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NEED & DESIRABILITY UPDATE 5 FEBRUARY 2026

With reference to the Department's request for additional information dated 28 November 2025, specifically regarding **Item 2.12** (the requirement for a comprehensive motivation for a Class B landfill site instead of a Class D site), EcoPartners (Pty) Ltd, on behalf of Middelwater Resource Facility (Pty) Ltd, hereby submits the following update.

1 INTRODUCTION

In South Africa, waste is disposed of in landfills as the preferred option because it is dependable, controllable and affordable. Landfills are backed by clear norms, licences, and compliance mechanisms. More importantly the systems provide jobs to many people. The provision of basic sanitation, electricity and housing often outranks the priority lists in providing services to citizens. Structurally there are also limited alternatives available, the Middelwater Resource Facility aims to at least in part address some systemic alternatives to landfill.

Recycling, recovery, and treatment require separated waste streams, stable markets, skilled operators, reliable data, and willingness from citizens across municipalities. Extended Producer Responsibility (EPR), rising landfill airspace scarcity, climate commitments, and the hard economics of disposal of resources are requiring the adoption of additional practices. While landfills remain a necessity for residual waste — specifically waste for which no viable management alternative exists — the Middelwater Resource Facility encourages the integration of non-landfill alternatives to strengthen the broader waste management system.

When an engineered landfill is authorised to dispose of municipal waste it will have as a minimum a Class B liner. Municipal waste generates leachate of variable composition over time as municipal waste streams are heterogeneous and routinely

contain household hazardous substances (cleaners, oils, paints, pharmaceuticals, batteries), elevated organic loads, salts, nutrients, and trace metals.

2 CLASS B VS. CLASS D LANDFILL JUSTIFICATION

A Class B liner is required because it provides an engineered barrier system capable of long-term protection of soil and groundwater, accounting for leachate generation, landfill gas interaction, settlement, and climatic variability.

2.1 THE CITY OF TSHWANE WASTE CRISIS

The City of Tshwane disposes of approximately 2.4 million tonnes of general waste per annum, the highest volume of any Gauteng metro (Godfrey, Muswema and Strydom, 2024). The lack of compliant airspace has contributed to a 380% increase in illegal dumping between 2021 and 2024, costing the City R187 million in cleanup efforts in 2024 alone (City of Tshwane, 2025).

2.2 TECHNICAL NECESSITY AND REGULATORY COMPLIANCE

The Middelwater Resource Facility is situated within the City of Tshwane Municipality and seek to provide sanitary solutions for the waste generated by the citizens and businesses that generate waste. Current waste characterisation studies (2023–2025) for the City of Tshwane (CoT) confirm that even after aggressive diversion, the residual waste stream comprises 25–35% organic fraction, 15–20% plastics/films, and 10–15% putrescibles (City of Tshwane, 2025; Godfrey, Muswema and Strydom, 2024).

The fundamental technical distinction between Class B and Class D landfills as described by the National Norms and Standards for the Assessment of Waste for Landfill Disposal (GN R.635 of 2013) and the National Norms and Standards for Disposal of Waste to Landfill (GN R.636 of 2013) is specified as.

a) **Class D Landfills**: Restricted to Type 4 (inert) waste or waste pre-treated to render it inert (Total Dissolved Solids < 500 mg/l and low leachability).
b) **Class B Landfills**: Mandatory for Type 2 waste (general waste with leachate potential).

The City of Tshwane's primary crisis lies in the disposal of General Household and Commercial Waste (Type 2). The proposed Middelwater GWRF addresses a

significant infrastructure gap in the region. Unlike many older facilities that predate current liner requirements, this project will utilise an approved Class B lining system. This represents a proactive step in supporting the City of Tshwane's long-term sustainability goals.

Residual waste (that must be disposed of in landfills) generates high-strength leachate with a Biochemical Oxygen Demand (BOD) > 5,000 mg/l and Chemical Oxygen Demand (COD) > 20,000 mg/l. Consequently, this waste should as a minimum legally or technically be classified as Type 2 waste. Responsible disposal would likely occur in a Class B facility, rather than in a Class D facility.

