

MONITORING PLAN

**PROPOSED DEVELOPMENT OF A NEW LANDFILL SITE (CLASS B) AND
ASSOCIATED INFRASTRUCTURE ON THE REMAINING EXTENT OF
PORTION 1 OF THE FARM MELK SPRUIT NO. 12, WALTER SISULU
LOCAL MUNICIPALITY, EASTERN CAPE PROVINCE
(REF No: JG/B/M/001/2025)**



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1. INTRODUCTION

In accordance with Regulation 12 of the 2014 EIA Regulations (GNR 326), Rambuda Consultants (Pty) Ltd has been appointed by Imbawula Civil Projects (Pty) Ltd (On behalf of Walter Sisulu Local Municipality), as an independent environmental practitioner to facilitate the Scoping & Environmental Impact Assessment (S&EIA) and Water Use Licence Application process required in terms of the National Environmental Management Act, 1998 (NEMA, Act 107 of 1998 as amended), National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) and National Water Act, 1998 (Act No. 36 of 1998) (NWA), for the proposed landfill site which is located on the remaining extent of portion 1 of the farm Melk Spruit No. 12, Walter Sisulu Local Municipality of Joe Qgabi District Municipality, Eastern Cape Province.

The proposed activity triggers Listed Activities in terms of the EIA Regulations of 2014, as amended. Government Notice 921, published in Government Gazette No. 37083, on 29 November 2013, lists the waste management activities that require licensing, and water uses in terms of section 40 of the National Water Act, 1998, as described below.

Table 1: Triggered Listed Activities in terms of EIA Regulations of 2014, as amended

Indicate the number and date of the relevant notice:	Activity No (s) (in terms of the relevant notice) :	Describe each listed activity as per the detailed project description (and not as per the wording of the relevant Government Notice):
Government Notice (GN) No. 983 of the 04 th of December 2014 (as amended by GN No. 327 of the 07 th of April 2017).	27	The proposed development entails the clearance of approximately 6 hectares of indigenous vegetation for the development of a landfill site with associated infrastructure. The proposed site has not been disturbed in more than 10 years; thus, the vegetation complies with the indigenous vegetation definitions.
	28	The proposed development involves the development of a landfill site covering approximately six (6) hectares outside the urban areas. The proposed site is used for agricultural purposes, mostly for grazing activities; however, it was previously used for other agricultural activities such as maize farming.

Table 2: triggered Listed Activity in terms of Waste Management Licence regulations of 2013, as amended

INDICATE THE NO. & DATE OF THE RELEVANT NOTICE:	ACTIVITY NUMBERS (AS LISTED IN THE WASTE MANAGEMENT ACTIVITY LIST) :	DESCRIBE EACH LISTED ACTIVITY (and not as per the wording of the relevant Government Notice):

Government Notice No. 921 in Government Gazette No. 37083 of 29 November 2013, as amended	Category C (Activity 1)	The proposed landfill site will have a Material Recovery Area with a capacity to store approximately 800 m ³ of the diverted waste materials.
	Category B (Activity 8)	The proposed development entails the development of a landfill site with four (4) cells covering approximately four (4) hectares with a combined designed airspace of approximately 460 881 m ³ .
	Category B (activity 10)	The proposed development entails the construction of a Class B landfill site.

The development triggers water use licensing in terms of Section 21 of the NWA, specifically the following water uses:

- Section 21 (a): Taking water from a borehole for commercial use.
- Section 21 (g) - Development of a landfill site and temporary storage of sewage in a septic tank.
- Section 21 (g) – for the landfill development, managed in terms of One Environmental System.

The NWA recognises that the entire ecosystem, and not just the water itself, and any given water resource as defined by the NWA constitutes the resource and as such needs to be protected, used, developed, conserved, managed and controlled sustainably and equitably, for the benefit of all persons and in accordance with its constitutional mandate.

2. PROJECT OVERVIEW

2.1. Project Background

The proposed development entails the establishment of a new Class B landfill site with a total gross landfill airspace of approximately 460 881 m³, inclusive of allowances for daily and intermediate cover, final capping, settlement, and operational inefficiencies. The facility is designed for a 20-year operational horizon, with phased in operation of four (4) engineered landfill cells ($\pm 115\,220$ m³ each). Each cell will be constructed with a composite Class B liner system (Geosynthetic Clay Liner and a 2.0 mm textured HDPE geomembrane, adopted following geotechnical investigations which confirmed that suitable clay materials are not available on site for construction of a conventional compacted clay liner) in compliance with the National Norms and Standards for Disposal of Waste to Landfill (GN 636 of 2013, as amended 2024).

The associated infrastructure will include:

