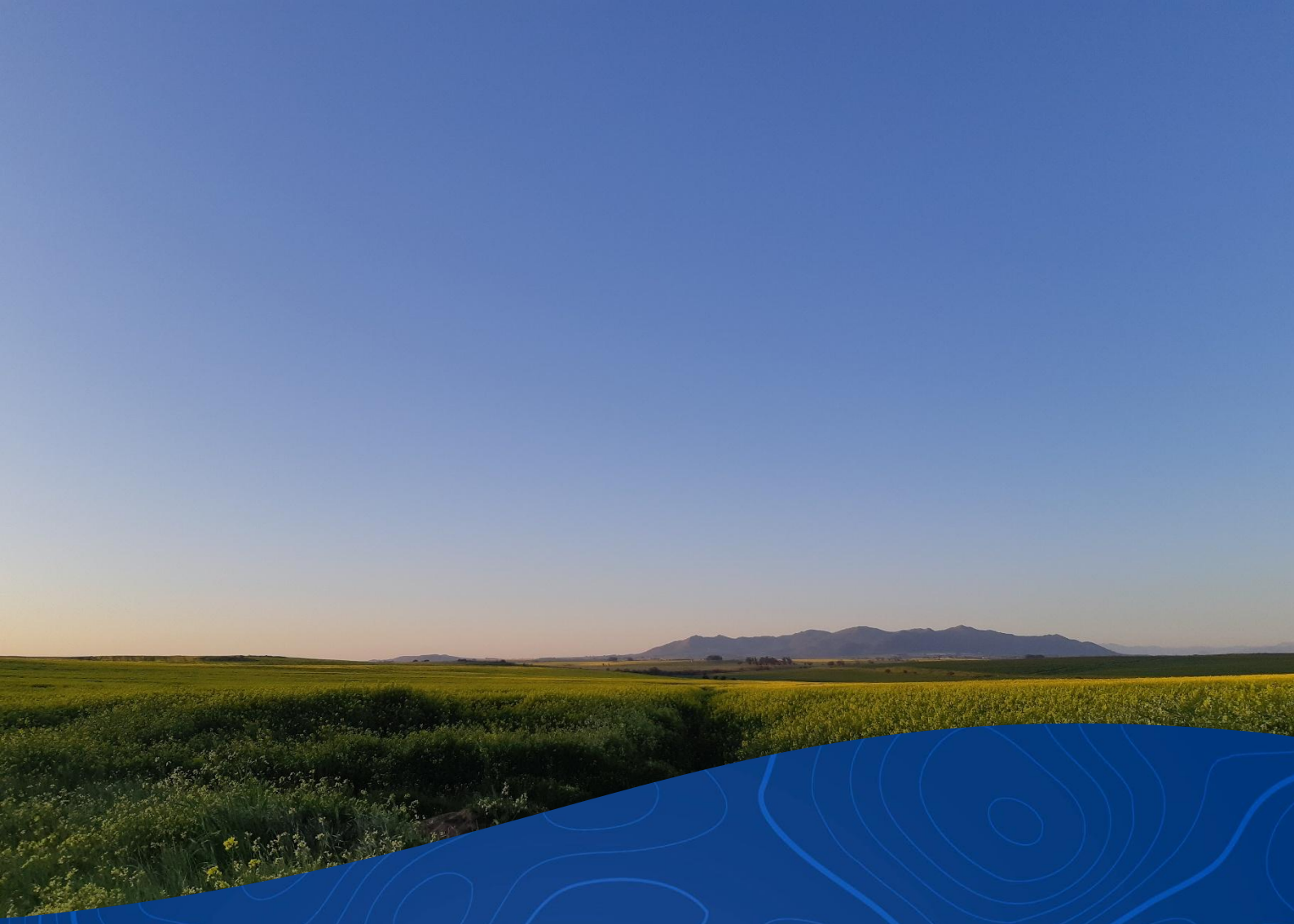
PROPOSED EXPANSION OF THE CAPE WINELANDS AIRPORT
EIA REFERENCE: 16/3/3/2/A5/20/2046/24
APPEAL DECISION: 14/3/1/A5/20/0705/26

ANNEXURE 17: GROUNDWATER MONITORING AND MANAGEMENT PLAN

OCTOBER 2026



Groundwater Monitoring and Management Plan for Cape Winelands Airport, Durbanville

Licence No: 01/G21E/ABCEGI/17483

7 OCTOBER 2026

GEOSS Report No.: 2026/09-19

GEOSS
Groundwater & Geo-Environmental Solutions

Executive Summary

GEOSS was appointed by PHS Consulting to prepare a Groundwater Monitoring and Management Plan(GWMP) for the Cape Winelands Airport in Durbanville, Cape Town, Western Cape. This GWMP has been developed to meet the groundwater monitoring requirements of the Water Use Licence (WUL) issued in terms of the National Water Act (Act 36 of 1998), and the Environmental Management Programme (EMPr). The programme supports compliance with the authorised water uses in terms of Section 21 (a), (c), (e), (g) and (i).

A number of monitoring boreholes have been proposed for quality monitoring near high-risk operational activities, and a number of existing, deeper boreholes have been proposed for regional water level monitoring. Groundwater monitoring is required throughout the construction and operational phases of the development. Groundwater levels will be measured monthly to assess seasonal variations and potential changes associated with the authorised activities. Groundwater quality monitoring will be undertaken quarterly and biannually as prescribed by the WUL. Groundwater samples will be collected during these monitoring events and analysed by a SANAS-accredited laboratory.

Based on the amount of groundwater users present in the immediate area, it is recommended that a groundwater monitoring forum/committee be established for the area. Local groundwater users identified in the surrounding area, or entities with a vested interest in the regional groundwater monitoring, should be invited to partake.

All groundwater level measurements, field observations and laboratory analytical results shall be captured and maintained in a dedicated groundwater monitoring database. Monitoring data shall be assessed against baseline conditions and previous monitoring events by a suitably qualified hydrogeologist to identify trends, assess potential impacts and support sustainable groundwater management. The groundwater monitoring results shall be incorporated into the required monitoring reports submitted to the Breede Olifants Catchment Management Agency (BOCMA) in accordance with the requirements of Water Use Licence 01/G21E/ABCEGI/17483.

Further, the WUL issued to Capewinelands Aero (Pty) Ltd has numerous requirements for monitoring of water resources across the development. This includes monitoring of the wetlands, streams, stormwater, groundwater and effluent. As a result, it is strongly suggested that water monitoring not occur in disjointed departments and reported separately. Monitoring data per discipline should feed into an integrated monitoring system where impacts to the various systems are cumulatively considered, and serve as precautionary and preventative management.

All individuals involved in the authorised activities, including employees and subcontractors, shall be made aware of the applicable authorisation conditions. The Licensee remains responsible for ensuring compliance with the conditions of the Water Use Licence and the implementation of the approved Groundwater Monitoring Programme. To ensure compliance, the Licensee will form an Environmental Management Department (EMD) to manage the environmental legislation requirements for the development.

Table of Contents

1. Introduction 1
2. Terms of Reference 2
3. Monitoring Compliance in terms of the WUL 3
4. Groundwater Monitoring Network 6
4.1 Construction Phase Monitoring Requirements 6
4.1.1 Decommissioning of boreholes 6
4.2 Operational Phase Monitoring Requirements 7
4.2.1 Water Quality Considerations 7
4.2.2 Water Level Considerations 8
5. Well Construction 11
5.1 Borehole Construction and Installation Specifications 11
5.2 Borehole Decommissioning Specifications 12
6. Monitoring Procedures 12
6.1 Groundwater Level Management 12
6.2 Groundwater Abstraction Management 14
6.3 Groundwater Quality Management 14
6.3.1 Detection Monitoring 15
6.3.2 Investigative Monitoring 16
6.4 Additional Water Monitoring Sites 17
6.5 Data Management 18
7. Monitoring Frequency 18
8. Additional Considerations 19
9. Conclusion 20
10. References 21
11. Appendix A: SANS 241:2025 Drinking Water Parameters 22
12. Appendix B: Maps 25

List of Tables

Table 1: Water Use Licence details 2
Table 2: Production boreholes authorised under the WUL 4
Table 3: Details of the boreholes that will be lost to construction at the Cape Winelands Airport 7
Table 4: Sites to be maintained across the development which may serve as standby supply or monitoring boreholes 7
Table 5: Details for the proposed monitoring sites during the operational phase of the development. 9
Table 6: Recommended frequency for groundwater level monitoring across the proposed Cape Winelands Airport 14

Table 7: Monitoring parameters required of the production boreholes as per the WUL 15
Table 8: Groundwater quality parameters to be monitored and the required frequencies 16
Table 9: Additional monitoring points to be incorporated into the water monitoring programme as it will have an impact on the groundwater monitoring programme 17
Table 10: Required parameter list and frequency for treated effluent quality monitoring 18
Table 11: Groundwater monitoring task frequency. 19
Table 12: Groundwater monitoring event frequency 19

List of Figures

Figure 1: Schematic representation of the proposed general borehole construction. 11

