 km radius of the project site of which six (6) are located within quaternary catchment C21D. Table 4-2 lists the boreholes identified with water level and their location is shown in Figure 4.1.

Table 4-2 Boreholes within a 5km radius of the project site

Borehole ID	Latitude	Longitude	Farm Name	Water Level (mbgl)	Quaternary Catchment
2628AB00038	-26.19027	28.30803	BENONI	-	C21D
2628AB00040	-26.19028	28.30803	BENONI	-	C21D
2628AB00041	-26.19027	28.30805	MORESHOFF SCHOOL	18.28	C21D
2628AB00480	-26.18138	28.36108	NEW MODDER.PTN BENONI	-	C21D
2628AB00484	-26.19499	28.32914	VAN RYN LANDBOUHOEWES.PTN BENONI	-	C21D
2628AB00039	-26.19027	28.30804	BENONI	18.28	C21D
2628AB00094	-26.21027	28.28581	BOKSBURG PTN. DUNSWART WASERY	3.6	C22B
2628AB00442	-26.22757	28.28311	BOKSBURG	10	C22B
2628AB00439	-26.2286	28.29997	WATTVILLE PTN. ETHOMELENG	-	C22C
2628AB00440	-26.22138	28.29942	WATTVILLE PTN. BOPANANG	-	C22C

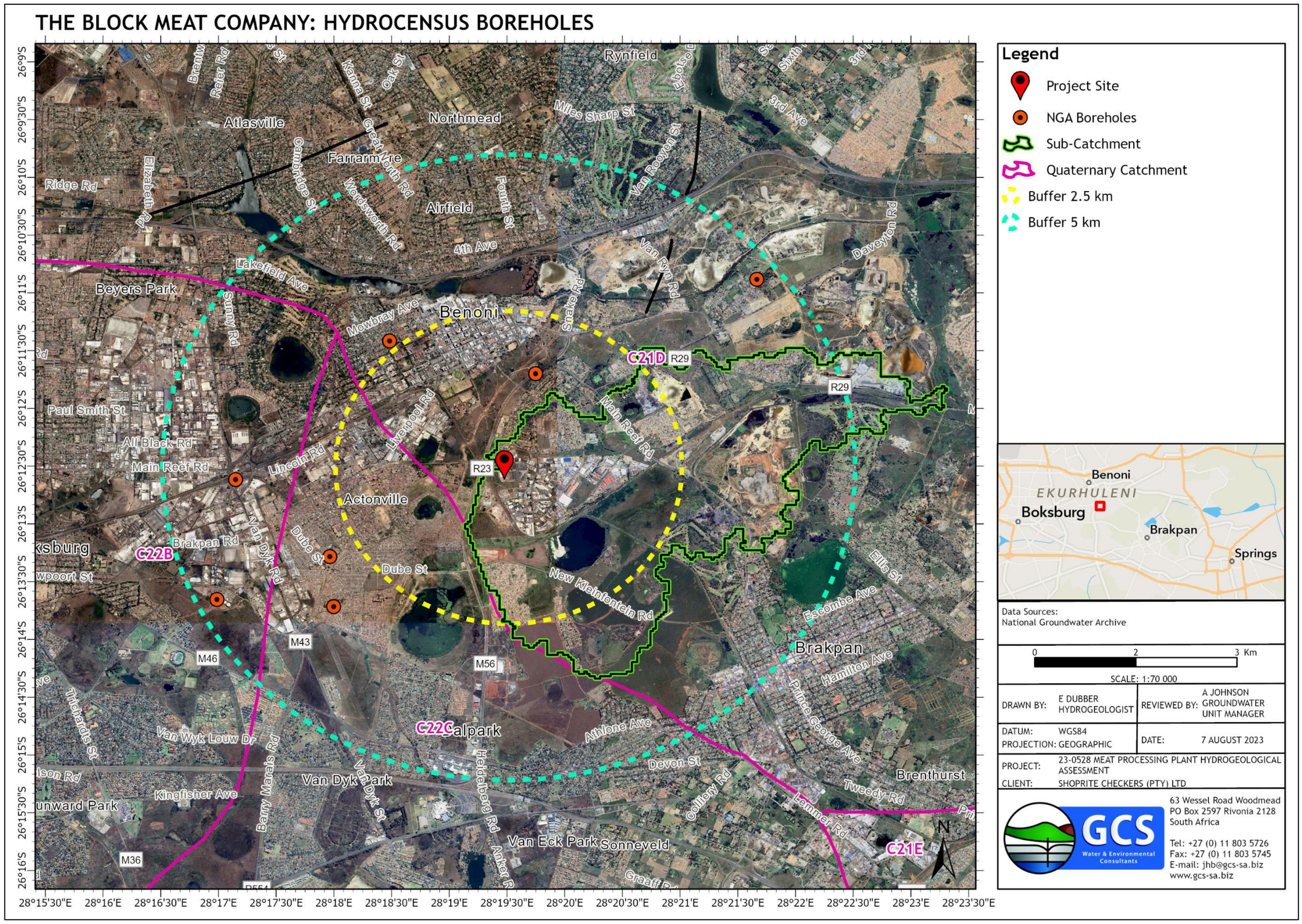


Figure 4.1: Desktop hydrocensus boreholes situated within a 5 km radius of the project site.

4.3.2 Geophysical assessment findings

Surface geophysical methods were utilised to identify potential groundwater flow paths and site potential drilling targets at the project site. Geophysical traverses were completed with the use of the Electro-Magnetic (EM) and Electrical Resistivity Tomography (ERT) methods.

The result of the ERT survey is a 2D collection of the raw resistivity measurements at different depths along a given survey line. The inversion (using the RES2Dinv inversion algorithm by Geotomo) of this 2D survey data results in a 2D resistivity inversion model along the surveyed line which is then interpreted in terms of the subsurface properties as per the requirements and/or objectives of the survey. The 2D resistivity inversion model and EM survey results along the planned traverses are shown in Figure 4.2.

- Two (2) EM survey lines were traversed. The spatial orientation of the survey and resulting profile lines are indicated in Figure 4.2. The EM results show low conductivity readings between 0 and 20 mS/m in the upper 20 m of the site. The anomalies at the start of EM line 1 and the end of EM line 2 are due to noise.
- One (1) ERT survey line was completed with 2.5 m electrode spacing. The traverse is 100 m long, starting in the northwest at 28°19’27” E; 26°12’36” S and ending in the southeast at 28°19’31” E; 26°12’37” S. The inversion model of the subsurface apparent resistivity data collected along the survey traverse is presented in Figure 4.2, while the summary for the recommended groundwater exploration borehole (and supplementary information) is presented in Table 4-3.
    - The inversion resistivity model for data obtained from the traverse surveyed indicates two principal resistivity ranges, the first being ≤518 Ωm and the second being ≥1 157 Ωm.
    - The areas of the model characterised by high resistivity distributions are interpreted as being unsaturated (dry) / competent formation of the site under investigation.
    - The offset from the high resistivity distributions to low resistivity distributions is interpreted as a result of an integral discontinuity (plane of physical weakness-due to physical or chemical processes). In hydrogeology, deep weathering is a target for the placement of groundwater production boreholes.
    - The resistivity distribution offset is relatively shallow (<10 m) and at depths greater than ~15 m along the surveyed line.

One (1) prospective drilling target was identified for the hydrogeological drilling program, based on the interpreted surface geophysical survey data obtained from the Electrical Resistivity Tomography (ERT) and Electro-Magnetic (EM) geophysical techniques. Table 4-3 provides a summary of the proposed drilling target, while Figure 4.2 provides a visual depiction of the drilling target along the traverse.

The drilling target was identified based on the observed low/intermediate resistivity zones obtained from the survey. These zones are potential weathered areas associated with fracturing and are potential areas of preferential groundwater flow paths.

Table 4-3 Proposed drilling target

Traverse #	Priority List	Coordinates		Target/Motivation	Proposed Depth (m)
		Latitude	Longitude		
ERT 1	Primary	-26.210133	28.324604	Zone of low resistivity at depth	60

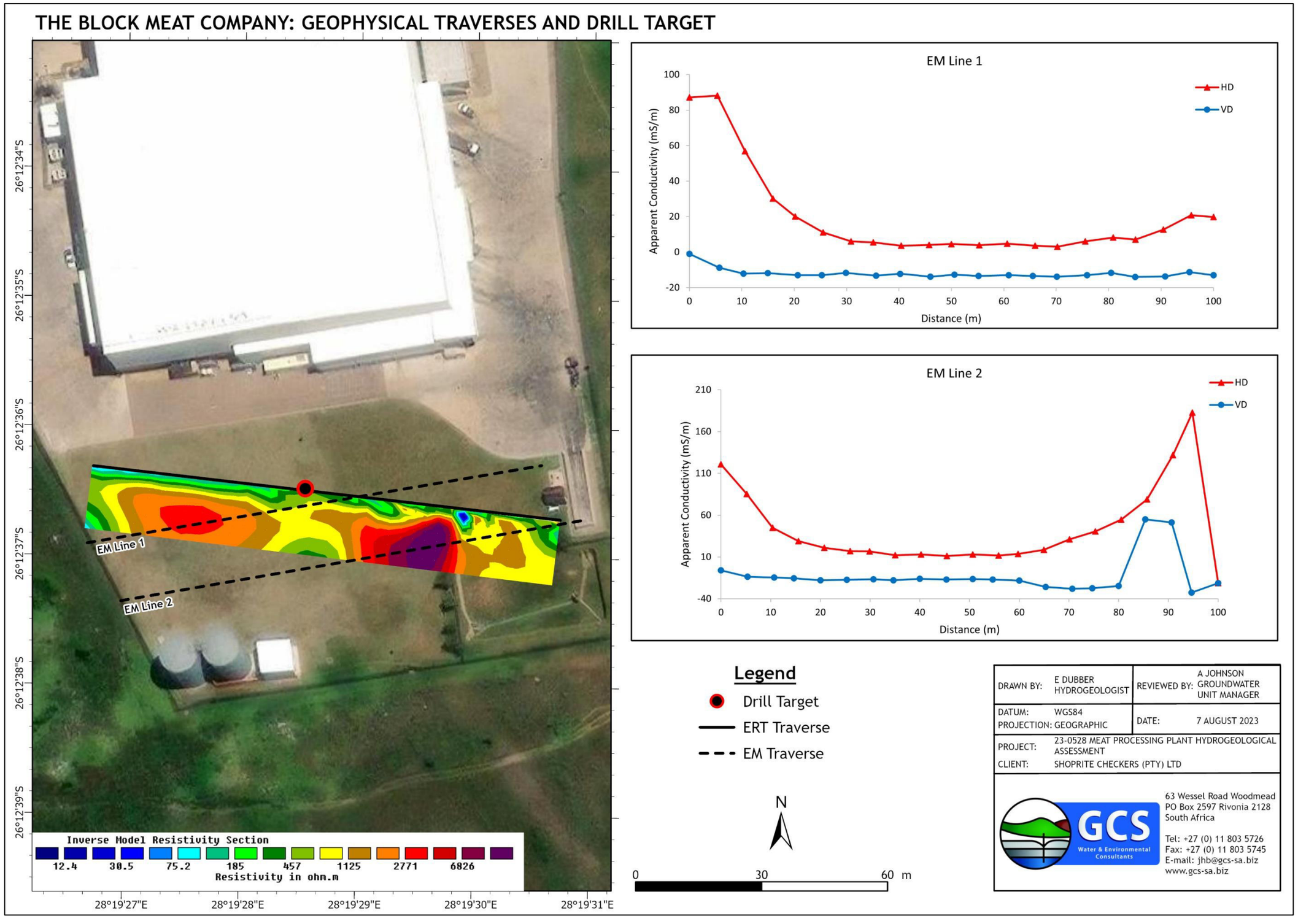


Figure 4.2: Locality and orientation of ERT and EM traverses surveyed.

4.3.3 Drilling

GASS was commissioned by GCS as the drilling contractor for the project. GCS provided on-site drilling supervision and contractor management, including hydrogeological/geological logging and coordination of program logistics.

One (1) hydrogeological exploration borehole (BH1) was drilled at 26°12'36.57"S, 28°19'28.44"E (refer to Figure 4.3), up to a depth of 100 m. The hydrogeological drilling and borehole construction log for BH1 is provided in **Appendix A** and summarised in Table 4-4 below.

- BH1 was drilled using a 254 mm nominal diameter drill bit from the surface to 18 mbgl and then cased with 177 mm solid steel casing (0 – 9 mbgl) and slotted steel casing (9 – 18 mbgl). After installing the casing, BH was advanced with a 165 mm nominal diameter drill bit from 18 to 100 mbgl.
- The encountered lithologies consisted of unconsolidated alluvium from 0 to 1 mbgl, and fresh solid Quartzite from 1 to 100 mbgl.
- No significant water strikes were encountered.
- A static water level of 66.55 mbgl was measured one (1) week after drilling and is interpreted as seepage water.

Table 4-4 Hydrogeological exploration drilling summary

Description				BH1
Decision Record				Primary Target
Status & Date Information	Status			Completed
	Commence date			01/09/2023
	Completion Date			04/09/2023
Bore/Hole Type Information	Monitoring / Production Bore			Hydrogeological Exploration Borehole
Driller/Company Information	Drilling Company			GASS
Drilling Information	Drilling Method			Conventional Rotary Air Percussion
	Depth Advanced			100
	Drill Bit Size	254 mm/ (8”)	From: [mbgl]	0
			To: [mbgl]	18
		165 mm/ (6.5”)	From: [mbgl]	18
			To: [mbgl]	100
Hydrogeological Information	Water Strike Information		[mbgl]	-
	Cumulative Yield Information		[l/s]	-
Geological Information				Unconsolidated alluvium from 0 to 1 mbgl and fresh solid Quartzite from 1 to 100 mbgl.
Spatial Survey Information	GPS/Differential GPS/LiDAR			GPS-Handheld
	Representative/Organization			GCS
	Coordinates	Projection		Geographic
		Datum		WGS84
		Latitude/Easting		-26.210157
		Longitude/Northing		28.324568
		Elevation*	[mamsl]	1655

Note/s:

- § mbgl - metres below ground level.
- § mm - millimetre.
- § “ - inch.
- § L/s - Litres per second.
- § mamsl - metres above mean sea level.
- § N/A - not applicable.
- § * - elevations derived from GPS Visualiser.

4.3.4 Magnetotelluric (MT) Survey

Since insignificant groundwater was intersected within the hydrogeological exploration borehole and the main lithology encountered was fresh solid Quartzite and not coarse-grained sandstone and shale as suggested by regional geological (Figure 3.1) and hydrogeological (Figure 5.2) maps, a Magnetotelluric (MT) geophysical survey was conducted to identify additional potential groundwater flow zones across the area of investigation up to a depth of 100 m.

MT geophysical methods measure the electrical resistivity of subsurface materials. High electrical resistivity often indicates the presence of impermeable materials, while low resistivity suggests the presence of more conductive materials, which can be indicative of water-bearing formations. Two (2) MT survey lines were traversed. The spatial orientation of the survey lines is indicated in Figure 4.3. The inversion model of the subsurface apparent resistivity data collected at each of the surveyed stations is presented in **Appendix B**.

Traverse 1 is 100 m long and was surveyed along the same line as the ERT survey line, starting in the northwest at 28°19'26.84"E, 26°12'36.56"S and ending in the southeast at 28°19'30.48"E, 26°12'36.71"S. MT readings were taken at five (5) stations with a 20 m station interval.

Traverse 2 is 40 m long, starting in the southwest at 28°19'28.27"E, 26°12'37.10"S and ending in the northeast at 28°19'28.57"E, 26°12'36.25"S. MT readings were taken at two (2) stations with a 20 m station interval.

The results show resistivity readings greater than 1000 Ωm up to depths of 100 m at all the stations. This indicates the presence of impermeable material interpreted as competent bedrock with low to limited groundwater potential.

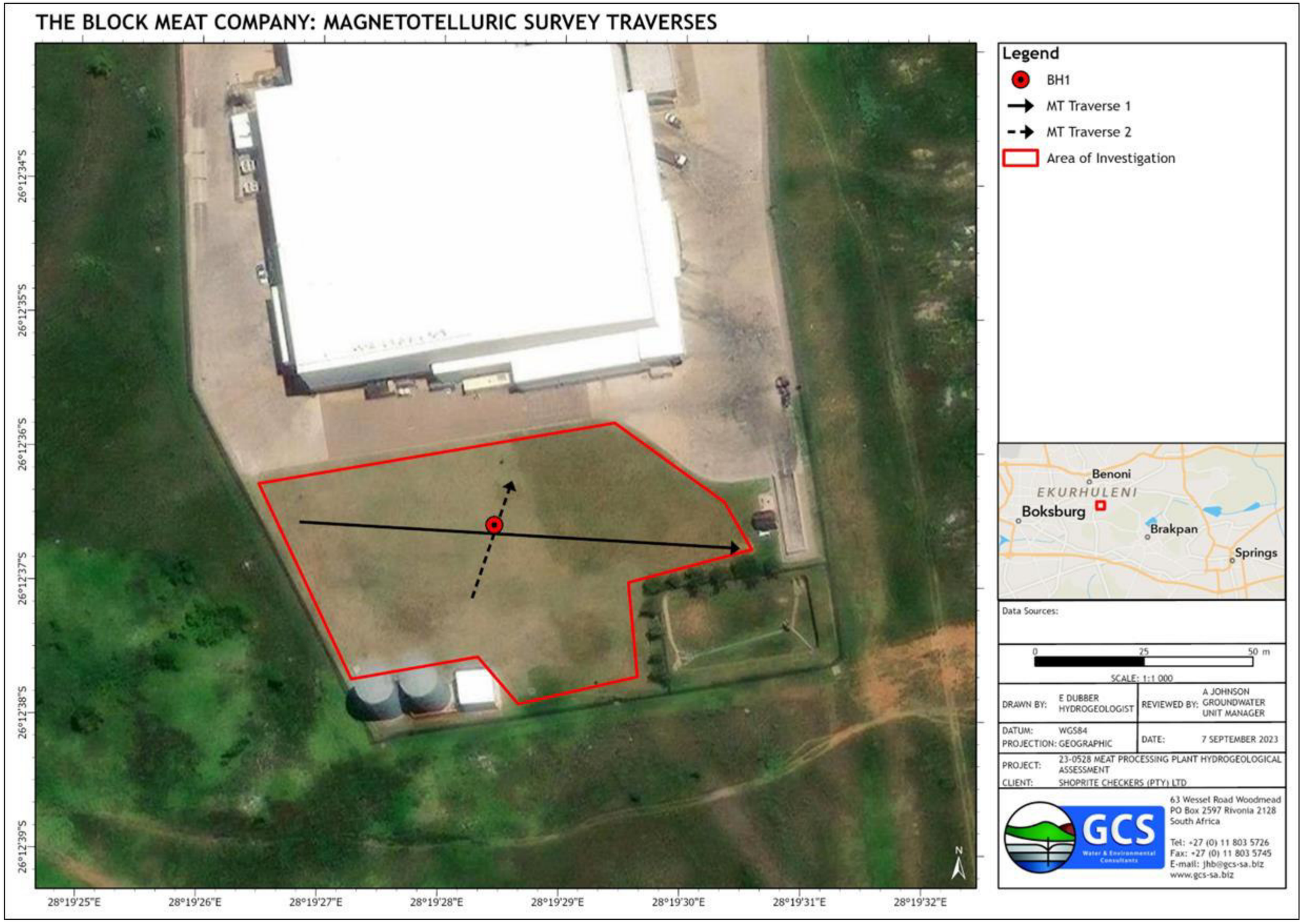


Figure 4.3: MT survey traverses and borehole BH1 location.

4.3.5 Aquifer testing

Following the drilling of the hydrogeological exploration borehole (BH1), The Meat Block Company drilled a hydrogeological production borehole (BH2) at 26°12'36.64"S, 28°19'28.38"E approximately 2 m south-west of BH1, to a depth of 164 m. According to the site representative, water was encountered at ~150 m. Figure 4.4 presents the spatial distribution of the hydrogeological production borehole (BH2) concerning the hydrogeological exploration borehole (BH1) and building site.

BH2 is equipped with a pump that yields 1.16 l/s (measured) with an installation depth of 155 m. The existing pump was used to conduct the aquifer testing. The aquifer hydraulic testing programme is summarised in Table 4-5 and Figure 4.5. Additional pump test data can be seen in **Appendix C.**

The objective of the aquifer testing programme was to estimate the sustainable yield, and in-situ aquifer hydraulic parameters, and interpret hydrogeological characteristics.

Before the commencement of the aquifer test programme, the static water level was measured in the borehole to allow drawdown calculations during the aquifer tests. A static water level of 120 mbgl was measured. All groundwater level measurements were collected from a fixed reference point (e.g., top of casing) using an “electrical contact groundwater level” meter (dip meter).