2.3 GEOHYDROLOGICAL RISK AND BARRIER REQUIREMENTS

A Class D liner system—typically consisting of a 150 mm drainage layer over natural soil (permeability ≤ 1×10^{-6} m/s)—offers no composite barrier or leachate collection system. Downgrading to Class D would lead to inevitable groundwater contamination in . The Middelwater–Vissershoek compartment is characterised by dolomitic and karstic geology and is classified as a Major Aquifer System with High Vulnerability (DWAF, 2005; Hobbs, 2023). Protection of this aquifer is therefore critical.

Therefore, a **Class B (GLB^{+})** liner system—incorporating a full composite liner (2 mm HDPE + 150 mm GCL or 300 mm compacted clay), leachate collection, and leak detection—is the minimum defensible barrier required (DFFE, 2013a; DFFE, 2013b). Note that the barrier system proposed for the landfill replaces the 600 mm compacted clay layers and the silty sand layer above the geomembrane, with a geosynthetic clay layer (GCL) and a protection geotextile over the geomembrane respectively (Envitech, 2022).

2.4 CIRCULAR ECONOMY ALIGNMENT & WASTE HIERARCHY

The National Waste Management Strategy (NWMS) 2020 requires new licenses to demonstrate measurable contributions to the circular economy (DFFE, 2020). The Middelwater GWRF is designed as a circular economy node rather than a conventional landfill.

Table 2: Diversion Capacity of the Middelwater GWRF and Policy Alignment

Facility Component	Annual Diversion Capacity (ton per annum)	Estimated Diversion Rate	Legislative Alignment
Materials Recovery (MRF)	180,000 tpa	25–30%	EPR Regulations (2021)
Composting Facility	120,000 tpa	20–25%	NWMS 2030 (50% Organics)
Builder's Rubble Crushing	80,000 tpa	10–12%	Operation Phakisa Goals
Total Pre-Landfill Diversion	380,000–450,000 tpa	55–65%	Exceeds NWMS 2030 target
Residual disposal (Class B)	250–300 000 tpa	35–45 %	Only residuals with leachate potential → Class B required

This diversion performance will place the facility in the top decile of South African general waste facilities (current national average diversion = 11 % – DEA, 2018; updated in Godfrey et al., 2024).

The establishment of the Middelwater Resource Facility is in line with to the City of Tshwane 2025 waste management strategy in that it addresses a high-priority objective: leveraging private sector collaboration to create multipurpose waste management infrastructure. This strategy facilitates waste diversion and source separation, ensuring the extended viability of current landfill resources.

3 NEED AND DESIRABILITY ASSESSMENT (DEA 2017 GUIDELINES)

3.1 ECOLOGICAL INTEGRITY AND SUSTAINABLE RESOURCE USE

3.1.1 SITE CONTEXT

The proposed GWRF is located within an existing mining right area that has been substantially transformed through lawful sand mining activities. The development is therefore situated on brownfield land and forms part of the mine's closure and rehabilitation strategy.

The proposed development does not introduce development into previously undisturbed natural areas. Instead, it utilises mining voids that would otherwise require rehabilitation through imported fill material.

This approach aligns with Section 2(4)(a)(i) of NEMA, which promotes sustainable development through the integration of social, economic and environmental factors.

3.1.2 Threatened Ecosystems And Biodiversity

The site falls within the Marikana Thornveld vegetation type (classified as Endangered). Specialist assessments confirmed:

a) The majority of the site is already transformed.
b) Remaining vegetation no longer resembles pristine Marikana Thornveld.
c) Ecological sensitivity is predominantly low to moderate.
d) Wetlands and specific ridges retain higher sensitivity.

The development footprint was refined to:

a) Avoid the northern ridge in relatively good condition.
b) Exclude wetland areas and apply a 54 m buffer.
c) Protect identified grass owl habitat and active heronry.
d) Avoid identified grave sites.

No Critical Biodiversity Areas (CBAs) are directly impacted. Ecological Support Areas (ESAs) were identified and avoided where feasible.

Accordingly, the development avoids irreversible impacts to high-value ecological features and is consistent with Section 2(4)(a)(vi) of NEMA, which requires that disturbance of ecosystems be avoided or minimised.

