



Project Prefeasibility Report

1. Project Details

Project Name	Karwyderskraal Waste Facility
Location	Overberg
Sector	Social
Department	Department of Environmental Affairs and Development Planning
Project Owner	Richard Bosman
Project Manager	Richard Bosman

1.1 Background & Justification

Background and Justification

The Karwyderskraal Regional Landfill Facility is a **Class B regional waste disposal site** owned and operated by the **Overberg District Municipality (ODM)**. It has served the waste disposal needs of Overstrand, Theewaterskloof and Cape Agulhas Municipalities since **2002** and forms a critical component of the district's solid waste management system. The facility's permitting history reflects compliant, long-term operation under evolving environmental legislation, with its initial permit issued in **2000**, amended in **2002**, **2005** and most recently **2018** to align with the National Environmental Management: Waste Act norms and standards.

1. Background

1.1 Regional Importance of the Facility

Karwyderskraal is the **only regional landfill** serving three municipalities, with waste transfer stations in place to support regional operations. The landfill diverts a significant portion of organics through composting but still receives over **53,000 tonnes of general waste annually**, with increasing trends (12.3% year-on-year as of 2024).

1.2 Historical Development and Capacity Status

Four disposal cells (Cells 1-4) have been constructed and filled progressively since operations began:

- **Cell 1 (2002-2005)**
- **Cell 2 (2005-2011)**
- **Cell 3 (2015-2019)**
- **Cell 4 (2019-present)** with remaining airspace **178,620 m3** (Oct 2024 survey) and projected to reach capacity by **Nov 2026** at a 3% growth rate.

Failure to commission **Cell 5A by October 2026** will result in complete landfill closure for waste acceptance, creating an urgent infrastructure requirement for uninterrupted service delivery across the district.

1.3 Strategic and Legislative Context

Under the Municipal Structures Act, district municipalities must operate regional waste disposal sites serving multiple local municipalities, regulate disposal activities, and ensure compliance with environmental standards. The IDP for 2025/26 identifies **solid waste management and regional infrastructure** as a key district responsibility and strategic priority, emphasising environmental sustainability and service continuity for the Overberg region.

In addition, the Waste Licence conditions require the ODM to divert **100% of organic waste by 2027**, necessitating the planned **Organic Waste Diversion Plant** and expansion of the composting site that form integral components of the Cell 5 development package.

2. Justification for Cell 5A Development

2.1 Impending Airspace Shortage and Service Continuity Risks

Cell 4 will reach capacity by **late 2026**, and without construction of Cell 5A, there will be **no legal disposal airspace** for the district. Overfilling is prohibited by licence conditions, making new cell development a regulatory and operational imperative rather than a discretionary project.

2.2 Regional Demand and Growing Waste Volumes

Three local municipalities currently depend on Karwyderskraal, with Cape Agulhas recently added through a 2024 SLA. Waste volumes are increasing due to both population growth and the closure of smaller, non-compliant local landfills, as highlighted in the IDP's environmental and infrastructure assessments.

2.3 Environmental Compliance and Risk Mitigation

The design of Cell 5 complies with the Class B liner standards of the 2013 Norms & Standards, incorporating:

- Composite liners
- HDPE geomembranes
- Leachate drainage systems
- Groundwater and stormwater protection measures

These are required to prevent contamination of sensitive downstream ecosystems such as the Botrivier Lagoon, as confirmed by the geotechnical, geohydrological and water quality monitoring assessments.

Long-term monitoring shows **no significant deterioration** in groundwater quality since 2002, and the continued protection of this aquifer requires uninterrupted, engineered containment capacity for future waste streams.

2.4 Alignment with Strategic Planning (IDP, WCIF 2050, G4J)

The project supports:

- **District IDP 2025/26** priorities on waste management, environmental resilience and infrastructure development.
- **WCIF 2050** principles of sustainable infrastructure, climate resilience and integrated regional systems.
- Provincial **Growth for Jobs (G4J)** strategy through green economy transitions (organic waste diversion, engineered regional waste capacity).