The aquifer testing programme included the following:

- Constant-Rate Test (CRT)- During the CRT, the groundwater level drawdown is recorded over time in the pumped borehole, and the pumping rate (yield) is kept constant by the operator. This is done by monitoring the pumping rate throughout the test and re-adjusting the pump if the observed outflow rate begins to deviate from the selected rate. The result of this test is a water-level response curve obtained under a constant rate of abstraction.
- Recovery Test (RT) – the RT is initiated at the cessation of the CRT where groundwater levels are allowed to recover (measured as residual drawdown) within the tested borehole. Recording of the residual drawdown is generally conducted until groundwater levels are within 90 to 100 % of pre-pumping water levels.



Figure 4.4: Borehole locality map.

Table 4-5 Aquifer hydraulic testing summary

Description		Borehole ID
BH2		
Aquifer Test Date Information		
Commence Date	[mm dd yyyy]	09 May 2024
Completion Date	[mm dd yyyy]	10 May 2024
Pump System and Installation Information		
Pump System		Submersible Pump
Pump Inlet Depth	[mbgl]	155
Static Water Level and Available Drawdown Information		
Static Water Level	[mbgl]	120
Available Drawdown	[m]	35
Constant-Rate Test Information		
Duration	[min]	1440
Yield	[L/s]	1.16
Drawdown Percentage Achieved	[%]	56.79
Recovery Information		
Duration	[min]	56
Recovery Percentage	[%]	90

4.3.5.1 Data Analysis

Interpretation of the constant-rate test and recovery monitoring data of the tested borehole was undertaken using the FC method (excel) to establish a relationship between drawdown and pumping rate and to derive preliminary aquifer parameters.

Before the commencement of the CRT, the static water level in BH2 was measured as 120 mbgl. With a pump installation depth of 155 m, 35 m of drawdown was available for the test. Figure 4.5 shows that BH2 was pumped at a constant discharge rate of 1.16 l/s for 1440 minutes (24 hours) during which a total drawdown of 19.88 m of the available 35 m drawdown was achieved at the end of the pumping period. With ~15.12 m of drawdown remaining, the data suggests BH2 can be pumped at a stronger discharge rate.

Following cessation of the 24-hour CRT test, the recovery of the water level was measured, and 90 % recovery of the pre-test static water level (120 mbgl) was reached within 56 minutes - suggesting good groundwater flow towards the borehole.

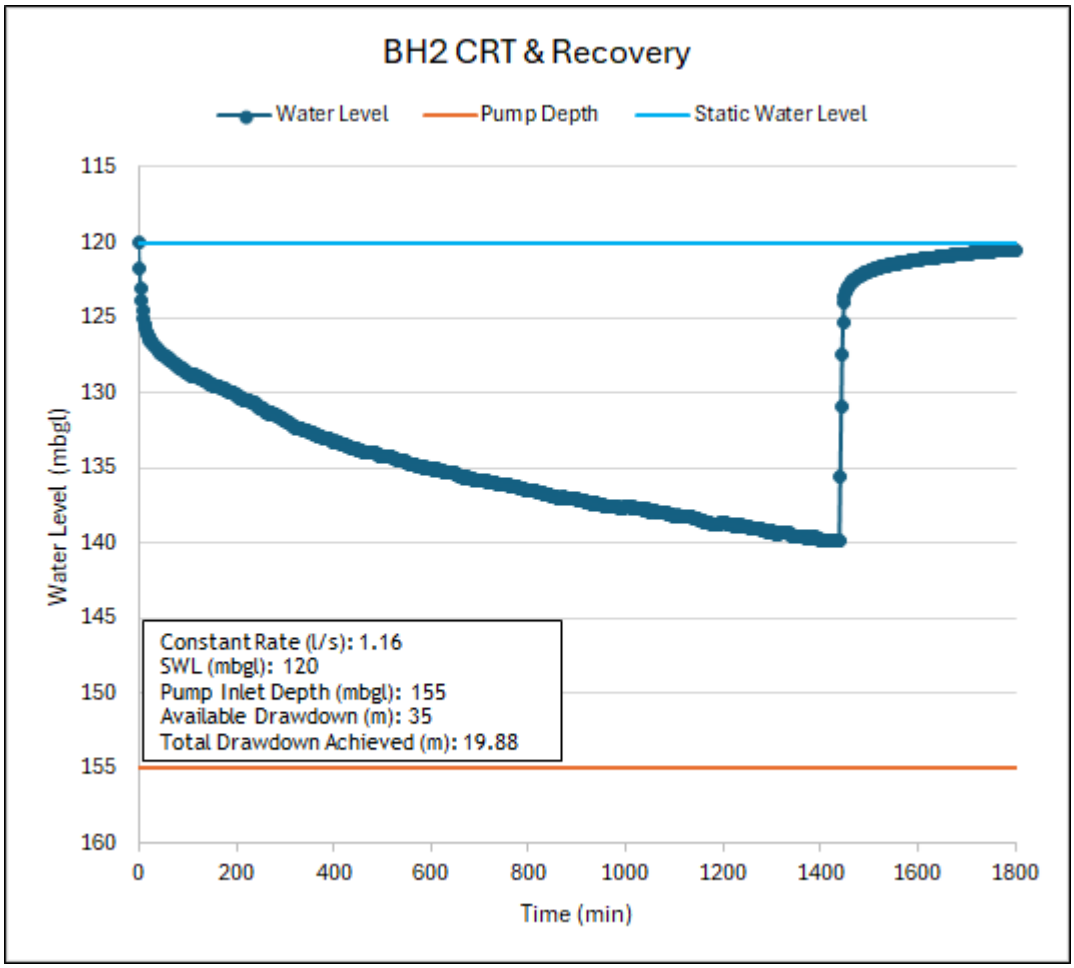


Figure 4.5: BH2 CRT and recovery summary.

4.3.5.2 Hydraulic Parameters

The aquifer parameters were estimated from the test pumping results using the Cooper-Jacob analytical solution (Cooper and Jacob, 1964). Although the applied methodology for calculating analytical parameters is based on assumptions not applicable to actual site conditions (e.g., infinite extent), the resulting hydraulic parameter from these calculations is representative of the test aquifer system within the vicinity of the test borehole. The transmissivity was calculated at 2.35 m^2/d. The curve fits used to derive this value are presented in Figure 4.6 and Figure 4.7.

Additionally, transmissivity is a product of the hydraulic conductivity and saturated thickness of the aquifer; therefore, the hydraulic conductivity (K) could be determined by dividing the transmissivity by the saturated thickness (total depth of BH minus SWL). The calculated hydraulic conductivity of the aquifer is 0.05 m/d.

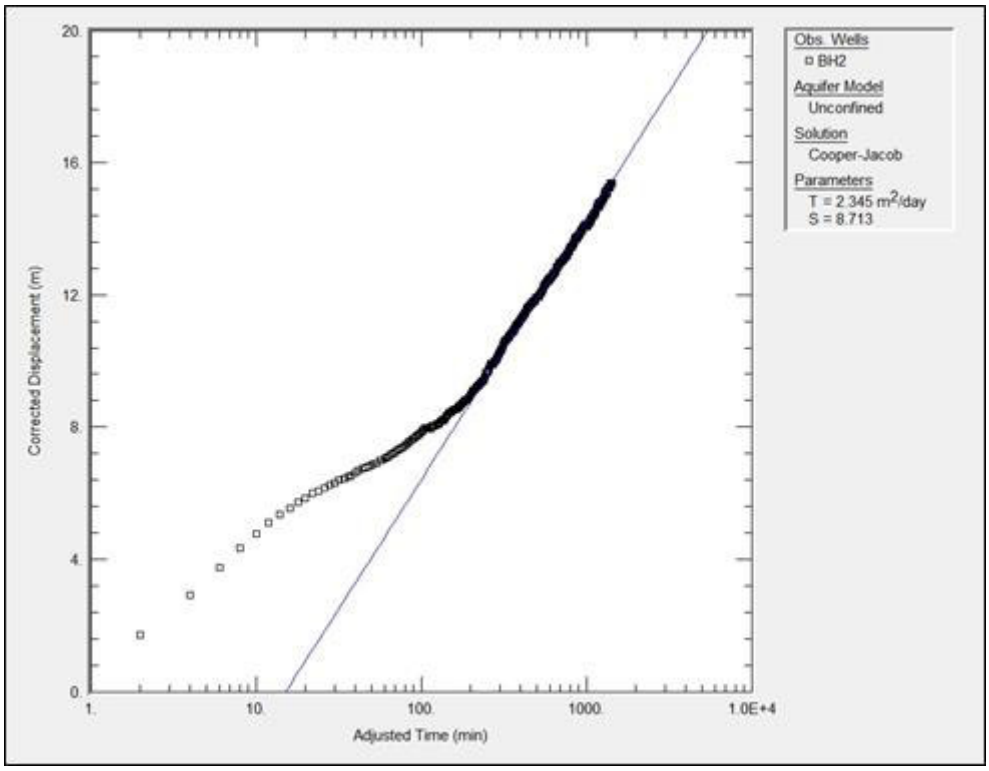


Figure 4.6: Aquifer hydraulic properties based on Cooper-Jacob unconfined aquifer analytical solution.

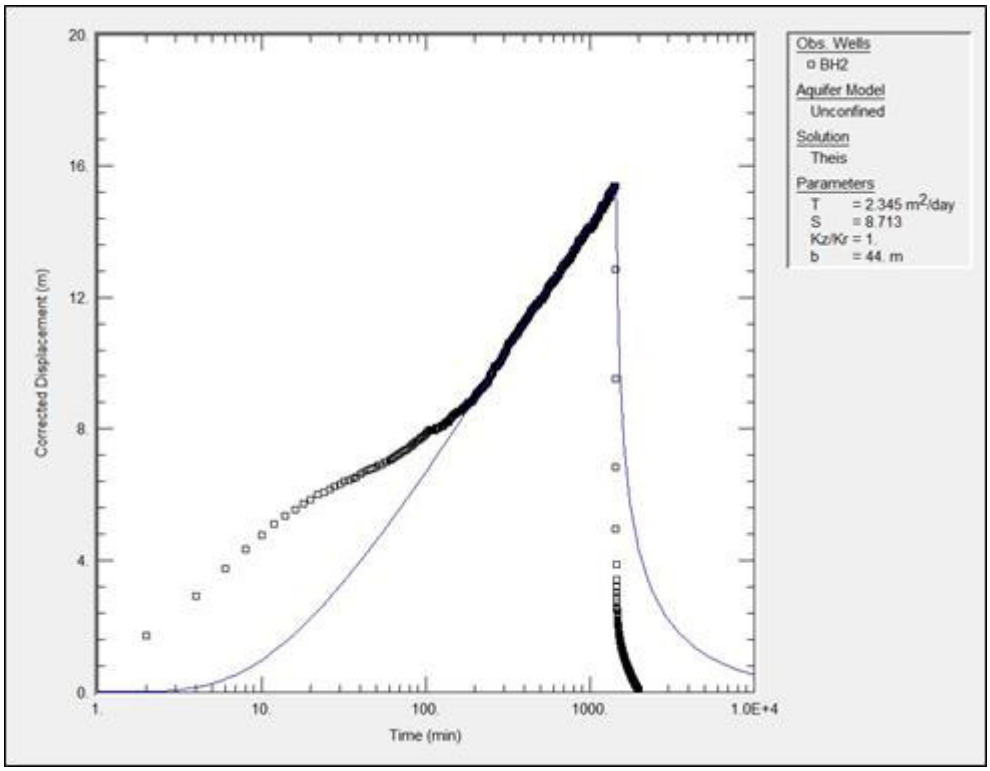


Figure 4.7: Aquifer hydraulic properties based on Theis unconfined aquifer analytical solution.

4.3.5.3 Sustainable Abstraction Rate

The borehole-specific sustainable abstraction rate was calculated using the Flow Characteristic (FC) Programme for Aquifer Test Analysis and the constant-rate test data was used as input.

The following criteria have been used in defining the sustainable yield:

- Sustainable yield calculations were calculated based on a twenty-four (24) hour and twelve (12) hour per day abstraction schedule.
- The groundwater level during pumping should not reach the depth of the pump inlet (e.g., ~2 m above the pump inlet depth).

The sustainable abstraction calculations contain the following limitations:

- The groundwater sustainable calculations do not consider any other abstractions in the surrounding area.
- Little information is available in terms of groundwater boundaries, including aquifer limits, low permeable barriers, and recharge flux boundaries. These boundaries will impact the medium to long-term groundwater drawdown response.
- No borehole and/or formation skin effects were considered. These skin effects could result in turbulent flow and increased drawdown.
- The estimation of the sustainable yield was determined based on the test pumping results utilising the Cooper-Jacob analytical solution, which was chosen because it accurately represents the aquifer's behaviour during the borehole testing. The Cooper-Jacob analytical solution, as proposed by Cooper and Jacob in 1964, provides valuable insights into the aquifer's performance during the testing process.

The results are summarized in Table 4-6 and indicate the calculated sustainable yield of BH2 is:

- 1.11 l/s for a 24-hour daily pumping schedule, and
- 1.56 l/s for a 16-hour daily pumping schedule.

BH2 can therefore be pumped at a rate of 1.16 l/s for 8 hours per day and sufficiently recover for sustainable abstraction. This will result in a yield of 33 408 l/d and 12 193.92 m^3/a (refer to Table 4-7), which is sufficient to satisfy the meat processing plant's estimated water demand of ~30 422 l/d and ~11 104 m^3/a.

Table 4-6 Calculated sustainable abstraction rate scenario summary

Description			BH2
Pump Inlet Depth		[m]	155
Sustainable Rate	24-Hour Daily Pump Schedule	[l/s]	1.11
	12-Hour Daily Pump Schedule	[l/s]	1.56

Table 4-7 Volume of water per day and per annum

8-hour pump schedule			
Borehole ID	**Sustainable Yield (8-hour) pump schedule - l/s**	**The volume of water per day (l/day)**	**The volume of water per year (m^3/annum)**
BH2	1.16	33 408	12 193.92

4.4 Groundwater quantity/availability assessment

An Intermediate Groundwater Reserve Determination (IGRD) (Parsons & Wentzel, 2007) was conducted for the study area to fulfil the requirements of the Water Use License concerning groundwater use, in terms of Section 21a of the National Water Act (No. 36 of 1998) (NWA, 1998). The IGRD aims to establish the groundwater reserve thereby quantifying the safe aquifer yield. It is necessary, from a GW resource management perspective, to quantify the GW quantity and likely impact on the groundwater reserve as a result of the proposed abstraction.

The approach to quantifying groundwater is based on the water balance equation which also gives an estimate of how much GW can safely be abstracted from the aquifer for the development of additional groundwater resources.

The groundwater reserve determination takes into account the following parameters:

- Area of the sub-catchment delineated for the site;
- Effective recharge from rainfall and specific geological conditions;
- Existing abstraction
- Basic Human needs for the site;
- Groundwater contribution to surface water (baseflow); and
- Surplus, if any, is available for abstraction.

The values presented in the tables and calculations below were derived from the Department of Water and Sanitation (DWS, 2020) and the DWS' website - National Integrated Water Information System (DWS, 2024).

The IGRD considers the following parameters:

- Effective recharge from rainfall and specific geological conditions;
- Basic human needs for the sub-catchment;
- Groundwater contribution to surface water (baseflow);
- Existing and proposed abstraction; and
- Surplus reserve.

The groundwater balance and the reserve determination on a sub-catchment scale are summarised below:

- $GW_{available}$ = (Re) - (EU + BHN + BF + PU)

Where:

- $GW_{available}$ = Available groundwater for use.
- Re = Effective recharge to the aquifer.
- BF = Baseflow to surface water streams.
- EU = Existing groundwater abstraction/use (identified on sub-catchment, excluding applicant).
- PU = proposed use.
- BHN = Basic Human Needs.

Remaining Groundwater availability (whilst "maintaining" groundwater's contribution to the ecological integrity of surface water, and maintaining ecological integrity in its present state) **= recharge - current use - current GWBF**

The following assumptions underlie these equations:

- The aquifer has reached dynamic equilibrium in response to abstraction, where groundwater recharge is equivalent to discharge. As such, the contribution to groundwater availability from storage is not considered.
- Contribution from enhanced recharge is not accommodated (i.e. recharge is constant under abstraction).
- Abstraction is therefore met by reduced discharge (at some time). As discharge is equivalent to recharge (when at dynamic equilibrium), recharge can be used as a proxy for groundwater availability.
- The aquifer is a closed system or a fixed directional flow system.
- If the portion of discharge that is known to support surface water (GWBF) is removed from the availability equation, it is not impacted. I.e., if abstraction is at or set below recharge minus use minus GWBF, then the quantity of GWBF will not be affected.
- Abstraction occurs sufficiently distant from locations of groundwater discharge to surface water, such that abstraction can harness recharge minus use minus GWBF, before reducing GWBF. In other words, it is assumed that abstraction is sufficiently distant from surface water such that the portion of recharge discharging to surface waters, is unaffected by the abstraction.

The groundwater balance and reserve determination for the delineated sub-catchment are summarized in Table 5-5.

The following applies to the water balance conducted:

- For this reserve determination, values from the quaternary catchment C21D Groundwater Reserve where downscaled to an area of 17.91 km^2 related to the delineated sub-catchment.
- The Groundwater Reserve already includes the BHN and EWR (GWBF) components.

4.5 Hydrogeological risk assessment

The potential impacts and the determination of the impact significance of the proposed abstraction were assessed. The process of assessing the potential impacts of the project includes the following four activities:

1. Identification and assessment of potential impacts.
2. Prediction of the nature, magnitude, extent, and duration of potentially significant impacts.
3. Identification of mitigation measures that could be implemented to reduce the severity or significance of the impacts of the activity; and
4. Evaluation of the significance of the impact after the mitigation measures have been implemented i.e., the significance of the residual impact.

As per GNR 982 of the EIA Regulations (2014), the significance of potential impacts was assessed in terms of the following criteria:

I. Cumulative impacts.
II. Nature of the impact.
III. The extent of the impact.
IV. Probability of the impact occurring.
V. The degree to which the impact can be reversed.
VI. The degree to which the impact may cause irreplaceable loss of resources; and
VII. The degree to which the impact can be mitigated.

Table 4-8 provides a summary of the criteria used to assess the significance of the potential impacts identified. An explanation of these impact criteria is provided in Table 4-9.

The net consequence is established by the following equation:

$$\textit{Consequence} = (\textit{Duration} + \textit{Extent} + \textit{Irreplaceability of resource}) \times \textit{Severity}$$

The environmental significance of an impact was determined by multiplying the consequence by probability.