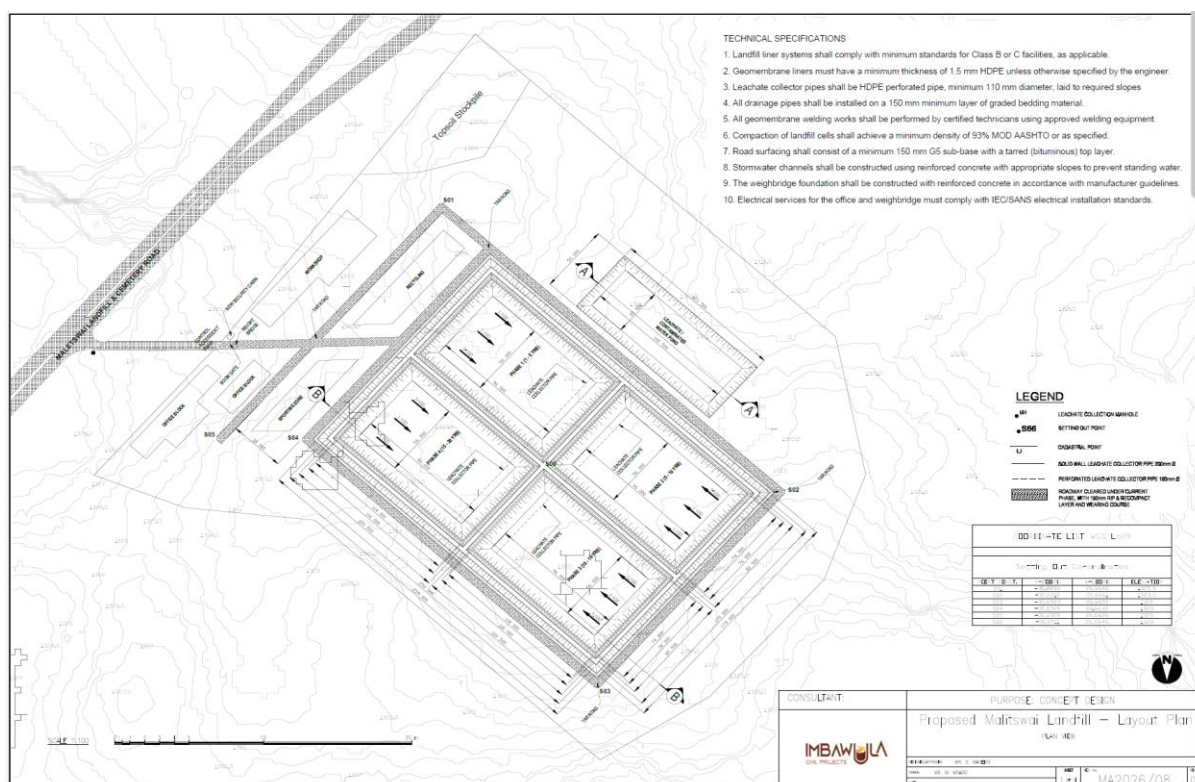
- Leachate & Evaporation dams
- Leachate monitoring and collection system (Leachate collector pipes will consist of HDPE perforated pipe, minimum 110 mm diameter, laid to required slopes and all drainage pipes shall be installed on a minimum 150 mm layer of graded bedding material).
- Stormwater Management System (to manage the dirty water channels and cut-off drain)
- Material Recovery and Sorting Facility
- Access roads, Office buildings, Electric Connection and Workshop
- Weighbridge (reinforced concrete foundation)
- Security Perimeter Fence
- Access control/Security House
- Topsoil stockpile and designated storage pits

The landfill will operate in four (4) operational phases (Phase 1: 1–5 years; Phase 2: 5–10 years; Phase 3: 10–15 years; Phase 4: 15–20 years), with progressive rehabilitation and capping. The preferred option consists of landfill cells with an effective height of approximately 13 m (10 m above ground, 3 m below ground). This configuration provides a compact footprint of 3.55 ha (cells only), expanding to ± 6 ha with ancillary infrastructure, balancing airspace efficiency with reduced visual impact, stability, and windblown litter risk.

Coordinates of the preferred site boundary:

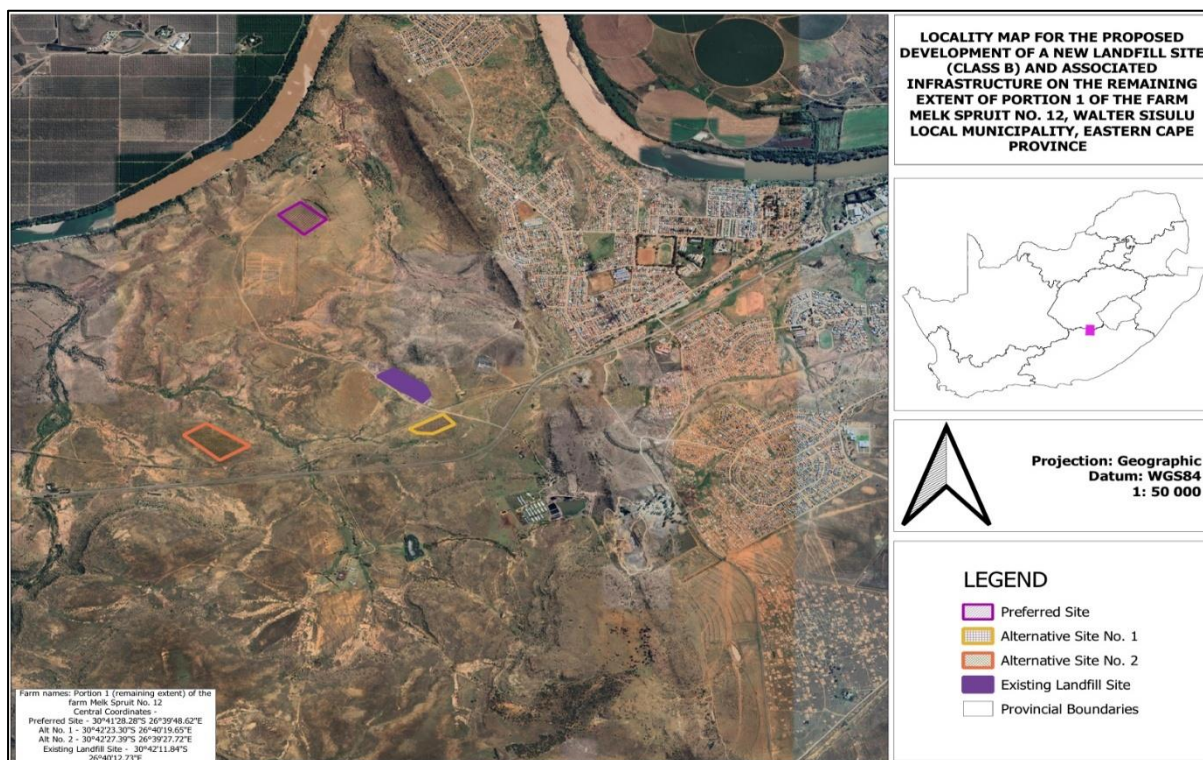
- Point No. 1: 30°41'29.43"S, 26°39'58.18"E; Point No. 2: 30°41'35.28"S, 26°39'52.11"E; Point No. 3: 30°41'27.44"S, 26°39'41.94"E and Point No. 4: 30°41'21.06"S, 26°39'48.92"E.