2.5 Economic and Operational Justification

Cell 5 provides **1.5 million m3** of airspace, securing 14-15 years of regional disposal capacity based on updated master planning, population growth and increasing regional waste generation.

The regional shared-services model is cost-effective, reduces duplication of infrastructure, and ensures stable revenue streams through SLAs. The landfill's strong audit performance (98.97% compliance in 2024) further supports continued investment in well-managed waste infrastructure.

2.6 Consequences of Not Proceeding

If Cell 5A is not constructed:

- ODM will breach waste licence conditions.
- Municipalities will have **no compliant regional landfill**, causing operational disruption and environmental violations.
- Waste may need emergency diversion to distant landfills at significant financial and environmental cost.
- Non-compliance with the Waste Act, Municipal Structures Act and IDP obligations becomes unavoidable.

This constitutes a critical municipal service risk.

Conclusion

The development of **Cell 5A at Karwyderskraal** is **urgently required** to ensure regional waste disposal capacity, maintain environmental protection, comply with statutory obligations, and support sustainable development across the Overberg District. The need is well-documented in engineering reports, environmental assessments, and strategic district planning instruments, with a hard deadline of **October 2026** for commissioning to avoid service disruption.

1.2 Project Scope

This project proposes the next phase of development of the existing Karwyderskraal Landfill Facility viz.:

- . Construction of the next disposal cell (Cell 5A);
- . Construction of a new Organic Waste Diversion Plant;
- . Extension of the composting facility; and
- . Extension of Entrance Road.

2. Objectives & Key Focus Areas

Objective	Key Focus Area
Ensure Continuous Regional Waste Disposal Capacity	• Prioritising Infrastructure for Maximum Impact • Strengthening Municipal Infrastructure
Comply with National Environmental Legislation & Waste Licence Conditions	• Prioritising Infrastructure for Maximum Impact • Strengthening Municipal Infrastructure • Enhancing Private Sector Partnerships • Innovation & Futures Planning • Addressing Climate Change & Sustainability
Reduce Environmental Impact & Enhance Pollution Control	• Strengthening Municipal Infrastructure • Addressing Climate Change & Sustainability
Support the District's Organic Waste Diversion Targets	• Prioritising Infrastructure for Maximum Impact • Strengthening Municipal Infrastructure

Objective	Key Focus Area
Advance Regional Waste Management Efficiency	• Prioritising Infrastructure for Maximum Impact • Strengthening Municipal Infrastructure
Align with District Strategic Planning & Provincial Infrastructure Frameworks	• Prioritising Infrastructure for Maximum Impact • Strengthening Municipal Infrastructure • Enhancing Private Sector Partnerships • Innovation & Futures Planning • Addressing Climate Change & Sustainability
Promote Environmental and Social Sustainability	• Prioritising Infrastructure for Maximum Impact • Strengthening Municipal Infrastructure • Enhancing Private Sector Partnerships • Innovation & Futures Planning • Addressing Climate Change & Sustainability
Strengthen Operational Reliability, Monitoring & Long-Term Stability	• Innovation & Futures Planning

3. Project Timeline & Cost

Estimated Duration	1 Year(s) & 8 Month(s)
Estimated Start Date	31 Mar 2025
Estimated Cost	R 80.195M

4. Project Stage-0 Submission & Approval

Submitted By	
Submitted On	
Signed By	
Approved On	

5. Environmental & Social Considerations

5.1 Environmental Considerations

- Air, water, and soil pollution from industrial and agricultural activities
- Environmental Authorisation Requirements
- Greenhouse gas emissions and deforestation contributing to climate change
- Overuse of natural resources leading to scarcity and degradation
- Loss of biodiversity due to habitat destruction and fragmentation
- Proper waste management to reduce pollution and health risks
- Sustainable water management to protect quality and prevent scarcity
- Preservation of ecosystem services like clean air, water, and climate regulation
- Land Use & Zoning Compliance

5.2 Social Considerations

- Respect for human rights including labor, land, and indigenous rights

- Assessment of community impacts such as displacement and livelihood loss
- Protection of health and safety from environmental hazards
- Preservation of cultural heritage sites and artifacts
- Promotion of social equity and fair distribution of development benefits
- Engagement with stakeholders throughout the project lifecycle
- Fair labor practices including wages, hours, and working conditions
- Support and compensation for involuntary resettlement

