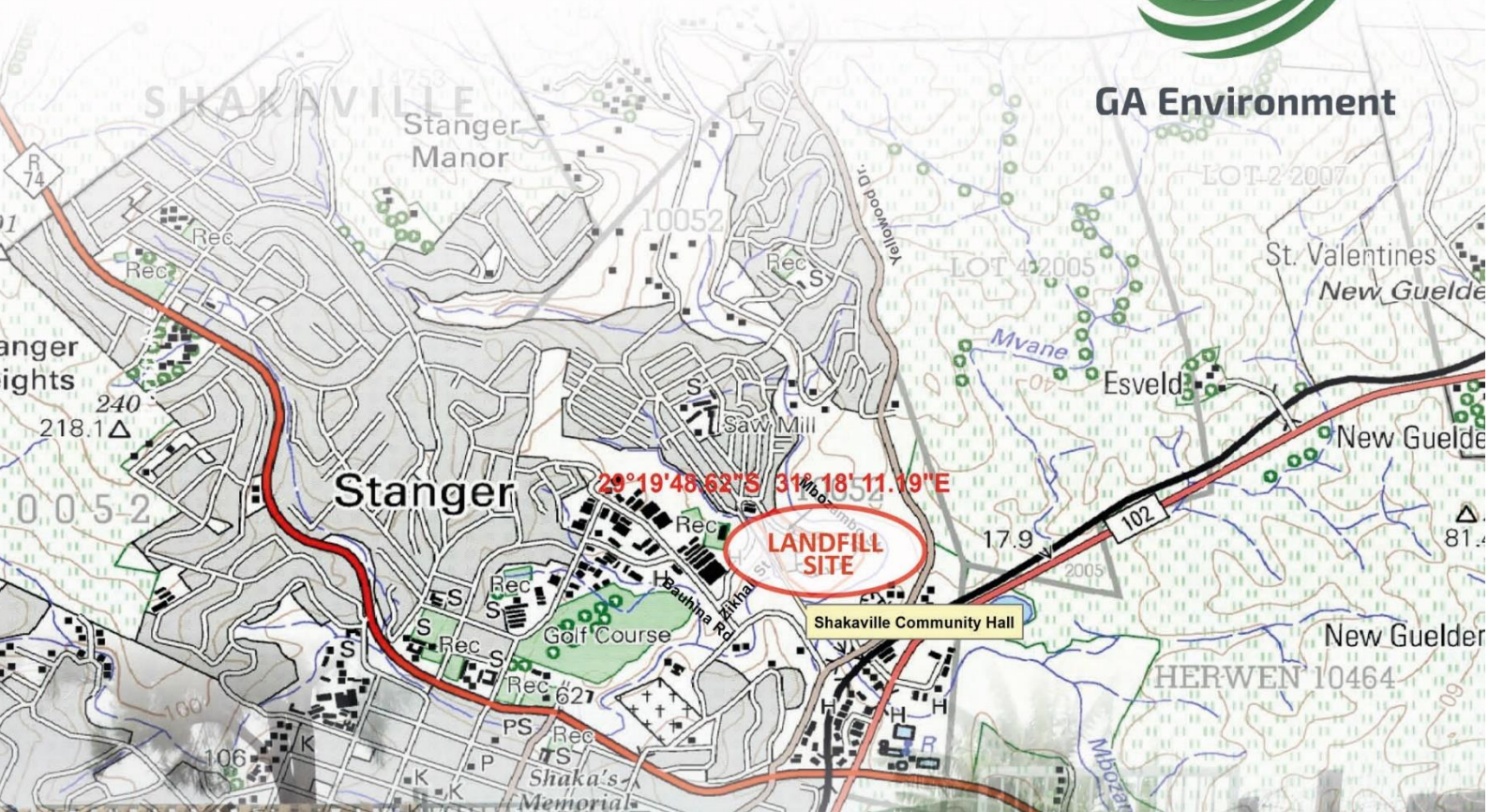




GA Environment



**DRAFT BASIC ASSESSMENT FOR THE PROPOSED DECOMMISSIONING (CLOSURE)
OF THE SHAKAVILLE LANDFILL, KWADUKUZA LOCAL MUNICIPALITY, KWAZULU
NATAL PROVINCE**

EDTEA REFERENCE NUMBER: DC29/0025/2017

JANUARY 2017

DRAFT BASIC ASSESSMENT REPORT
for
THE PROPOSED CLOSURE (DECOMMISSIONING) OF THE SHAKAVILLE LANDFILL, KWADUKUZA LOCAL MUNICIPALITY, KWAZULU NATAL PROVINCE

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PROJECT INFORMATION

Title:	Basic Assessment Process for the proposed Licensing of the Shakaville Landfill, KwaDukuza Local Municipality, KwaZulu Natal Province
Competent Authority:	KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA)
Reference No.:	DC29/0025/2017
Applicant:	KwaDukuza Local Municipality
Environmental Assessment Practitioner:	GA Environment (Pty) Ltd.
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AFFIRMATION OF ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

I **Ntsebo Mkhize**, an EAP employed by **GA Environment (Pty) Ltd** declare that the information provided in this report is correct and relevant to the activity/ project, that comments from interested and affected parties have been incorporated into this report, that there has an inclusion of inputs from Specialists and that all relevant project information was made available to interested and affected parties.