List of Maps

Map 1: Proposed network changes for the existing boreholes located at the Cape Winelands Airport development, Durbanville. 26
Map 2: Proposed monitoring network for the Cape Winelands Airport development, Durbanville. 27
Map 3: Proposed monitoring network superimposed on the interpolated groundwater flow direction in the region of the Cape Winelands Airport, Durbanville. 28

Abbreviations

a	annum
BH	borehole
BTEX	Benzene, Toluene, Ethylbenzene, Xylenes
COD	Chemical Oxygen Demand
CWA	Cape Winelands Airport
DRO	Diesel Range Organics
DWAF	Department of Water Affairs and Forestry
EA	Environmental Authorisation
EC	Electrical Conductivity
EMD	Environmental Management Department
EMPr	Environmental Management Programme
GRO	Gasoline Range Organics
GWMP	Groundwater Monitoring Programme
ha	hectares
L/s	litres per second
m	metre
mm	millimetres
m^3	cubic metres

mbgl	metres below ground level
mm/a	millimetres per annum
mS/m	milli-Siemens per metre
NWA	National Water Act
SDP	site development plan
SANS241-1:2015	The South African National Standards for drinking water
SANAS	South African National Accreditation System
SAR	Sodium Absorption Ration
TPH	Total Petroleum Hydrocarbons
TSS	Total Suspended Solids
WL	Water level
WUL	Water Use Licence
UST	Underground Storage Tank

Glossary of Terms

Aquifer:	A geological formation, which has structures or textures that hold water or permit appreciable water movement through them [from National Water Act (Act No. 36 of 1998)].
Borehole:	Includes a well, excavation, or any other artificially constructed or improved groundwater cavity which can be used for the purpose of intercepting, collecting or storing water from an aquifer; observing or collecting data and information on water in an aquifer; or recharging an aquifer [from National Water Act (Act No. 36 of 1998)].
Electrical conductivity:	The ability of groundwater to conduct electrical current, due to the presence of charged ionic species in solution (Freeze and Cherry, 1979).
Fractured aquifer:	Fissured and fractured bedrock resulting from decompression and/or tectonic action. Groundwater occurs predominantly within fissures and fractures.
Groundwater:	Water found in the subsurface in the saturated zone below the water table or piezometric surface, i.e., the water table marks the upper surface of groundwater systems.

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Document Information and History:

Report Name	**Groundwater Monitoring and Management Plan for Cape Winelands Airport, Durbanville**		
Report No	2026/09-19		
Suggested Citation	GEOSS (2026). Groundwater Monitoring and Management Plan for Cape Winelands Airport, Durbanville. GEOSS Report Number: 2026/09-19. GEOSS – South Africa (Pty) Ltd. Stellenbosch, South Africa.		
GEOSS Project Number	2021_09-4505_Q		
Cover Photo	Image of the quarry located on site (2022)		
Issue	Version	Date	Revisions
1	1.0	30 September 2026	-
2	1.1	7 October 2026	Amending minor comments regarding site operations

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1. Introduction

GEOSS was appointed by PHS Consulting to prepare a Groundwater Monitoring and Management Plan(GWMP) for the Cape Winelands Airport in Durbanville, Cape Town, Western Cape. This GWMP has been developed to meet the groundwater monitoring requirements of the Water Use Licence (WUL) issued in terms of the National Water Act (Act 36 of 1998), and the project's Environmental Management Programme (EMPr). The programme supports compliance with the authorised water uses in terms of:

- Section 21 (a) of the Act: Taking water from a water resource;
- Section 21 (c) of the Act: Impeding or diverting the flow of water in a watercourse;
- Section 21 (e) of the Act: Engaging in a controlled activity;
- Section 21 (g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource;
- Section 21(i) of the Act: Altering the bed, banks, course or characteristic of a watercourse.

The purpose of this GWMP is to fulfil the groundwater monitoring requirements of the Environmental Authorisation and WUL by monitoring groundwater levels, volumes and groundwater quality throughout the construction and operational phases of the authorised activities. The monitoring programme provides a mechanism to identify changes in groundwater conditions that may result from the implementation of the authorised water uses, and to confirm that the activities are not resulting in unacceptable impacts on groundwater resources or the surrounding aquatic environment.

The Licence has been issued for the expansion of the existing airport to a commercial airport capable of facilitating long-haul, wide-body flights. The water uses will include abstraction of 163 671 m^3/a of groundwater from three production boreholes (CWA_BH001, CWA_BH002 and CWA_BH003) for potable use. The water will be used for a variety of uses including business/commercial uses, yard connections, warehouses, hotels, parks, wash facilities, club house buildings, industrial uses, parking areas, a filling station and the terminal building as represented in the water balance (GEOSS 2025).

An on-site treatment facility will be constructed to ensure the abstracted groundwater meets potable water standards. The proposed internal water reticulation network for CWA is sourced from a combination of boreholes and municipal supply. These sources will feed into proposed on-site storage tanks from which water will be distributed throughout the development. The on-site storage tanks will be designed to provide sufficient buffering capacity to accommodate peak demand and high-demand scenarios, ensuring consistent water availability. For non-potable water requirements, treated wastewater will be used, reducing reliance on groundwater abstraction and enhancing the resilience of the development to drought conditions in the short- to medium-term.

The development will include the construction of an on-site package treatment plant to treat sewage generated on-site. The on-site package plant will only produce volumes sufficient to meet the non-potable water requirement for the development, and surplus sewage will be sent to the nearby Fistantekraal WWTW. On-site effluent will be stored in storage facilities, and include an emergency overflow pond with 1 260 m^3 for emergency sewage storage, 3 000 m^3 for treated effluent storage and 1 136 m^3 for brine storage.

The treated effluent will be used to irrigate ±220 hectares (ha) across the property with a total volume of 147 226 m^3 per annum. Portions of the proposed development activities will also occur within the regulated area of delineated watercourses, and the primary runway will intersect with a portion of Seep Wetland 1 (centre of the development).

2. Terms of Reference

The purpose of this Groundwater Monitoring and Management Planis to establish the monitoring requirements necessary to demonstrate compliance with the groundwater-related conditions of the WUL and the EMPr for the authorised water uses in terms of Sections 21(a), (c), (e), (g) and (i) of the National Water Act (Act 36 of 1998). Details of the WUL are tabulated below in **Table 1**.

Table 1: Water Use Licence details

Licence No:	01/G21E/ABCEGI/17483
File No:	27/2/2/G521/98/1
WUA No:	WU33620
Date of issuance:	18 December 2025
Licensee:	Capewinelands Aero (Pty) Ltd
Property Details:	RE/Farm 724, Joostenberg Vlakte, Paarl Portion 10 of Farm 724, Joostenberg Vlakte, Paarl Portion 4 of Farm 474, Joostenbergs Kloof, Paarl Portion 7 of Farm 942, Kliprug, Malmesbury Erf 180, Fisantekraal Portion 11 of Farm 474, Joostenbergs-kloof, Paarl Portion 23 of Farm 724, Joostenberg Vlakte, Paarl
Water Management Catchment:	Berg-Olifants
Quaternary Catchment:	G21E
Licensed for the following activities:	Section 21 (a) of the Act: Taking water from a water resource; Section 21 (c) of the Act: Impeding or diverting the flow of water in a watercourse; Section 21 (e) of the Act: Engaging in a controlled activity; Section 21 (g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource; Section 21(i) of the Act: Altering the bed, banks, course or characteristic of a watercourse.
Licence Validity:	20 years
Review Period:	5 years

3. Monitoring Compliance in terms of the WUL

The WUL issued to Capewinelands Aero (Pty) Ltd in respect of the Cape Winelands Airport development prescribes a number of water monitoring and reporting requirements to ensure compliance with the authorised water uses in terms of Sections 21(a), (c), (e), (g) and (i) of the National Water Act (Act 36 of 1998). The WUL issued to the development encompasses a number of compliance conditions across the broader water discipline as it includes rivers, wetlands and groundwater. This report, however, establishes the minimum monitoring, reporting and compliance obligations that are applicable to the project in terms of groundwater resources and form the basis of this **Groundwater Monitoring and Management Plan(GWMP)**.

The GWMP stipulates the requirements for monitoring boreholes, groundwater monitoring methodology, monitoring frequency and reporting requirements to ensure that groundwater data is consistently collected, and is suitable for assessing temporal trends. Monitoring results will be compared with baseline conditions and previous monitoring events to identify any deterioration in groundwater quality or changes in groundwater levels that may require investigation or corrective action in accordance with the WUL conditions and EMPr. The GWMP provides the framework for implementing groundwater monitoring and documenting compliance with the WUL throughout the duration of the licensed activities, while providing the Regional Authority with verifiable records of groundwater monitoring undertaken at the site.

As part of the WUL, monitoring is required for the authorised water uses:

- Section 21 (a) of the Act: Taking water from a water resource;
- Section 21 (c) of the Act: Impeding or diverting the flow of water in a watercourse;
- Section 21 (e) of the Act: Engaging in a controlled activity;
- Section 21 (g) of the Act: Disposing of waste in a manner which may detrimentally impact on a water resource;
- Section 21(i) of the Act: Altering the bed, banks, course or characteristic of a watercourse.