Table 4-8 Proposed criteria and rating scales to be used in the assessment of the potential impacts

Criteria	Rating Scales	Notes
Nature	Positive (+)	An evaluation of the effect of the impact related to the proposed development.
	Negative (-)	
Extent	Footprint (1)	The impact only affects the area in which the proposed activity will occur.
	Site (2)	The impact will affect only the development area.
	Local (3)	The impact affects the development area and adjacent properties.
	Regional (4)	The effect of the impact extends beyond municipal boundaries.
	National (5)	The effect of the impact extends beyond more than 2 regional/ provincial boundaries.
	International (6)	The effect of the impact extends beyond country borders.
Duration	Temporary (1)	The duration of the activity associated with the impact will last 0-6 months.
	Short-term (2)	The duration of the activity associated with the impact will last 6-18 months.
	Medium-term (3)	The duration of the activity associated with the impact will last 18 months or years.
	Long-term (4)	The duration of the activity associated with the impact will last more than 5 years.
Severity	Low (1)	Where the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected.
	Moderate (2)	Where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive, or vulnerable systems or communities are negatively affected.
	High (3)	Where natural, cultural, or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive, or vulnerable systems or communities are substantially affected.
Potential for impact on irreplaceable resources	No (0)	No irreplaceable resources will be impacted.
	Yes (1)	Irreplaceable resources will be impacted.
Consequence	Extremely detrimental (-25 to -33)	A combination of extent, duration, intensity, and the potential for impact on irreplaceable resources.
	Highly detrimental (-19 to -24)	
	Moderately detrimental (-13 to -18)	
	Slightly detrimental (-7 to -12)	
	Negligible (-6 to 0)	
	Slightly beneficial (0 to 6)	
	Moderately beneficial (13 to 18)	
	Highly beneficial (19 to 24)	
	Extremely beneficial (25 to 33)	
Probability (the likelihood of the impact occurring)	Improbable (0)	It is highly unlikely or less than 50 % likely that an impact will occur.
	Probable (1)	It is between 50 and 70 % certain that the impact will occur.
	Definite (2)	It is more than 75 % certain that the impact will occur, or the impact will occur.
Significance	Very high - negative (-49 to -66)	A function of Consequence and Probability.
	High - negative (-37 to -48)	
	Moderate - negative (-25 to -36)	
	Low - negative (-13 to -24)	
	Neutral - Very low (0 to -12)	
	Low - positive (0 to 12)	
	Moderate - positive (13 to 24)	
	High-positive (37 to 48)	
	Very high - positive (49 to 66)	

Table 4-9 Explanation of assessment criteria

Criteria	Explanation
Nature	This is an evaluation of the type of effect the construction, operation, and management of the proposed development would have on the affected environment. Will the impact of change on the environment be positive, negative, or neutral?
Extent or Scale	This refers to the spatial scale at which the impact will occur. The extent of the impact is described as footprint (affecting only the footprint of the development), site (limited to the site), and regional (limited to the immediate surroundings and closest towns to the site). The extent of scale refers to the actual physical footprint of the impact, not to the spatial significance. It is acknowledged that some impacts, even though they may be of a small extent, are of very high importance, e.g., impacts on species of very restricted range. To avoid "double counting, specialists have been requested to indicate spatial significance under "intensity" or "impact on irreplaceable resources" but not under "extent" as well.
Duration	The lifespan of the impact is indicated as temporary, short, medium, and long-term.
Severity	This is a relative evaluation within the context of all the activities and the other impacts within the framework of the project. Does the activity destroy the impacted environment, alter its functioning, or render it slightly altered?
Impact on irreplaceable resources	This refers to the potential for an environmental resource to be replaced, should it be impacted. A resource could be replaced by natural processes (e.g., by natural colonization from surrounding areas), through artificial means (e.g., by reseeding disturbed areas or replanting rescued species) or by providing a substitute resource, in certain cases. In natural systems, providing substitute resources is usually not possible, but in social systems, substitutes are often possible (e.g., by constructing new social facilities for those who are lost). Should it not be possible to replace a resource, the resource is essentially irreplaceable e.g., red data species that are restricted to a particular site or habitat to a very limited extent.
Consequence	The consequence of the potential impacts is a summation of the above criteria, namely the extent, duration, intensity, and impact on irreplaceable resources.
Probability of occurrence	The probability of the impact occurring is based on the professional experience of the specialist with environments of a similar nature to the site and/or with similar projects. It is important to distinguish between the probability of the impact occurring and the probability that the activity causing a potential impact will occur. Probability is defined as the probability of the impact occurring, not as the probability of the activities that may result in the impact.
Significance	Impact significance is defined to be a combination of the consequence (as described below) and the probability of the impact occurring. The relationship between consequence and probability highlights that the risk (or impact significance) must be evaluated in terms of the seriousness (consequence) of the impact, weighted by the probability of the impact occurring. In simple terms, if the consequence and probability of an impact are high, then the impact will have a high significance. The significance defines the level to which the impact will influence the proposed development and/or environment. It determines whether mitigation measures need to be identified and implemented and whether the impact is important for decision-making.
Degree of confidence in predictions	Specialists and the EIR team were required to indicate the degree of confidence (low, medium, or high) that there is in the predictions made for each impact, based on the available information and their level of knowledge and expertise. The degree of confidence is not taken into account in the determination of consequence or probability.
Mitigation measures	Mitigation measures are designed to reduce the consequence or probability of an impact or to reduce both consequence and probability. The significance of impacts has been assessed both with mitigation and without mitigation.

4.6 Water monitoring plan

The monitoring network is based on the principles of a monitoring network design as described by the DWAF Best Practice Guidelines: G3 Monitoring (DWAF, 2007). The methodological approach that the monitoring plan follows is represented in Figure 4.8, below.

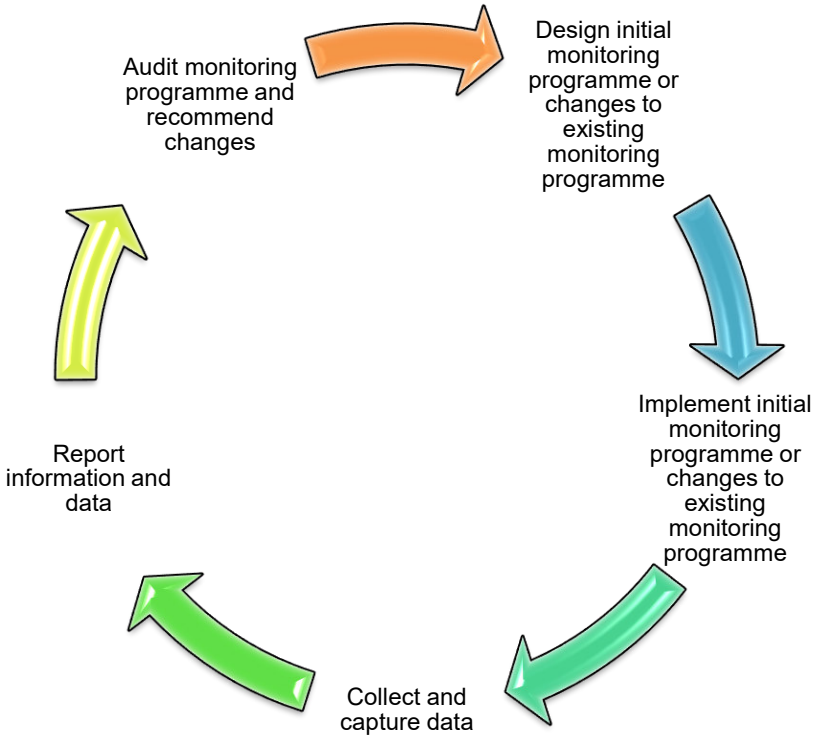


Figure 4.8: Monitoring process

A groundwater monitoring plan was drafted and is based on the site's conceptual model and risk assessment.

4.7 Groundwater management plan

Groundwater management measures were formulated based on the results of the groundwater impact assessment.

5 PREVAILING GROUNDWATER CONDITIONS

The following section supplies an overview of the prevailing hydrogeological conditions encountered in the area of the project site. The data were derived from available literature sources and completed fieldwork.

5.1 Local geology

The 2628 East Rand – 1:250 000 Geological map series (Department of Mineral and Environmental Affairs [DMEA], 1998) and the 2628AB Benoni – 1:50 000 Geological Series (Council for Geoscience, 2007) indicate the local geology is characterised by fine- to coarse-grained sandstone and shale of the Vryheid Formation in the Ecca Group of the Karoo Sequence (refer to Figure 3.1). The geophysical surveys and hydrogeological drilling confirmed that at the Block Meat Company, the sandstones are overlain by ~100 m thick Quartzite.

5.2 Aquifer characteristics, classification, and groundwater recharge

The 1:500 000 Hydrogeological map series 2526 Johannesburg (Figure 5.2) was reviewed to present the hydrogeological characterisation of the project area. The map indicates that the aquifer underlying the Block Meat Company can be regarded as a low to moderate-yielding intergranular and fractured aquifer, with reported yields ranging from 0.1 to 0.5 l/sec - Class D2 aquifer. Groundwater occurrence is typically associated with weathered and fractured sedimentary rocks (Vegter et al., 1968).

Recharge to the underlying aquifer is estimated to be in the order of 2.8% of the MAP (698 mm) which falls within quaternary catchment C21D (DWS, 2020). The aquifer is considered an important contributor to groundwater baseflow to streams and rivers (Barnard, H.C., 2000).

5.3 Depth to groundwater

A field hydrocensus was conducted within 2.5 km of the project site and no boreholes were located on-site. This is because most households and industries around this area are dependent on municipal water supply sources. A review of the NGA database indicated that ten (10) registered boreholes are situated within a 5 km radius of the project site of which six (6) are located within quaternary catchment C21D. Only four (4) of the available ten (10) boreholes have water level information and Table 4-2 lists the available information on the boreholes in the area according to the National Groundwater Archive (NGA).

The regional groundwater levels range from 3.6 meters below ground level (mbgl) and 18.28 mbgl (average 12.54 mbgl). These shallow groundwater levels indicate the NGA boreholes are drilled into the regional weathered aquifer. Whereas the deep-water level of BH2 on site (120 mbgl) indicates BH2 is drilled into a confined fractured aquifer network.

The regional spatial distribution of the existing boreholes as well as the estimated groundwater elevation in the weathered aquifer around the site is shown in Figure 5.3.

Figure 5.1 plots available groundwater elevation data for the area. There is a good relationship (R = 85 %), between groundwater and topography elevation which suggests that the regional groundwater table mimics the topography. The data suggest that groundwater levels are shallower close to non-perennial and perennial streams where groundwater contributes to streamflow as baseflow seepage. These areas are typically prominent groundwater-surface water interaction areas. Bayesian interpolation of available groundwater level data was applied to the area to conceptualize the groundwater flow.

Figure 5.3 indicates the generated Bayesian interpolated groundwater elevations for the area. The data suggest that the general groundwater flow direction is from west to east.

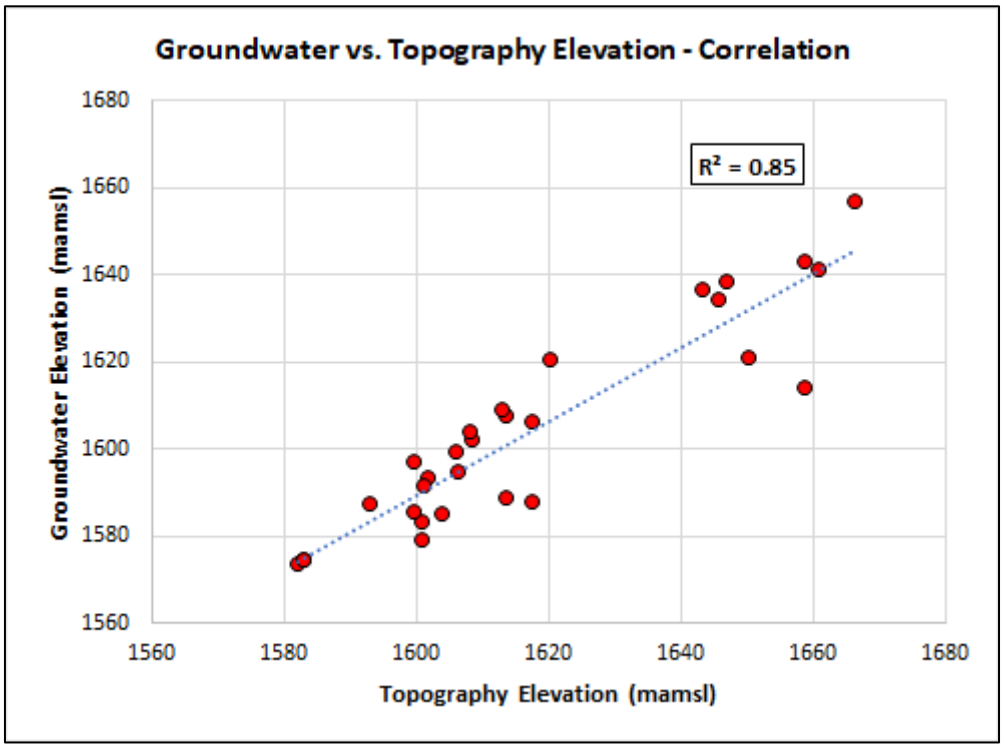


Figure 5.1: Groundwater elevation vs topography elevation correlation.

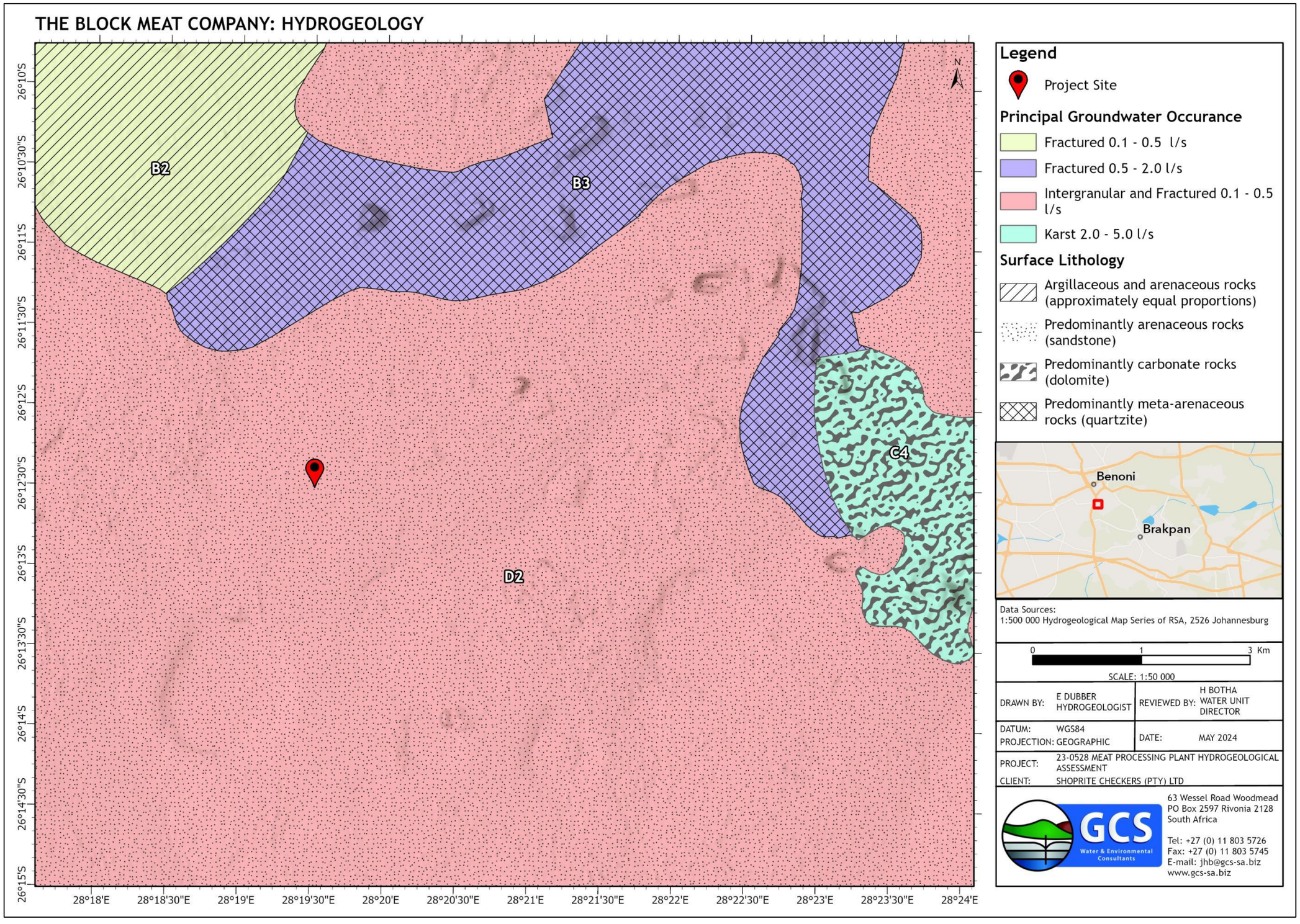


Figure 5.2: Local hydrogeology.

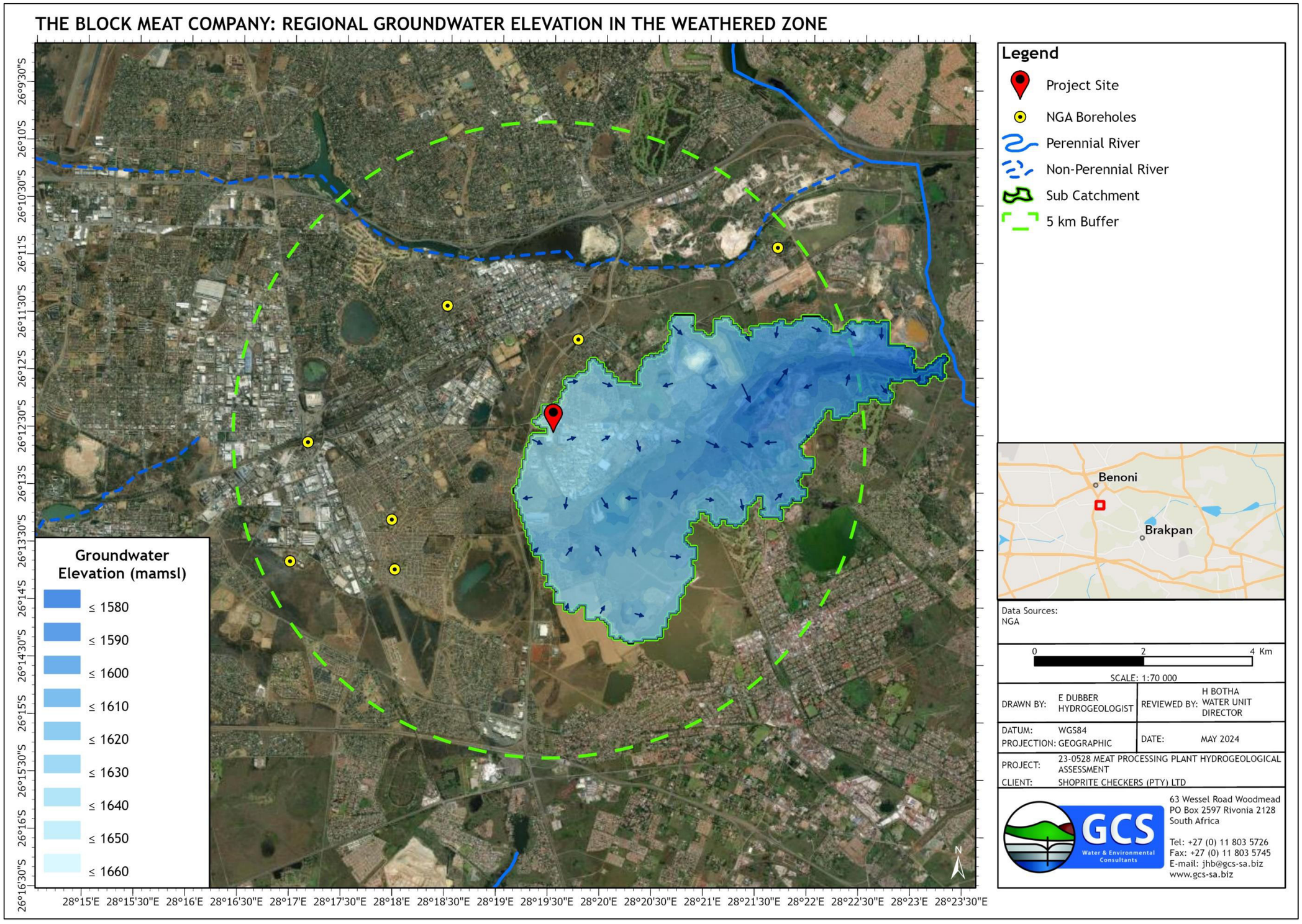


Figure 5.3: **Boreholes within a 5 km radius of the project site, estimated groundwater elevation and flow direction map.**

5.4 Groundwater quantity

The DWS conducted a Reserve Determination for the water resources of the Vaal Water Management Area in terms of section 16(1) of the National Water Act, 1998 (Act No. 36 of 1998) (DWS, 2020). The proposed GRD for quaternary C21D is summarized in Table 5-1. The groundwater reserve for quaternary catchment C21D consists of the volume of groundwater required to satisfy the Basic Human Needs (BHN) and to meet the Ecological Water Requirements (EWR) through groundwater contribution to baseflow (GWBF).

Table 5-1 Quaternary catchment C21D groundwater reserve (DWS, 2020)

Quaternary Catchment	Area (km^2)	Mean Annual Precipitation (mm)	Recharge (m^3/a)	Population (minimum level)	Basic Human Needs (m^3/a)	Groundwater Component of Baseflow (m^3/a)	Total Reserve (m^3/a)	Groundwater Use (WARMS, 2024) (m^3/a)	Allocable Groundwater Total (m^3/a)
C21D	446	698	8 560 000	180 660	1 650 000	4 200 000	5 850 000	1 005 735	1 704 265

5.4.1 Sub-catchment delineation

A sub-catchment was delineated with Global Mapper. A 3 Arc Second Resolution Shutter Radar Topography Mission (SRTM) Digital Elevation Model (DTM) was used as input, and the drainage systems were delineated for the local area (1:10 000 stream count, with 30 m DEM fill).

The delineated sub-catchment is indicated in Figure 3.1. The total sub-catchment area is in the order of 17.91 km^2.

The groundwater reserve determination calculation, scale of abstraction and stress index will focus on the delineated sub-catchment. Table 5-2 presents a summary of the hydrogeological information for the delineated sub-catchment.

Table 5-2 Delineated sub-catchment information summary

Description	Delineated Sub-Catchment	
Surface Area	17.91	[km^2]
Recharge	343 743.50	[m^3/a]
Population	7 254.75	people
BHN	66 258.97	[m^3/a]
Baseflow	168 659.19	[m^3/a]
Groundwater Use	40 387.25	[m^3/a]
Reserve	234 918.16	[m^3/a]
Reserve as % of Recharge	68%	[%]

Note/s:

[km^2] - squared kilometres

[m^3/a] - cubic metres per annum

[%] - percentage

5.4.2 Groundwater recharge

The effective groundwater recharge from precipitation is the portion of precipitation that reaches the groundwater. The remainder of the precipitation comprises surface water runoff, evapotranspiration, and soil moisture. The effective recharge is dependent on the geology, soils, surface run-off and stream morphology but most importantly for the study area, the effective storage.