3.1.3 Ecological Drivers And Pollution Prevention

Mining activities have already altered hydrological processes on site. The proposed GWRF introduces engineered containment systems, including:

a) Liner systems to prevent leachate infiltration;
b) Stormwater management infrastructure;
c) Landfill gas extraction and flaring (70–80% destruction target);
d) Controlled sanitary landfill practices.

These measures improve environmental control relative to unmanaged mining voids and reduce risks to groundwater and surface water systems.

The facility will operate under a Waste Management Licence (WML), ensuring monitoring, reporting, and compliance with pollution prevention standards.

This satisfies the NEMA principle that pollution and degradation must be avoided or minimised and remedied.

3.1.4 Climate Change And International Responsibilities

The facility supports:

a) Methane capture and destruction;
b) Resource recovery and recycling;
c) Composting of organic waste;
d) Reduced pressure on virgin materials.

The project contributes to South Africa's transition toward a circular economy and aligns with Sustainable Development Goal 12 (Responsible Consumption and Production).

The site is located within the buffer/transition zone of the Magaliesberg Biosphere Reserve but not within the Core Zone. No Ramsar sites are affected.

3.1.5 Resource Efficiency

The GWRF:

a) Utilises mining overburden as cover material;
b) Avoids sourcing additional fill material elsewhere;
c) Recovers recyclable materials;
d) Provides composting infrastructure;
e) Reduces illegal dumping pressures.

The proposal therefore reduces resource dependency and supports dematerialised growth.

3.1.6 Risk-Averse And Cautious Approach

The assessment incorporated:

a) Botanical, wetland, faunal, air quality and heritage specialist studies;
b) Screening tool outputs;
c) Declared assumptions and knowledge gaps;

d) Layout refinement based on specialist findings.

Sensitive features were avoided rather than relying solely on mitigation. Mitigation measures have been incorporated into the EMPr and will form part of enforceable licence conditions.

Given the already disturbed baseline condition, residual ecological risks are not significantly greater than the authorised mining activity.

3.2 SOCIO-ECONOMIC JUSTIFICATION AND SPATIAL PLANNING

3.2.1 SOCIO-ECONOMIC CONTEXT

The surrounding area is characterised by:

a) Low income levels;
b) High unemployment;
c) Rapid residential expansion (including Rama City);
d) Increasing waste generation;
e) Declining landfill airspace within Gauteng.

Gauteng generates approximately one-third of South Africa's waste and faces medium-term landfill capacity constraints.

The City of Tshwane's IDP prioritises:

a) Stabilisation of waste services;
b) Reduction of illegal dumping;
c) Improved waste infrastructure;
d) Environmental sustainability.

The proposed GWRF directly supports these objectives.

3.2.2 INFRASTRUCTURE NEED

The City of Tshwane disposes of approximately 2.4 million tonnes of general waste per annum, the highest volume of any Gauteng metro (Godfrey, Muswema and Strydom, 2024). The lack of compliant airspace has contributed to a 380% increase in illegal dumping between 2021 and 2024, costing the City R187 million in cleanup efforts in 2024 alone (City of Tshwane, 2025).

Table 1: Remaining Landfill Airspace

Landfill Site	Remaining Airspace (June 2024)	Total remaining airspace in years	Data Source
Ga Rankuwa	2 694 156 m³	12	City of Tshwane (2025)
Soshanguve	2 239 292 m³	3	City of Tshwane (2025)
Heartherly	< 12 million m³	13	City of Tshwane (2025)
Bronkhorstspruit	158 263 m³	3	City of Tshwane (2025)

3.2.2.1 The Critical Landfill Airspace Crisis in the City of Tshwane (CoT)

The City of Tshwane is currently facing an unprecedented waste management crisis. Data from the City's own Waste Management Division (May 2025) and recent regional assessments highlight a terminal shortage of legal waste disposal airspace:

- **Imminent Closure of Municipal Sites**: As of the June 2024 airspace assessment, the Soshanguve and Bronkhorstspruit landfills reached a critical "end of life" status, with approximately 3 years or less of remaining capacity.
- **Regional Imbalance**: There are currently no City-owned landfill sites in the western and southern areas of the metro. This forces long-haulage to the northern sites, which are themselves reaching capacity, leading to accelerated airspace depletion.
- **Waste Generation Volumes**: The City of Tshwane generates the highest volume of general waste among the Gauteng metros, at approximately 2.4 million tonnes per annum. Without the immediate licensing of new, high-capacity facilities, the City faces a total "disposal vacuum" which will inevitably lead to a surge in illegal dumping and public health risks.