6. Regulatory & Environmental Approvals

6.1 National Level

- Department of Forestry, Fisheries and the Environment (DFFE): Responsible for environmental management, conservation, and protection in South Africa
- South African National Biodiversity Institute (SANBI): Plays a leading role in biodiversity management and research
- Environmental Management Inspectors (EMIs): Responsible for compliance and enforcement of environmental regulations
- National Environmental Management Act (NEMA): Governs environmental management and authorization processes, including Environmental Authorizations (EAs)
- Environmental Management Frameworks (EMFs): Strategic planning tools for land-use and environmental management decisions

6.2 Provincial and Local Levels

- Provincial Environmental Departments: Implement and enforce environmental regulations within provinces
- Municipalities: Play a role in environmental management, especially in land-use planning and development applications

6.3 Other Relevant Entities

- Environmental Assessment Practitioners Association of South Africa (EAPASA): Voluntary certification body for Environmental Assessment Practitioners
- Councils for the Built Environment Professions (CBEP): Regulates professions involved in the built environment
- Wildlife and Environment Society of South Africa (WESSA): Non-profit organization involved in environmental conservation and education

7. Identify Key Stakeholders

7.1 Government

- Department Of Infrastructure
- Provincial Treasury
- Local Government
- Department of Environmental Affairs and Development Planning

7.2 State-Owned Entities

7.3 Private Sector

- Construction Companies
- Engineering Firms
- Financial Institutions

7.4 Civil Society

- Civil society organizations advocating for community needs

7.5 Other Stakeholders

8. WCG Sector Priorities

Outcomes	Social	Energy & Water	Economic	Technology	Ecological
Investment in social infrastructure improves access to health, education, social development, and recreation opportunities	Long Term 15-30 YRS				

9. Infrastructure Type

9.1 Hard

9.2 Soft

9.3 Critical

10. Project Stage-1 Submission & Approval

Submitted By	
Submitted On	
Signed By	
Approved On	

11. Geo Location

Geo Location	
Latitude	
Longitude	

12. Procurement Planning

- **Decentralized Preference Criteria** - Municipalities
- **Designated Groups** - Historically disadvantaged individuals, Women-owned businesses, Youth-owned businesses, Persons with disabilities
- **Broad-Based Black Economic Empowerment (B-BBEE)**

13. Procurement Action

14. Social Impact

15. Property Availability

Has the land for the site been identified?: Yes
Remarks: Existing site

16. Project Stage-2 Submission & Approval

Submitted By	
Submitted On	

Signed By	
Approved On	

17. Background & Justification

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18. Economic and Social Justification

- **Poverty reduction**
- **Job creation**
- **Inclusive growth**
- **Reducing inequality**
- **Improving access**
- **Ensuring Cost-Effective Regional Waste Management**

Karwyderskraal is a shared regional facility serving Overstrand, Theewaterskloof, and Cape Agulhas Municipalities under formal SLAs. The shared service model lowers per-ton disposal costs, avoids duplication of landfill infrastructure, and enables long-term financial planning. Evidence: The Prospectus highlights that shared infrastructure “reduces duplication and operational costs,” with predictable budgeting through annual tariff adjustments and rehabilitation charges.

- **Avoiding High Costs of Emergency or External Waste Disposal**

If Cell 5A is not commissioned by October 2026, Karwyderskraal must close for waste acceptance. This would force municipalities to transport waste to distant, more expensive facilities—creating immediate financial burdens and major disruptions to essential services. Evidence: Prospectus warns that Cell 4 will reach capacity by Nov 2026, and without Cell 5A “Karwyderskraal would close for waste acceptance.”

- **Long-Term Asset Value and Optimized Airspace**

Cell 5 provides ±1.5 million m³ of airspace, extending the site's lifespan by 14–15 years and supporting the district's waste management strategy until at least 2076 when combined with future cells. Evidence: Master plan projections confirm lifespan until July 2076 based on waste growth and diversion rates.