Figure 1 below shows the proposed project Layout Plan.



2.2. Project Location

The proposed landfill site is located on the remaining extent of portion 1 of the farm Melk Spruit No. 12, Walter Sisulu Local Municipality. The central coordinates of the preferred site are situated at the following coordinates: 30°41'27.97" S 26°39'46.43" E. Refer to the locality map below.



3. MONITORING PLAN AND PROGRAMME

Monitoring refers to the repetitive and continuous observation, measurement, and evaluation of environmental criteria to follow changes over a period of time and to assess the efficiency of control measures. The monitoring plan aims to ensure that mitigation measures are effective as well as to establish whether rehabilitation and maintenance activities are successful.

The monitoring plan and programme for the Maletswai landfill site were informed by the following specialists reports/ studies:

- Ecological (Terrestrial) and Aquatic Impact Assessment Study
- Air Quality Impact Assessment Study
- Geohydrological Impact Assessment Study
- Agricultural Impact Assessment Study
- Heritage and Palaeontological Impact Assessment Study
- Geotechnical Impact Assessment Study

3.1. Ecological and Aquatic Monitoring Programme

The ecological and Aquatic studies have identified a few small and highly ephemeral streams and drainage lines in the vicinity of the new landfill site alternatives. Those in the vicinity of the Preferred Site flow directly into the Orange River, while those near Option 1 and Option 2 flow into the Melkspruit. There is a small out-of-stream impoundment at the Preferred Site. The small impoundment is not very functional and was created to trap (impound) surface rainwater run-off, probably to retain some water for grazing livestock. However, the water volumes are low, and the impoundment is dry (that is, no visible surface water) for most of the year. The impoundment is not a natural watercourse. The natural environments in the area of Options 1 & 2 are in a much better condition than that of the Preferred Site, which, for many years, was cultivated fields and is therefore transformed. Refer to Figure 3 to 5 below for the sites sensitivities.