SIGNATURE OF EAP15 January 2018**DATE**

EXECUTIVE SUMMARY

1 INTRODUCTION

GA Environment (Pty) Ltd has been appointed by the Department of Environmental Affairs (hereafter DEA) to undertake the Waste Management Licencing Process for the disused Shakaville landfill. This facility is located within the jurisdiction of the KwaDukuza Local Municipality and the iLembe District Municipality in the KwaZulu Natal Province. The Shakaville landfill requires a decommissioning licence from the KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA). The disposal of waste on the Shakaville landfill commenced in the 1970's and ceased in about the year 2007. The Shakaville landfill was operating without a licence and site activities were not undertaken according to the Minimum Requirements for Waste Disposal by Landfill (Department of Water Affairs and Forestry (DWAF), 2nd Edition), the National Environmental Management Waste Act 2008 (Act No. 59 of 2008) (NEM:WA 2008 hereafter), as well as any other environmental legislation. The main objective of the current Waste Management Licencing Process is to ensure that the Shakaville landfill is legally decommissioned. It is envisaged that subsequent to the licencing of the Shakaville landfill, the KwaDukuza Local Municipality will rehabilitate the Shakaville landfill in line with applicable environmental legislation thereby reducing adverse impacts on the environment.

2 BASIC ASSESSMENT AND PUBLIC PARTICIPATION PROCESS

According to the National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) as amended, the licensing of the Shakaville landfill requires a Waste Management License (as per Government Notice 921 of November 2013). The following Waste Management **Category A** listed activities are thus applicable.

- *Activity 14: The decommissioning of a facility for a waste management activity listed in Category A or B of this schedule.*

With regard to the Environmental Impact Assessment (EIA) Regulations, a Basic Assessment is required as per Activity 27 of Listing Notice 1 (Government Notice 983 of December 2014, as amended in April 2017). The triggered Activity is as follows:

- *The clearance of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-*
 - the undertaking of a linear activity; or*
 - maintenance purposes undertaken in accordance with a maintenance management plan*

In terms of Section 24(1) of NEMA, the potential impact on the environment associated with the listed activities must be considered, investigated, assessed and reported on to EDTEA as the competent authority (CA) as the decision-maker. Furthermore, EDTEA is charged by Section 43(2) of NEWA, 2008, as the Licensing Authority for the Shakaville landfill.

The findings of the Basic Assessment process are included in this Report which will be made available for comment and review to Interested and Affected Parties (I&APs). These I&APs, which include surrounding residents as well as various government departments and parastatals, were involved in

the Public Participation Process (PPP) undertaken to date. The summary of the PPP that commenced in October 2017 is summarised as follows:

- An advertisement inviting any potential I&APs to register on the project was placed on page 14 of the *Stanger Weekly* newspaper published on Wednesday 18th October 2017;
- On-site notices advertising the Waste Management Licence Process were erected on site and at visible and accessible locations close to the site on Wednesday 18th October 2017;
- Notification Letters were distributed in the Shakaville Area on Wednesday 18th October 2017. Notification Letters were also distributed by e-mail to other potential I&AP's from the 18th October 2017 to date.

This Basic Assessment Report will be made available for comments and review to I&APs. Sms, e-mail notifications and telephone calls will be utilised to notify all registered I& about the availability of the report.

3 ENVIRONMENTAL IMPACTS

Potential risks and key issues identified during the Basic Assessment were based on consultation with I&APs, specialist investigations, desktop studies and the current state of the site. EDTEA will advise on further studies that may be required subsequent to the review of the Draft Basic Assessment.

Chapter 4 of this Draft Basic Assessment Report (BAR) provides a description of the biophysical and social environment of the Shakaville landfill and provides a background to ensuring that all potential risks and issues are taken into consideration in all phases of the development. The key potential impacts and key issues identified during the Basic Assessment take into consideration how the landfill has natural rehabilitated with invasives as well as indigenous species and how some of these will need to be removed to allow for the construction activities associated with the closure and rehabilitation of the landfill in line with NEMWA, 2008. As the boundaries of the site are located within the riparian area of the tributary of the Mbozamo River. Other potential impacts include groundwater contamination, soil contamination; increased noise levels during the upgrade; atmospheric pollution and odours (Air Emissions); and visual disturbances.