A summary of the monitoring and compliance conditions applicable to the development is provided below (as stipulated in the WUL).

Abstraction Monitoring

- Flow meters are required to monitor the abstraction rates and volumes from the boreholes.
- The daily abstraction volumes must be summed into monthly totals and recorded.
- Borehole abstraction volumes must be monitored and reported in line with the sustainable yield assessment with adaptive pumping schedules implemented to protect the aquifer.

Level Monitoring

- Groundwater levels must be monitored on a monthly basis using both manual water level measurements and automated data loggers.
- Automated water level loggers must be installed to facilitate daily or continuous monitoring of the water levels.

- Monthly water level measurements must be accompanied by a specific date, time and geographical location.
- The groundwater level in each production borehole must not drop below the critical water levels as outlined in **Table 2**. Should any of the water levels drop below the critical level, the total abstraction must be reduced by 10%, monitoring will persist and after 30 days, if the water level in the borehole does not recover, abstraction must be reduced by a further 10%. This process must continue until the water level in the borehole recovers.

Table 2: Production boreholes authorised under the WUL

Site	Abstraction Rate (L/s)	Pumping Duration (hours/day)	Critical Water Level (mbgl)	Abstraction Volume (m^3/a)
CWA_BH001	1.0	24	85	31 536
CWA_BH002	2.5	24	61	78 840
CWA_BH003	1.69	24	101	53 295

Quality Monitoring Requirements

- Where water will be supplied for drinking water, a full analysis of groundwater quality for SANS 241:2025[1] parameters must be conducted on a biannual basis.
- Sample analysis must be conducted by a recognized analytical laboratory, accredited by the South African National Accreditation System (SANAS).
- Risk-based organics including Benzene, Toluene, Ethylbenzene, Xylenes (BTEX), Gasoline Range Organics (GROs) and Total Petroleum Hydrocarbons (TPH) must be monitored quarterly in boreholes proximal to hydrocarbon sources to detect potential fuel leaks.
- The date and time of monitoring in respect of each sample taken shall be recorded together with the results of the analysis.
- The groundwater quality results must not demonstrate any deteriorating trend.
- Water quality must be consistently maintained at the baseline levels established in the initial water quality data. The trends observed in the monitoring data should be evaluated by a hydrogeologist on a biannual basis to identify any potential deteriorating trends outside of seasonal variation.

Water Measurement and Reporting

- The licensee shall install appropriate water measuring devices to measure the amount of water abstracted as indicated by the WUL. The licensee must install flow metering devices for all water uses and readings must be taken on each flow meter on a monthly basis. Flow measuring, recording and monitoring devices must be maintained in a sound state of repair and calibrated/verified by a competent person at the frequency required by device specifications. This must include a programme of checking, calibration and/ or replacement of measuring devices.

[1] *The licence currently states that water supplied for drinking water must meet SANS 241:2015 standards, and measured on an annual basis. It is important to note that this standard has recently been updated to SANS 241:2025, and the requirement has therefore been updated in the compliance conditions.*

Calibration verification certificates of the flow measuring, recording and integrating devices must be available for inspection upon request.

- Due to the nature of the development, in-line digital flow metering is recommended to limit any downtime of the production boreholes. Electromagnetic flow meters and in-line ultrasonic flow meters are the ideal option as they do not require physical removal for calibration. These meters rely on in-situ electronic verification (dry calibration) to maintain regulatory compliance and accuracy.

Membership to a Water Users Association

If a water user association exists or is established in the area to manage the resource, it is compulsory for the licensee to be a member of the water user association. The licensee must adhere to the rules, regulations and water management stipulations of the water user association.

Reporting Requirements

- A Groundwater Monitoring and Management Planmust be established and actively maintained throughout the entire period of the license.
- The licensee must conduct annual internal audits on compliance with the conditions of the WUL. The first audit must be conducted within ninety (90) calendar days from the date of commencement of water use entitlement. A report on internal audits must be submitted to the Provincial Head/CEO within sixty (60) calendar days of the finalisation of the audits.
- The licensee must appoint an independent external auditor to conduct biennial (every two (2) years) external audits on compliance with the conditions this licence. The first audit must be conducted and finalised within one (1) year after commencement of a water use. A report on the audit must be submitted to the Provincial Head/CEO within sixty (60) calendar days of the finalisation of each audit.
- A groundwater monitoring report must be submitted to the Department annually to ensure compliance and optimize groundwater management practices. The report must include records of the abstraction volumes, monthly groundwater level recordings and water quality results.

Impact on Groundwater Resources

- If groundwater monitoring data indicates a deterioration in groundwater quality due to contamination, appropriate remediation measures must be implemented immediately to prevent further contaminant migration.
- Any incident that may cause water pollution must be reported to the Provincial Head/CEO within 24 hours. Should the incident occur during a weekend or public holiday, the incident must be reported on the next official working day. Within 14 days from a potential pollution incident, the licensee must submit an action plan including a detailed time schedule of the measures that will be taken to:
    - correct the impacts resulting from the incident;
    - prevent the incident from causing any further impacts; and
    - prevent the recurrence of a similar incident.
- To prevent adverse effects on other water users, the licensee must maintain a complaints register. All complaints must be recorded in the register and be investigated by a suitably qualified person appointed by the licensee. Should investigations prove that the licensee has impaired the rights of

other water users, the licensee must implement appropriate compensative measures as determined by the Minister.

4. Groundwater Monitoring Network

4.1 Construction Phase Monitoring Requirements

The exact location of the fuel storage placement on site during the construction phase (for refuelling of the vehicles) is currently unknown. Fuel storage tanks, however, will be placed at or in close vicinity of the construction camps. The locations of the construction camps are yet to be finalised at this stage of the development, but the development has advised the construction companies to place their camps in the same area where the listed activity for fuel storage was authorised. Further, the following restrictions apply to where the construction camps may be located:

- 50 m buffer from the existing boreholes;
- 500 m from identified wetlands or rivers; and
- Not within 100 m of the property boundary.

Once final placement is decided upon, it is recommended that one monitoring well be installed upgradient and one monitoring well be installed downgradient of each construction camp with fuel storage. Where feasible, shallow wells/piezometers will suffice as monitoring points.

To limit capital expenditure, it is strongly recommended that the proposed operational phase monitoring points (see **section 5.2**) be considered when deciding on the construction base camps. Where possible, these boreholes can be installed and used during the construction phase as well as the operational phase of the airport.

4.1.1 Decommissioning of boreholes

The existing boreholes listed in **Table 3** are located on the airside of the Cape Winelands Airport, and will be lost during construction. Consequently, these boreholes need to be appropriately decommissioned prior to the construction phase to ensure that the boreholes do not serve as potential contaminant pathways. Decommissioning must occur in accordance with the South African National Standard (SANS) for the decommissioning of boreholes is SANS 10299-9:2003. This specific part of the broader SANS 10299 standard (which covers the development, maintenance and management of groundwater resources) provides the detailed procedures and legal guidelines required to safely seal, cap and close a borehole in a manner that protects the environment and adheres to national compliance regulations.

The primary goal of sealing is to prevent the vertical flow of groundwater or gas, protecting the underlying aquifers from contamination. The borehole must be filled with alternating layers of engineered sealing materials and fill. Approved backfill materials typically include bentonite, cement grout or sand. Once the borehole is adequately backfilled, any surface features such as covers or chambers, must be permanently sealed. The final step involves restoring the surface site to eliminate safety hazards and return the immediate environment to its natural state.

Table 3: Details of the boreholes that will be lost to construction at the Cape Winelands Airport

Site_ID	Latitude (DD, WGS84)	Longitude (DD, WGS84)	Location and depth
HBH17	-33.762654	18.741142	RE/474; 60 m deep
HBH18	-33.743924	18.729662	P7/942; 25 m deep
HBH19	-33.755274	18.734510	RE/474; 15 m deep
HBH23	-33.770025	18.742650	P10/724; Depth unknown

Two existing boreholes identified during the hydrogeological assessment are located in the airport landside precinct. These boreholes are located in close proximity to a number of proposed operational phase boreholes, and are unlikely to interfere with construction in this precinct. It is highly recommended that these boreholes be preserved as either standby production boreholes, or standby monitoring boreholes. These boreholes are presented in **Table 4** and **Map 1**.

Table 4: Sites to be maintained across the development which may serve as standby supply or monitoring boreholes

Site_ID	Latitude (DD, WGS84)	Longitude (DD, WGS84)	Location	Depth (mbgl)
HBH12	-33.766220	18.732568	Airport Landside Precinct (west)	Unknown
HBH24	-33.766175	18.731747		Unknown

4.2 Operational Phase Monitoring Requirements

A number of groundwater monitoring points have been selected based on their proximity to high-risk operational activities, as well as strategic sites to monitor changes in the regional water level. The proposed monitoring points are presented in **Table 5** and **Map 2**. In **Table 4**, sites proposed for local groundwater level and quality monitoring are highlighted in grey, and sites proposed for regional water level monitoring are highlighted in blue. Groundwater flow direction is interpolated to flow from beneath the site both towards the west and the northeast where rivers create topographic lows (GEOSS, 2024) (**Map 3**). Consequently, it is important that that there are also monitoring points on both the eastern and western boundaries to ensure no potential contaminants migrate off-site.