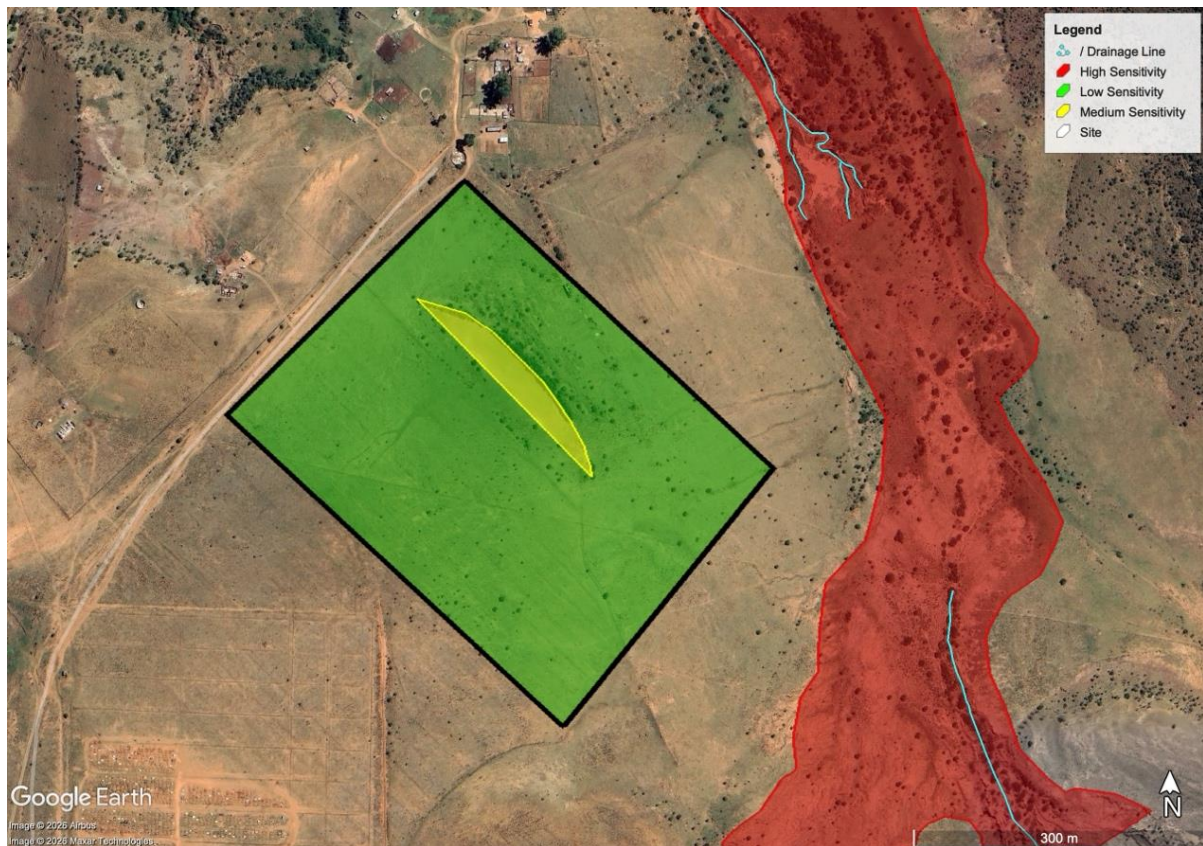


Figure 3: Aquatic Sensitivity Map: Preferred Site

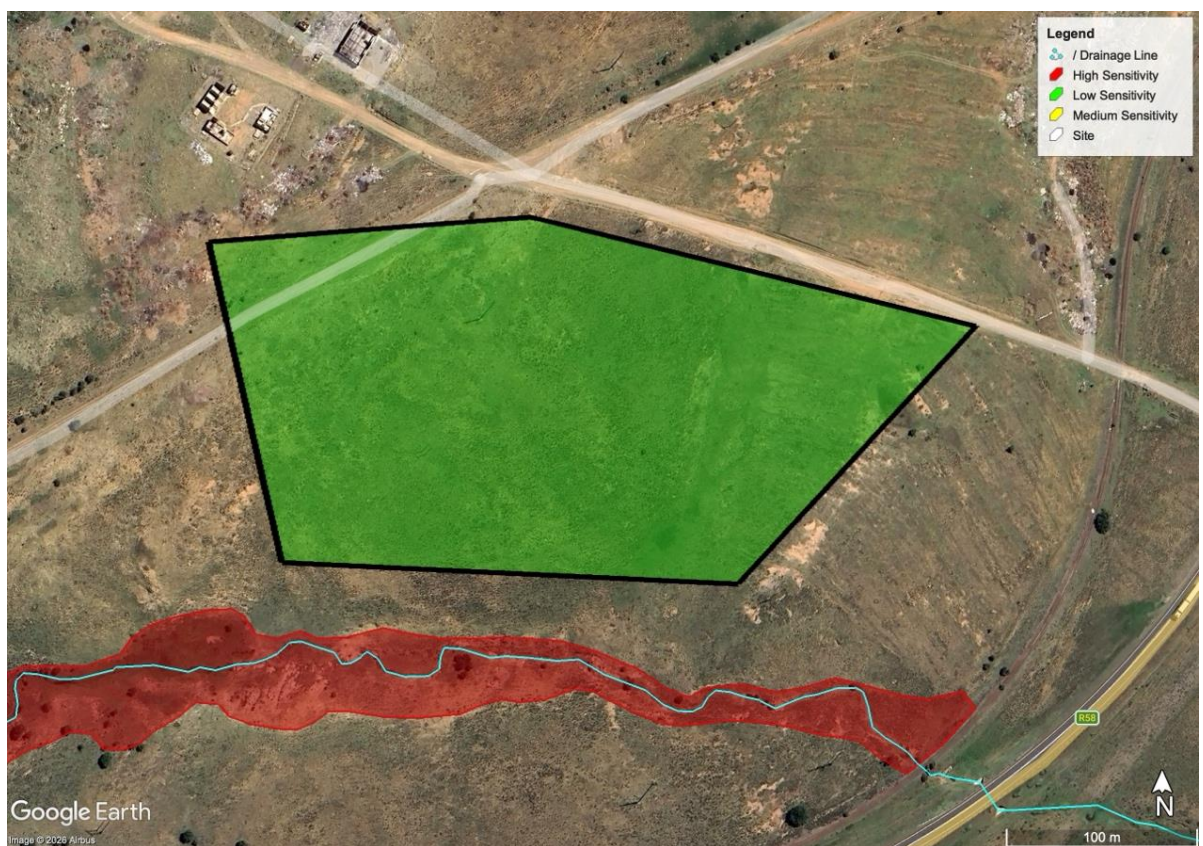


Figure 4: Aquatic Sensitivity Map: Option 1

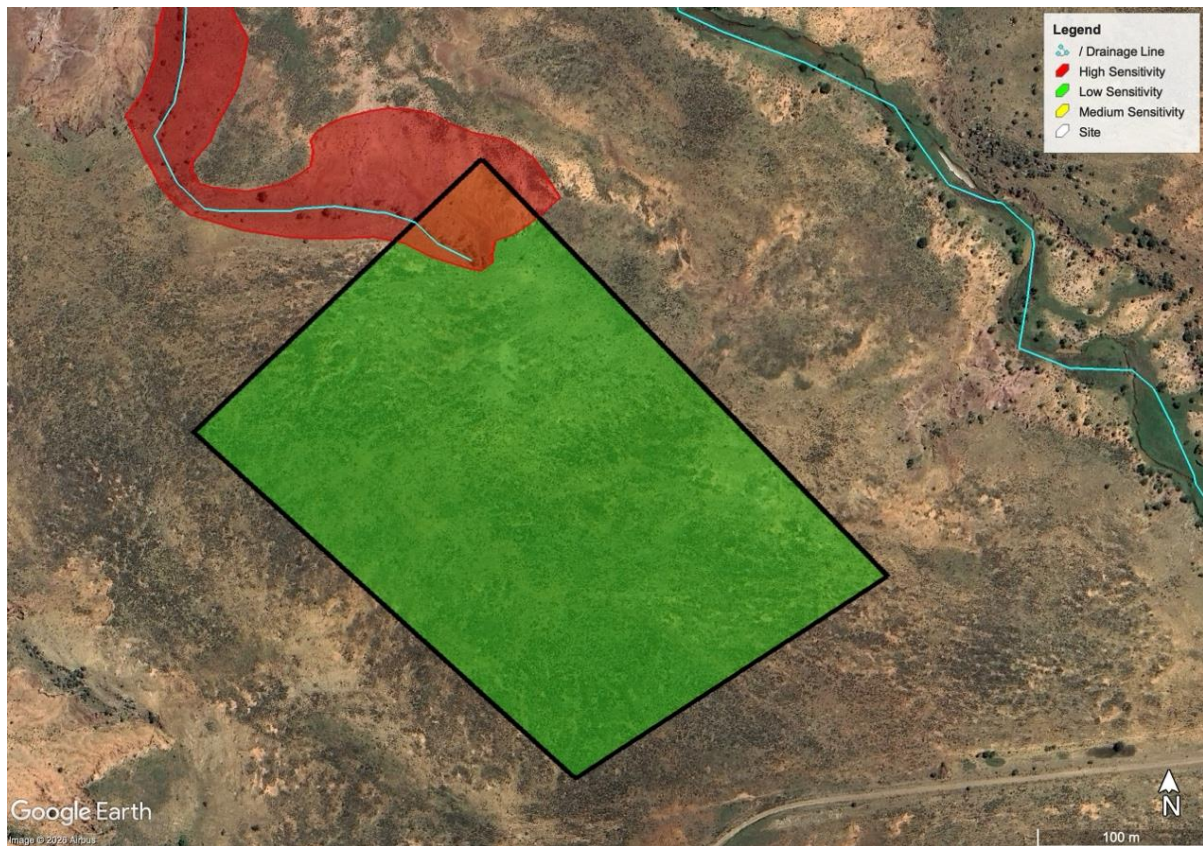


Figure 5: Aquatic Sensitivity Map: Option 2

The ecological and Aquatic studies have identified the potential environmental impact (such loss of natural vegetation, Impeding, impounding or changing the characteristics of a watercourse, Siltation and erosion and Loss or impact on wildlife). Table 2 below describe the monitoring programme for the terrestrial and aquatic recommended mitigation measures.

Table 3: Monitoring Programme for the terrestrial and aquatic mitigation measures

Monitoring Variables	Methods	Monitoring Frequency
Alien Plant Monitoring	• Detect and control alien invasive species across the site and buffer zones. • Monitor species cover abundance and ensure that natural species cover increases (compare to vegetation study results prior to construction)	• Annual surveys
Flora SCC	• Check for the presence of flora Species of Conservation Concern (SCC), with records maintained and reported	• Seasonal
Faunal	• Assess disturbance levels of the faunal SCC using Opportunistic sightings and targeted surveys	• During breeding seasons

Monitoring Variables	Methods	Monitoring Frequency
Terrestrial habitat Condition	Inspect the rehabilitated areas and buffer zones to evaluate vegetation recovery, erosion control effectiveness, and ecological connectivity	Annually
Riparian Habitat	Ecological surveys to assess vegetation recovery, erosion control effectiveness, and habitat connectivity.	Annually
Water Quality	Sampling water quality via perimeter boreholes to detect changes in water quality and sedimentation.	Regularly
Compliance Audits	Conduct ECO audits to verify implementation of mitigation measures, including stormwater management and rehabilitation commitments.	Regularly

3.2. Air Quality Monitoring Programme

An air quality monitoring programme should be implemented to verify the effectiveness of the mitigation measures prescribed in the Air Quality Impact Assessment and to identify emerging dust, landfill gas or odour problems before significant off-site impacts occur.

Monitoring should focus on the principal pollutants and nuisance impacts identified during the assessment, namely PM₁₀, PM_{2.5}, TSP/dust, CH₄, CO₂, H₂S, NO₂, SO₂ and offensive odour. Meteorological parameters, particularly wind speed and wind direction, should be recorded alongside air quality measurements to assist with source and receptor interpretation. The programme should be risk-based, with greater monitoring effort directed toward the active landfill area, site boundaries and sensitive receptors located in prevailing downwind directions.