4 ALTERNATIVES

Three alternatives (No- go option, the preferred Closure and Rehabilitation of the Shakaville landfill as well as the Identification of potential end use planning) were identified and are captured in this report. These alternatives were evaluated to determine the most environmental and technically feasible alternative.

5 CONCLUSIONS AND RECOMMENDATIONS

The Draft BAR provides a broader description of the biophysical and socio-economic issues associated with the proposed licencing of the Shakaville landfill. A comprehensive public participation process was conducted and is discussed in this report.

The BAR has presented an assessment of the impacts of each of the proposed decommissioning activities as well as ascertain the potential cumulative impacts of the development in its entirety. Mitigation measures for each of the impacts are discussed to ensure that positive impacts can be

optimised and negative impacts minimised in order for the project to be integrated into the environment in a sustainable manner.

Subsequent to the review of the Draft BAR by EDTEA and other authorities and I&APs, the comments received from I&APs will be incorporated into the Final BAR that will be submitted to EDTEA for review and consideration.

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED CLOSURE (DECOMMISSIONING) OF THE SHAKAVILLE LANDFILL

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LIST OF ABBREVIATIONS / ACRONYMS

BAR	Basic Assessment Report
CA	Competent Authority
DEA	Department of Environmental Affairs
EDTEA	KwaZulu Natal Department of Economic Development, Tourism and Environment Affairs
DWA	Department of Water Affairs (currently Department of Water and Sanitation)
DWS	Department of Water and Sanitation
DWAF	Department of Water Affairs and Forestry (now Department of Water and Sanitation)
ECA	Environmental Conservation Act (Act 73 of 1989)
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EMPR	Environmental Management Programme
H	Hazardous Waste
I&APs	Interested and Affected Parties
IDP	Integrated Development Plan
IWMP	Integrated Waste Management Plan or Industry Waste Management Plan
NEMA	National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998),
KPI	Key Performance Indicators

GLOSSARY OF TERMS

This section provides a catalogue of terms and definitions, which may be used in this report and, or other future waste management plans and documents. Where more than one definition for a term exists in the literature, additional definitions have been provided for clarity.

Term	Definition	Reference
Audit	A site inspection at which the condition of the site on that day is appraised in terms of a number of predetermined criteria.	DWAF Minimum Requirements for disposal of waste by landfill 2 nd Edition, 1998, Minimum Requirements (1998) hereafter
Buffer Zones	Buffer Zones are separations between the boundaries of registered landfill sites and residential developments. They may vary between 500m and 1000m in width, depending on the classification of the landfill. No residential development may take place within a proclaimed buffer zone. At the discretion of the local authority and the state departments, however, developments such as industrial development may be permitted.	Minimum Requirements (1998)
Cell	This is the basic landfill unit of compacted solid waste which, when completed at the end of each day, is entirely contained by cover material. The sides may be typically formed by 1,5m or 2,0m high soil or rubble berms, or sloped covered waste. Cell width is determined by the manoeuvring requirements of vehicles depositing waste at the working face.	Minimum Requirements (1998)
Co-Disposal	Co-disposal (General and Hazardous waste): The mixing and joint disposal of Hazardous (H) and General (G) waste in the same landfill. The co-disposal of general waste with hazardous waste as a means of facilitating disposal on a hazardous waste landfill is acceptable, whereas the co-disposal of any significant quantity of hazardous waste with general waste on a general waste landfill is unacceptable.	Minimum Requirements (1998)
Co-Disposal	Co-disposal: (Liquid with Dry waste): The mixing of high moisture content or liquid waste with dry waste. This affects the water balance and is an acceptable practice on a hazardous waste landfill site. This is only acceptable on a general waste landfill site when the liquid is not hazardous and the site is equipped with leachate management measures.	Minimum Requirements (1998)
Cover	The material used to cover waste. Cover material is usually soil, but may comprise builders' rubble, ash or other suitable material. Daily cover is usually 150mm thick, intermediate cover is usually 300mm thick and final cover or capping usually 500mm thick. Final cover may form part of a special capping design and, as is the case with intermediate cover, must be able to support vegetation.	Minimum Requirements (1998)
Development Plan	A plan indicating the phasing of the development of a landfill from the landfill preparation, through the operation (which is usually divided into areal phases), to the final closure, rehabilitation and end-use. The phasing, and hence the Development Plan, forms part of the design.	Minimum Requirements (1998)
Disposal Site	A site used for the accumulation of waste with the purpose of disposing or treatment of such waste.	Environmental Conservation Act ECA
Duty of Care	This requires that any person who generates, transports, treats or disposes of waste must ensure that there is no unauthorised transfer or escape of waste from his control. Such a person must retain documentation describing both the waste and any related transactions. In this way, the person retains responsibility for the waste generated or handled.	Minimum Requirements (1998)
Eco-Toxicity	Eco-toxicity is the potential to harm animals, plants, ecosystems or environmental processes.	Minimum Requirements (1998)
End-Use Plan	The purpose for which the area of the rehabilitated and closed landfill is used. This may be as a park, playing fields, or other suitable land-use.	Minimum Requirements (1998)
Environment	the surroundings within which humans exist and that are made up of— (i) the land, water and atmosphere of the earth; (ii) micro-organisms, plant and animal life; (iii) any part or combination of (i) and (ii) and the interrelationships among and between them; and	National Environmental Management Act 1998 (Act No. 107 of 1998), as amended, NEMA hereafter