4.2.1 Water Quality Considerations

The greatest potential for groundwater contamination to occur is from airside activities, jet fuel storage and refuelling activities, the wastewater treatment works, irrigation with potentially poorly treated effluent and the energy centre.

Monitoring boreholes have not been proposed downgradient of the attenuation ponds as the ponds have been designed to be dry and vegetated. The ponds have been designed in such a manner as to prevent attracting birds and other wildlife to the site which poses a serious aviation risk. Stormwater emanating from site is designed to be captured in the existing quarry. It is not necessary to install monitoring boreholes downgradient of the quarry as the GEOSS (2022b) yield test indicated no connectivity to between the

groundwater system and the quarry. Based on the yield test of the quarry conducted in 2022, the water in the quarry is dependent on precipitation. Little to no detectable groundwater in flows were observed during testing, indicating a lack of connectivity with the groundwater system.

It is important to note that the groundwater monitoring positions around the proposed fuel station will need to be revised once a detailed Site Development plan (SDP) becomes available. Three monitoring locations are proposed for the filling station, and should account for one site upgradient of where the underground storage tanks (USTs) will be located, and two located downgradient. These three monitoring points can only be finalised once the exact locations of the USTs become known. Although the monitoring information must be incorporated into the greater Cape Winelands Airport water monitoring plan, the installation and maintenance of these boreholes will be the responsibility of the filling station management.

According to the Kantey and Templer (2025) geotechnical report, the weathered layer and bedrock are intersected at variable depths across the site. A general recommendation for the proposed depths of the monitoring boreholes is 15 metres below ground level (mbgl) or until bedrock is intersected, whichever comes first. It is essential that the bedrock be cased off during the monitoring well installation so as to not create a pathway for surface-based contaminants to migrate into the fractured aquifer.

4.2.2 Water Level Considerations

A number of existing boreholes discovered during the hydrogeological assessment are recommended for regional water level monitoring to quantify the impact that CWA's groundwater abstraction may have on the regional water table and effectively, nearby users. It is important that water level monitoring commence prior to the abstraction by the development.

Table 5: Details for the proposed monitoring sites during the operational phase of the development.

Site_ID	Latitude (DD, WGS84)	Longitude (DD, WGS84)	Location	Depth (mbgl)	Recommended Phase Implementation
CWA_BH001	-33.76452	18.73271	Existing production borehole	100.0	Monitoring to start prior to commencement of construction
CWA_BH002	-33.76876	18.732067	Existing production borehole	100.4	Monitoring to start prior to commencement of construction
CWA_BH003	-33.774037	18.747742	Existing production borehole	149.9	Monitoring to start prior to commencement of construction
MBH1	-33.749406	18.728261	Proximal to solid waste storage and the WWTW	15 mbgl or until bedrock is intersected, whichever comes first	Prior to operation of the treatment and waste storage facilities
MBH2	-33.752460	18.732566	East of the fuel farm	15 mbgl or until bedrock is intersected, whichever comes first	Prior to installation of the USTs and operation of the fuel farm
MBH3	-33.752852	18.731723	West of the fuel farm	15 mbgl or until bedrock is intersected, whichever comes first	Prior to installation of the USTs and operation of the fuel farm
MBH4	-33.762284	18.732234	Proximal to the Energy Centre	15 mbgl or until bedrock is intersected, whichever comes first	Prior to operation of the Energy Centre
MBH5	-33.765145	18.731779	Proximal and upgradient of the retail service station (eastern boundary)	15 mbgl or until bedrock is intersected, whichever comes first; responsibility of the fuel station management	Prior to operation of the fuel station
MBH6	-33.764789	18.730984	Proximal and downgradient of the retail service station (northern corner)	15 mbgl or until bedrock is intersected, whichever comes first; responsibility of the fuel station management	Prior to operation of the fuel station
MBH7	-33.765948	18.731057	Proximal and downgradient of the retail service station (southern corner)	15 mbgl or until bedrock is intersected, whichever comes first; responsibility of the fuel station management	Prior to operation of the fuel station
MBH8	-33.775420	18.735445	Downgradient of the general aviation precinct	15 mbgl or until bedrock is intersected, whichever comes first	Once development of the generational aviation precinct commences
MBH9	-33.773715	18.749793	Downgradient (east) of the airside activities; outside of the Eskom substation	15 mbgl or until bedrock is intersected, whichever comes first	Once airside activities commence
MBH10	-33.757925	18.741250	Downgradient (east) of the airside activities	15 mbgl or until bedrock is intersected, whichever comes first	Once airside activities commence
MBH11	-33.745708	18.734629	Downgradient (east) of the airside activities	15 mbgl or until bedrock is intersected, whichever comes first	Once airside activities commence

Site_ID	Latitude (DD, WGS84)	Longitude (DD, WGS84)	Location	Depth (mbgl)	Recommended Phase Implementation
MBH12	-33.738904	18.731453	Downgradient (east) of the airside activities	15 mbgl or until bedrock is intersected, whichever comes first	Once airside activities commence
MBH13	-33.742781	18.722358	Downgradient of the services precinct (northwest); upgradient of the wetland	15 mbgl or until bedrock is intersected, whichever comes first	Once airside activities commence
HBH10	-33.763711	-33.763711	Regional groundwater level monitoring (west)	Existing site needs to be investigated as a potential monitoring site	Once licensed abstraction commences
HBH11	-33.765210	18.730670	Regional groundwater level monitoring (west)	Existing site needs to be investigated as a potential monitoring site	Once licensed abstraction commences
HBH13	-33.775183	18.735044	Deep existing borehole; regional groundwater level monitoring (west)	200.0	Once licensed abstraction commences
HBH16	-33.763135	18.743671	Existing borehole; regional downgradient (east) of the airside activities	Existing site needs to be investigated as a potential monitoring site	Once licensed abstraction commences
HBH20	-33.753275	18.750856	Existing borehole; regional downgradient (east) of the airside activities	Existing site needs to be investigated as a potential monitoring site	Once licensed abstraction commences
HBH26	-33.762813	18.761930	Regional downgradient (east) of the airside activities	Existing site needs to be investigated as a potential monitoring site	Once licensed abstraction commences

**grey sites – local water level and on-site quality monitoring sites; blue sites – regional water level monitoring sites*

5. Well Construction

5.1 Borehole Construction and Installation Specifications

Drilling of the monitoring wells should be supervised by a hydrogeologist with drill samples collected and logged every metre. Additional information including water strikes depths, associated water strike yields and groundwater quality, should be recorded. This information is crucial for the optimal design of the boreholes. A graphical representation of a proposed borehole construction is presented in **Figure 1**; the exact construction, however, will be unique for each borehole.

The boreholes are to be drilled by means of mud rotary or ODEX drilling to the specified depths. A gravel pack should be installed with an annulus of approximately 12 mm. The boreholes should be developed with compressed air for at least two hours upon completion along with an airlift test to estimate the yield of the borehole. A bentonite plug of at least 500 mm needs to be installed at the top of the hole to prevent ingress of surface water. If necessary, the monitoring wells should be protected with a protected manhole if there is traffic. All boreholes require lockable lids to prevent unauthorised access.