The monitoring programme for the air quality should:

- establish whether landfill activities are materially affecting ambient air quality;
- verify the effectiveness of dust-control measures;
- identify abnormal landfill gas concentrations;
- detect potential H₂S and odour problems;
- determine whether emissions are migrating beyond the landfill boundary;
- evaluate potential impacts on SR01–SR06;
- investigate complaints;
- identify deteriorating trends; and

- provide information for corrective operational management.

3.2.1. Particulate Matter Monitoring

- PM₁₀ and PM_{2.5} should be monitored **periodically** at representative boundary and receptor-oriented locations, particularly during dry and windy conditions.
 - The baseline field assessment recorded PM₁₀ concentrations of 17–23 µg/m³ across MP01, MP02, MP04 and MP05, compared with 48 µg/m³ at the waste-influenced MP03 location. PM_{2.5} ranged from 6–9 µg/m³ at the general monitoring locations and reached 18 µg/m³ at MP03.
 - These baseline measurements can be used as indicative reference conditions when evaluating future monitoring results, while recognising that the measurements were short-duration screening observations rather than 24-hour compliance measurements.
 - Where regulatory compliance is being assessed, monitoring duration and methodology should correspond with the applicable averaging period.

3.2.2. Dust-Fall Monitoring

- Dust-fall monitoring should be considered around the landfill perimeter, particularly where unpaved roads, active cells and material-handling areas occur close to the site boundary.
- A minimum network should include representative upwind and downwind locations.
- Additional monitoring should be considered toward sensitive receptors if persistent dust complaints occur.
- Dust-fall monitoring should be undertaken using an appropriate recognised method and assessed against the applicable National Dust Control Regulations.

3.2.3. Landfill Gas Monitoring

- Landfill gas monitoring should commence as waste accumulation becomes established and continue throughout operation and post-closure.
- Monitoring should principally include:
 - CH₄;
 - CO₂;
 - O₂; and
 - H₂S where odour or sulphur-related decomposition is of concern.
- Monitoring locations should include representative landfill-gas infrastructure, landfill perimeter locations and areas where subsurface migration may reasonably occur.
- The baseline MP03 result, where CH₄ reached approximately 3 ppm compared with <1 ppm at the other field locations, demonstrates the value of monitoring around active waste disposal environments.