Based on values sourced from the Vaal Water Management Area Groundwater Reserve Determination (DWS, 2020), a recharge of 2.8% (8 560 000 m^3/a) of the annual precipitation is estimated (refer to Table 5-1). Higher recharge is however expected along geological structural features due to their increased permeability and associated storage. Recharge data used in this study is potential direct recharge only and significant lateral or indirect recharge may occur. The precipitation recharge, for the delineated sub-catchment area, is described below and summarised in Table 5-3.

$$\mathbf{Re}_{Catchment\ Area} = \mathbf{Re}_{\%MAP} \times \mathbf{Area}_{Catchment\ Area}$$

Where:

- $Re_{\%MAP}$ = Recharge (2.8 % of MAP) [mm/a] for the delineated catchment area
- $Area_{Catchment\ Area}$ = Area [m^2]

Table 5-3 Delineated sub-catchment recharge summary

Description	Delineated Sub-Catchment	
Total Recharge (~2.8% of MAP)	8 560 000	[m^3/a]
Delineated Catchment Area	17 910 000	[m^2]
Delineated Catchment Recharge	343 743.50	[m^3/a]

Note/s:

MAP - mean annual precipitation

[m^2] - squared metres

[m^3/a] - cubic meters per annum

5.4.3 Existing GW usage (EU)

According to the latest available information from the Water Authorization Registration and Management System (WARMS) database (May 2024), the volume of groundwater allocated within quaternary catchment C21D is in the order of 1 005 735 m^3/a (NIWIS, 2024). This equates to a calculated 40 387.25 m^3/a existing groundwater usage within the delineated sub-catchment.

5.4.4 Basic human needs (BHN)

According to the Government Gazette no 46798 of 26 August 2022, the BHN Reserve provides for the essential needs of individuals served by the water resource in question and includes water for drinking, food preparation and personal hygiene. Basic Human need is set by the Water Service Act (Act No. 108 of 1997) at 25 litres per person per day. The reserve is calculated by multiplying the number of people living within the confines of a source unit by 25 L/d. The estimated BHN of quaternary catchment C21D is 1 650 000 m^3/a (refer to Table 5-1), which equates to 66 258.97 m^3/a for the delineated sub-catchment.

5.4.5 Proposed GW usage (PU)

Based on the recommended abstraction time of 8 hours, the sustainable yield of 33 408 l/day (12 193.92 m^3/a) for borehole BH2 is recommended to meet the water demand for the meat processing plant.

5.4.6 Groundwater contribution to baseflow

Baseflow is the low flow in a river during dry or fair-weather conditions, but not necessarily all contributed by groundwater, baseflow includes contributions from delayed interflow and groundwater discharge. Because of the contribution of groundwater to surface water flow in certain circumstances, the volume of groundwater that could be abstracted without impacting the ability of the groundwater to sustain or contribute to the surface water Reserve has to be taken into account.

The baseflow of groundwater into surface water bodies in the quaternary catchment is 4 200 000 m^3/a (DWS, 2020). The groundwater contribution to baseflow of the delineated sub-catchment is described below and summarized in Table 5-4.

$$\mathbf{Baseflow}_{Catchment\ Area} = \mathbf{Baseflow}_{\ Catchment\ Area} \mathbf{\ x\ Area}_{\ Catchment}$$

Where:

- $Baseflow_{Catchment\ Area}$ = value for baseflow in quaternary catchment C21D (DWS, 2020) [m^3/a]
- $Area_{Catchment\ Area}$ - Delineated catchment area [m^2]

Table 5-4 Delineated sub-catchment groundwater contribution to baseflow summary

Description	Delineated Sub-Catchment	
Baseflow for Quaternary Catchment	4 200 000	[m^3/a]
Delineated Catchment Area	17 910 000	[m^2]
Delineated Catchment Areas Baseflow	168 659.19	[m^3/a]

Note/s:

[m^3/a] - cubic metres per annum

[m^2] - squared metres

5.4.7 GW balance

The GW balance and the reserve determination on a sub-catchment scale are presented in Table 5-5 and summarised below:

- $GW_{available}$ = (Re) - (EU + BHN + BF + PU)

Where:

- $Gw_{available}$ = Available GW for use.
- Re = Effective recharge to the aquifer.
- BF = Baseflow to surface water streams.
- EU = Existing GW abstraction/use (identified on sub-catchment, excluding applicant).
- BHN = Basic Human Needs.
- PU = Proposed Use.

Table 5-5 Delineated sub-catchment GW balance and reserve determination

Description	Delineated Sub-Catchment	
Recharge through Precipitation	343 743.50	[m^3/a]
Groundwater Reserve	234 918.16	[m^3/a]
Total Available Groundwater	108 825	[m^3/a]
Existing GW Use (WARMS, 2024)	40 387.25	[m^3/a]
Remaining Available Groundwater	68 438.09	[m^3/a]
Proposed Abstraction	12 193.92	[m^3/a]
Surplus Groundwater Available	56 244.17	[m^3/a]

Note/s:

[m^3/a] - cubic metres per annum

The GW balance indicates there's approximately 68 438.09 m^3/a groundwater available for abstraction on a sub-catchment scale and a surplus value of approximately 56 244.17 m^3/a will be available after the proposed abstraction of 12 193.92 m^3/a.

5.5 Groundwater quality

Groundwater sampling was undertaken from BH2 by the client and the results were provided to GCS. The analysis of the laboratory results is shown in Table 5-6 below and the laboratory certificate of the results can be seen in **Appendix D**.

The results showed that all chemical parameters fall within the SANS241:2015 water standards for domestic use, except for turbidity and manganese. Manganese is naturally abundant in rocks, soil and groundwater. The elevated manganese concentration in BH2 is potentially sourced from the sedimentary host rock and is therefore naturally occurring. Manganese supports the growth of certain nuisance organisms in water distribution systems, giving rise to taste, odour and turbidity problems.

Turbidity in water is caused by the presence of suspended matter which usually consists of a mixture of inorganic matter, such as clay and soil particles, and organic matter. The elevated turbidity in the water pumped from BH2 is most likely associated with the elevated manganese concentration as well as suspended soil particles.

Table 5-6 Groundwater quality results

Parameter	Risk	Unit	Standard Limit	BH2
Physical and aesthetic determinants				
Colour	Aesthetic	mg/L Pt-Co	≤ 15	<5.00
Conductivity at 25 °C	Aesthetic	mS/m	≤ 170	97.5
pH at 25 °C	Operational	pH units	≥ 5 to ≤ 9.7	6.93
Total dissolved solids	Aesthetic	mg/L	≤ 1 200	846
Turbidity	Operational	NTU	≤ 1	**20.5**
Turbidity	Aesthetic	NTU	≤ 5	**20.5**
Chemical determinants – macro-determinants				
Ammonia as N	Aesthetic	mg/L	≤ 1.5	<0.005
Chloride as Cl^-	Aesthetic	mg/L	≤ 300	119
Combined nitrate plus nitrite	Acute health	mg/L	≤1	<1.00
Fluoride as F^-	Chronic health	mg/L	≤ 1.5	0.32
Free chlorine as Cl_2	Chronic health	mg/L	≤ 5	0.11
Monochloramine	Chronic health	mg/L	≤ 3	0.12
Nitrate as N	Acute health	mg/L	≤ 11	0.571
Nitrite as N	Acute health	mg/L	≤ 0.9	<0.06S
Sodium as Na	Aesthetic	mg/L	≤ 200	27.9
Sulphate as SO_4^{2-}	Acute health	mg/L	≤ 500	174
Sulphate as SO_4^{2-}	Aesthetic	mg/L	≤ 250	174
Zinc as Zn	Aesthetic	mg/L	≤ 5	<0.002
Chemical determinants – micro-determinants				
Aluminium as Al	Operational	mg/L	≤ 0.3	<0.002
Antimony as Sb	Chronic health	mg/L	≤ 0.02	<0.001
Arsenic as As	Chronic health	mg/L	≤ 0.01	<0.006
Barium as Ba	Chronic health	mg/L	≤ 0.7	0.04
Boron as B	Chronic health	mg/L	≤ 2.4	<0.013
Cadmium as Cd	Chronic health	mg/L	≤ 0.003	<0.002
Copper as Cu	Chronic health	mg/L	≤ 2	0.012
Cyanide (recoverable) as CN^-	Acute health	mg/L	≤ 0.2	<0.005
Iron as Fe	Chronic health	mg/L	≤ 2	1.9
Iron as Fe	Aesthetic	mg/L	≤ 0.3	1.9
Lead as Pb	Chronic health	mg/L	≤ 0.01	<0.004
Manganese as Mn	Chronic health	mg/L	≤ 0.4	**1.07**
Manganese as Mn	Aesthetic	mg/L	≤ 0.1	**1.07**
Mercury as Hg	Chronic health	mg/L	≤ 0.006	<0.005
Nickel as Ni	Chronic health	mg/L	≤ 0.07	0.011
Selenium Se	Chronic health	mg/L	≤ 0.04	<0.002
Total chromium as Cr	Chronic health	mg/L	≤ 0.05	<0.010
Uranium as U	Chronic health	mg/L	≤ 0.03	<0.015
Chemical determinants – organic determinants				
Bromodichloromethane	Chronic health	mg/L	≤ 0.06	<0.002
Bromoform	Chronic health	mg/L	≤ 0.1	<0.020
Dibromochloromethane	Chronic health	mg/L	≤ 0.1	<0.002
Phenols	Aesthetic	mg/L	≤ 0.01	<0.01
Total microcystin	Chronic health	mg/L	≤ 0.001	<0.0005
Total organic carbon as C	Chronic health	mg/L	≤ 10	1.75
Trihalomethanes Chloroform	Chronic health	mg/L	≤ 0.3	<0.002

Note:

Red and Bold exceed the SANS 241:2015 Standard

6 PRELIMINARY RISK AND IMPACT ASSESSMENT

In this section, the Impact on groundwater aquifer and surrounding water bodies as a result of the proposed abstraction was assessed. The Source – Pathway- Receptor (SPR) model (DWAF, 2008) was considered to quantify and illustrate the potential groundwater risks.

6.1 Site conceptual model

The Site Conceptual Model (SCM) for The Block Meat Company comprise the following:

- Two (2) aquifer systems: A regional upper weathered aquifer and a deeper confined fractured aquifer.
- The weathered aquifer has a low yield potential, and the solid rock is not fissured to an extent to promote water movement.
- The production borehole (BH2) on site draws from the deeper fractured aquifer (>150 mbgl), with a static water level recorded at 120 mbgl and a yield of 1.16 l/s

Due to the depth of the aquifer zone (>150 mbgl) the potential for pollution is low, except if poor quality runoff directly into or along the borehole casing takes place (i.e. from the site down via the weathered zone to the water table). Recharge in the confined zone will be subjected to transboundary inflows as well as recharge via the vadose and weathered zones. The extent of the fractured aquifer is however uncertain.

During the field hydrocensus, no groundwater users could be identified within a 2.5 km radius of BH2. The risk of having a potential impact on surrounding groundwater users is therefore also considered low to insignificant.

6.2 Geohydrological impacts and mitigation measures

Risk assessment entails understanding the generation of a hazard, the probability that the hazard will occur, and the consequences if it should occur. The net consequence is established by the following equation:

Consequence = (Duration + Extent + Irreplaceability of resource) x Severity

The environmental significance of an impact was determined by multiplying the consequence by probability. The risk significance rating is summarised in Table 6-1.

Table 6-1 Risk rating scale

Criteria	Rating Scales
Significance	Very high – negative (-49 to -66)
	High – negative (-37 to -48)
	Moderate – negative (-25 to -36)
	Low – negative (-13 to -24)
	Neutral - Very low (0 to -12)
	Low-positive (0 to 12)

Criteria	Rating Scales
	Moderate-positive (13 to 24)
	High-positive (37 to 48)
	Very high - positive (49 to 66)

Key assumptions made:

- The risk/impact assessment conducted for the site is based on the topography, groundwater flow direction, groundwater levels, geology, geophysical data, and characteristics associated with the aquifer system.
- The risk/impact assessment incorporates a worst-case scenario approach.
- Groundwater mimics the topography.
- Bayesian interpolation of available groundwater data was applied to conceptualize the groundwater flow and groundwater depth in the study area.

6.2.1 Impacts on the groundwater reserve

The potential radius of influence of pumping for borehole BH2 [identified for GW use during this study] was determined by applying the Cooper-Jacob equation (1):

$$\textbf{\textit{Radius of Influence}}\ (r_e) = 1.5\sqrt{\frac{Tt}{S}} \qquad \textbf{Equation 1}$$

Where:

T = aquifer transmissivity (m^2/day)

t = exploitation time/pumping time (days); and

S = aquifer storativity.

The estimated radius of influence for the borehole is listed in Table 6-2. The predicated pumping radius of influence for BH2 is in the order of 8.58 m. During pumping, no interference in BH1 was noted. It is therefore anticipated that BH2 is drawing from the fractured aquifer network or contact zones, which are not connected.

Table 6-2 Summary of the radius of influence for borehole BH2

Parameter	Units	BH 13 (PV1)
T	m^2/day	2.35
t	days	121.67
s		8.71

Tt		285.32
Tt/s		32.75
Square Root (Tt)	m	5.72
The radius of Influence	*m*	*8.58*

6.2.1.1 Scale of abstraction

Based on the DWS Requirements for Water Use License Application: Groundwater Abstraction [S21(a)], the license application must be evaluated in terms of three possible categories. Categories A, B, and C, each have an applicable list of information requirements for the license application. The categories are as follows:

Small-scale abstractions (<60% recharge) **Category A**

Medium-scale abstractions (60-100% recharge) **Category B**

Large-scale abstractions (>100% of recharge) **Category C**

Concerning the DWS scale of abstraction categories, the scale of abstraction after the proposed abstraction from the groundwater unit, relative to recharge, across the delineated sub-catchment area is 77% and is classified as Category B "Medium Scale" abstraction.

6.2.1.2 Water quantity stress index

The status of a groundwater resource unit can be assessed in terms of sustainable use, observed ecological impacts, or water stress. As no ecological reserve is available for the affected catchment, the impact of the proposed abstraction on the ecological reserve cannot be determined.

The concept of stressed water resources is addressed by the National Water Act, 1998 (Act No. 36 of 1998) (NWA) but is not defined. Part 8 of the Act gives some guidance by providing the following qualitative examples of 'water stress:

- Where water demands are approaching or exceed the available supply.
- Where water quality problems are imminent or already exist; or
- Where water resource quality is under threat.

To provide a quantitative means of defining stress, a groundwater stress index was developed by dividing the volume of groundwater abstracted from a groundwater unit by the estimated recharge to that unit (Parsons and Wentzel, 2007). However, this concept does not take cognisance of the impact of other land-use practices on groundwater and surface water resources. It is therefore proposed to modify the stress index by taking the groundwater contribution to baseflow into account.

The modified stress index is as follows:

Stress Index = Proposed Abstraction / (Recharge – Baseflow)

= 52 581.17 m^3/a / (343 743.50 m^3/a – 168 659.19 m^3/a)

= 0.3

The stress index and classes described in Table 6-3 are a guide for determining the level of stress of a groundwater resource unit, based on abstraction, baseflow, and recharge (modified after (Parsons & Wentzel, 2007).

Table 6-3 Guide for determining the level of stress of a groundwater resource unit

Present Status Category	Description	Stress Index
A	Unstressed or low level of stress	<0.05
B		0.05 - 0.2
C	Moderate levels of stress	0.2 - 0.5
D		0.5 - 0.75
E	Stressed	0.75 - 0.95
F	Critically stressed	>0.95

Based on the guide for determining the level of stress of the groundwater resource unit, the abstraction of 52 581.17 m^3/a across the delineated sub-catchment area is classified as status category C. The aquifer unit will thus have a moderate level of stress after the proposed abstraction.

6.3 Geohydrological impacts and mitigation measures

Risk assessment entails the understanding of the generation of a hazard, the probability that the hazard will occur, and the consequences if it should occur. The net consequence is established by the following equation:

Consequence = (Duration + Extent + Irreplaceability of resource) x Severity

The environmental significance of an impact was determined by multiplying the consequence by probability.

The anticipated hydrogeological impacts as a result of the proposed abstraction are discussed in Table 6-4 below.

Table 6-4 Potential hydrogeological impacts and mitigation measures

Component Being Impacted On	Activity Which May Cause the Impact	Activity	Pre- Mitigation							Recommended Mitigation Measures	Post Mitigation						
			Duration	Extent	Potential for impact on irreplaceable resources	Severity	Consequence	Probability	Significance		Duration	Extent	Severity	Potential for impact on irreplaceable resources	Consequence	Probability	Significance
Regional water table / GW aquifer	Due to the depth of the aquifer zone (>150 mbgl) the potential for pollution is low, except if poor quality runoff directly into or along the borehole casing takes place (i.e. from the site down via the weathered zone to the water table).	Site activities	Long-term (4)	Site (2)	Yes (1)	Low (-1)	Slightly detrimental (-13 to -18) (-16)	Probable (1)	Neutral – Very low (0 to -12) (-7)	Visual soil assessments for signs of contamination. Ensure adequate stormwater systems to manage runoff.	Long-term (4)	Footprint (1)	Low (-1)	Yes (1)	Negligible (-6 to 0) (-6)	Improbable (0)	Neutral – Very low (0 to -6) (0)
	Over abstraction and impact on the sub-catchment	Abstracting groundwater from BH2	Long-term (4)	Local (3)	Yes (1)	Moderate (-2)	Moderately detrimental (--15 to --24) (-16)	Probable (1)	Low - negative (-13 to -24) (-16)	Do not overproduce from borehole BH2. 8 hours of pumping per day is recommended. Ensure routine water quality monitoring is undertaken.	Long-term (4)	Footprint (1)	Low (-1)	Yes (1)	Negligible (-6 to 0) (-6)	Probable (1)	Neutral – Very low (0 to -6) (-6)

7 WATER MONITORING

BH2 is equipped with a flow meter which will be used to monitor the meat processing plant's daily groundwater abstraction.

Regular visual assessments of sewer infrastructure (i.e., hydraulic monitoring), parking and service areas should be adequate to monitor for obvious signs of pollution in the environment.

Monitoring the groundwater quality and quantity at BH2 should be sufficient to determine the impact on the local aquifer system. No other monitoring boreholes are proposed at this stage but can be considered if there are noted operational issues associated with the existing borehole.

7.1 Monitoring parameters and frequency

The groundwater quality and quantity monitoring frequency are summarised in Table 7-1 and should include the following for the abstraction borehole BH2:

- Monitoring of abstraction volumes from the borehole, with an installed automated flow meter;
- Monitoring of water level responses (use and/or rest periods) in the production borehole (water level devices or permanently installed data loggers); and
- Water quality analysis once a year.

Table 7-1 Proposed monitoring frequency

Monitoring Point	Interval	Purpose
BH2	Monthly	Abstraction volumes – flow meter readings
	Monthly	Water level measurement
	Annual	Sampling for water quality analysis

It is recommended that a qualified hydrogeologist evaluate the data and make the necessary adjustments to the monitoring programme after the first year's monitoring data is available.

8 CONCLUSIONS

Based on the investigation undertaken the following conclusions are made:

- The Block Meat Company property is situated along the eastern boundary of quaternary catchment C21D within the Upper Vaal Water Management Area at an altitude of between 1656 and 1655 mamsl.
- The Block Meat Company property is underlain by low to moderate-yielding intergranular and fractured aquifer hosted within weathered and fractured Ecca Group sedimentary rocks.
- The regional groundwater flow, assuming hydraulic connectivity across the aquifer system/s, is in an easterly direction, a subdued reflection of the surface topography, with groundwater levels ranging from 3.6 to 18.28 (average 12.54) mbgl.
    - However, on a local scale, the flow is likely to be significantly more complex due to geological and structural controls resulting in potential groundwater barriers and discrete conduits to flow. Such as BH2 having a static water level of 120 mbgl which is likely due to semi-confined conditions caused by the Quartzite layer overlying the sedimentary aquifer.
- The Turbidity and Manganese are the only constituents in the water pumped from BH2 that exceed the SANS241:2015 water standards for domestic use.
    - Manganese is naturally abundant in rocks, soil and groundwater. The elevated manganese concentration in BH2 is potentially sourced from the sedimentary host rock and is therefore naturally occurring. Manganese supports the growth of certain nuisance organisms in water distribution systems, giving rise to taste, odour and turbidity problems.
    - Turbidity in water is caused by the presence of suspended matter which usually consists of a mixture of inorganic matter, such as clay and soil particles, and organic matter. The elevated turbidity in the water pumped from BH2 is most likely associated with the elevated manganese concentration as well as suspended soil particles.
- The aquifer test results showed that BH2 has a transmissivity value of 2.35 m^2/d and a hydraulic conductivity of 0.05 m/d, indicating a relatively low to intermediate-yielding aquifer system.
- Borehole-specific sustainable abstraction rate was calculated for BH2 as 1.11 l/s for a 24-hour daily pumping schedule, and 1.56 l/s for a 16-hour daily pumping schedule.