Term	Definition	Reference
	(iv) the physical, chemical, aesthetic and cultural properties and conditions of the foregoing that influence human health and well-being.	
Extended Producer Responsibility	Means measures that extend a person's financial or physical responsibility for a product to the post-consumer stage of the product, and includes— (a) waste minimization Programmes; (b) financial arrangements for any fund that has been established to promote the reduction, re-use, recycling and recovery of waste; (c) awareness Programmes to inform the public of the impacts of waste emanating from the product on health and the environment; and (d) any other measures to reduce the potential impact of the product on health and the environment.	National Environmental Management Waste Act 2008 (Act No. 59 of 2008), as amended, NEM: WA hereafter
Fatal Flaw	A factor or situation which prevents the development of an environmentally acceptable waste disposal facility, except as prohibitive cost.	Minimum Requirements (1998)
General Waste	Waste that does not pose an immediate threat to man or to the environment, i.e. household waste, builder's rubble, garden waste, dry industrial and commercial waste.	White Paper on IP&WM
General Waste	Waste that does not pose an immediate threat to man or the environment, i.e. household waste, builders' rubble, garden waste, and certain dry industrial and commercial waste. It may, however with decomposition, infiltration and percolation, produce leachate with an unacceptable pollution potential.	Minimum Requirements (1998)
General Waste	All urban waste that is produced within the jurisdiction of local authorities. It comprises rubble, garden, domestic, commercial and general industrial waste. It may also contain small quantities of hazardous substances dispersed within it such as batteries, insecticides and weed-killers discarded on domestic and commercial premises. General waste may be disposed of in a permitted landfill and may be equated to what is commonly referred to as domestic, solid waste and municipal waste, i.e. that which is normally managed by a local authority.	DWAF Waste Generation Baseline Studies
General Waste	Means waste that does not pose an immediate hazard or threat to health or to the environment, and includes— (a) domestic waste; (b) building and demolition waste; (c) business waste; and (d) inert waste.	NEM:WA
General Waste Landfill	A landfill designed to accept only general waste. Depending on the Site Water Balance, it may or may not have a leachate management system.	Minimum Requirements (1998)
Generator	An industry or other party whose activities result in the production of waste. The responsibility for hazardous waste remains from cradle-to-grave with the generator of the waste and the generator is held liable for any damage that the waste may cause to humans or to the environment.	Minimum Requirements (1998)
Guidelines	While not requirements, guidelines are recommended actions, which represent good practice. They are not enforceable, but may form the basis for site specific permit conditions in which case they become mandatory.	Minimum Requirements (1998)
Hazard	A source of or exposure to danger.	NEMA
Hazardous Waste	Waste that may, by circumstances of use, quantity, concentration or inherent physical, chemical or infectious characteristics, cause ill-health or increase mortality in humans, fauna and flora, or adversely affect the environment when improperly treated, stored, transported or disposed of.	Minimum Requirements (1998)
Hazardous Waste	Waste, other than radioactive waste, which is legally defined as hazardous in the state in which it is generated, transported or disposed of. The definition is based on the chemical reactivity or toxic, explosive, corrosive or other characteristics, which cause, or are likely to cause, danger to health or to the environment, whether alone or when in contact with other waste.	Minimum Requirements (1998)
Hazardous Waste	Waste, including radioactive waste, which is legally defined as "hazardous" in the state in which it is generated. The definition is based on the chemical reactivity or toxic, explosive, corrosive or other characteristics which cause, or are likely to cause, danger to health or to the environment, whether by itself or when in contact with other waste.	White Paper on IP&WM