3.2.4. Hydrogen Sulphide and Odour Monitoring

- H₂S should be included in routine screening because of its relevance to landfill odour.
- The field assessment recorded <0.1 ppm at MP01, MP02, MP04 and MP05 and approximately 0.2 ppm at the waste-influenced MP03 location.
- Where persistent odour is detected, the investigation should consider: Odour complaint → Wind direction → Receptor location → Active landfill activity → H₂S measurement → Source inspection → Corrective action.
- Potential sources should include the active working face, landfill gas infrastructure, exposed waste, leachate and contaminated-water infrastructure.

3.2.5. Meteorological Monitoring

- Air quality data should be interpreted together with meteorological conditions.
- At minimum, the following should be recorded during monitoring events:
 - Wind speed;
 - Wind direction;
 - Temperature;
 - Relative humidity; and
 - Rainfall or recent rainfall conditions.
- Wind direction is particularly important because it enables differentiation between potentially landfill-related impacts and unrelated background sources.
- The field assessment on 30–31 August 2026 recorded approximately 21–28°C, 14% relative humidity, no precipitation and south-easterly winds of approximately 8 km/h (2.2 m/s). These conditions should be retained as part of the baseline field record.

3.2.6. Sensitive Receptor Monitoring

- The identified sensitive receptors should form part of the monitoring and complaints response framework. The receptor map confirms the distribution of SR01–SR06 within the adopted 5 km assessment area.
- Priority should be given to SR01, SR02, SR05 and SR06 because these represent school, accommodation and residential environments.
- Routine fixed monitoring at every receptor is not necessarily required. Instead, targeted receptor monitoring should be undertaken where operational observations, prevailing wind direction, monitoring results or complaints indicate potential off-site impacts.

3.2.7. Recommended Monitoring Programme

Table 4: Air Quality Monitoring Programme

Aspect	Parameter / Indicator	Location	Recommended Frequency	Corrective Response
Fugitive particulate matter	PM ₁₀ and PM _{2.5}	Site boundary / representative downwind location	Quarterly and during significant complaints	Investigate roads, working face and exposed surfaces; increase suppression
Suspended dust	TSP	Representative operational areas	Quarterly / targeted	Identify and suppress source
Dust fall	mg/m ² /day	Upwind and downwind landfill boundaries	Monthly where programme is implemented	Review dust-control measures
Landfill gas	CH ₄ , CO ₂ and O ₂	Gas points, landfill perimeter and relevant infrastructure	Monthly once gas generation becomes established	Inspect cover/gas system and investigate migration
H ₂ S	ppm	Working face, leachate areas and complaint locations	Monthly / complaint-based	Identify odour source and implement corrective action
NO ₂ / SO ₂	Screening concentrations	Representative boundary locations	Quarterly or as operationally required	Inspect vehicles/equipment and other combustion sources
Odour	Presence, intensity and complaint frequency	Boundary and sensitive receptor direction	Routine operational inspection	Identify source, cover waste, inspect gas/leachate systems
Wind	Speed and direction	Site meteorological point	During monitoring; preferably continuous	Use to identify source–receptor pathway
Temperature	°C	Site	During monitoring	Supporting interpretation
Relative humidity	%	Site	During monitoring	Supporting dust interpretation
Visible dust	Dust plume crossing boundary	Site perimeter	Daily operational observation	Immediate dust suppression
Windblown litter	Waste beyond working area/boundary	Site and surrounding land	Daily	Collect litter and improve containment

3.2.8. Trigger and Response Framework

Monitoring results should not be reviewed in isolation. Increasing concentrations, recurring complaints and visible off-site impacts should be treated as early-warning indicators.

Table 5: Operational Trigger and Response Framework

Trigger	Required Response
Visible dust leaving landfill boundary	Immediately suppress source and investigate operational cause
Repeated elevated particulate readings	Review roads, traffic speed, exposed surfaces and waste handling
Increasing CH ₄ trend	Inspect landfill gas infrastructure and cover integrity
Detectable/persistent H ₂ S increase	Inspect waste, gas and leachate sources
Persistent offensive odour beyond boundary	Immediate source investigation and corrective action
Repeated complaints from same receptor area	Conduct targeted receptor monitoring
Windblown waste outside authorised footprint	Retrieve waste and improve litter-control measures
Smoke or waste fire	Activate emergency/fire response immediately
Monitoring equipment failure	Repair/calibrate/replace equipment and document data gap

3.2.9. Monitoring Equipment and Quality Assurance

- Monitoring instruments should be maintained and calibrated in accordance with manufacturer requirements and the applicable monitoring methodology.
- The ES60A portable multi-gas detector and PDM99 portable particulate monitor may be used for operational screening where appropriate. Where measurements are intended to demonstrate formal compliance with regulatory ambient standards, appropriate reference or equivalent monitoring methods and applicable averaging periods should be used.
- Monitoring records should include the instrument used, calibration status, date, time, location, duration, meteorological conditions and relevant landfill activities.

3.2.10. Reporting and Record Keeping

Air quality records should include:

- Monitoring results;
- Meteorological observations;
- Calibration records;
- Monitoring locations;

- Photographs where relevant;
- Visible-dust observations;
- Landfill-gas inspections;
- Odour observations;
- Complaints received;
- Investigation findings;
- Corrective actions; and
- Follow-up verification.

Results should be reviewed for trends rather than only individual measurements.

3.3. Groundwater Monitoring Plan

According to the Geohydrological Study for the project, the proposed cattle feedlots have a low impact to contaminate the groundwater system and the environment. However, it is important that mitigation measures, which include the development of a groundwater monitoring plan, be implemented. The study has recommended that MAL Bh1 and 2 be used for monitoring., as indicated in Figure 6.