- With no significant geological and/or hydrogeological boundaries within quaternary catchment C21D, the groundwater reserve determination was based on a delineated sub-catchment area of ~ 17.91 km^2 with an estimated groundwater recharge of 343 743.50 m^3/a and an existing abstraction volume of 40 387.25 m^3/a, resulting in a groundwater resource water availability of 68 438.09 m^3/a. This results in a surplus volume of ~ 56 244.17 m^3/a available water when the Block Meat Company's proposed annual water abstraction of 12 193.92 m^3 is considered.
- The groundwater unit/s is considered to be at moderate levels of stress (Category C, 0.2 – 0.5 stress index) with Medium-scale abstraction (Category B, ~84% of recharge).
- In the SCM, there are 2 aquifer systems: A regional upper weathered aquifer and a deeper confined fractured aquifer.
    - The weathered aquifer has a low yield potential, and the solid rock is not fissured to an extent to promote water movement.
    - The production borehole (BH2) on site draws from the deeper fractured aquifer (>150 mbgl), with a static water level recorded at 120 mbgl and a yield of 1.16 l/s
- Due to the depth of the aquifer zone (>150 mbgl) the potential for pollution is low, except if poor quality runoff directly into or along the borehole casing takes place (i.e. from the site down via the weathered zone to the water table). Recharge in the confined zone will be subjected to transboundary inflows as well as recharge via the vadose and weathered zones. The extent of the fractured aquifer is however uncertain.
- During the field hydrocensus, no groundwater users could be identified within a 2.5 km radius of BH2. The risk of having a potential impact on surrounding groundwater users is therefore also considered low to insignificant.
- Based on the above, it is evident that groundwater can be abstracted as a viable source to meet the meat processing plant's proposed water demand requirements.

9 RECOMMENDATIONS

Based on the site-specific hydrogeological conditions and the outcome of this investigation, the sustainable abstraction rate of BH2 is recommended at 1.16 l/s for 8 hours of pumping per day. This will result in a yield of 33 408 l/d and 12 193.92 m^3/a which is sufficient to satisfy the meat processing plant's estimated water demand of ~30 422 l/d and ~11 104 m^3/a.

.

10 REFERENCES

Barnard, H.C. 2000. An explanation of the 1:500 000 general hydrogeological map Johannesburg 2526.

DMEA. 1998. 1:250 000 Geological Series – 2628 East Rand.

DWA. 2012. Aquifer Classification of South Africa map. Hydrological Services. Groundwater Information.

DWAF. 2007. Best Practice Guidelines – G3: Water Monitoring Systems

Johnson, M.R., Anhaeusser, C.R. and Thomas, R.J. (Eds.) (2006). The Geology of South Africa. Geological Society of South Africa, Johannesburg/Council for Geoscience, Pretoria, 691 pp.

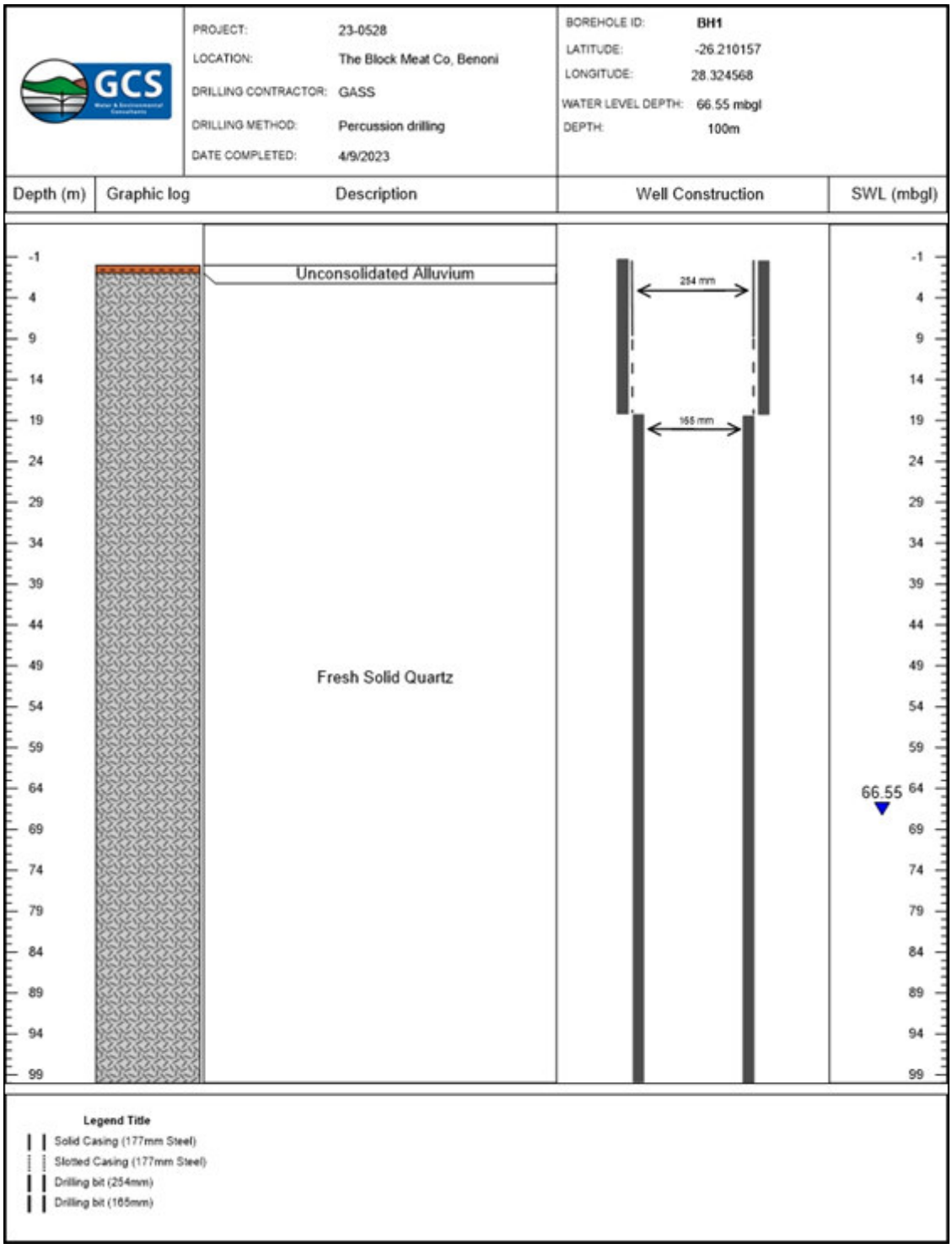
NGA. 2024. National Groundwater Archive.

Parsons and Wentzel. 2007. Groundwater Resource Directed Measures Manual.

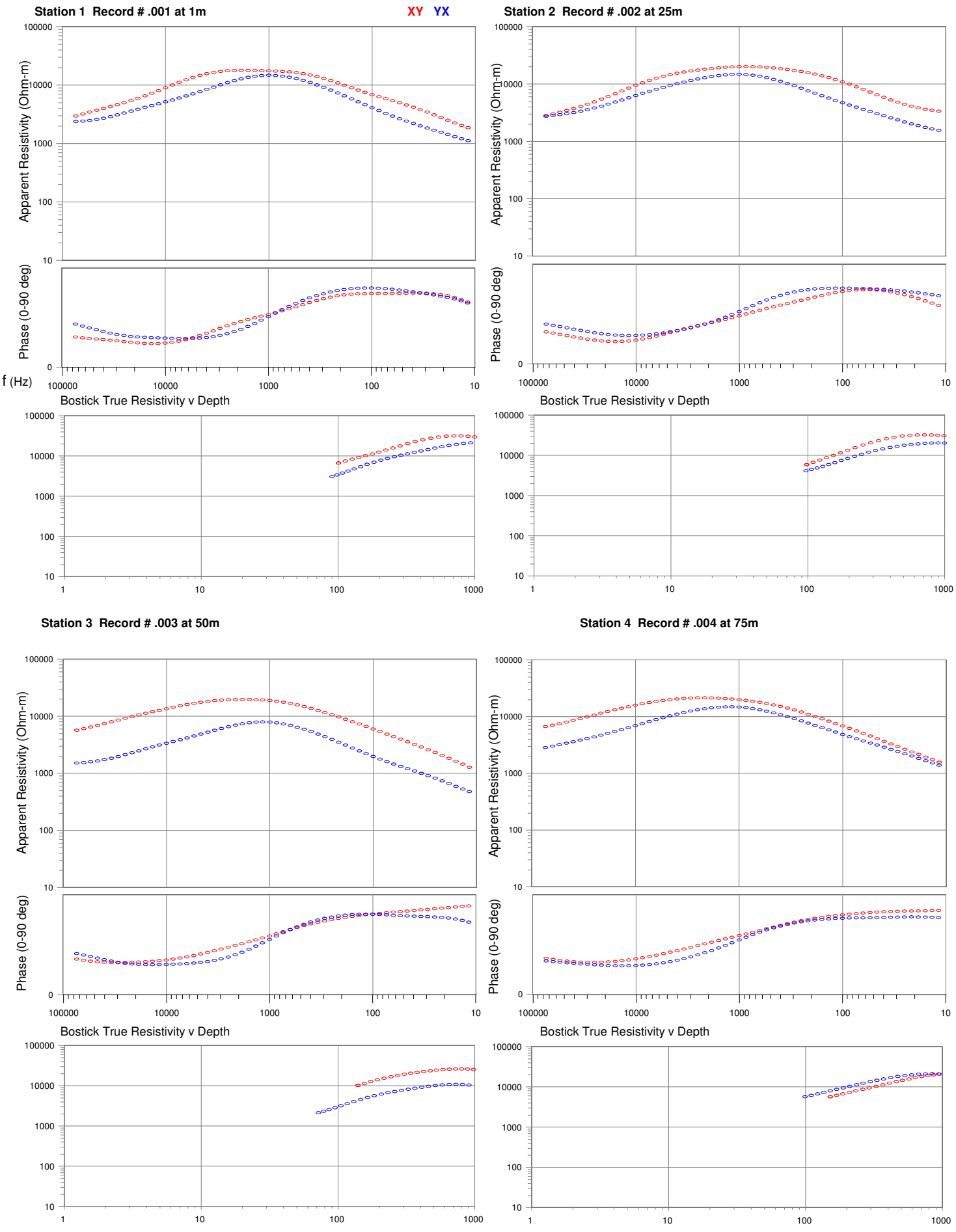
Parsons, R. 1995. A South African Aquifer System Management Classification. Water Research Commission Report No. VK 7795.

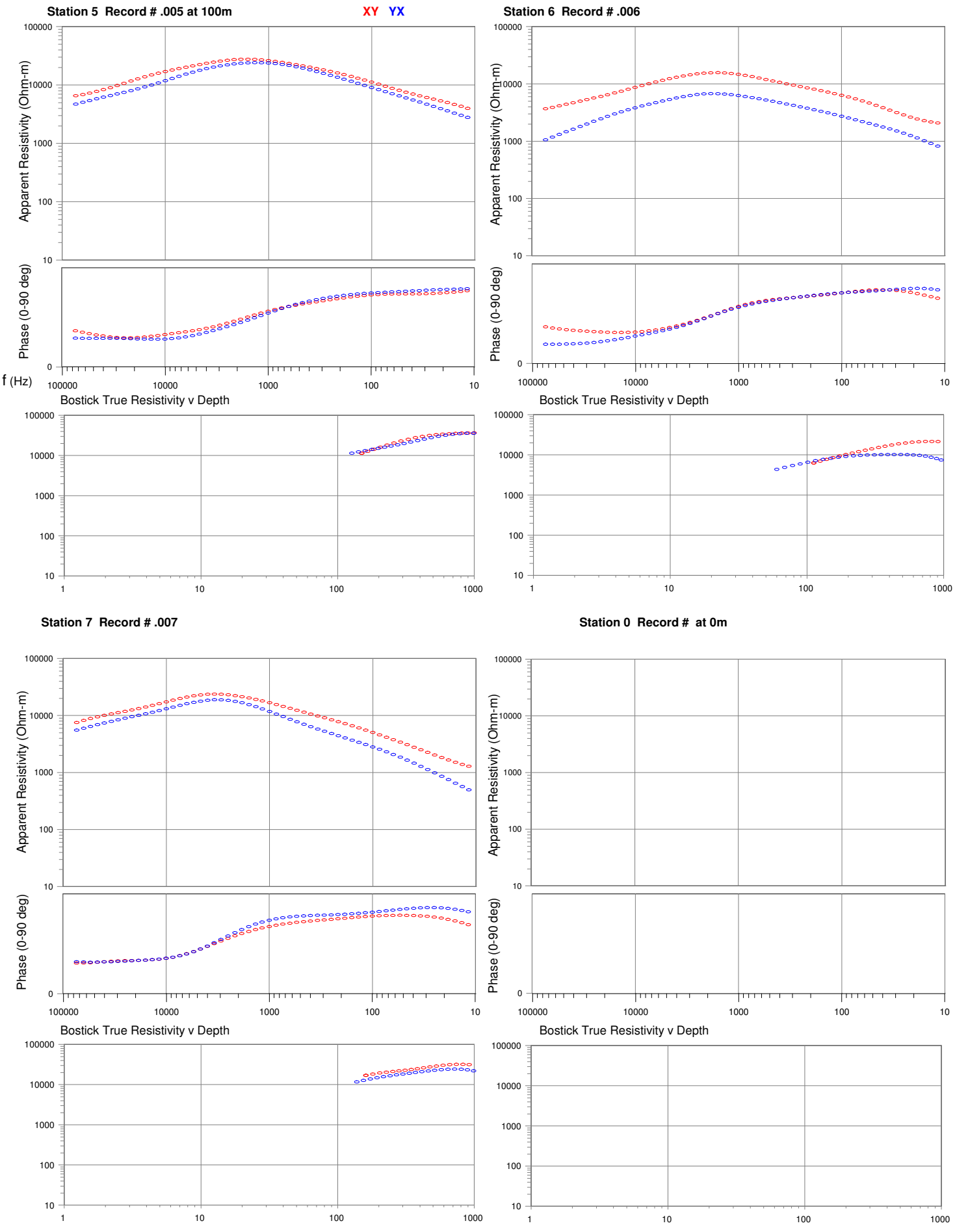
The National Integrated Water Information System (NIWIS). https://www.dws.gov.za/niwis2/GroundWaterStatus

APPENDIX A: HYDROGEOLOGICAL EXPLORATION BOREHOLE LOG



APPENDIX B: MAGNETOTELLURIC (MT) GEOPHYSICAL SURVEY RESULTS


Station 1 Record # .001 at 1m
XY YX
Station 2 Record # .002 at 25m
Apparent Resistivity (Ohm-m)
Phase (0-90 deg)
f (Hz)
Bostick True Resistivity v Depth
Station 3 Record # .003 at 50m
Station 4 Record # .004 at 75m


Station 5 Record # .005 at 100m
XY YX
Apparent Resistivity (Ohm-m)
Phase (0-90 deg)
f (Hz)
Bostick True Resistivity v Depth
Station 6 Record # .006
Apparent Resistivity (Ohm-m)
Phase (0-90 deg)
Bostick True Resistivity v Depth
Station 7 Record # .007
Apparent Resistivity (Ohm-m)
Phase (0-90 deg)
Bostick True Resistivity v Depth
Station 0 Record # at 0m
Apparent Resistivity (Ohm-m)
Phase (0-90 deg)
Bostick True Resistivity v Depth

APPENDIX C: AQUIFER HYDRAULIC TESTING RESULTS

AQUIFER TEST DATA SHEET					
Time (min)	Water Level above/below	L/s Yield	Recovery Water level	EC	Comments
0	120.00		135.63		
2	121.73	1.16	130.88		
4	123.03		127.49		
6	123.92		125.28		
8	124.58		124.06		
10	125.05	1.16	123.55		
12	125.46		123.31		
20	126.30		122.82		
30	126.86		122.47		
40	127.20		122.24		
50	127.47		122.06		
60	127.72		121.92		
70	127.97		121.80		
80	128.21		121.69		
90	128.45		121.60		
120	128.96		121.39		
150	129.46		121.22		
180	129.86		121.08		
210	130.34		120.95		
240	130.74		120.84		
270	131.37		120.73		
300	131.87		120.64		
330	132.39		120.55		
360	132.76		120.47		
390	133.11		120.39		
420	133.47		120.32		
450	133.81		120.25		
480	134.02		120.19		
510	134.23		120.13		
540	134.48		120.07		
570	134.86		120.02		
600	135.05				
630	135.32				
660	135.57				
690	135.80				
720	135.93				
750	136.10				
780	136.34				
810	136.55				
840	136.76				
870	136.99				

900	137.11				
930	137.38				
960	137.56				
990	137.72				
1020	137.68				
1050	137.92				
1080	138.03				
1110	138.22				
1140	138.38				
1170	138.63				
1200	138.67				
1230	138.80				
1260	139.01				
1290	139.27				
1320	139.29				
1350	139.63				
1380	139.66				
1410	139.76				
1440	139.83				

APPENDIX D: WATER QUALITY LAB CERTIFICATE

aquatico Laboratories (Pty). Ltd.

ilac-MRA sanas testing laboratory T0685

Test Report

Client:	MLS National Laboratory Pty Ltd	**Date of report:**	06 November 2023
Address:	67 Morkels Close, c/o Le Roux Ave and Capitol Hill Commercial Park, Midrand,	**Date accepted:**	27 October 2023
Report no:	167971	**Date completed:**	06 November 2023
Project:	MLS Laboratory	**Date received:**	27 October 2023

Lab no:					338643
Date sampled:					26-Oct-23
Aquatico sampled:					No
Sample type:					Water
Locality description:					CR 27960 Borehole water
		Analyses	**Unit**	**Method**	
A	AQL	pH @ 25°C	pH	ALM 20	6.93
A	AQL	Electrical conductivity (EC) @ 25°C	mS/m	ALM 20	97.5
A	AQL	Total Dissolved solids @ 180°C	mg/l	ALM 24	846 ✓
A	AQL	Total Alkalinity	mg $CaCO_3$/l	ALM 01	233
A	AQL	Chloride (Cl)	mg/l	ALM 02	119
A	AQL	Sulphate (SO_4)	mg/l	ALM 03	174 ✓
A	AQL	Nitrate (NO_3) as N	mg/l	ALM 06	0.571
A	AQL	Total oxidised nitrogen as N	mg/l	ALM 06	0.612
A	AQL	Nitrite (NO_2) as N	mg/l	ALM 07	<0.065 ✓
A	AQL	Ammonium (NH_4) as N	mg/l	ALM 05	0.058 ✓
N	AQL	Un-ionized Ammonia as N	mg/l	ALM 26	<0.005
A	AQL	Fluoride (F)	mg/l	ALM 08	0.320
A	AQL	Acid Soluble Sodium (Na)	mg/l	ALM 30	27.9 ✓ Within Spec
A	AQL	Acid Soluble Aluminium (Al)	mg/l	ALM 31	<0.002
A	AQL	Acid Soluble Iron (Fe)	mg/l	ALM 31	1.90 ✓ Within Spec
A	AQL	Acid Soluble Manganese (Mn)	mg/l	ALM 31	1.07
A	AQL	Total Chromium (Cr)	mg/l	ALMT 31	<0.010
A	AQL	Acid Soluble Chromium (Cr)	mg/l	ALM 31	<0.003
A	AQL	Acid Soluble Copper (Cu)	mg/l	ALM 31	0.012
A	AQL	Acid Soluble Nickel (Ni)	mg/l	ALM 31	0.011
A	AQL	Acid Soluble Zinc (Zn)	mg/l	ALM 31	<0.002
A	AQL	Acid Soluble Cadmium (Cd)	mg/l	ALM 31	<0.002
A	AQL	Acid Soluble Lead (Pb)	mg/l	ALM 31	<0.004
A	AQL	Turbidity	NTU	ALM 21	20.5
A	AQL	Free chlorine (Cl_2)	mg/l	ALM 23	0.11

A = Accredited N = Non accredited Sub = Sub-contracted NR = Not requested RTF = Results to follow NATD = Not able to determine ATR = Alternative test report ; Results relate only to the items received and tested ; Results reported against the limit of detection; Results marked 'Non SANAS Accredited' in this report are not included in the SANAS Schedule of Accreditation for this laboratory; Uncertainty of measurement available on request for all methods included in the SANAS Schedule of Accreditation; The report shall not be reproduced except in full without approval of the laboratory

M. Swanepoel
Technical Signatory

Client:	MLS National Laboratory Pty Ltd	**Date of report:**	06 November 2023
Address:	67 Morkels Close, c/o Le Roux Ave and Capitol Hill Commercial Park, Midrand,	**Date accepted:**	27 October 2023
Report no:	167971	**Date completed:**	06 November 2023
Project:	MLS Laboratory	**Date received:**	27 October 2023