Term	Definition	Reference
Hazardous Waste	Means any waste that contains organic or inorganic elements of compounds that may, owing to the inherent physical, chemical or toxicological characteristics of that waste, have a detrimental impact on health and the environment.	NEM:WA (2008)
Incineration	Incineration is both a form of treatment and a form of disposal. It is simply the controlled combustion of waste materials to a non-combustible residue or ash and exhaust gases, such as carbon dioxide and water.	Minimum Requirements (1998)
Infectious Waste	Any waste which is generated during the diagnosis, treatment or immunisation of humans or animals; in the research pertaining to this; in the manufacturing or testing of biological agents – including blood, blood products and contaminated blood products, cultures, pathological wastes, sharps, human and animal anatomical wastes and isolation wastes that contain or may contain infectious substances.	Minimum Requirements (1998)
Interested and Affected Parties (IAPs)	Interested and Affected Parties are those people who will be affected in some way by the Hazardous Waste disposal process. Residents or farmers, a whole residential community, or the public at large may represent them.	Minimum Requirements (1998)
Landfill (V)	To dispose of waste on land, whether by use of waste to fill in excavations or by creation of a landform above grade, where the term “fill” is used in the engineering sense.	Minimum Requirements (1998)
Landfill (N)	The waste body created by land filling. This may be above or below grade, or both.	Minimum Requirements (1998)
Leachate	An aqueous solution with a high pollution potential, arising when water is permitted to percolate through decomposing waste. It contained final and intermediate products of decomposition, various solutes and waste residues. It may also contain carcinogens and/or pathogens. Sporadic/Significant.	Minimum Requirements (1998)
Litter	Any object or matter discarded or left behind by the person in whose possession or control it was.	Environmental Conservation Act, 1989 (Act No. 73 of 1989)
Minimum Requirement	A standard by means of which environmentally acceptable waste disposal practices can be distinguished from environmentally unacceptable waste disposal practices.	Minimum Requirements (1998)
Monitoring	The process of checking for changes in status or trends over time. This may be achieved by compiling successive audit or water quality analyses results.	Minimum Requirements (1998)
Operating Plan	A site-specific document which describes the way in which the landfill is operated. The Operating Plan commences at the level and detail of daily cell construction and continues through to the development and excavation sequence, access and drainage within a given phase of the Development Plan.	Minimum Requirements (1998)
Permit	The Permit issued by the Department of Water Affairs, & Forestry for the operation or closure of a landfill, in terms of Regulation 1549, promulgated under the Environment Conservation Act (Act 73 of 1989).	Minimum Requirements (1998)
Pollution	Any change in the environment caused by— (i) substances; (ii) radioactive or other waves; or (iii) noise, odours, dust or heat, emitted from any activity, including the storage or treatment of waste or substances, construction and the provision of services, whether engaged in by any person or an organ of state, where that change has an adverse effect on human health or well-being or on the composition, resilience and productivity of natural or managed ecosystems, or on materials useful to people, or will have such an effect in the future.	National Environmental Management Act, 1998 (Act No. 107 of 1998), NEMA hereafter
Precautionary Principle	Where a risk is unknown; the assumption of the worst-case situation and making provision for such a situation.	Minimum Requirements (1998)
Recycle	The use, re-use, or reclamation of material so that it re-enters the industrial process rather than becoming a waste.	Minimum Requirements (1998)
Remediation	The rectification of problems, caused by bad practices, through the implementation of remedial measures.	Minimum Requirements (1998)
Responsible Person	The Permit Holder or his legally appointed representative who takes responsibility for ensuring that all or some of the facets of any of the following are properly directed, guided and executed, in a professionally justifiable	Minimum Requirements (1998)