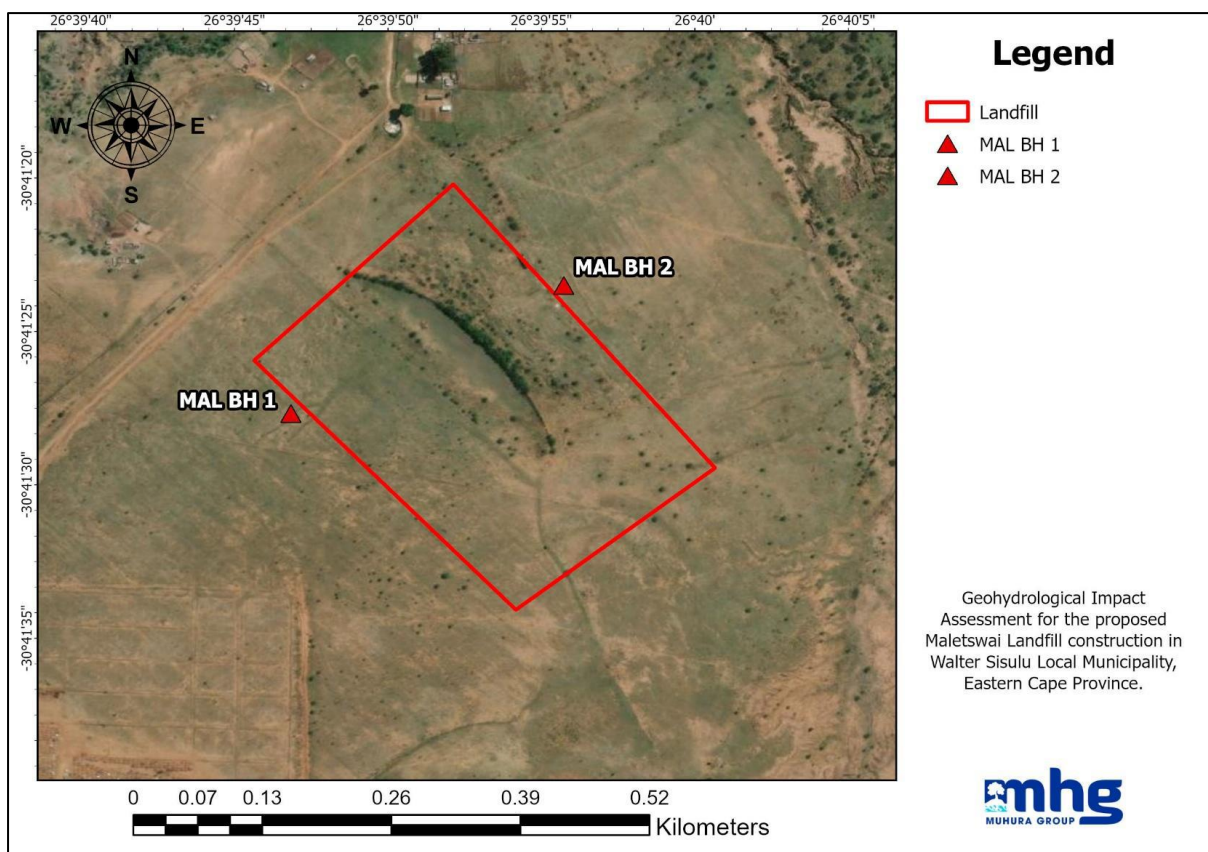


Figure 6: Ground water Monitoring Plan

3.3.1. Recommended Monitoring Programme

Groundwater quality monitoring data will serve as an early warning for groundwater pollution and decline in the area. Samples should be analysed for chemical and physical constituents normally associated with coal mining. These constituents are listed in Table 5 below.

Table 6: Monitoring Programme for the groundwater

Monitoring position	Frequency	Variables
Boreholes (MAL Bh1 and 2)	Quarterly*	EC, pH, TDS, total hardness, total alkalinity, calcium, magnesium, sodium, potassium, phosphate, chloride, sulphate, fluoride, nitrate, iron, manganese, aluminium, cadmium, turbidity and heavy metals.

Note: *Once trends are established, some of these constituents may be sampled less frequently, while others found to be problematic may be added as determined in consultation with the relevant role players, such as the DWS.*

3.4. Agricultural Monitoring

According to the Agricultural study, the proposed landfill will result in direct and long-term transformation of land within the development footprint. The principal agricultural impacts relate to loss of grazing land, removal and disturbance of topsoil, soil compaction, erosion, contamination and reduction in the future agricultural functionality of the affected footprint.

The assessment considers impacts during the construction, operational and closure/rehabilitation phases. The three alternatives are predominantly used for livestock grazing and have been assessed as having moderate agricultural potential, with Option Site 1 occurring within a comparatively more disturbed landscape.

However, the proposed mitigation focuses on preventing unnecessary disturbance outside the footprint, conserving usable topsoil, preventing erosion and contamination, and ensuring progressive rehabilitation of disturbed areas.

3.4.1. Recommended Monitoring Programme

The study indicates that monitoring should also continue during construction, operation and rehabilitation to identify deterioration of soil conditions before significant degradation occurs.