- **Stimulating Local Economic Activity**
Construction of Cell 5A, the Organic Waste Diversion Plant, composting expansions, and infrastructure upgrades will create local job opportunities, contractor involvement, material supply demands, and indirect economic spin-offs for nearby towns (Hermanus, Botrivier, Caledon, Grabouw). Evidence: Prospectus states that the project “provides a stimulus for the regional economy with the employment of local labour.”
- **Financial Sustainability Through Diversion and Efficiency**
The diversion of organic waste reduces the long-term cost of landfill operations by lowering waste volumes, extending airspace, and reducing leachate generation. Evidence: ODM’s licence requires 100% organic diversion by 2027, and the current diversion rate (±49%) already reduces pressure on landfill capacity.
- **Alignment with Provincial Economic Strategies**
The project supports the Western Cape’s Growth for Jobs (G4J) strategy by enabling green-economy initiatives such as waste diversion and responsible infrastructure expansion. It also aligns with the WCIF 2050 Panoptic Principles, promoting resilient, equitable, and environmentally-sound infrastructure systems. Evidence: The Prospectus directly aligns the project with G4J and WCIF 2050 objectives.
- **Protecting Public Health and Environmental Quality**
Karwyderskraal’s engineered cells prevent groundwater contamination and manage leachate responsibly. Continuity of compliant disposal services protects communities from illegal dumping, waste accumulation, and harmful health outcomes. Evidence: Long-term monitoring shows no significant deterioration in groundwater quality over 20 years, proving effective pollution control.
- **Meeting a Critical Public Service Obligation**
Waste disposal is a statutory service mandated to the District under the Municipal Structures Act. Ensuring uninterrupted service delivery is essential for public health, dignity, and quality of life, particularly for fast-growing communities. Evidence: IDP notes that solid waste disposal is a core function of the District, vital for integrated service delivery.
- **Improving Social and Environmental Equity**
Regional waste infrastructure ensures that small or under-resourced municipalities (e.g., Cape Agulhas) have equitable access to environmentally-safe disposal services without bearing the full cost of operating their own landfills. Evidence: Cape Agulhas began using Karwyderskraal after a new SLA in 2024, improving service equity across the district.
- **Supporting Community Trust and Transparency**
ODM maintains high compliance levels, transparent public reporting, and regular community engagement through IWMPs, monitoring committees, and audits. This strengthens public confidence in municipal environmental governance. Evidence: The landfill achieved 98.97% compliance in the Nov 2024 audit.
- **Job Creation, Skills Development and Local Participation**
Construction, operations, and expanded diversion activities create employment for local communities, including opportunities in waste sorting, composting operations, civil construction, and maintenance. The district prioritises local labour and skills upliftment in line with IDP social development goals. Evidence: IDP emphasises job creation, human development, and social upliftment as strategic pillars.
- **Improving Environmental Awareness and Behaviour**
The divert-and-compost model encourages communities to adopt more sustainable waste practices. Over time, this reduces household waste volumes and enhances community knowledge and participation in recycling and composting programmes. Evidence: Prospectus highlights ongoing public education as necessary for diversion success.
- **Supporting Climate Resilience**
The IDP includes a dedicated chapter on climate resilience. Organic diversion, stormwater management, and sustainable landfill engineering reduce greenhouse gas emissions and improve resilience against extreme weather events. Evidence: IDP Climate Resilience chapter integrates climate adaptation into all service delivery frameworks.

19. Geographic Coverage

- 19.1 Regions
- Overberg

19.2 Municipalities

District	Municipalities
Overberg District Municipality	Cape Agulhas, Overstrand, Swellendam, Theewaterskloof

19.3 Communities

District	Communities
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20. Sector-specific analysis

- **Waste Management and Environmental Infrastructure Sector**
Sector Mandate

The Waste Management sector ensures:

- Safe disposal of general waste at licensed facilities.
- Protection of natural resources (surface water, groundwater, ecosystems).
- Implementation of the waste hierarchy: **avoid ? reduce ? reuse ? recycle ? recover ? dispose**.

Alignment with national, provincial, and municipal environmental objectives.