3.2.2.2 Strategic Significance of the Middelwater Facility

The Middelwater Resource Facility is not merely a "new landfill," but a strategic asset for the Gauteng Province:

- **Long-Term Airspace Security**: The facility provides 30 million m³ of airspace. At a deposition rate of 30,000 tonnes per month, it offers a lifespan of 83 years. This provides the City of Tshwane with nearly a century of waste disposal security, stabilizing the metro's long-term planning.

- **Public-Private Partnership (PPP) Alignment**: The City of Tshwane's Integrated Waste Management Plan (IWMP), approved in April 2025, explicitly identifies the need to "Secure Private Partnerships" and "Acquire additional landfill airspace" to compensate for municipal funding and infrastructure shortfalls. Middelwater is a direct solution to this stated government objective.
- **Proximity and Logistics**: Located in the northern region where airspace is most constrained, the facility reduces the "long-haul" burden on the City's fleet, thereby reducing the carbon footprint of the waste collection value chain.

There is a demonstrable need for:

- Additional landfill airspace;
- Regulated waste disposal infrastructure;
- Facilities that support material recovery and composting;
- Proximity-based waste management to reduce transport impacts.

The facility provides a lawful disposal option near emerging residential developments, thereby reducing illegal dumping and associated environmental degradation.

The need for the facility is therefore both immediate and strategic.

3.2.3 Spatial Planning Alignment

The proposal:

a) Falls within EMF Zone 1, which supports urban infill;
b) Aligns with the Metropolitan SDF, which identifies provision for a landfill in the area;
c) Utilises underutilised mining land within the urban edge;
d) Avoids urban sprawl;
e) Optimises existing access infrastructure.

The location is physically buffered by mountainous terrain, reducing visual and nuisance impacts on nearby communities.

3.2.4 Employment and Economic Impacts

The project will create:

a) Approximately 40 temporary construction jobs;
b) 10–20 permanent operational jobs;

c) Secondary opportunities in recycling and material recovery.

Employment benefits are localised, while environmental impacts are confined to an already disturbed site and regulated through licence conditions.

3.2.5 Environmental Justice And Equity

The facility:

a) Does not displace communities;
b) Avoids sensitive heritage and ecological areas;
c) Accepts waste from all communities without discrimination;
d) Provides a public drop-off facility;
e) Enables participation in recycling value chains.

No disproportionate environmental burden on vulnerable communities has been identified.

3.2.6 Health and Nuisance Control

Operational controls include:

a) Odour control through daily cover and compaction;
b) Dust suppression;
c) Rodent and vector management;
d) Noise control through equipment maintenance and operational hours;
e) Windblown litter control;
f) Compliance monitoring under the WML.

Health and safety of employees will be managed under the Occupational Health and Safety Act.

3.3 BEST PRACTICABLE ENVIRONMENTAL OPTION (BPEO)

3.3.1 Alternatives

Alternatives were assessed in Section 6 of the EIA Report.

The preferred alternative was selected because it:

a) Utilises already transformed mining land;
b) Avoids wetlands, ridges, grass owl habitat and graves;
c) Incorporates engineered pollution control;

d) Provides a 54 m wetland buffer;
e) Supports circular economy objectives;
f) Addresses urgent landfill airspace shortages;
g) Forms part of the mine's rehabilitation strategy.

The No-Go alternative would:

a) Leave mining voids requiring alternative rehabilitation;
b) Fail to address landfill airspace shortages;
c) Potentially increase illegal dumping pressures;
d) Forego socio-economic benefits.