Term	Definition	Reference
	manner: Investigatory work, design, preparation, operation, closure and monitoring.	
Standard	A criteria/measure by which the accuracy or quality of others is judged or a model for imitation, or the degree of excellence required.	Minimum Requirements (1998)
Toxic Waste	A form of hazardous waste that causes death or serious injury, such as burns, respiratory diseases, cancer or genetic mutations.	White Paper on IP&WM
Transporter	A person, organisation, industry or enterprise engaged in or offering to engage in the transportation of waste.	Minimum Requirements (1998)
Treatment	Treatment is used to remove, separate, concentrate or recover a hazardous or toxic component of a waste or to destroy or, at least, to reduce its toxicity in order to minimise its impact on the environment.	Minimum Requirements (1998)
Waste	Any matter, whether gaseous, liquid or solid or any combination thereof, which is from time to time designated by the Minister by notice in the Gazette as an undesirable or superfluous by-product, emission, residue or remainder of any process or activity (definition of 'waste' substituted by s. 1 (h) of Act 79 of 1992).	ECA
Waste	An undesirable or superfluous by-product, emission, or residue of any process or activity which has been discarded, accumulated or been stored for the purpose of discarding or processing. It may be gaseous, liquid or solid or any combination thereof and may originate from a residential, commercial or industrial area. This definition includes industrial waste water, sewage, radioactive substances, mining, metallurgical and power generation waste.	White Paper on IP&WM
Waste	Any matter, whether gaseous, liquid or solid or any combination thereof, originating from any residential, commercial or industrial area or agricultural area identified by the Minister of Environment Affairs as an undesirable or superfluous by-product, emission, residue or remainder of any process or activity.	DWAF Waste Generation Baseline Studies
Waste	Means any substance, whether or not that substance can be reduced, re-used, recycled and recovered— (a) that is surplus, unwanted, rejected, discarded, abandoned or disposed of; (b) where the generator has no further use of for the purposes of production, reprocessing or consumption; (c) that must be treated or disposed of; or (d) that is identified as a waste by the Minister, but— (i) a by-product is not considered waste; and (ii) any portion of waste, once re-used, recycled and recovered, ceases to be waste.	NEM:WA
Waste Body	This refers to the body of waste (and cover) that is contained in the landfill. Because it is subject to decomposition, it has the potential to generate leachate and must therefore be adequately separated from the water regime.	Minimum Requirements (1998)
Waste Disposal Facility	Means any site or premise used for the accumulation of Waste with the purpose of disposing of that waste at that site or on that premise.	NEM:WA
Waste Management Activity	Means any activity listed in Schedule 1 or published by notice in the <i>Gazette</i> under section 19 of the NEM Waste Act, and includes— (a) the importation and exportation of waste; (b) the generation of waste, including the undertaking of any activity or process that is likely to result in the generation of waste; (c) the accumulation and storage of waste; (d) the collection and handling of waste; (e) the reduction, re-use, recycling and recovery of waste; (f) the trading in waste; (g) the transportation of waste; (h) the transfer of waste; (i) the treatment of waste; and (j) the disposal of waste.	NEM:WA
Waste Management License	Means a license issued in terms of section 49 of the NEM Waste Act (2008) for waste management activities listed under section 19 of the Act.	NEM:WA
Waste Management Facility	All wastes or products stored on a temporary or permanent basis, that could impact on surface or groundwater quality, by leaching into or coming in contact with water, are referred to a "Waste Management Facilities". See also the Waste	Minimum Requirements (1998)

Term	Definition	Reference
	Management Documents, "Minimum requirements for waste disposal sites" and "Minimum requirements for the handling and disposal of hazardous waste".	
Waste Management Services	Means waste collection, treatment, recycling and disposal services.	NEM:WA
Waste Minimisation programme	Means a programme that is intended to promote the reduced generation and disposal of waste.	NEM:WA
Waste Transfer Facility	Means a facility that is used to accumulate and temporarily store waste before it is transported to a recycling, treatment or waste disposal facility.	NEM:WA
Waste Treatment Facility"	Means any site that is used to accumulate waste for the Purpose of storage, recovery, treatment, reprocessing, recycling or sorting of that Waste.	NEM:WA

1 INTRODUCTION

1.1 Background

The Department of Environmental Affairs (DEA hereafter) is assisting the KwaDukuza Local Municipality to licence the disused Shakaville landfill which requires a decommissioning licence from the KwaZulu Natal Department of Economic Development, Tourism and Environment (EDTEA hereafter). The DEA has thus appointed GA Environment (Pty) Ltd as independent Environmental Assessment Practitioners, to undertake the Basic Assessment (BA hereafter) process for the Shakaville landfill as part of the Waste Management Licence Application Process.

The KwaDukuza Local Municipality, which is located within the iLembe District Municipality of the KwaZulu Natal Province, proposes to formally decommission the disused Shakaville landfill site. The Shakaville landfill ceased operations between 2007 and 2010 after approximately 30 years of operation. According to the KwaDukuza Local Municipality Integrated Development Plan (IDP), the site was intended as a Garden refuse facility at Shakaville and approximately 720 tons of was disposed of on a monthly basis. Based on the waste remnants observed on site as well as information obtained from the Municipality, the site was not only used for disposal of garden waste, but general waste.

The Shakaville landfill was operating without a licence and site activities were not undertaken according to the Minimum Requirements for Waste Disposal by Landfill (DWAf, 1998 2nd Edition), the National Environmental Management Waste Act (NEM:WA hereafter), 2008 (Act No. 59 of 2008) as well as any other environmental legislation. The proposed activities associated with the decommissioning of the landfill site will however be undertaken according to required legislation.