Lab no:					338643
Date sampled:					26-Oct-23
Aquatico sampled:					No
Sample type:					Water
Locality description:					CR 27960 Borehole water
		Analyses	**Unit**	**Method**	
A	AQL	True Colour	mg/l Pt-Co	ALM 22	<5.00
A	AQL	Total Cyanide (CN)	mg/l	ALM 16	<0.005
N	AQL	Phenol	mg/l	ALM 71	<0.01
A	AQL	Total organic carbon (TOC)	mg/l	ALM 63	1.75
A	AQL	Acid Soluble Arsenic (As)	mg/l	ALM 34	<0.006
A	AQL	Acid Soluble Selenium (Se)	mg/l	ALM 34	<0.002
A	AQL	Acid Soluble Mercury (Hg)	mg/l	ALM 34	<0.005
A	AQL	Acid Soluble Boron (B)	mg/l	ALM 33	<0.013
A	AQL	Acid Soluble Barium (Ba)	mg/l	ALM 33	0.040
A	AQL	Acid Soluble Uranium (U)	mg/l	ALM 37	<0.015
A	AQL	Acid Soluble Antimony (Sb)	mg/l	ALM 36	<0.001
N	AQL	Temperature	°C	ALM 20	24.2
A	AQL	Trihalomethanes (THM)	µg/l	OLM 02	<2
A	AQL	Bromoform	µg/l	OLM 02	<2
A	AQL	Chloroform	µg/l	OLM 02	<2
A	AQL	Dibromochloromethane	µg/l	OLM 02	<2
A	AQL	Bromodichloromethane	µg/l	OLM 02	<2
A	AQL	Combined Bromoform	ratio	OLM 02	<0.020
A	AQL	Combined Chloroform	ratio	OLM 02	<0.007
A	AQL	Combined Dibromochloromethane	ratio	OLM 02	<0.020
A	AQL	Combined Bromodichloromethane	ratio	OLM 02	<0.033
A	AQL	THM Sum of rations	ratio	OLM 02	<0.080
N	AQL	Monochloramine	mg/l	ALM 67	0.12
N	AQL	Microcystin	µg/l	ALM 68	<0.5
N	AQL	Combined Nitrate plus Nitrite	ratio	ALM 26	<1.00

A = Accredited N = Non accredited Sub = Sub-contracted NR = Not requested RTF = Results to follow NATD = Not able to determine ATR = Alternative test report ; Results relate only to the items received and tested ; Results reported against the limit of detection; Results marked 'Non SANAS Accredited' in this report are not included in the SANAS Schedule of Accreditation for this laboratory; Uncertainty of measurement available on request for all methods included in the SANAS Schedule of Accreditation; The report shall not be reproduced except in full without approval of the laboratory

Authenticated signature on first page

Client:	MLS National Laboratory Pty Ltd	**Date of report:**	06 November 2023
Address:	67 Morkels Close, c/o Le Roux Ave and Capitol Hill Commercial Park, Midrand,	**Date accepted:**	27 October 2023
Report no:	167971	**Date completed:**	06 November 2023
Project:	MLS Laboratory	**Date received:**	27 October 2023

Lab no:				338643
Date sampled:				26-Oct-23
Aquatico sampled:				No
Sample type:				Water
Locality description:				CR 27960 Borehole water
	Analyses	**Unit**	**Method**	
A	AQL HNO3-Microwave digestion	mg/l	ALM 90	Yes

A = Accredited N = Non accredited Sub = Sub-contracted NR = Not requested RTF = Results to follow NATD = Not able to determine ATR = Alternative test report ; Results relate only to the items received and tested ; Results reported against the limit of detection; Results marked 'Non SANAS Accredited' in this report are not included in the SANAS Schedule of Accreditation for this laboratory; Uncertainty of measurement available on request for all methods included in the SANAS Schedule of Accreditation; The report shall not be reproduced except in full without approval of the laboratory

Authenticated signature on first page

APPENDIX C: PUBLIC PARTICIPATION REPORT

63 Wessel Road, Rivonia, 2128 PO Box 2597, Rivonia, 2128 South Africa
Tel: +27 (0) 11 803 5726 **Fax:** +27 (0) 11 803 5745 **Web:** www.gcs-sa.biz

Public Participation Report for The Block Meat Company Water Use Licence Application

Report

Version - Final

15 October 2026

GCS Project Number: 24-0773

Client Reference: The Block Meat Company



GCS Environment South Africa (Pty) Ltd **Reg No:** 2002/028494/07
Offices: **Johannesburg**
Directors: AC Johnstone | W Sherriff | T Isaac | A Theunissen

Public Participation Report for The Block Meat Company Water Use Licence Application

Report

Version - Final

15 October 2026

DOCUMENT ISSUE STATUS

Report Issue	Final		
GCS Reference Number	24-0773		
Client Reference	The Block Meat Company		
Title	Public Participation Report for The Block Meat Company Water Use Licence Application		
	Name	**Signature**	**Date**
Author	Luyanda Macheke	Luyanda Macheke Digitally signed by Luyanda Macheke Date: 2026.10.15 11:05:02 +02'00'	15 October 2026
Document Reviewer	Paula Tolksdorff	Paula Tolksdorff Digitally signed by Paula Tolksdorff Date: 2026.10.15 13:14:21 +02'00'	15 October 2026
Unit Manager			
Director	Andrew Johnstone	Andrew Johnstone Digitally signed by Andrew Johnstone Date: 2026.10.15 14:15:20 +02'00'	15 October 2026

LEGAL NOTICE

This report or any proportion thereof and any associated documentation remain the property of GCS until the mandator effects payment of all fees and disbursements due to GCS in terms of the GCS Conditions of Contract and Project Acceptance Form. Notwithstanding the aforesaid, any reproduction, duplication, copying, adaptation, editing, change, disclosure, publication, distribution, incorporation, modification, lending, transfer, sending, delivering, serving or broadcasting must be authorised in writing by GCS.

CONTENTS PAGE

1 INTRODUCTION 1
1.1 PROJECT LOCATION 1
1.2 OBJECTIVES OF THE PUBLIC PARTICIPATION PROCESS 4
1.3 LEGAL FRAMEWORK 4
2 PUBLIC PARTICIPATION ACTIVITIES 5
2.1 DEVELOPMENT OF STAKEHOLDER DATABASE 5
2.2 PUBLIC PARTICIPATION MEDIA 5
2.2.1 Publication of Newspaper Advertisements 5
2.2.2 Site Notices 6
2.2.3 Background Information Document and Registration and Comment Form 6
2.2.4 Announcement of the Availability of the Draft Technical Report 6
2.2.5 Invitation Email 7
3 COMMENTS AND RESPONSE REPORT 7
4 CONCLUSION 10

LIST OF APPENDICES

APPENDIX A: STAKEHOLDER DATABASE 11
APPENDIX B: NEWSPAPER ADVERTISEMENT 15
APPENDIX C: SITE NOTICES 17
APPENDIX D : BACKGROUND INFORMATION DOCUMENT 19
APPENDIX E: EMAIL FOR THE AVAILABILITY OF THE DRAFT TECHNICAL REPORT 25

LIST OF ABBREVIATIONS

Abbreviation	Description
BH	Borehole
BH1	Borehole 1
BH2	Borehole 2
BID	Background Information Document
CRR	Comments and Responses Report
DWS	Department of Water and Sanitation
GCS	GCS Environment South Africa (Pty) Ltd
GNR	Government Notice Regulation
I&APs	Interested and Affected Parties
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PPP	Public Participation Process
WUL	Water Use Licence
WULA	Water Use Licence Application

UNITS OF MEASURE

Unit	Description
km	Kilometre
%	Percentage

1 INTRODUCTION

The Block Meat Company (Pty) Ltd (Block Meat), a subsidiary of the Shoprite Group, operates a 24-hour meat processing facility in Apex, Benoni, within the City of Ekurhuleni in the Gauteng Province. As a food-for-human-consumption processing facility, Block Meat is legally obliged to comply with strict food safety regulations. To ensure uninterrupted processing, sanitation and hygiene, the facility requires a reliable and continuous water supply. In addition to municipal water, the applicant has developed a borehole on site to supplement municipal supply and to maintain operations during periods of municipal service interruption.

The Block Meat Company therefore seeks to apply for a new Water Use Licence (WUL) to authorise the abstraction of groundwater as a supplementary water source. This is critical to sustaining operational continuity, particularly in view of increasing municipal service delivery challenges that result in regular water supply disruptions.

The proposed water use involves the abstraction of groundwater from an existing borehole located on site at The Block Meat Company facility. Two boreholes (BH1 and BH2) have been drilled on site; however, BH1 is dry, while BH2 is equipped and operational. Block Meat proposes to use groundwater abstracted from BH2 to supplement the processing plant's existing water supply.

The abstraction of groundwater from a borehole constitutes a water use in terms of Section 21(a) of the National Water Act, 1998 (Act No. 36 of 1998) (NWA), and requires appropriate authorisation. The Block Meat Company has therefore appointed GCS Environment South Africa (Pty) Ltd (GCS) to undertake the Water Use Licence Application (WULA) process on its behalf.

1.1 Project Location

The application area is situated approximately 15 kilometres (km) north-east of the town of Benoni, within the Apex Industrial Area in the City of Ekurhuleni Metropolitan Municipality, Gauteng Province. The regional (and geological) setting and site location of the Project area are illustrated respectively in Figure 1-1 and Figure 1-2.

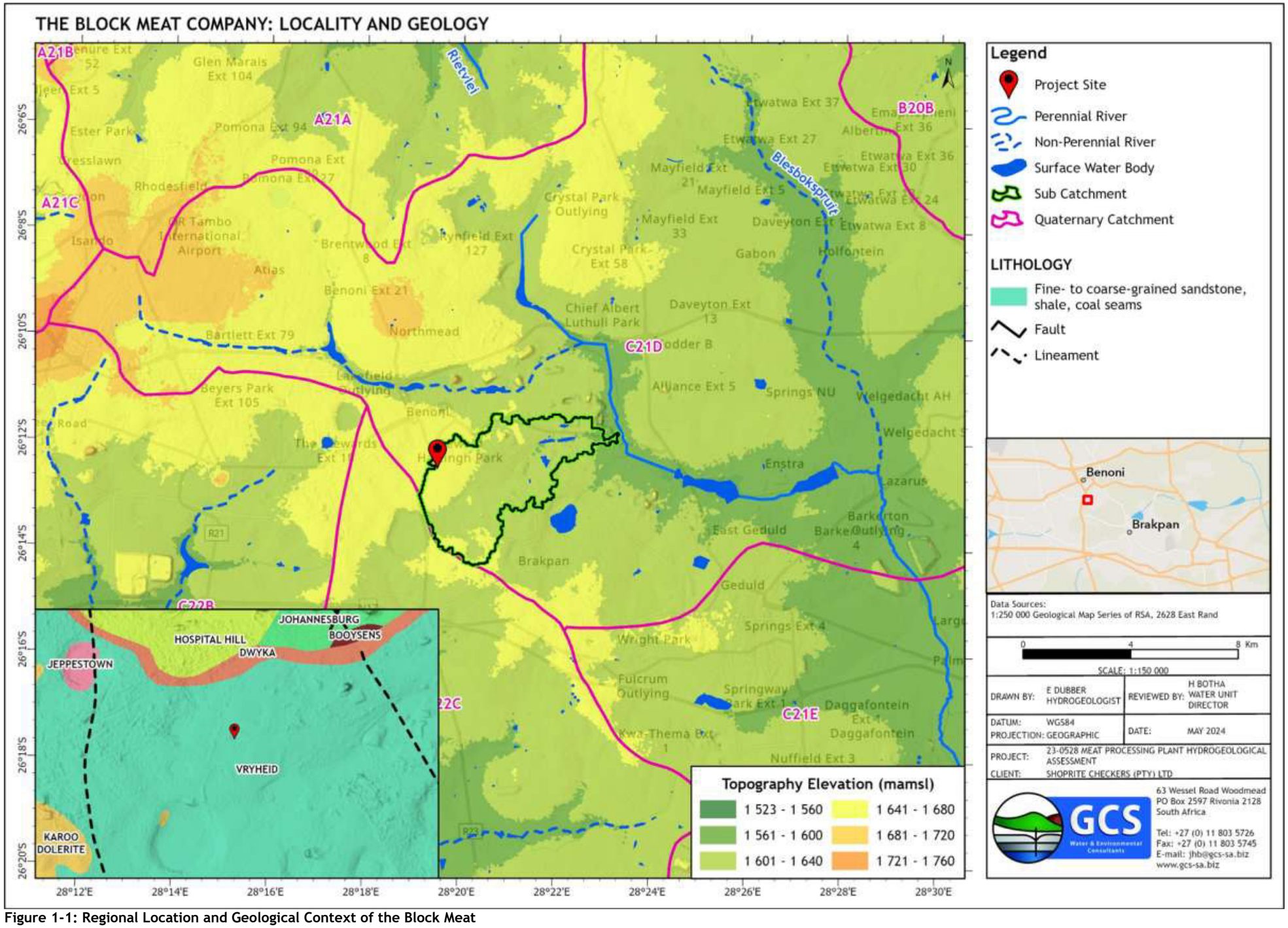


Figure 1-1: Regional Location and Geological Context of the Block Meat

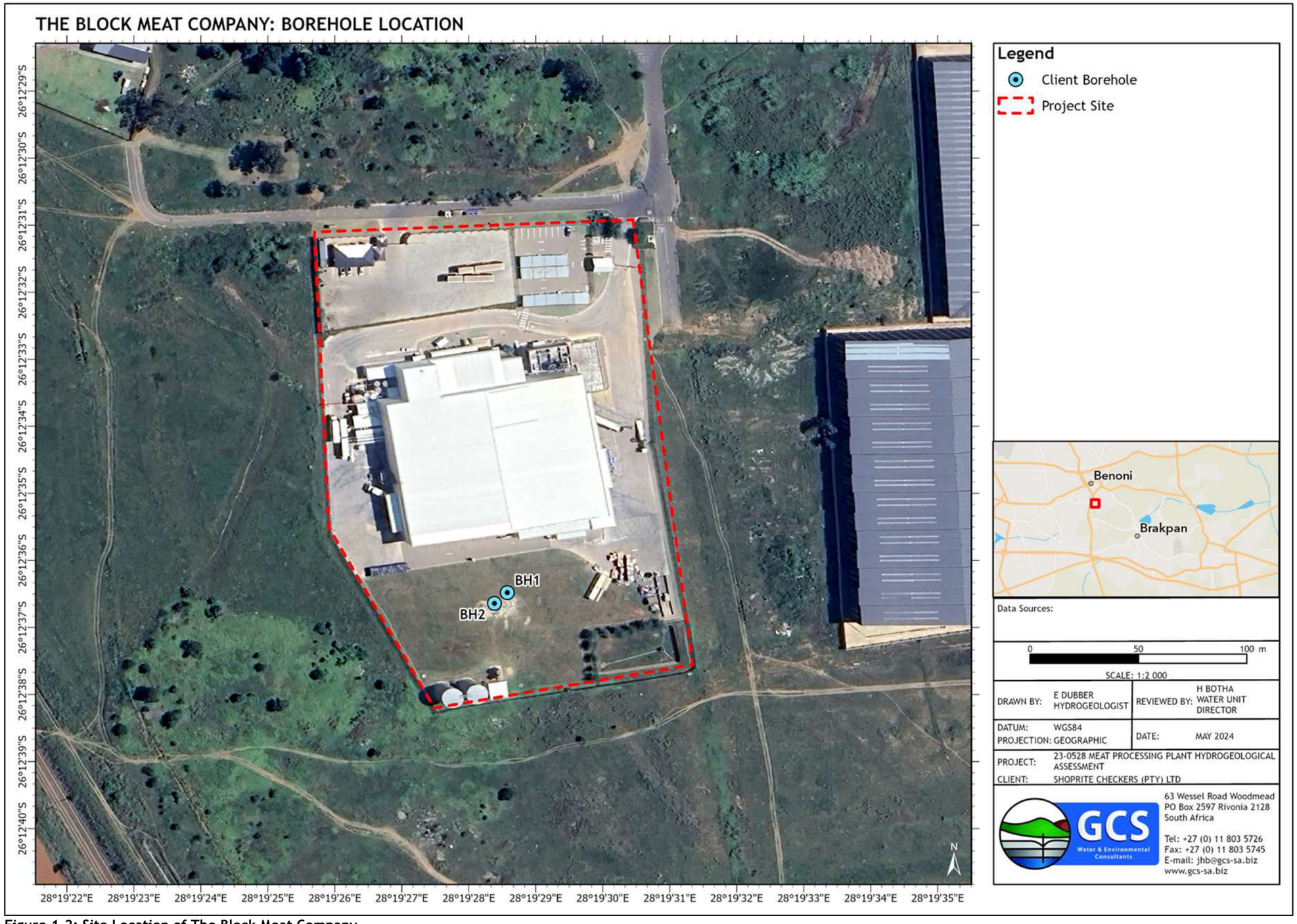


Figure 1-2: Site Location of The Block Meat Company

1.2 Objectives of the Public Participation Process

The Public Participation Process (PPP) forms an integral part of the WULA process and aims to ensure that Interested and Affected Parties (I&APs) are provided with meaningful opportunities to participate in a transparent, inclusive and fair manner. The process facilitates the dissemination of information regarding the proposed groundwater abstraction and enables stakeholders to raise concerns, submit comments and contribute to informed decision-making by the Department of Water and Sanitation (DWS).

The objectives of the PPP include the following:

- Identifying and registering I&APs who may have an interest in, or may be affected by, the proposed water use.
- Providing stakeholders with accessible and accurate information regarding the nature, scope and potential impacts of the proposed groundwater abstraction.
- Facilitating meaningful consultation with relevant authorities, neighbouring landowners, businesses, communities and other stakeholders.
- Providing I&APs with an opportunity to review and comment on the Draft WULA Technical Report and associated documentation.
- Recording stakeholder comments, concerns and queries, together with the responses provided, in a Comments and Responses Report (CRR).
- Ensuring that relevant stakeholder inputs are considered and, where appropriate, incorporated into the WULA documentation and proposed management measures.
- Ensuring compliance with the applicable public participation requirements of the NWA, and associated regulations.
- Maintaining transparent communication with registered I&APs throughout the application process.

The PPP was undertaken to ensure that stakeholders were adequately informed of the proposed water use and afforded an opportunity to participate in the application process. The outcomes of the consultation process, including the comments received and responses provided, are documented in this report to support informed decision-making by the DWS.

1.3 Legal Framework

The PPP undertaken for the WULA was guided by the NWA, and the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals, 2017, published under Government Notice Regulation (GNR) 267 of 24 March 2017, as amended.

Section 41(4) of the NWA makes provision for the responsible authority to require an applicant to undertake appropriate public notification and consultation measures to bring a WULA to the attention of relevant organs of state, interested persons and the public. Regulation 17 of

the WULA Regulations provides for the public participation requirements applicable to water use licence applications.

As part of the PPP undertaken for the proposed groundwater abstraction, the following activities were implemented:

- Identification and registration of I&APs, including relevant authorities, neighbouring landowners, businesses and other stakeholders who may have an interest in, or be affected by, the proposed water use.
- Notification of stakeholders through the distribution of a Background Information Document (BID), registration and comment forms, newspaper advertisements, site notices and electronic correspondence.
- Provision of a 60-day public review and commenting period, from 9 February 2026 to 13 April 2026, during which the Draft WULA Technical Report was made available for review at the Benoni City Centre Library and on the GCS website.
- Recording and consideration of comments, queries and concerns received from I&APs, together with the responses provided, in a CRR.

The PPP was undertaken to facilitate stakeholder participation and provide the DWS with a record of the consultation activities conducted, issues raised and responses provided for consideration during the WULA decision-making process.

2 PUBLIC PARTICIPATION ACTIVITIES

2.1 Development of Stakeholder Database

A project-specific stakeholder database was compiled, reviewed and verified to identify relevant I&APs who may have an interest in, or be affected by, the proposed groundwater abstraction. The stakeholder database included representatives from the following categories:

- National, provincial and local authorities responsible for water resource management, environmental management and regulatory oversight.
- Environmental non-governmental organisations.
- Adjacent businesses, neighbouring landowners, residents and community representatives.

The stakeholder database is provided in **APPENDIX A**.

2.2 Public Participation Media

The following public participation activities were undertaken as part of the WULA process in accordance with the applicable provisions of the NWA, and associated regulations.

2.2.1 Publication of Newspaper Advertisements

A newspaper advertisement was published in English in the Benoni City Times on 6 February

2026 to notify the public of the proposed groundwater abstraction and the associated WULA process.

The advertisement invited I&APs to register their interest in the application and provided information regarding the opportunity to review and comment on the Draft WULA Technical Report during the public review period.

Proof of publication is provided in **APPENDIX B**.

2.2.2 Site Notices

Site notices were erected on 9 February 2026 at two publicly accessible locations to notify I&APs of the application and provide an opportunity to register and submit comments on the Draft WULA Technical Report.

The notices were placed at the following locations:

- Benoni City Centre Library: Elston Avenue, Benoni, 1500.
- The Block Meat Company facility: Main entrance security gate, 20 Dunedin Street, Apex, Benoni, 1501.