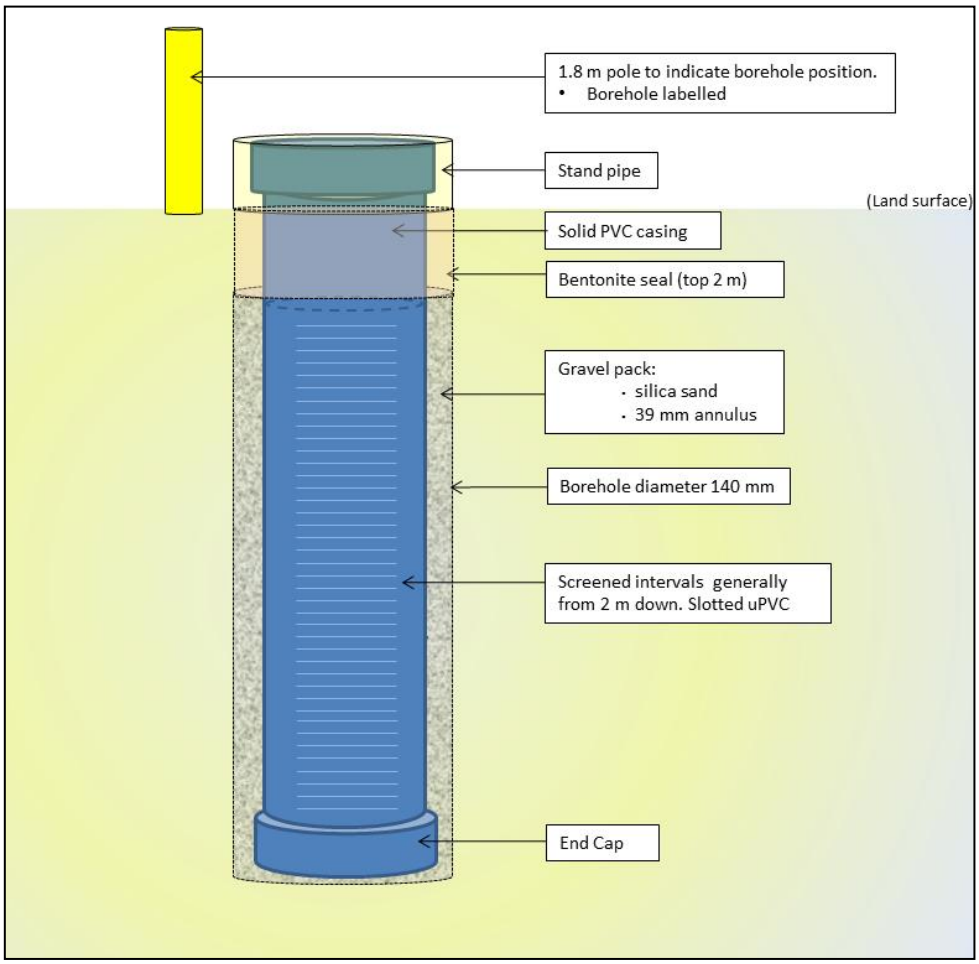


Figure 1: Schematic representation of the proposed general borehole construction.

5.2 Borehole Decommissioning Specifications

The general procedure for decommissioning a borehole includes:

Equipment Removal and Inspection

All headworks, submersible pumps, rising mains, cables and observation pipes must be removed from the borehole, leaving it entirely free of obstructions. For deep boreholes, a submersible camera can be lowered down the borehole column to confirm the depth and inspect the structural integrity of the walls.

Casing Assessment

Where possible, the condition of the casing should be evaluated. If the casing is severely corroded or the surrounding grout has failed, leaving it in place could allow contaminated surface water to flow down the outside of the casing into the aquifer.

Strategic Backfilling

The borehole must be backfilled using clean, uncontaminated materials that match the permeability of the surrounding rock layers.

- Water-bearing units should be filled with permeable aggregates like clean silica sand.
- Non-water-bearing zones should be sealed off using low permeability materials like bentonite clay pellets or liquid cement grout.
- Alternatively, to prevent any vertical movement of water whatsoever, the entire column may be continuously grouted from the bottom to the top.

Surface Sealing and Capping

To prevent contaminated surface runoff from entering the sealed hole, the top two metres of the borehole should be filled with a solid, impermeable plug of concrete or bentonite grout. Finally, a reinforced concrete cap should be poured over the top. This cap is typically buried at least one to two mbgl to prevent interference with future property development. The locations must be marked and recorded for future development purposes.

6. Monitoring Procedures

The groundwater level, volume and quality monitoring frequencies presented below are adopted from the WUL, the EMPr and hydrogeological assessment, which provide the detailed implementation requirements for the groundwater monitoring programme.

6.1 Groundwater Level Management

The proposed groundwater monitoring boreholes identified shall be monitored throughout the construction and operational phases of the development. The monitoring boreholes shall be maintained in a functional condition to ensure continued monitoring of groundwater conditions.

Groundwater levels in the three production boreholes are required to be continuously monitored through an automatic pressure transducer (i.e. a datalogger). When submerged, a water level datalogger can

continuously measure the hydrostatic pressure exerted by the overlying water column. The datalogger can be set to record water levels in 20 minute intervals which will provide a sufficient data record. The data on the logger can be manually downloaded during quarterly monitoring visits, or be connected to a telemetric system to allow for live, real-time level monitoring.

As stipulated in the WUL, should any of the water levels of any of the production boreholes drop below the critical level, the total abstraction must be reduced by 10%, monitoring will persist and after 30 days, if the water level in the borehole does not recover, abstraction must be reduced by a further 10%. This process must continue until the water level in the borehole recovers.

Groundwater levels must be measured monthly at the monitoring boreholes to assess temporal variations and potential changes associated with the authorised activities. Groundwater level measurements shall be undertaken using an appropriate water level meter (e.g., dip meter) and shall be recorded relative to a fixed reference point at each borehole. The borehole collar/casing height shall be recorded, allowing groundwater levels to be reported as metres below ground level (mbgl). The date and time of each groundwater level measurement shall be recorded. Groundwater level data shall be assessed against baseline conditions and previous monitoring events to identify seasonal variations, long-term trends or any significant changes requiring further investigation. Details for the water level monitoring sites are presented in **Table 6**.

Table 6: Recommended frequency for groundwater level monitoring across the proposed Cape Winelands Airport

Site_ID	Monitoring Frequency	Data Logger
CWA_BH001	Continuously, verified monthly	Installation Required
CWA_BH002	Continuously, verified monthly	Installation Required
CWA_BH003	Continuously, verified monthly	Installation Required
MBH1	Quarterly	Not required
MBH2	Quarterly	Not required
MBH3	Quarterly	Not required
MBH4	Quarterly	Not required
MBH5	Quarterly	Not required
MBH6	Quarterly	Not required
MBH7	Quarterly	Not required
MBH8	Quarterly	Not required
MBH9	Quarterly	Not required
MBH10	Quarterly	Not required
MBH11	Quarterly	Not required
MBH12	Quarterly	Not required
MBH13	Quarterly	Not required
HBH10	Quarterly	Not required
HBH11	Quarterly	Not required
HBH13	Quarterly	Not required
HBH16	Quarterly	Not required
HBH20	Quarterly	Not required
HBH26	Quarterly	Not required

6.2 Groundwater Abstraction Management

Groundwater abstraction from the production boreholes should be automatically metered using in-line flowmeters on the production boreholes. In-line telemetric flowmeters can be used as they wirelessly connect to stream real-time yield and consumption data to a central SCADA system or cloud portal. Daily abstraction volumes must be summed to monthly totals and reported to the Regional Authority on an annual basis, on or before 25 January and 25 July of each year.

Should abstraction occur from any additional boreholes not currently licensed under the WUL, permission must be granted from the Regional Authority.

6.3 Groundwater Quality Management

Groundwater quality monitoring must be undertaken at the recommended monitoring boreholes using recognised groundwater sampling procedures. Groundwater samples must be collected using a submersible low-flow pump or a suitable bailer in accordance with accepted groundwater sampling practices.

Prior to sampling, it is recommended that an interface meter be used at each monitoring site as a physical check for free-phase contamination at all of the monitoring boreholes. Before sample collection, the monitoring borehole must be purged, where appropriate, to obtain a representative groundwater sample. Field parameters including electrical conductivity (EC), oxidation-reduction potential (ORP), pH,

temperature and dissolved oxygen (DO) must be measured and recorded prior to sampling. Sample bottles shall be appropriately labelled with the borehole identification, site name and sampling date. Samples must be collected in the appropriate sample containers, preserved in accordance with laboratory requirements and submitted to a SANAS-accredited laboratory for analysis. The sampling methodology and sample preservation requirements must be confirmed with the laboratory prior to the first sampling event.

The WUL dictates that groundwater quality monitoring must be undertaken quarterly to assess seasonal variations and identify potential changes in groundwater quality. Monitoring data should be compared with baseline conditions and previous monitoring events to identify any changes associated with the authorised activities.

6.3.1 Detection Monitoring

The primary goal of detection monitoring is to act as an early warning system to determine if operations on site have released contaminants into the surrounding groundwater. Routine monitoring is conducted on a quarterly basis and focuses on a limited, specific set of "indicator" parameters sampled at regular intervals from established wells. If contaminant levels remain within normal background variations or regulatory limits, standard detection monitoring will continue. If a statistically significant increase is detected, investigative monitoring will be triggered.

6.3.1.1 Production Boreholes

The WUL requires quarterly to biannual quality monitoring of the production boreholes (i.e. CWA_BH001, CWA_BH002 and CWA_BH003) as stipulated in **Table 7** below. Although biannual monitoring of the full SANS 241-1:2015 parameter list is required of the production boreholes, it is essential to note that the SANS standards have been updated in 2025, affecting the parameter list. The SANS 241:2025 parameter list is provided in **Appendix A**.

Table 7: Monitoring parameters required of the production boreholes as per the WUL

Parameter	Frequency	Sites
pH	Quarterly	All
Electrical conductivity (EC)	Quarterly	All
Total Dissolved Solids (TDS)	Quarterly	All
Chemical Oxygen Demand (COD)	Quarterly	All
Benzene, toluene, ethylbenzene, xylenes (BTEX)	Quarterly	All
Gasoline Range Organics (GROs) ($C_6 - C_{10}$)	Quarterly	All
Diesel Range Organics (GROs) ($C_{10} - C_{28}$)	Quarterly	All
Total Petroleum Hydrocarbons (TPH)	Quarterly	All
Full SANS 241:2025*	Biannually	All

**The licence currently states that water supplied for drinking water must meet SANS 241:2015 standards. It is important to note that this standard has recently been updated to SANS 241:2025.*

6.3.1.2 *Monitoring Boreholes*

The primary risk at an airport is a subterranean leak or surface spill of Jet A-1 or AVGAS. Monitoring must focus on volatile and semi-volatile petroleum fractions. Selected parameters will be analysed to screen for potential contamination. The focus for MBH1 is the operation of the water treatment facilities and waste storage. MBH13 is the lowest risk site which will measure select indicator parameters moving off site. The details of the recommended parameters and the frequency at which they should be measured, is presented in **Table 8**.