The KwaDukuza Local Municipality currently disposes off their waste at the Dolphin Coast Landfill Management (DCLM), however pockets of illegal dumping of waste were evident within the site landfill boundaries. The Shakaville landfill was noted to have naturally rehabilitated as vegetation has been fully established. Current land use on some sections of the landfill, particularly close to the gate and on the western sections of the landfill, includes pockets of informal housing infrastructure. The occupants of these informal housing infrastructure are regarded as historical reclaimers of waste that have since occupied this land when the disposal of waste ceased on this site.

The main objective of the current Waste Management Licencing Process is to ensure that the Shakaville landfill is legally decommissioned. It is envisaged that subsequent to the issuing of the licence for the Shakaville landfill, the KwaDukuza Local Municipality will source funds for the undertaking of rehabilitation activities and to ensure ongoing monitoring of the rehabilitated areas.

The Shakaville landfill occupies an area of approximately 80 000m² (8 Ha) and is located on Erf 3595 Stanger within the KwaDukuza Local Municipality. The 21-digit Surveyor General Code for the property is NOFU03200000359500000. Direct access to the site is available from Mbozambo Street which is located to the north west of the site. The site centre co-ordinates are 29°19'48.62"S; 31° 18' 17.19"E. The boundaries of the site are within the riparian area of a tributary of the Mbozamo River. Refer to **Figure 1** and **Appendix A** for the Locality Map of the site.

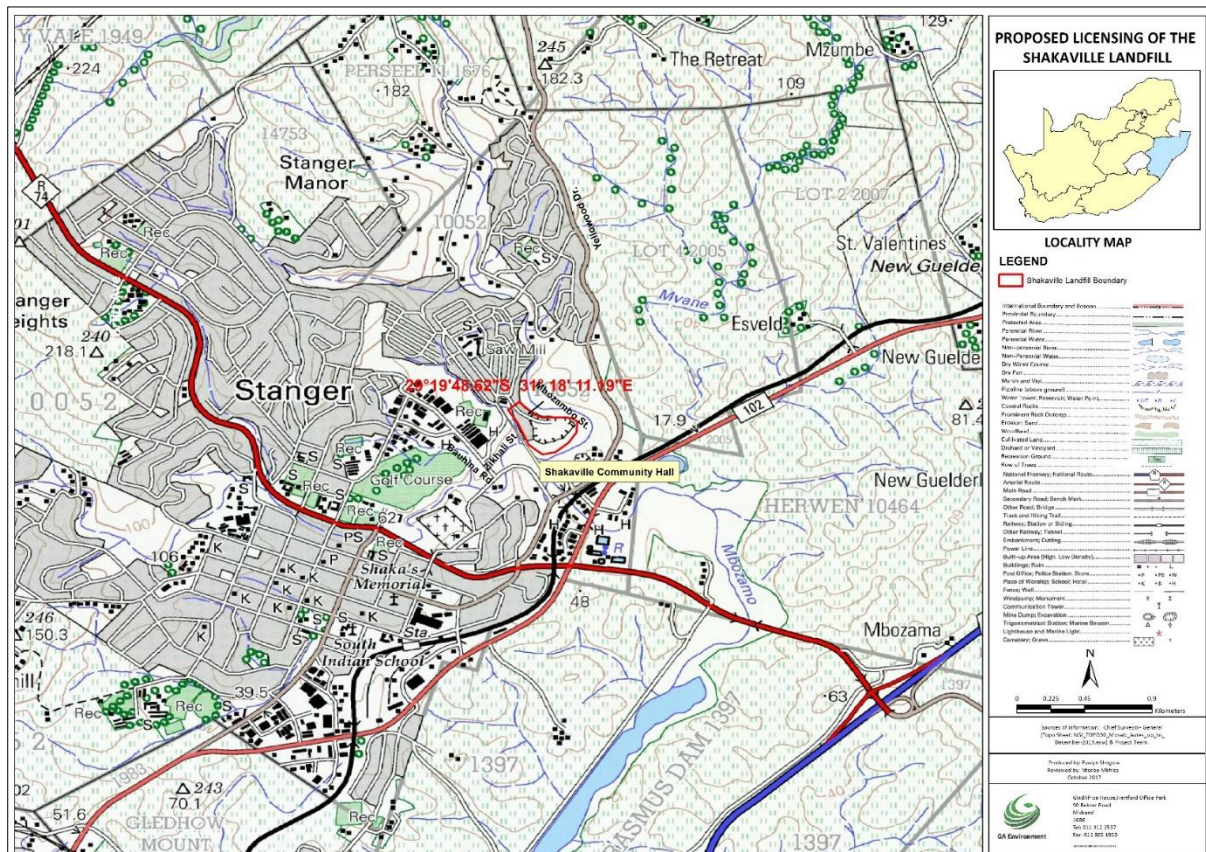


Figure 1: Locality map of the Shakaville landfill Site

It must be highlighted that Shakaville landfill is not fenced to indicate its boundaries and the Municipality is also unable to confirm the landfill boundary. The information presented in this report is based on the EAP’s assessment of the study site based on the extent of the waste body as shown in historical aerial images.