- **Drivers of Demand**

Sector Trends and Drivers

2.1 Increasing Waste Generation and Urban Growth

Waste volumes in the Overberg are rising due to:

- Population growth (359 446 residents in 2022 census, exceeding MERO projections).
- Urban expansion in Overstrand, Theewaterskloof, and Cape Agulhas.
- Pressure on smaller municipal landfills nearing closure.

Evidence:

Waste volumes at Karwyderskraal increased by **12.3%** between 2023 and 2024.

2.2 Transition Toward Organic Waste Diversion

National and provincial policy requires:

- **100% diversion of organic waste from landfill by 2027.**
- Development of mechanical separation, composting, and alternative treatment infrastructure.

Evidence:

ODM currently achieves **±49% organic diversion** and must intensify efforts by developing the Organic Waste Diversion Plant.

2.3 Strengthening Environmental Safeguards

Environmental governance requires:

- Composite liners, leachate capture, and stormwater controls.
- Groundwater and surface water monitoring.
- Gas emissions tracking.

Evidence:

20 years of monitoring show **no significant deterioration** in groundwater quality at Karwyderskraal.

2.4 Infrastructure Aging and Capacity Limits

Older municipal landfill sites face:

- Non-compliance issues.
- Reduced capacity due to age and insufficient engineering.
- High rehabilitation and closure liabilities.

Evidence:

Karwyderskraal is the only compliant, permitted regional site available to absorb waste growth.

- **Risks and Challenges**

Sector Challenges

3.1 Imminent Loss of Disposal Capacity

Cell 4 will reach capacity by **November 2026**, threatening:

- Waste service interruption.
- Non-compliance with licence conditions.

- Need for emergency waste transfer to distant landfills.

Evidence:

Prospectus warns that **Karwyderskraal would close for waste acceptance** without Cell 5A readiness.

3.2 Financial Constraints Across Municipalities

Smaller municipalities have limited capital to develop their own engineered landfills, increasing reliance on shared infrastructure.

Evidence:

Prospectus notes that ODM must secure loans and tariff structures to fund capital works.

- Class B engineered cells.
- Leachate and stormwater improvements.
- Independent external audits.

Evidence:

Karwyderskraal achieved **98.97% compliance** in its latest audit, requiring continued investment.

3.4 Climate Vulnerabilities

Flooding, extreme rainfall, and increased organic waste decomposition can elevate:

- Leachate generation.
- Erosion risk.
- Greenhouse gas emissions.

Evidence:

IDP emphasises climate resilience as a key component of infrastructure planning.

• Sector Opportunities

Sector Opportunities

4.1 Regional Integration and Economies of Scale

Karwyderskraal serves three municipalities under SLAs, enabling:

- Affordability through shared fixed costs.
- Consolidated waste processing and diversion programmes.
- Reduced duplication of infrastructure.

Evidence:

Prospectus highlights shared infrastructure efficiencies and the new SLA with Cape Agulhas.

4.2 Green Economy and Job Creation

Waste diversion, composting, and infrastructure development generate local jobs and emerging-sector opportunities:

- Compost production.
- Waste sorting services.
- Construction and engineering employment.

Evidence:

Prospectus emphasises local labour uptake during construction.

4.3 Climate-Resilient Infrastructure

Engineered stormwater channels, composite liners, and monitoring networks reduce climate-related risks.

Evidence:

Design Report details engineered solutions to protect surface and groundwater.

4.4 Strengthening District Environmental Governance

Consistent monitoring, compliance reporting, and community engagement build public trust.

Evidence:

IDP and Prospectus outline mechanisms for public participation and reporting.

21. Approval Bodies

21.1 Provincial Government Departments

- Department Of Infrastructure
- Provincial Treasury
- Local Government
- Department of Environmental Affairs and Development Planning
- Municipalities
- Municipal Planning, Engineering, Transport, and Environmental Units

22. Enviornmental Considerations

23. Social Considerations

23.1 Inclusive Economic Development

- Encourages job creation through public procurement and infrastructure projects
- Supports SMMEs, women- and youth-owned enterprises

23.2 Public Participation and Equity

- Ensures community involvement in planning and decision-making
- Promotes equitable access to services and opportunities

23.3 Expanded Public Works Programme (EPWP)

- Provides short-term employment and skills development
- Targets vulnerable groups including youth, women, and persons with disabilities

24. Investment Needs

24.1 Green Economy

- Waste-to-energy and recycling initiatives.