Table 8: Groundwater quality parameters to be monitored and the required frequencies

Parameter	Frequency	Sites Required
pH	Quarterly	All
Electrical conductivity (EC)	Quarterly	All
Total Dissolved Solids (TDS)	Quarterly	All
Turbidity	Quarterly	MBH1
Total Suspended Solids (TSS)	Quarterly	MBH1
Biological Oxygen Demand (BOD)	Quarterly	MBH1
Chemical Oxygen Demand (COD)	Quarterly	All
Inorganic parameters: Na, K, Ca, Mg, Cl, HCO_3, SO_4	Quarterly	All
Nutrients: P, PO_4, NO_3, NH_4	Quarterly	MBH1
Metals: Cu, Zn, Cd, Pb, Ni	Annually	MBH2 – MBH13
BTEX	Quarterly	MBH2 – MBH12
Gasoline Range Organics (GROs) ($C_6 – C_{10}$)	Quarterly	MBH2 – MBH12
Diesel Range Organics (GROs) ($C_{10} – C_{28}$)	Quarterly	MBH2 – MBH12
Total Petroleum Hydrocarbons (TPH)	Quarterly	MBH2 – MBH12
Soaps, oils and greases	Quarterly	MBH1
Total Coliforms	Quarterly	MBH1
Faecal coliforms	Quarterly	MBH1
E.coli	Quarterly	MBH1

All laboratory analyses must be undertaken by a SANAS-accredited laboratory, and all analytical parameters shall fall within the laboratory's accredited scope of analysis. Groundwater monitoring results should be interpreted by a suitably qualified hydrogeologist and incorporated into the reporting required under the WUL. Monitoring records shall be maintained in a secure database and made available to the Regional Authority on an annual basis and/or upon request.

6.3.2 Investigative Monitoring

Investigative monitoring is also referred to as evaluation monitoring. This phase is initiated either to fully characterize a confirmed contamination event, or where continuous deterioration in water quality is noted (i.e. not attributed to short-term seasonal changes). Investigative monitoring requires testing for an expanded list of parameters, at a higher frequency, sometimes necessitating the installation of additional monitoring wells to map the boundary of the contamination plume and monitor its movement. Where

necessary, the data gathered will be used to evaluate risks to receptor health and the environment, and to design a targeted corrective action or remediation plan to clean up the aquifer.

Investigative monitoring will be evaluated on a case-by-case basis in consultation with a hydrogeologist, dependent on the nature of the incident that has occurred, or the variables that indicate a change in water quality. Certain parameters may fluctuate according to seasonality (nutrients, inorganic parameters, etc.), however, certain indicator parameters should not be detected in groundwater such as hydrocarbons. Should hydrocarbons be detected in the groundwater, detection monitoring will be upgraded to investigative monitoring.

6.4 Additional Water Monitoring Sites

Additional water monitoring requirements have been identified for infrastructure that is likely to have an impact on groundwater resources if not appropriately managed or monitored. Quality of the water from the water treatment works (WTW), stormwater, and treated effluent for irrigation will require monitoring. It is, however, important to note that monitoring of these sites will still need to be comprehensively addressed in a stormwater management plan, irrigation management plan and potable supply programme. The additional monitoring sites and the required monitoring parameters are presented in **Table 9**.

Table 9: Additional monitoring points to be incorporated into the water monitoring programme as it will have an impact on the groundwater monitoring programme

Site_ID	Location	Recommended Parameters	Frequency
Water Treatment Works Treated Product	Outflow from the WWTW	Full SANS 241 Drinking Water Standards* where water is supplied for drinking water	Biannually
Treated effluent	Inflow into the irrigation dam	See **Table 10**	Monthly

**The licence currently states that water supplied for drinking water must meet SANS 241:2015 standards. It is important to note that this standard has recently been updated to SANS 241:2025.*

Treated effluent will be widely used across the development for irrigation. As monitoring at each irrigated land parcel is impractical, it is recommended that treated effluent be monitored monthly as per the WUL for the parameters conforming to the limits provided in **Table 10**.

Table 10: Required parameter list and frequency for treated effluent quality monitoring

Parameter	Limit	Frequency
pH	5.5 – 9.5	Monthly
Chemical Oxygen Demand (COD) (mg/L)	75	Monthly
Electrical Conductivity (mS/m)	150	Monthly
Ammonia (mg/L)	3	Monthly
Nitrate/Nitrite as Nitrogen (mg/L)	15	Monthly
Total Suspended Solids (TSS) (mg/L)	25	Monthly
Soap, Oil & Grease (mg/L)	≤2.5	Monthly
Chloride as Free Chlorine	0.25	Monthly
Total coliforms (cfu/100 mL)	1 000	Monthly
E. coli (cfu/100 mL)	1 000	Monthly
Sodium Absorption Ration (SAR) (mg/L)	5	Monthly

Where treated effluent does not meet the relevant limits, irrigation with treated effluent must cease immediately until treatment standards return to normal. Based on the measured degree of exceedance, further groundwater monitoring sites may be recommended through the installation of piezometers in irrigated areas of the development.

6.5 Data Management

All groundwater monitoring data, including field measurements, groundwater levels, abstracted volumes, laboratory analytical results and supporting documentation, shall be captured and maintained in an appropriate database. Monitoring data shall be reviewed by a suitably qualified hydrogeologist to assess trends, identify potential impacts and provide recommendations where required.

Groundwater monitoring reports shall be prepared in accordance with the requirements of the WUL. Groundwater abstraction volumes must be submitted to the Regional Authority twice annually, on or before the 25th of January and July of each year. Annual groundwater monitoring reports detailing abstraction, level and quality monitoring shall be submitted to the Regional Authority unless otherwise agreed in writing by the Provincial Head. Monitoring records shall be retained and made available to upon request.

7. Monitoring Frequency

The recommended monitoring frequency for collection and reporting on water levels, volumes and quality, as well as the recommended frequency for the compilation of groundwater monitoring data is tabulated in **Table 11**.

Table 11: Groundwater monitoring task frequency.

Compliance	Frequency
Groundwater abstraction monitoring	• Monthly • Biannual reporting to the Provincial Head by 25 January and 25 July of each year.
Groundwater level monitoring	• Monthly • Biannual reporting to the Provincial Head by 25 January and 25 July of each year.
Groundwater quality monitoring	• Quarterly • Quarterly reporting to the Provincial Head

Based on the above requirements, a monitoring schedule has been compiled to accommodate the necessary compliance conditions in the WUL as well as the recommended intervals to download and calibrate the automated water level sensors. The recommended schedule for specialist site visits is highlighted in blue with bold text in **Table 12**.

Table 12: Groundwater monitoring event frequency

January	February	**March**	April	May	**June**
July	August	**September**	October	November	**December**

8. Additional Considerations

Based on the amount of groundwater users present in the immediate area, it is highly recommended that a groundwater monitoring forum/committee be established for the area. Local groundwater users identified in the surrounding area, or entities with a vested interest in the regional groundwater monitoring, should be invited to partake. Monitoring data can be shared amongst the committee to ensure sustainable use and management of the groundwater resources.

Further, the WUL issued to Capewinelands Aero (Pty) Ltd has numerous requirements for monitoring of water resources across the development. This includes monitoring of the wetlands, streams, stormwater, groundwater and effluent. As a result, it is strongly suggested that water monitoring not occur in disjointed departments and reported separately. Monitoring data per discipline should feed into an integrated monitoring system where impacts to the various systems are cumulatively considered, and serve as precautionary management. For example, quality monitoring of the effluent used for irrigation should be cumulatively assessed as any exceedances may pose a risk to groundwater resources, or surface water systems.

9. Conclusion

The current report presents the Groundwater Monitoring and Management Plan(GWMP) methodology to be implemented at the Cape Winelands Airport in Durbanville. The programme has been developed based on the recommendations of the hydrogeological assessment and the groundwater monitoring requirements specified in the Water Use Licence 01/G21E/ABCEGI/17483. The programme is considered to be dynamic and may be updated as required based on monitoring results, stakeholder input, or changes to the development activities. It is further recommended that the GWMP be reviewed every five years following the WUL review period to ensure that all the necessary compliance requirements are being met.

All groundwater level measurements, field observations and laboratory analytical results shall be captured and maintained in a dedicated groundwater monitoring database. Monitoring data shall be reviewed by a suitably qualified hydrogeologist to identify trends, assess potential impacts and support sustainable groundwater management.