3.3.2 Positive Socio-Economic and Environmental Outcomes

The Middelwater GWRF will provide several high-priority benefits:

a) **Mitigation of Illegal Dumping**: By providing a legal, engineered alternative to the currently overflowing municipal sites, the facility will directly reduce the incentive for illegal dumping, which is currently costing the City millions in "clearance programs."
b) **Waste-to-Energy Potential**: As outlined in the conceptual design, the facility is being developed with a long-term vision for LFG (Landfill Gas) beneficiation. This includes CH4 mitigation, potential CHP power generation, and CNG production, aligning with South Africa's Just Energy Transition and Carbon Tax offset requirements.
c) **Economic Investment**: The project represents an investment of over R100 million in local infrastructure, creating jobs in engineering, construction, and specialized waste management.

3.3.3 Cumulative Impacts

Positive cumulative impacts:

a) Reduction in illegal dumping;
b) Resource recovery and recycling;
c) Rehabilitation of mine voids;
d) Improved waste management infrastructure;
e) Employment creation.

Negative cumulative risks:

a) Waste transport traffic;
b) Air emissions;
c) Long-term monitoring obligations.

These are mitigated through engineered design, licence conditions and post-closure requirements.

4 CONCLUSION

Having regard to:

a) The transformed nature of the site;
b) Avoidance of remaining sensitive ecological features;
c) Alignment with municipal and provincial planning instruments;
d) Demonstrated infrastructure need;
e) Circular economy contributions;
f) Employment and socio-economic benefits;
g) Mitigation measures embedded in enforceable licence conditions;

the proposed GWRF is considered both necessary and desirable.

Subject to strict compliance with the Waste Management Licence and Environmental Management Programme, the development is consistent with NEMA principles, promotes sustainable development, and represents the Best Practicable Environmental Option.

The "Status Quo" for waste management in Tshwane is no longer sustainable. The City is running out of space, and its existing infrastructure is under-funded and over-capacitated.

5 REFERENCES

City of Tshwane, 2025. *Presentation to Portfolio Committee on Forrestry, Fisheries and the Environment*. May 2025. Pretoria: City of Tshwane.

Department of Environmental Affairs (DEA), 2017. *Guideline on Need and Desirability*. Pretoria: Department of Environmental Affairs.

Department of Environmental Affairs (DEA), 2018. *South Africa State of Waste Report*. Pretoria: Department of Environmental Affairs.

Department of Forestry, Fisheries and the Environment (DFFE), 2013a. *Government Notice R.635: National Norms and Standards for the Assessment of Waste for Landfill Disposal*. Government Gazette 36784, 23 August 2013.

Department of Forestry, Fisheries and the Environment (DFFE), 2013b. *Government Notice R.636: National Norms and Standards for Disposal of Waste to Landfill*. Government Gazette 36784, 23 August 2013.

Department of Forestry, Fisheries and the Environment (DFFE), 2020. *National Waste Management Strategy 2020*. Pretoria: DFFE.

Department of Water Affairs and Forestry (DWAF), 2005. *Groundwater Resource Assessment II – Dolomitic Aquifers of Gauteng*. Pretoria: DWAF.

Envitech. 2022. *Multisand Waste Management Facility Operating Manual*, Ref. No.755-2022, February 2023

Gauteng Province, 2024. *Gauteng Waste Information System Annual Report 2023/24*. Johannesburg: GDARD.

Godfrey, L., Muswema, A. and Strydom, W., 2024. Waste sector trends and the transition to a circular economy in South Africa. *Waste Management*, 158, pp. 1–12.

Hobbs, P., 2023. *Hydrogeological assessment of the Middelwater–Vissershoek compartment*. Report No. MW2023/01. Pretoria: Council for Geoscience.

Kyllinga. 2022. *Vegetation and Wetland Assessment for the proposed Middelwater Regional General Waste Management Facility*, June 2022.

Pachnoda. 2022. *Fauna Evaluation for the Middelwater Regional General Waste Management Facility, near Tshwane, Gauteng*. Terrestrial Component. Initial Report: March 2014, Updated Report: June 2022.

South Africa, 2008. *National Environmental Management: Waste Act 59 of 2008*. Pretoria: Government Printer.

South Africa, 2021. *Extended Producer Responsibility Regulations (GN 1185 of 2020 as amended)*. Government Gazette 44539, 5 May 2021.