Details of the site notice locations and supporting evidence are provided in **APPENDIX C**.

2.2.3 Background Information Document and Registration and Comment Form

A BID was prepared to inform stakeholders of the proposed groundwater abstraction, the WULA process and the opportunities available for public participation.

The BID provided information regarding the location and nature of the proposed water use, the applicable regulatory process, the availability of the Draft WULA Technical Report and the procedures for registering as an I&AP and submitting comments.

The BID was prepared in English and distributed electronically to stakeholders on the project database on 5 February 2026.

A Registration and Comment Form accompanied the BID to enable stakeholders to register their interest in the application and submit comments, concerns or queries regarding the proposed water use.

Copies of the BID and Registration and Comment Form are provided in **APPENDIX D**.

2.2.4 Announcement of the Availability of the Draft Technical Report

On 5 February 2026, stakeholders on the project database were notified electronically of the availability of the Draft WULA Technical Report for public review and comment.

The Draft WULA Technical Report was made available at the following locations:

- Benoni City Centre Library: Elston Avenue, Benoni, 1500.
- GCS website: https://www.gcs-sa.biz/public-documents/

The Draft WULA Technical Report was available for a 60-day public review and commenting period from 9 February 2026 to 13 April 2026.

During this period, I&APs were afforded an opportunity to review the documentation and submit comments, queries or concerns regarding the proposed groundwater abstraction.

2.2.5 Invitation Email

Email notifications were distributed to stakeholders on 5 February 2026, inviting them to participate in the WULA process and informing them of the availability of the Draft WULA Technical Report for public review.

Copies of the notification correspondence are provided in **APPENDIX E.**

3 COMMENTS AND RESPONSE REPORT

Comments and queries received from I&APs during the PPP, together with the responses provided by the project team, were documented in the CRR, presented in Table 3-1.

The CRR provides a record of the issues raised by stakeholders, the responses provided and, where applicable, how the comments were considered and addressed during the WULA process.

The original stakeholder submissions and responses have been retained to preserve the consultation record.

Table 3-1:Comments and Response

No.	ISSUE OR CONCERN	CONTRIBUTOR	DATE OF CONTRIBUTION	MEANS OF CONTRIBUTION	RESPONSE
1.	Good day Councillors from Benoni area Kind regards	**Councillor Wendy Morgan** *Ward 36*	05 February 2026	Email	Noted.
2.	Good afternoon Not sure why this was sent to me, I am in Boksburg Ward 22	**Madelaine Muller** *Ekurhuleni Government*	05 February 2026	Email	Noted.
3.	Good Day Marandela Muzhambi I need more information please. 1. When water is extracted from the boreholes, where will it go afterwards? 2. Do you have a borehole permita/ 3. What is in place to manage waste water? 4. Is this anywhere near a water body? Wetland? 5. Yes please register me as an I&AP	**Councillor Jill A. Humphreys** *Ward 20* *Ekurhuleni, Environment Oversight*	05 February 2026	Email	*Marandela Muzhambi responded:* *23 February 2026* Dear Cllr Jill, I hope you are well. Thank you for your questions. Please see our responses below: 1. When water is extracted from the boreholes, where will it go afterwards? 2. The water abstracted from the on-site borehole will be stored in on-site storage tanks before use within the facility. It will supplement the existing municipal water supply and support operational requirements such as sanitation, hygiene and processing activities necessary for food safety. 3. Do you have a borehole permit? 4. The Block Meat Company is currently in the process of applying for a borehole permit from the Ekurhuleni Municipality. This permit is also required by the Department of Water and Sanitation (DWS) before a Water Use Licence can be issued. 5. What is in place to manage wastewater? 6. The facility has management measures in place to control

No.	ISSUE OR CONCERN	CONTRIBUTOR	DATE OF CONTRIBUTION	MEANS OF CONTRIBUTION	RESPONSE
					wastewater and protect water resources, including effluent control, stormwater management, fat traps and spill prevention procedures. 7. Is this anywhere near a water body? Wetland? 8. There are no watercourses within the Project area. As part of the DWS site visit, the authorities also assessed whether there are any water bodies within the regulated area. 9. I have added you as an I&AP. 10. The technical report is available here for your review: https://www.gcs-sa.biz/public-documents/ Kind regards, Marandela
5.	What is this for? Which area is the application for?	**Councillor Wollaston Labuschagne** *Ward 88* *Economic Development Oversight Committee*	12 February 2026	Email	*Marandela Muzhambi responded:* 22 February 2026 Dear Wollaston, I hope you are well. The application is for a Water Use Licence relating to the abstraction of water from a borehole for The Block Meat Company located in Apex, Benoni. Kind regards, Marandela
6.	Kindly exclude me from future communication.	**Councillor Wollaston Labuschagne** *Ward 88* *Economic Development Oversight Committee*	24 February 2026	Email	Noted. Councillor Wollaston Labuschagne was removed from the database.

4 CONCLUSION

A PPP was undertaken as part of the WULA for the proposed groundwater abstraction at The Block Meat Company facility. The process included the identification and notification of I&APs, publication of a newspaper advertisement, placement of site notices, distribution of a BID and provision of a 60-day public review and commenting period from 9 February 2026 to 13 April 2026.

Comments and queries received during the consultation process, together with the responses provided, were documented in the CRR. The PPP provided stakeholders with an opportunity to review the proposed water use and raise matters for consideration during the application process.

The PPP was undertaken in accordance with the applicable public participation requirements of the NWA, and associated regulations.

The outcomes of the PPP, together with the Final WULA Technical Report, Integrated Water and Waste Management Plan, specialist assessment and supporting documentation, will be submitted to the DWS for consideration as part of the WUL decision-making process.

APPENDIX A: STAKEHOLDER DATABASE

Authorities		
Ms F. Mamabolo	Department of Water and Sanitation	WULA Manager
Bishop Windsor Malatsi	Department of Water and Sanitation	Case Officer
Thabelo Tshipate	Department of Water and Sanitation	Case Officer
Daniel Masemola	Environmental Protection, Resilience and Project Management	
Derek Edwin Thomson	City of Ekurhuleni	Councillor Ward 01
Thato S.G Mashiane	City of Ekurhuleni	Councillor Ward 02
Kedibone Yvonne Machete	City of Ekurhuleni	Councillor Ward 03
Daniel Mbathane	City of Ekurhuleni	Councillor Ward 04
Malesela Francis Kgafela	City of Ekurhuleni	Councillor Ward 05
Patric Abisang Tleane	City of Ekurhuleni	Councillor Ward 06
Thabang Asaph Jiyane	City of Ekurhuleni	Councillor Ward 07
Nhlanhla Lucky Ntshingila	City of Ekurhuleni	Councillor Ward 08
Malinga Nomvula	City of Ekurhuleni	Councillor Ward 09
Petlele Pusetso	City of Ekurhuleni	Councillor Ward 10
Legala Oriel Thoabala	City of Ekurhuleni	Councillor Ward 11
Ndinisa Gloria M.	City of Ekurhuleni	Councillor Ward 12
Ngqwangi Bulelwa P.	City of Ekurhuleni	Councillor Ward 13
Mnguni Adelaide Lindiwe	City of Ekurhuleni	Councillor Ward 14
Davison Amanda	City of Ekurhuleni	Councillor Ward 15
Terblanche Hendrik Jacobus	City of Ekurhuleni	Councillor Ward 16
Lapping Simon James	City of Ekurhuleni	Councillor Ward 17
Hart Heather Dawn	City of Ekurhuleni	Councillor Ward 18
Rundle William G. R.	City of Ekurhuleni	Councillor Ward 19
Humphreys Jill Ada	City of Ekurhuleni	Councillor Ward 20
Mudau Martha Mashudu	City of Ekurhuleni	Councillor Ward 21
Goslin Gerald	City of Ekurhuleni	Councillor Ward 23
Da Silva Nicola Brigitte	City of Ekurhuleni	Councillor Ward 24
Beukes Marinda	City of Ekurhuleni	Councillor Ward 25
Mathole Thamaga Wa Ga-Mathole (A	City of Ekurhuleni	Councillor Ward 26
Joseph Lornette Jayne (DA)	City of Ekurhuleni	Councillor Ward 27
Goby Mary Elizabeth (DA)	City of Ekurhuleni	Councillor Ward 28
Loonat Imitiaz Ahmed (ANC)	City of Ekurhuleni	Councillor Ward 29
Ranyawo Kenny Daniel (ANC)	City of Ekurhuleni	Councillor Ward 30
Sabe Simangele Evelyn	City of Ekurhuleni	Councillor Ward 31
De Vos Marius Nico	City of Ekurhuleni	Councillor Ward 32
Hoods Ashley Ronald	City of Ekurhuleni	Councillor Ward 33
Klassen Kathrine Edith (PA)	City of Ekurhuleni	Councillor Ward 34
Mpambani Ntuthuzelo	City of Ekurhuleni	Councillor Ward 35
Naidoo Ivan	City of Ekurhuleni	Councillor Ward 37
Maifala Malcom Tau	City of Ekurhuleni	Councillor Ward 38
Ingram Maureen Jean	City of Ekurhuleni	Councillor Ward 39

Tshabalala Nqabayethu L.	City of Ekurhuleni	Councillor Ward 40
Hlongwane Sanele	City of Ekurhuleni	Councillor Ward 41
Motloung Tsotang Princece	City of Ekurhuleni	Councillor Ward 42
Marais Carolana	City of Ekurhuleni	Councillor Ward 43
Shongwe Nkosinathi B.	City of Ekurhuleni	Councillor Ward 44
Sidu Nkululeko	City of Ekurhuleni	Councillor Ward 45
Quntana Thunyiswa Kwame	City of Ekurhuleni	Councillor Ward 46
Nkosi Reginah Thandi	City of Ekurhuleni	Councillor Ward 47
Dube Mfana	City of Ekurhuleni	Councillor Ward 48
Ramafikeng Frans Lekgotla	City of Ekurhuleni	Councillor Ward 49
Ngwenya Vuyani	City of Ekurhuleni	Councillor Ward 50
Poki Tinstwalo Lumka	City of Ekurhuleni	Councillor Ward 51
Dlamini Sibusiso Promise	City of Ekurhuleni	Councillor Ward 52
Mketsu Mziyanda	City of Ekurhuleni	Councillor Ward 53
Thupa Thabo Xerxes	City of Ekurhuleni	Councillor Ward 54
Zikode Lucky Simon	City of Ekurhuleni	Councillor Ward 55
Radebe Fanifani Moses	City of Ekurhuleni	Councillor Ward 56
Peterson Dino (PA)	City of Ekurhuleni	Councillor Ward 57
Fodo Mfundiso	City of Ekurhuleni	Councillor Ward 58
Msimango Khumbuzile P.	City of Ekurhuleni	Councillor Ward 59
Qwema Princess Phindiwe	City of Ekurhuleni	Councillor Ward 60
Ngubane Sanele Cromwell	City of Ekurhuleni	Councillor Ward 61
Letsoela Thabiso	City of Ekurhuleni	Councillor Ward 62
Kiyane Nomonde Cynthia	City of Ekurhuleni	Councillor Ward 63
Motsopi Thekiso Amos	City of Ekurhuleni	Councillor Ward 64
Moloi Siyabonga Matthews	City of Ekurhuleni	Councillor Ward 65
Khumalo Samuel Mzwakhe	City of Ekurhuleni	Councillor Ward 66
Moimana Jerry Leshalabe	City of Ekurhuleni	Councillor Ward 67
Mbeki Vuyani Welcome	City of Ekurhuleni	Councillor Ward 68
Radebe Mpho Gift	City of Ekurhuleni	Councillor Ward 69
Ndlovu Sibongiseni R.	City of Ekurhuleni	Councillor Ward 70
Lubisi Thembinkosi C.	City of Ekurhuleni	Councillor Ward 71
Stone Dean Desmond	City of Ekurhuleni	Councillor Ward 72
Ngobese Samuel Sipho	City of Ekurhuleni	Councillor Ward 73
Simelane David Thulani	City of Ekurhuleni	Councillor Ward 74
Kock Charmaine Patricia	City of Ekurhuleni	Councillor Ward 75
Du Toit Michael Duncan	City of Ekurhuleni	Councillor Ward 76
Dunjana Thulani Xolani	City of Ekurhuleni	Councillor Ward 77
Nhleko Sizwe Enock	City of Ekurhuleni	Councillor Ward 78
Mbonani Njabulo Ronald	City of Ekurhuleni	Councillor Ward 79
Nkosi-Ramothebe Sarah C.	City of Ekurhuleni	Councillor Ward 80
Bulala Standley Jeremia	City of Ekurhuleni	Councillor Ward 81
Buitendacht Henry C.	City of Ekurhuleni	Councillor Ward 82
Pike Slindokuhle	City of Ekurhuleni	Councillor Ward 83

Mthiyane Phikisile E.	City of Ekurhuleni	Councillor Ward 84
Sibiya Moses Sipho	City of Ekurhuleni	Councillor Ward 85
Mekgwe Nkgopotse Nsizwa	City of Ekurhuleni	Councillor Ward 86
Hlophe Simon Bongani	City of Ekurhuleni	Councillor Ward 87
Pudi Tshoarelo	City of Ekurhuleni	Councillor Ward 89
Selwana Hendrick Ntate	City of Ekurhuleni	Councillor Ward 90
McKenzie Desmond A.	City of Ekurhuleni	Councillor Ward 91
Guerreiro Kade Ricci	City of Ekurhuleni	Councillor Ward 92
Mthembu Geoffrey Isaac	City of Ekurhuleni	Councillor Ward 93
Madlala Khehla Phillip	City of Ekurhuleni	Councillor Ward 95
Mashala Stenias Ranias	City of Ekurhuleni	Councillor Ward 96
Pretorius Brandon	City of Ekurhuleni	Councillor Ward 97
Motaung Tefo Patrick	City of Ekurhuleni	Councillor Ward 98
Daemane Petrus Andile	City of Ekurhuleni	Councillor Ward 99
Khotha Bennet Mluleki	City of Ekurhuleni	Councillor Ward 100
Ngwenya Mzayifani R.	City of Ekurhuleni	Councillor Ward 101
Madi Lillian Ntombikayise	City of Ekurhuleni	Councillor Ward 103
Lourenco Tracey	City of Ekurhuleni	Councillor Ward 104
Verster Antoinette E.	City of Ekurhuleni	Councillor Ward 105
Denny Timothy Mark	City of Ekurhuleni	Councillor Ward 106
Goje Thabani Moses	City of Ekurhuleni	Councillor Ward 107
Thobejane Phatudi Alex M.	City of Ekurhuleni	Councillor Ward 108
Madihlaba Masele Sophet	City of Ekurhuleni	Councillor Ward 109
Mnisi Sarah Lebogang	City of Ekurhuleni	Councillor Ward 110
Mabhe Zingisile	City of Ekurhuleni	Councillor Ward 111
Nomalanga Annah Mnguni	City of Ekurhuleni	Councillor Ward 112
Forums		
	Ekurhuleni Small Business Forum (ESBF)	
	Gauteng Business Forum (GBF)	
Business Name		
Quick Packaging Distributors	Packaging Distributors	
RGM Cranes Johannesburg	Crane manufacturer and supplier	
Morris Material Handling SA (Pty) Ltd	Maintenance, servicing, modernisation, loading testing, refurbishment	
IA Heating Systems (Pty) Ltd	Heating System	
Zakspeed Diesel Power	Repairs & maintenance to diesel fuel pumps , injections & turbocharges.	
Meat Direct	Meat supplier	
Environmental Organisation		
	WESSA (Wildlife & Environment Society of South Africa)	
	BirdLife South Africa Headquarters	

APPENDIX B: NEWSPAPER ADVERTISEMENT

Mayor honours the life of Ekurhuleni MMC

City of Ekurhuleni (CoE) Mayor Doctor Xhakaza has expressed shock and deep sadness following the untimely passing of the MMC for Roads and Transport Planning, Andile Mngwevu, and his companions, who lost their lives after the vehicle they were travelling in was swept away by floods in Chókwè, Mozambique.

Mngwevu was travelling with four companions when the disaster struck. One of his companions reportedly managed to escape from the vehicle, while Mngwevu and the three others were later found dead. Authorities have not yet identified the three deceased and the survivor, who are all from Kwa-Thema.

The news of the passing of Mngwevu and his companions emerged on January 27 after days of search and rescue operations conducted by the South African Defence Force in collaboration with their Mozambican counterparts.

Mngwevu, who also served as the leader of government business in the city, has been described as a committed and dedicated public servant who devoted his life to improving mobility, infrastructure development and service delivery for Ekurhuleni residents.

"His passing is a loss to the city, the council, and the community," said Xhakaza.

"He was a critical member of the mayoral committee that paid attention to detail and assured that the interests of Ekurhuleni residents were always prioritised."

On behalf of the city's leadership, the mayor extended heartfelt condolences to the Mngwevu family, friends, colleagues, and all those affected by this tragic loss.

"We stand in solidarity with them during this difficult time and mourn the loss of a dedicated leader whose contribution to public service will forever be remembered," he said.

Xhakaza also conveyed condolences to the families of the three other individuals who were travelling with Mngwevu at the time of the incident.

On January 27, Gauteng Premier Panyaza Lesufi and Xhakaza, accompanied by MMC for Finance Jongizizwe Dlabathi, visited the families of the deceased to offer their condolences.

The City of Ekurhuleni further extended its sympathies to the people of Mozambique affected by the recent floods and joined them in mourning the lives lost as a result of this tragedy.



The CoE's MMC for Roads and Transport Planning, Andile Mngwevu, and three of his companions died while on a trip to Mozambique when the vehicle they were travelling in was swept away by floodwaters. *Photo: Fanie Mthupha.*



APPLICATION FOR WATER USE LICENCE FOR THE BLOCK MEAT COMPANY

• Ref No. WU40024 • GCS Ref. No: 24-0773

NOTICE is hereby given in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA), and the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals, 2017 (Government Notice R267 of 24 March 2017) (WULA Regulations), of the submission of a Water Use Licence Application (WULA) by the Block Meat Company (Pty) Ltd (Block Meat) to the Department of Water and Sanitation.

LOCATION: The Block Meat facility is located in Benoni, Gauteng, South Africa.

PROJECT DESCRIPTION: Block Meat, a subsidiary of the Shoprite Group, operates a 24 hour meat processing facility in Apex, Benoni, within the City of Ekurhuleni in the Gauteng Province. As a food-for-human consumption processing facility, Block Meat is legally obliged to comply with strict food safety regulations. To ensure uninterrupted processing, sanitation and hygiene, the facility requires a reliable and continuous water supply.

In addition to municipal water, the applicant has developed a borehole on site to supplement municipal supply and to maintain operations during periods of municipal service interruption. Block Meat is applying for a Water Use Licence to authorise and utilise groundwater in line with regulations and long-term sustainability objectives.

ENVIRONMENTAL ASSESSMENT PRACTITIONER: GCS Environment South Africa (Pty) Ltd (GCS) has been appointed as the independent environmental consultant to manage the WULA process on behalf of Block Meat.

INVITATION TO PARTICIPATE AND COMMENT ON THE DRAFT WULA TECHNICAL REPORT: The draft WULA Technical Report will be available for public review and comment from 09 February 2026 to 10 April 2026 at the following locations:

Place	Address	Telephone
Benoni City Centre Library	Elston Ave, Benoni, 1500	+27 (0)11 999 0800
GCS Website	https://www.gcs-sa.biz/public-documents/	+27 (0)11 301 5733

Written comments and informational inputs must be submitted to GCS by 10 April 2026. Late submissions are encouraged to allow the GCS sufficient time to address comments comprehensively.

Interested and Affected Parties who wish to register, participate by contributing comments or who would like to obtain more information, should please contact:

GCS Environment South Africa (Pty) Ltd
Attention: Ms Ayanda Mashaba
Tel: +27 (0)11 301 5733, Fax: +27 (0)11 805 5232
E-mail: ayanda@gcs-sa.biz / Mashaba88@gmail.com
Postal Address: PO Box 2787, Rivonia, Johannesburg, 2128

The Block Meat Co

GCS

Prolonged power outage, public demands answers

Jani de Beer

Residents and businesses are demanding transparent answers and actionable solutions following the week-long power outage, which affected Mackenzie Park, Rynsoord, New Modder, Western Extension, the CBD, Northmead, Rynfield, and surrounding areas.

In an open letter addressed to the City of Ekurhuleni (CoE) executive mayor Nkosindiphile Xhakaza and the MMC for Energy Mzayifani Ngwenya, Ward 27 Cllr Lornette Joseph has requested an in-person public meeting to give officials the opportunity to explain the events that led to the extensive financial loss suffered by residents and businesses.

On January 24 at 01:22 thousands of households and businesses were plunged into darkness following an alleged attempted cable theft on a 32kVA underground aluminium cable, running between the Morehill and CBD substations, along Snake Road.

"These events have exposed serious failures in service delivery, communication, risk management, and oversight," said Joseph.