All individuals involved in the authorised activities, including employees and subcontractors, shall be made aware of the applicable licence conditions. The Licensee remains responsible for ensuring compliance with the conditions of the WUL and the implementation of the approved GWMP. Ultimately, an EMD will be formed to manage environmental compliance across the development.

10. References

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11. Appendix A: SANS 241:2025 Drinking Water Parameters

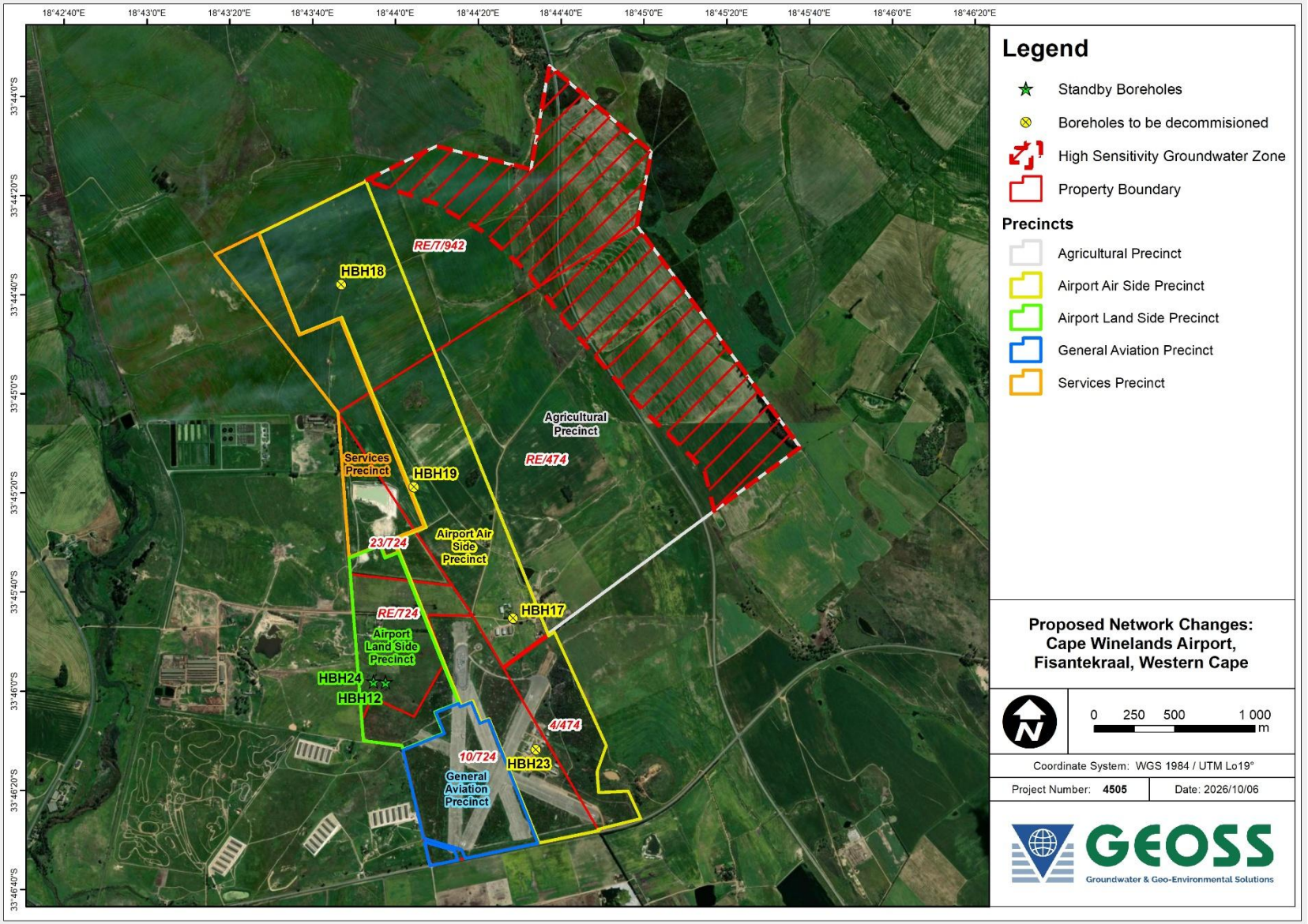
Mandatory Process Risk Parameters

Parameter	Risk	Unit	Standard limit	Water Supply System	Borehole System
Escherichia coli	Acute health	Counts per 100 mL (MPN or CFU)	Not detected	Yes	Yes
Intestinal enterococci	Acute health	Counts per 100 mL (MPN or CFU)	Not detected	Yes	Yes
Protozoan parasites: Cryptosporidium spp. Giardia spp.	Acute health	Counts per 10 L (count)	Not detected	Yes	No
Heterotrophic plate count (HPC) at 35°C to 37°C (±2°C)	Operational	Counts per 1 mL (CFU)	≤ 1 000	Yes	No
Total coliforms	Operational	Counts per 100 mL (MPN or CFU)	≤ 10	Yes	Yes
Somatic coliphages	Operational	Counts per 10 mL (PFU)	Not detected	Yes	No
Conductivity at 25°C (Electrical)	Aesthetic	mS/m	≤ 170.0	Yes	Yes
pH at 25°C	Operational	pH units	≥ 5.0 to ≤ 9.7	Yes	Yes
Turbidity	Operational	NTU	≤ 1.00	Yes	Yes
Apparent colour	Aesthetic	mg/L Pt-Co	≤ 15	Yes	Yes
True colour	Operational	mg/L Pt-Co	≤ 15	Yes	No
Disinfectant residual Chlorinated system: Free chlorine as Cl2	Operational Operational Chronic health	mg/L	≥ 0.50 for final water ≥ 0.10 for the distribution network ≤ 5.00	Yes	Yes
Disinfectant residual Chloraminated system: Sum of free chlorine and monochloramine as Cl2	Operational Chronic health	mg/L	≥ 0.10 for the distribution network ≤ 4.10	Yes	No
Disinfection by-product Bromate as $BrO3^-$	Chronic health	µg/L	≤ 10	Yes	No
Disinfection by-product Chlorite as $ClO2^-$	Operational	mg/L	≤ 0.70	Yes	No
Disinfection by-product Chlorate as $ClO3^-$	Operational	mg/L	≤ 0.70	Yes	No
Disinfection by-products Trihalomethanes: Bromodichloromethane Bromoform Dibromochloromethane Chloroform	Chronic health	µg/L	≤ 60 ≤ 100 ≤ 100 ≤ 300	Yes	No
Trihalomethane ratio	Chronic health	Ratio	≤ 1.0	Yes	No