Table 7: Soil and Agricultural Monitoring Programme

Monitoring Aspect	Indicator	Frequency	Corrective Action
Development footprint	Disturbance outside approved boundary	Monthly during construction	Stop activity and rehabilitate unauthorised disturbance
Topsoil stockpiles	Erosion, contamination, compaction and vegetation condition	Monthly	Repair erosion, remove contaminants and stabilise stockpile
Soil erosion	Rills, gullies and sediment movement	Monthly and after significant rainfall	Install/repair erosion controls and rehabilitate affected area
Soil contamination	Fuel, oil, chemical or leachate contamination	Continuous operational observation	Contain spill, remove affected material and remediate
Stormwater controls	Erosion, blockage or failure	Monthly and after significant rainfall	Repair or clean drainage infrastructure
Rehabilitated areas	Vegetation establishment and bare areas	Quarterly during establishment	Reseed, stabilise and undertake erosion control
Invasive vegetation	Establishment of invasive species	Quarterly	Implement appropriate control
Livestock interaction	Damage to fencing or livestock entering operational areas	Routine inspection	Repair fencing and restore access control

3.5. Heritage and Palaeontological Monitoring Plan

The Heritage Specialist Report has identified one historical structure (Site 1) and one cemetery (Site 2) that were recorded during the survey. The dam retaining wall probably dates to the early 20th century, which was connected with a system of furrows (canals). The dam is currently still in use and retains water for livestock in the region south of the Orange River. Site 2 is an active cemetery.

No archaeological (both Stone Age and Iron Age) artefacts, assemblages, features, structures or settlements were recorded during the survey of the project footprint. It is well known that Late Iron Age stone-walled settlements do not usually occur in open, exposed low-lying grasslands and floodplains.

It is therefore recommended, from a cultural heritage perspective, that the proposed development may proceed, taking into account the proposed mitigation measures. However, despite the implementation of mitigation measures, some residual impacts may persist. These include the potential for accidental disturbance of subsurface palaeontological resources during excavation and the permanent alteration of heritage context if structures are removed under permit.

While these impacts are anticipated to be of low significance after mitigation, they underscore the importance of strict adherence to chance-find procedures, permit conditions, and ongoing communication with heritage authorities.

3.5.1. Monitoring Programme

The heritage monitoring programme include the following:

- **Chance-Find Monitoring:** ECO oversight during excavation to ensure chance-find procedures are followed.
- **Permit Compliance:** Verification that all required permits from SAHRA/EC-PHRA are obtained before disturbance.
- **Reporting:** Documentation of any heritage or palaeontological finds, with reports submitted to SAHRA/EC-PHRA.
- **Adaptive Management:** Implementation of additional mitigation measures if monitoring identifies risks not previously anticipated.

3.6. Geotechnical and Engineering Monitoring Plan

The Geotechnical study and the Engineering design report has recommended the following monitoring plan for the proposed Maletswai landfill site.

3.6.1. Construction Monitoring and Testing

It is recommended that all foundations be inspected by a Competent Person, prior to placing of any concrete in the ground. In addition, regular checks on the quality and compaction of the backfill to the foundations and terraces should be made.

- The CQA Monitor shall be responsible for observing and testing all components of the works to verify compliance with the Construction Specifications and approved Project Drawings. The CQA Engineer shall review the activities and findings of the CQA Monitor to ensure that all quality assurance requirements are adequately implemented and maintained.
- Any substandard test results, non-compliant visual inspections, or unsuitable materials identified during construction shall be recorded by the CQA Monitor and immediately brought to the attention of the Design Engineer. Appropriate corrective actions shall be implemented to prevent any potential underperformance of critical components, particularly the compacted clay liner system.
- An independent surveyor shall be appointed to carry out surveys and visual verification of the works to ensure that all construction is executed in accordance with the specified levels, grades, and alignments as indicated on the Construction Drawings. Survey verification shall be undertaken at key stages during construction to confirm compliance.
- All construction activities shall be subject to continuous observation and testing by the CQA Monitor to ensure adherence to Project Specifications. The Design Engineer shall review the monitoring results and

identify any deficiencies in construction methods or materials that may negatively impact the performance of the NEMWA-compliant containment barrier system. Visual inspections and survey verification shall be conducted for specific layers throughout the construction process to confirm that materials are placed in accordance with the required lines and grades.

- The CQA Monitor and Design Engineer shall provide the Project Manager with adequate notice of the anticipated completion of construction components to allow for timely review and acceptance of CQA documentation, thereby avoiding delays to the Contractor.
- Specific CQA monitoring and testing shall be conducted for the following components:
 - Engineered fill
 - Subgrade preparation, including subsurface drainage
 - Compacted clay liner (CCL)
 - Anchor trench backfill
 - Soil protection layer
 - Drainage gravel and leachate collection system (LCS) drainage layer
 - Operations soil layer or initial waste layer
- In addition, the CQA Monitor and CQA Engineer shall oversee the independent CQA Laboratory in carrying out detailed inspections and testing, including:
 - Verification of compaction layer thickness, moisture content, and dry density (including nuclear/Troxler testing) for engineered fill and PCD embankments
 - Monitoring compaction and material requirements of the clay liner constructed in two layers of 150 mm each
 - Inspection of trenching and backfilling, including gradients and installation of perforated underdrainage pipes
 - Concrete testing, including slump and cube strength tests for silt traps and overflow structures
 - Verification of final surface finishes of concrete and earthworks to prevent damage to the HDPE geomembrane and ensure proper interface

The CQA Monitor and Design Engineer shall also observe the installation of aggregate base layers (serving as geomembrane protection) and HDPE piping systems to confirm compliance with the Project Drawings and Specifications.

CONCLUSION

This Monitoring Plan provides a structured framework for the implementation, verification and continuous implementation of the recommended mitigation measures for the proposed Maletswai landfill site and associated infrastructure. The plan consolidates the monitoring requirements informed by specialist studies and engineering reports, including ecological and aquatic, air quality, geohydrological, agricultural, heritage, palaeontological, geotechnical and engineering considerations.

The monitoring programme is intended to provide early warning of potential environmental deterioration, support environmental compliance, and enable timely corrective actions. Effective implementation of this Monitoring Plan will assist in ensuring that the recommended mitigation measures are fully implemented, thereby ensuring continuous protection of the surrounding environmental receptors and ensuring sustainable operation of the landfill site.