"Residents endured a week without stable electricity, suffered food spoilage, business losses, and household disruption. The lives of residents who rely on medical devices were at risk.

"This situation represents a failure of a basic municipal function. Where critical infrastructure is repeatedly compromised, the city is required to demonstrate risk mitigation, asset protection, and intergovernmental co-ordination, particularly when the SAPS facilities are affected."

Timeline of events:

January 26
CoE energy department excavated the damaged line to conduct two joint installations.
The expected restoration time was 17:00 on January 27, 72 hours after the outage occurred.

January 27
Power was restored to the CBD at noon, with other areas coming online as technicians worked to stabilise the feed.
Power to all affected areas was once again interrupted at 18:00.

January 28
CoE teams identified another fault on the newly repaired cable.

January 29
Breaking its silence, the CoE spokesperson, Zwali Dlamini, issued the first official statement regarding the outage, indicating that power restoration operations were underway and that services would be expected to return to normal at 16:00 on January 30.
In his statement, Dlamini said: "The cable is installed along Snake Road, between New Modder Road and Golden Drive, where frequent underground blasting by illegal miners takes place.
"The recurring underground cable failures along the Snake Road area are closely linked to illegal mining activities.
"Blasting-induced ground vibrations subject cable joints to repeated mechanical stress, which accelerates the degradation of stress-control components and insulation interfaces."
He said International Electrotechnical Commission (IEC) guidelines confirm that cable joints are the most failure-prone elements of underground networks, accounting for the majority of in-service failures.
"Uncontrolled blasting significantly increases the risk of unplanned supply interruptions," he said.

January 30
Joseph submitted a petition signed by more than 2 000 Benoni residents and an urgent motion to council, in terms of Rule 90 of the CoE standing order by-law, to secure the electricity cables in areas where illegal mining is prevalent.

Recommendations included:
• In accordance with industry-accepted norms, underground high-voltage cables must be installed at a depth of between 1.2m and 1.5m, however in high-risk areas including blasting or mining zones, it is recommended that cables are installed at 1.8m to 2.5m.
• Further mechanical protection, such as concrete encasement, duct banks, or equivalent protective measures, should be undertaken.
• Until trenches are deepened and cables fully protected, the city must ensure that the EMPD and appointed security services patrol high-risk areas regularly, particularly during identified high-risk periods.
The motion was rejected and deemed not to be a matter of urgency.
Power was again restored to the Benoni CBD, Mackenzie Park, Rynsoord, New Modder, Western Extension at 16:30. The remaining areas were switched on intermittently, as teams worked to balance the load to achieve a stable supply.
Rynfield and Northmead experienced approximately four to five power interruptions before again suffering another outage at 20:30.
This time, technicians suspected the fault occurred at a feeder substation.

February 1
Power is restored.

POWER CRISIS

SAPS operations hampered

Benoni CPF chairperson, Dr Raza Patel, raised the alarm, stating that operations at the Benoni Police Station came to a standstill during the outage, due to its back-up generator unit being faulty for more than four years.
"It is unacceptable that during a city-wide power outage, essential services such as law enforcement cannot function at optimal levels due to a non-functioning generator," said Patel.
"Officers' safety is being jeopardised while the community does not have efficient access to emergency assistance during a time when their personal security measures have been compromised. Immediate action is needed to prevent future incidents such as these."
The spokesperson for the police station, Captain Nomsa Sakala, confirmed that essential services at the station and its telephone lines were affected. The CPF supplied the temporary use of a generator which ensured that part of the station had access to power.

Businesses suffer

The Benoni City Times visited the CBD, where bustling streets had grown silent with small businesses closing their doors to curb further financial losses due to the outage.
Quinton Naidoo, who owns the Manhattan Dry Cleaners on Cranbourne Avenue, said the issue had negatively affected his month-end figures.
"The financial loss is huge. We are waiting for a miracle," he said.
The owner of Signs Malistas, who wished to remain anonymous, said he had lost over R150 000 in revenue.
"We cannot honour commitments to do vehicle branding because our operations rely on electricity. Not all small businesses can afford back-up generators, and we cannot absorb losses of this extent."

What residents had to say

Northmead home-owner: There is more to this story than what the municipality is telling us. Cable theft, illegal mining and underground blasting causing the issues - what is the truth?

Sasha Ormond, Western Extension: The impact of this prolonged outage has been devastating. We had to dispose of nearly R5 000 worth of food.

This situation, caused by municipal negligence and the ongoing issues with illegal mining activities, is unacceptable.
The updates provided offered little reassurance.
I would like to know who will be held accountable for losses and how residents will be reimbursed?
What specific precautions will be implemented to secure the cables and prevent future theft?
We expect our tax contributions to provide basic service delivery?

Michelle Muller Beeler: Using the zama zamas as the excuse that the first repair didn't work is so unbelievable. Normally, when the illegal miners blast, you feel tremors or read about it on Facebook. Nobody posted anything after the first repair failed.

APPENDIX C: SITE NOTICES

Coordinates	Benoni City Centre Library	
26°11′ 9.35″ S, 28°18′ 55.01″ E		
Coordinates	**The Block Meat Company Site**	
26°12′30.71″ S 28°19′30.43″ E		

APPENDIX D : BACKGROUND INFORMATION DOCUMENT

GCS Environment South Africa
63 Wessel Road, Rivonia, 2128 PO Box 2597, Rivonia, 2128 South Africa
Tel: +27 (0) 11 803 5726 Fax: +27 (0) 11 803 5745 Web: www.gcs-sa.biz

APPLICATION FOR A WATER USE LICENCE FOR THE BLOCK MEAT COMPANY

Ref No. WU40624
GCS Ref. No: 24-0773

PURPOSE OF THE DOCUMENT

The purpose of this document is to provide Interested and Affected Parties (I&APs) with information regarding the Block Meat Company Water Use Licence Application (WULA).

The aim of this document is thus to:

- Provide I&APs with background information about the WULA;
- Explain the application process followed; and
- Indicate how an I&AP can become involved in the process, receive information, raise issues, and make comments.

LOCATION

The Block Meat Company (Pty) Ltd (Block Meat) is a prominent facility located in Benoni, Gauteng, South Africa. (Figure 2 and Figure 3).

PROJECT DESCRIPTION

Block Meat, a subsidiary of the Shoprite Group, operates a 24-hour meat processing facility in Apex, Benoni, within the City of Ekurhuleni in the Gauteng Province. As a food-for-human-consumption processing facility, Block Meat is legally obliged to comply with strict food safety regulations. To ensure uninterrupted processing, sanitation and hygiene, the facility requires a reliable and continuous water supply.

In addition to municipal water, the applicant has developed a borehole on site to supplement municipal supply and to maintain operations during periods of municipal service interruption. Block Meat is applying for a Water Use Licence (WUL) to authorise and utilise groundwater in line with legislation and long-term sustainability objectives.

LEGISLATIVE CONTEXT

A WULA is being submitted by Block Meat to the Department of Water and Sanitation (DWS) in terms of the National Water Act, 1998 (Act No. 36 of 1998) (NWA), and the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals, 2017 (Government Notice Regulation 267 of 24 March 2017) (WULA Regulations). The application is required for the following water use as defined in Section 21 of the NWA:

- **Section 21(a): Taking water from a water resource.**
  Applicability: This refers to the abstraction of groundwater from a borehole. As such, the abstraction qualifies as a regulated water use and must be formally authorised through a WULA process in accordance with the NWA and supporting regulations.

DELEGATED LEAD AUTHORITIES

The DWS is the delegated authority responsible for the administration and implementation of the NWA.

THE WATER USE LICENCE PROCESS

GCS Environment South Africa (Pty) Ltd (GCS) has been appointed as the independent environmental consultant to manage the WULA process on behalf of Block Meat.

A WULA is a legal requirement under the NWA to ensure the sustainable use and protection of South Africa's water resources. The process plays a critical role in:

- Promoting environmental stewardship;

GCS Environment South Africa (Pty) Ltd Reg No: 2002/028494/07
Offices: Johannesburg
Directors: DA Kriel (Managing) | AC Johnstone | W Sheriff | T Isaac | A Theunissen

- Preventing the degradation and pollution of water resources;
- Ensuring compliance with national legislation;
- Minimising the risk of legal penalties; and
- Enhancing transparency through stakeholder engagement.

The following key steps form part of the WULA process (Figure 1):

- Pre-application engagement with DWS: The applicant must meet with the DWS to confirm the need for a WUL, understand site-specific requirements, and obtain guidance on the application scope.
- Appointment of an independent environmental consultant: An independent environmental consultant is then appointed to manage the process, compile the WUL report, and coordinate public participation.
- Identification of Applicable Section 21 Water Uses: The independent environmental consultant and applicant identify which of the 11 water uses in Section 21 apply.
- Compilation of Technical and Specialist Studies: Relevant specialist studies are undertaken to assess the implications of the proposed water use.
- Public Participation Process (PPP):
  - A Draft WUL Report is made available for a minimum 60-day public comment period. A Comment and Response Report (CRR) is compiled to document and respond to stakeholder concerns.

  You are hereby invited to review the Draft WUL Report and submit comments during the public comment period, which will run from 09 February 2026 to 13 April 2026 at the following locations:
  - **Benoni City Centre Library, Elston Ave, Benoni, 1500 (+27 (0)11 999 8809).**
  - **GCS website: https://www.gcs-sa.biz/public-documents/.**

  Written comments and substantiated issues must be submitted to GCS by 13 April 2026. Early submissions are encouraged to allow the GCS sufficient time to address concerns comprehensively.

- Final Submission to DWS: The Final WUL Report, including technical documents, maps, and the CRR, is submitted to DWS for review and decision-making.
- DWS Review and Decision: DWS assesses the application against criteria such as water availability, environmental impact, alignment with the National Water Resource Strategy, and socio-economic benefits. A decision is typically made within 90 days (or longer for complex cases).
- Notification and Appeal: All registered I&APs are notified of the outcome. An appeal can be lodged within 30 days of the decision, in terms of the WULA Regulations.



Figure 1: Key steps form part of the WULA process

REGISTERING AS AN INTERESTED AND AFFECTED PARTY

By registering as an I&AP, you will be included in the Project stakeholder database and receive further information in future for comment. Your comments will ensure that all relevant issues are incorporated and addressed.

Please complete and submit the enclosed registration / comment sheet or contact GCS if you wish to comment or register on the Project. I&APs who wish to participate by contributing comments, or who would like to

The Block Meat Co.

obtain more information, should please contact:

GCS Environment South Africa (Pty) Ltd
Attention: Marandela Muzhambi
Tel: +27 (0)11 803 5726, Fax: +27 (0)11 803 5232
E-mail: ppp@gcs-sa.biz / MarandelaM@gcs-sa.biz
Postal Address: PO Box 2597, Rivonia, Johannesburg, 2128

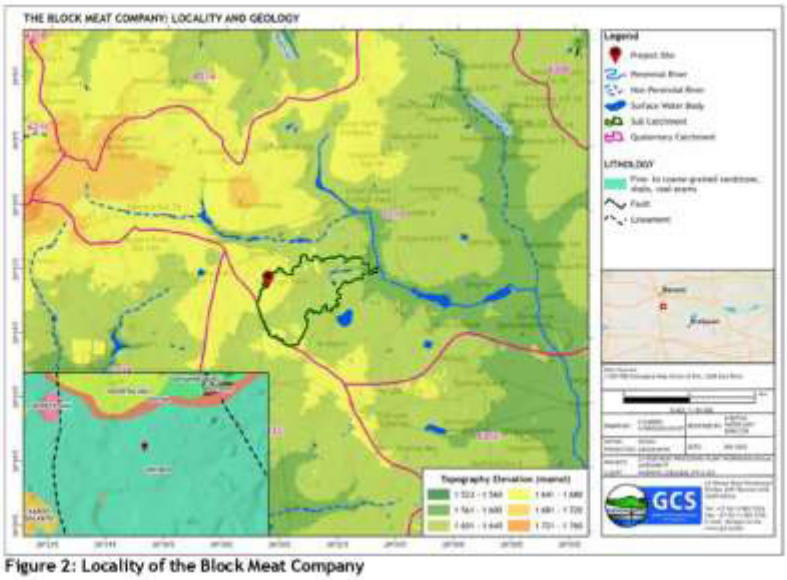


Figure 2: Locality of the Block Meat Company

APPLICATION FOR A WATER USE LICENCE FOR THE BLOCK MEAT COMPANY
Ref No. WU40624
GCS Ref. No: 24-0773

REGISTRATION AND COMMENT FORM

Registered interested and Affected Party (I&AP) will be informed of ongoing developments via their preferred means of communication (SMS, e-mail, post or fax). Please register as an I&AP and provide comments by sending this form, or other written correspondence, to the contact details provided below:

GCS Environment South Africa (Pty) Ltd
Attention: Marandela Muzhambi
Tel: +27 (0)11 803 5726, Fax: +27 (0)11 803 5232
E-mail: ppp@gcs-sa.biz / MarandelaM@gcs-sa.biz
Postal Address: PO Box 2597, Rivonia, Johannesburg, 2128

Please formally register me as an Interested and Affected Party	Yes	No
I would like to receive my notifications by	E-mail	SMS

Please indicate which sector you represent and also provide a name

Government Department	
Municipality	
Community	
Non-Government Organisation	
Business	

If you are a *landowner* or *land occupier*, please indicate which farm(s) and portion(s) you reside on

Landowner	
Land occupier	

Please fill in your contact details below for the Project database

Title, Full Name					
Designation					
Cell phone		Fax		Tel	
E-mail					

4

Postal Address	

Do you have any specific concerns, issues to raise or general comments that the Applicant or Environmental Assessment Practitioner should consider? Please state below:

In compliance with the Protection of Personal Information Act, 2013 (Act No. 4 of 2013) (POPI Act) you are requested to provide consent to GCS Environment South Africa (Pty) Ltd (GCS) in utilising your personal information throughout the process. GCS is obliged to use this information only for the purpose of this Project.

Kindly complete the following section, as permission to engage you in respect of the Public Participation Process that will be undertaken for the Project. If there are any other stakeholders, we should include onto the stakeholder database for the Project, please provide their contact details.

Title, Full Name	
Organisation	
Cell phone	
E-mail	

Signature *Date*

5

APPENDIX E: EMAIL FOR THE AVAILABILITY OF THE DRAFT TECHNICAL REPORT

Fetsi Telkedorff

From: Public Participation Process
Sent: Thursday, 05 February 2026 12:19
To: Nyanda Machete; Marandela Muzhambi
Subject: 24-0773 APPLICATION FOR WATER USE LICENSE FOR THE BLOCK MEAT COMPANY (Ref No. WU/EWQA)
Attachments: BID 05022026.pdf

Dear [redacted]

Dear Stakeholder

24-0773 APPLICATION FOR WATER USE LICENCE FOR THE BLOCK MEAT COMPANY (REF NO. WU/EWQA)

NOTICE
Notice is hereby given in terms of the National Water Act, 1998 (Act No. 36 of 1998) and the Regulations Regarding the Procedural Requirements for Water Use Licence Applications and Appeals, 2017 (Government Notice Regulation 267 of 24 March 2017) (WULA Regulations), of the submission of a Water Use Licence Application (WULA) by The Block Meat Company (Pty) Ltd (Block Meat) to the Department of Water and Sanitation.

LOCATION
The Block Meat facility located in Benoni, Gauteng, South Africa.

PROJECT DESCRIPTION
Block Meat, a subsidiary of the Shoprite Group, operates a 24-hour meat processing facility in Apex, Benoni, within the City of Ekurhuleni in the Gauteng Province. As a food-for-human-consumption processing facility, Block Meat is legally obliged to comply with strict food safety regulations. To ensure uninterrupted processing, sanitation and hygiene, the facility requires a reliable and continuous water supply.

In addition to municipal water, the applicant has developed a borehole on site to supplement municipal supply and to maintain operations during periods of municipal service interruption. Block Meat is applying for a Water Use Licence to authorise and utilise groundwater in line with legislation and long-term sustainability objectives.

PUBLIC PARTICIPATION PROCESS
GCS Environment South Africa (Pty) Ltd (GCS) has been appointed as the independent environmental consultant to manage the WULA process on behalf of Block Meat.

INVITATION TO PARTICIPATE AND COMMENT ON THE DRAFT WULA TECHNICAL REPORT
The Draft WULA Technical Report will be available for public review and comment from 05 February 2026 to 13 April 2026 at the following locations:

Place	Address	Telephone
Benoni City Centre Library	Elston Ave, Benoni, 1500	+27 (0)11 999 8809
GCS Website	https://www.gcs-sa.biz/public-documents/	+27 (0)11 803 5726

Attached is a Background Information Document (BID) for more information. Written comments and substantiated issues must be submitted to GCS by 13 April 2026. Early submissions are encouraged to allow the GCS sufficient time to address concerns comprehensively.

Interested and Affected Parties who wish to register, participate by contributing comments or who would like to obtain more information, should please contact:

GCS Environment South Africa (Pty) Ltd
Attention: Marandela Muzhambi
Tel: +27 (0)11 803 5726, Fax: +27 (0)11 803 5232
E-mail: ppp@gcs-sa.biz / MarandelaM@gcs-sa.biz
Postal Address: PO Box 2597, Rivonia, Johannesburg, 2128

Regards

APPENDIX D: CITY OF EKURHULENI MUNICIPAL APPROVAL

WATER AND SANITATION BUSINESS UNIT

City of Ekurhuleni

TO: Fresh Food Direct
ADDRESS: 20 Dunedin Street
Apex Ext 4313/0
Benoni

FROM: Mr Thokozani Maseko
Head of Business Unit
Water and Sanitation Business Unit

ENQUIRIES: Ms Liziwe Mabulu
TEL: (011) 999 7526
E-MAIL: Liziwe.Mabulu@ekurhuleni.gov.za

DATE: 18 August 2026

HEAD OFFICE

6th Floor, Boksburg Civic Centre
Cnr Market Str and Trichardts Rd
Boksburg
1459

PO Box 215
BOKSBURG
1460

Website: www.ekurhuleni.gov.za

Dear Sir/Madam,

SUBJECT: THE USE OF BOREHOLE AT PRIVATE PROPERTY: ERF 451, 20 DUNEDIN STREET, APEX EXT. 4313/0, BENONI.

You are hereby informed that the City of Ekurhuleni Water and Sanitation Department does not have any objection to the use of a borehole on the above-mentioned property,

However, this permission is subject to the following conditions:

1. Water from this borehole should **under no circumstances be used for drinking purposes**.
2. The owner will **be held liable** for any direct or indirect consequence from the drilling and utilization of such borehole.
3. You need to ensure that your borehole is not being contaminated by any source. You are required to provide water quality test every six months to Annamarie.Maurizi@ekurhuleni.gov.za
4. Water from the borehole may by no means be allowed to enter the City's potable water system.
5. Drilling should be carried out according to the Development, Maintenance and Management of Groundwater Sources – SA Code of Practice Ref SABS 0299 1, 2 &3 – Design and Construction of Groundwater Boreholes & Drilling of Groundwater Boreholes.
6. Any fittings linked to the borehole water system on the premises is to be properly identified to prevent any cross connection with the City's water system on such premises.
7. All authorization/s such as General Authorization or Water Use License from the National Department of Water and Sanitation, Environmental Authorizations, etc., where applicable are to be obtained and copy of such forwarded to this office at Mthokozisi.Mlotshwa@ekurhuleni.gov.za
8. All matters pertaining to the authorization/s mentioned above where applicable, must always be complied with.

9. It is recommended that the owner keeps monthly records of its water consumption.
10. Considering the City's water conservation and demand management priorities you are further advised to take steps that prevent any wastage of water.
11. The City of Ekurhuleni (CoE) and/or other governing institutions may conduct ad-hoc inspections requiring access to all monitoring records when requested.
12. The owner/applicant shall comply with any directive/notice issued by the City (CoE) in this regard, whenever the City deems it necessary.
13. The City's Water Service By-laws must be adhered to at all costs.
14. Kindly note that any discharge into the City's sewer network requires the City's written approval.
15. The owner is to include borehole information and meter reading data in any future Industrial Effluent Permit Applications and monthly submission of borehole meter readings from calibrated water meters to CoE's Water Quality Section.
16. You are required to give a written notice of the date of your intention to drill a borehole.

Trusting that the above is in order.

RECOMMENDED ✓	NOT RECOMMENDED

DATE: 19/08/2026

MR MTHOKOZISI MLOTSHWA
CHIEF ENGINEER: WATER DEMAND MANAGEMENT
CITY OF EKURHULENI

SUPPORTED ✓	NOT SUPPORTED

DATE: 25/8/2026

MR LUBABALO MATAKANE
DIVISIONAL HEAD: STRATEGIC & FUNCTIONAL PLANNING
CITY OF EKURHULENI

APPROVED X	NOT APPROVED

DATE: 04/09/2026

MR THOKOZANI MASEKO
HEAD OF BUSINESS UNIT: WATER AND SANITATION BUSINESS UNIT
CITY OF EKURHULENI