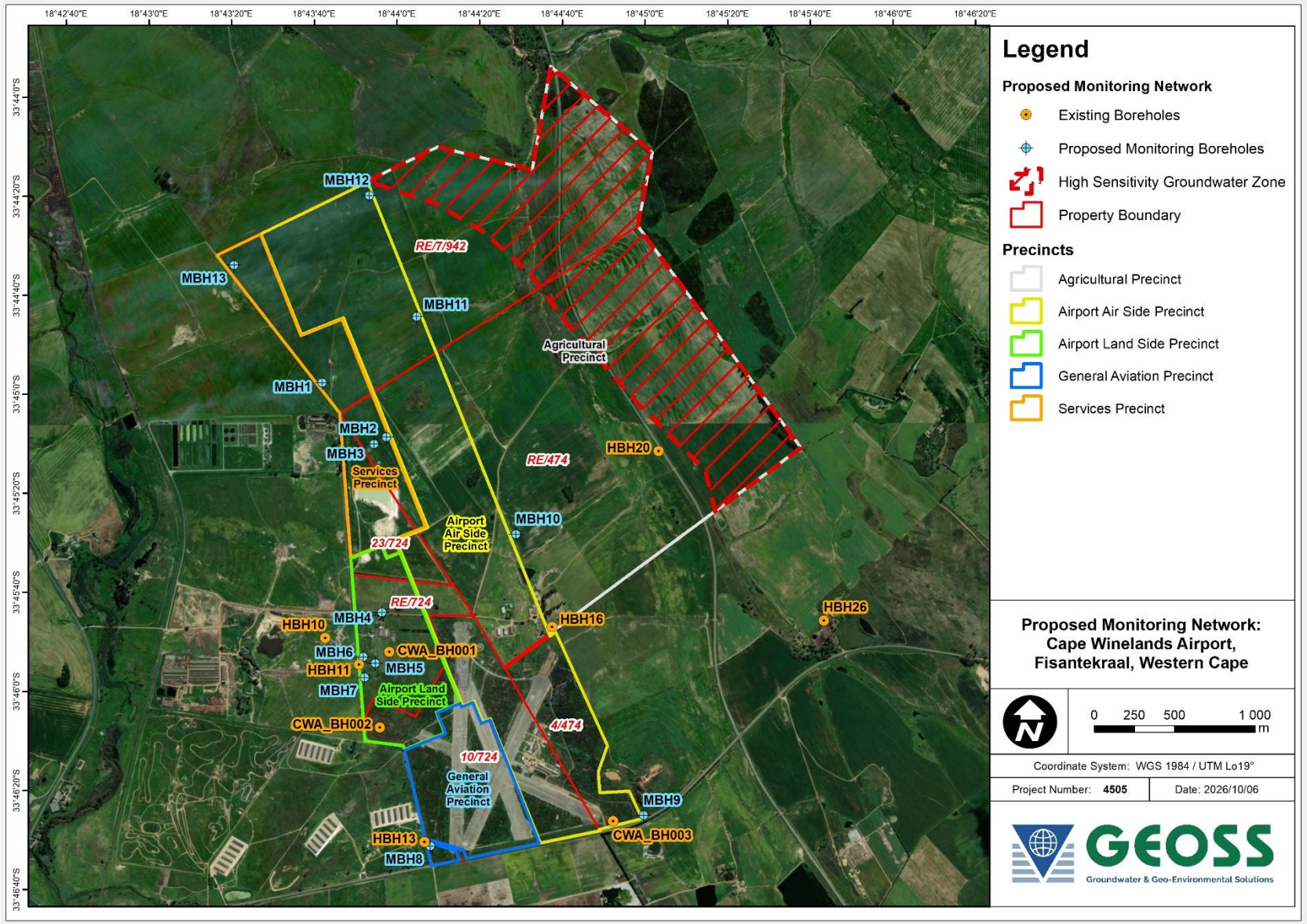
Risk Analysis Based Parameters

Parameter	Risk	Unit	Standard limit	Water Supply System	Borehole System
Ammonia as N	Aesthetic	mg/L	≤ 1.5	Yes	Yes
Ammonia as N	Operational	mg/L	≤ 0.30	Yes	No
Chloride as Cl^-	Aesthetic	mg/L	≤ 250	Yes	Yes
Fluoride as F^-	Chronic health	mg/L	≤ 1.5	Yes	Yes
Nitrate as N	Acute health	mg/L	≤ 11	Yes	Yes
Nitrate as NO_3	Acute health	mg/L	≤ 50	Yes	Yes
Nitrite as N	Acute health	mg/L	≤ 0.9	Yes	Yes
Nitrite as NO_2	Acute health	mg/L	≤ 3	Yes	Yes
Nitrate/Nitrite Ratio	Acute health	Ratio	≤ 1.0	Yes	Yes
Sodium as Na (dissolved)	Aesthetic	mg/L	≤ 200	Yes	Yes
Sulphate as SO_4^{2-}	Aesthetic	mg/L	≤ 250	Yes	Yes
Zinc as Zn (acid soluble)	Aesthetic	mg/L	≤ 3	Yes	Yes
Aluminium as Al (acid soluble)	Operational	µg/L	≤ 200	Yes	Yes
Antimony as Sb (acid soluble)	Chronic health	µg/L	≤ 20	Yes	Yes
Arsenic as As (acid soluble)	Chronic health	µg/L	≤ 10	Yes	Yes
Barium as Ba (acid soluble)	Chronic health	µg/L	≤ 1 300	Yes	Yes
Boron as B (acid soluble)	Chronic health	µg/L	≤ 2 400	Yes	Yes
Cadmium as Cd (acid soluble)	Chronic health	µg/L	≤ 3	Yes	Yes
Chromium as Cr (acid soluble)	Chronic health	µg/L	≤ 50	Yes	Yes
Copper as Cu (acid soluble)	Chronic health	µg/L	≤ 2 000	Yes	Yes
Iron as Fe (acid soluble)	Aesthetic	µg/L	≤ 300	Yes	Yes
Lead as Pb (acid soluble)	Chronic health	µg/L	≤ 10	Yes	Yes
Manganese as Mn (acid soluble)	Aesthetic	µg/L	≤ 100	Yes	Yes
Mercury as Hg (acid soluble)	Chronic health	µg/L	≤ 6	Yes	Yes
Nickel as Ni (acid soluble)	Chronic health	µg/L	≤ 70	Yes	Yes
Selenium Se (acid soluble)	Chronic health	µg/L	≤ 40	Yes	Yes
Uranium as U (acid soluble)	Chronic health	µg/L	≤ 30	Yes	Yes
Total organic carbon (TOC) as carbon	Chronic health	mg/L	≤ 10.0	Yes	Yes
Benzene	Chronic health	µg/L	≤ 10	Yes	Yes
Atrazine and its chloro-s-triazine metabolites (cumulative)	Chronic health	µg/L	≤ 100	Yes	Yes
Dichlorodiphenyltrichloroethane (DDT) and metabolites (cumulative)	Chronic health	µg/L	≤ 1	Yes	No
Total microcystin	Chronic health	µg/L	≤ 1	Yes	No
Geosmin	Aesthetic	ng/L	≤ 10	Yes	No
2-Methylisoborneol (MIB)	Aesthetic	ng/L	≤ 10	Yes	No

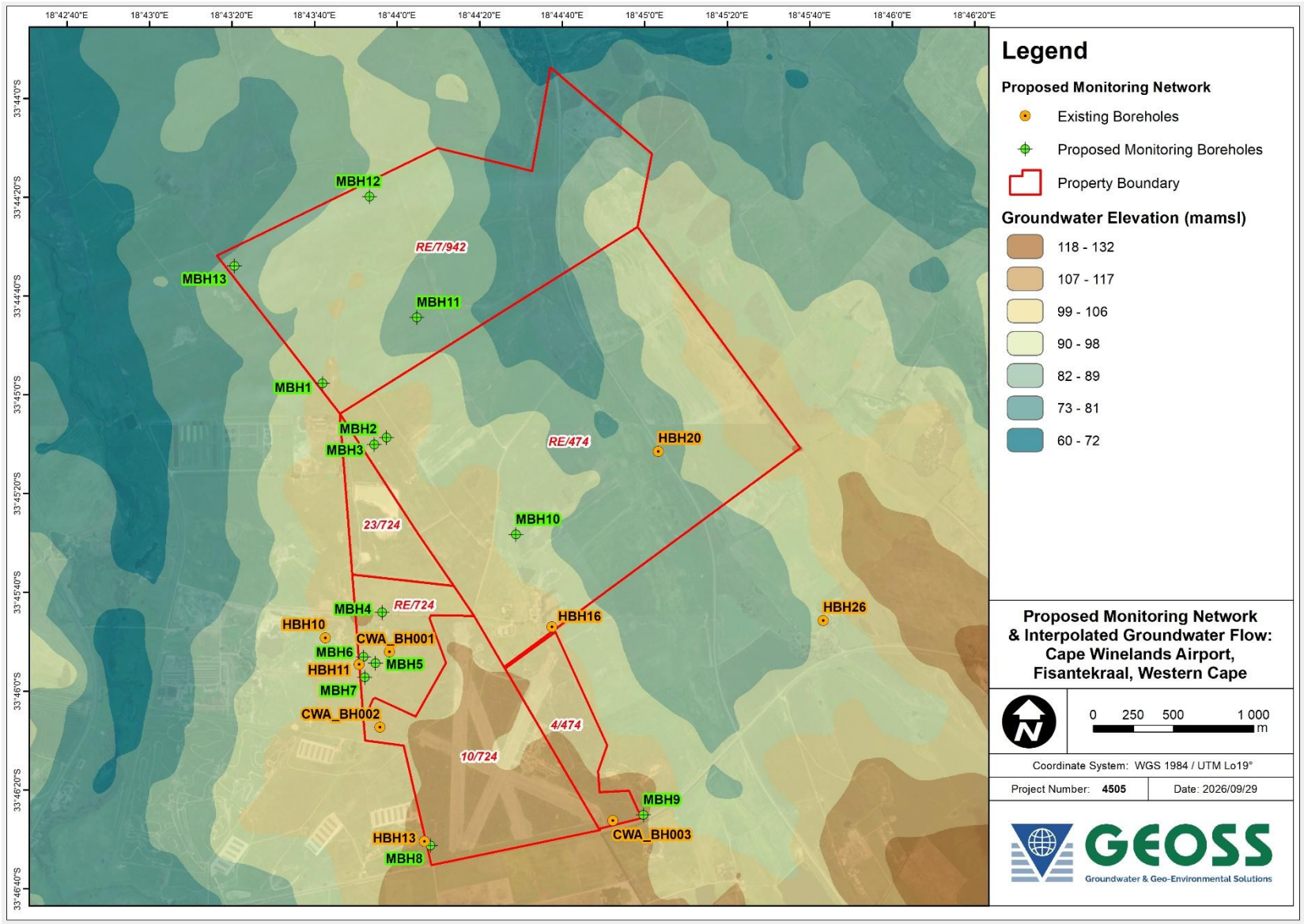
12. Appendix B: Maps



Map 1: Proposed network changes for the existing boreholes located at the Cape Winelands Airport development, Durbanville.



Map 2: Proposed monitoring network for the Cape Winelands Airport development, Durbanville.



Map 3: Proposed monitoring network superimposed on the interpolated groundwater flow direction in the region of the Cape Winelands Airport, Durbanville.