25. Policy Incentives

25.1 Sector-Focused Incentives

- Green Economy: Incentives for renewable energy, water efficiency, and waste-to-energy projects.

25.2 Investment Ecosystem Support

- Municipal Investment Readiness Programme: Helps municipalities prepare for and attract investment.
- Western Cape Infrastructure Pipeline / DOI support
- Provincial Treasury PPP and project preparation support
- WCIF 2050 Panoptic Evaluation framework

26. Scale And Complexity

26.1 Total Addressable Market (TAM)

26.2 Served Available Market (SAM)

26.3 Demand Forecasting

26.4 Size

Project Type	Routine Project
Project Size	Large - Total of 30 Mill or more

27. Challenges

27.1 Financial Complexity

Financial Challenges

- **High Capital Costs:**
 - Cell 5 construction involves significant expenditure on geosynthetics, clay, sand, drainage systems, and pumping infrastructure.
 - Estimated quantities: ±395,000 m³ earthworks, ±93,000 m² HDPE liner, ±165,000 m² geotextile.
- **Budget Constraints:**
 - ODM faces financial sustainability risks due to limited revenue streams.
 - Heavy reliance on waste management tariffs and government grants.
- **Long-Term Liabilities:**
 - Rehabilitation and post-closure monitoring for 30 years.
 - Ring-fenced funds for future closure and environmental compliance.
- **Cost of Compliance:**
 - Continuous audits, monitoring, and reporting add operational overhead.
- **Funding Gaps:**
 - Underfunded mandates for environmental and disaster management.
 - Need for PPPs and alternative revenue sources (e.g., crematorium, waste-to-energy).

27.2 Operational Complexity

Operational Challenges

- **Capacity & Resource Constraints:**
 - Aging fleet and high maintenance costs.
 - Shortage of technical staff for specialized landfill operations.
- **Waste Diversion Targets:**
 - Organic waste ban by 2027 requires accelerated composting and beneficiation solutions.
- **Regulatory Compliance:**
 - Quarterly internal audits and annual external audits demand robust systems.
 - IPWIS reporting and adherence to multiple legislative frameworks.
- **Risk Management:**
 - Climate change impacts (flooding, drought) threaten infrastructure integrity.
 - Emergency response readiness for fires, hazardous waste incidents.
- **Community & Stakeholder Engagement**
 - Maintaining transparency and trust through Monitoring Committees and IDP consultations.
- **Operational Continuity:**
 - Load-shedding mitigation (backup power for weighbridge and pumps).
 - Managing leachate during peak rainfall periods.

27.3 Technical challenges

Technical Challenges

- **Engineering Complexity:**
 - Design and construction of **Cell 5** requires compliance with **National Norms & Standards (2013)** for Class B landfills.
 - Advanced liner systems: multi-layer composite (HDPE geomembrane, clay layers, geotextiles) with strict permeability and stability requirements.
 - **Leachate & Gas Management:**
 - Integration of under-drainage monitoring systems for leakage detection.
 - Pumping systems and redundancy for leachate removal.
 - **Slope Stability:**
 - Global and veneer stability analysis using GEO5 software; reinforcement grids needed for long slopes.

- **Environmental Safeguards:**
 - Groundwater and surface water protection through engineered barriers.
 - Compliance with climate resilience and stormwater diversion standards.
- **Specialized Testing & QA:**
 - Laboratory and on-site permeability tests.
 - Interface shear strength and geosynthetic conformance testing.
- **Dependency on Skilled Expertise:**
 - Limited availability of accredited labs for triaxial tests.
 - Need for qualified engineers for CQA/CQC during construction.

28. Phases

29. Project Stage-3 Submission & Approval

Submitted By	
Submitted On	
Signed By	
Approved On	