1.1.1 Motivation for the need of the project and preferred location

The Shakaville landfill was operating illegally (without a licence) for about 30 years. The KwaDukuza Local Municipality intends to apply for a licence to legally decommission the facility. According to the KwaDukuza Municipality’s Integrated Development Plan (IDP) (2012- 2017), the implementation of the closure and the rehabilitation of the Shakaville landfill was targeted for the year 2014 and was allocated the project number MS/41/2012. To date, the closure and rehabilitation of the site has not been undertaken. It is the intention of the Basic Assessment Process to ensure that the closure of the Shakaville landfill is undertaken in line with the legislative requirements.

The KwaDukuza Local Municipality is applying for a Waste Management Licence in order to legally decommission the facility, and to ensure that the site adheres to the NEM:WA, 2008 requirements and other key legislation. The Waste Management Licence will be issued by the KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs (EDTEA). The need to

license many of the unlicensed Waste Disposal in South Africa is regarded as one of key project towards a cleaner environment by the Minister of Environmental Affairs. Further delays in implementing the project will mean that the impacts arising from the current status of the landfill will continue thereby causing adverse environmental problems. This initiative of the licensing of the landfill will aid in achieving the Minister's service delivery agreement Outcome 10 (Output 1 to 4) deliverable target/indicator that serves to ensure that environmental assets and natural resources are well protected and are continually enhanced.

The issuing of a Decommissioning license for the Shakaville landfill will allow the Municipality to source funds for construction activities required as part of the rehabilitation of the site. In addition to this, the rehabilitation of the site will ensure that the site is available for other land uses. No other site alternatives have been considered for the purpose of this decommissioning as the intention of this application is to close and rehabilitate the site.

The disposal of waste at the Shakaville landfill ceased sometime between 2007 and 2010 after the landfill had been operating for approximately 30 years. During the time of the operation of the Shakaville landfill, waste pickers or waste reclaimers began to occupy the site and erected informal dwelling structures. Based on the study of the historical aerial images of the site as well as the site visit, these activities were dominant in the western portion of the landfill in the areas closest to the gate as shown in **Figures 5 to 9**. During the site visit, several new informal dwelling structures were noted within the site boundaries.

According to the KwaDukuza Local Municipality, only general waste was disposed of at the Shakaville landfill. During the time of the landfill's operation, although a gate existed, access was not controlled. The 'end tipping' landfilling method which involves the pushing of waste over a slope was used on site. This created visual nuisances and instability of the waste body and did not cater for waste compaction. The end tipping method accelerated by the ongoing illegal dumping of waste was noted from the site observations as shown in **Figures 2 & 3**.



Figure 2: Historical 'end-tipping' method of landfilling noted on rehabilitated section of the landfill

Evidence of the end tipping of waste was also noted along the riparian area of the tributary of the river as shown in the area close to the gate as shown in **Figure 3**.



Figure 3: 'End-tipping and ongoing illegal dumping of waste' noted in the section of the landfill in close proximity to the partial fence and gate

According to the information provided by the Municipality, during the time of the operation of the Shakaville landfill, the only equipment used was an Agricore Dumper shown in **Figure 4**.



Figure 4: Africo Dumper previously used at the Shakaville landfill (KwaDukuza Local Municipality)

Google Earth aerial images of the Shakaville site were studied to investigate the extent and the historical dumping of waste in 2006, 2010, 2012, and 2016 to 2017 are shown in **Figures 5 to 9**. A short description of the images is provided. **Figure 5** below shows the conditions of the site on the 2nd June 2006 when the landfill site was still receiving waste.



Figure 5: Shakaville landfill aerial Image dated 06/02/2006 (Google Earth)

Figure 6 shows the condition of the site on the 04th January 2010 and shows that the extent of the waste body between 2007 and 2010 particularly on the southern section of the landfill. Review of **Figure 6** shows what seems to have been the commencement of the natural rehabilitation of the site.



Figure 6: Shakaville landfill aerial Image dated 01/04/2010 (Google Earth)

The Google Earth image of the 23rd March 2012 is shown in **Figure 7** and indicates the level of rehabilitation that had naturally occurred on the site between 2010 and 2012.

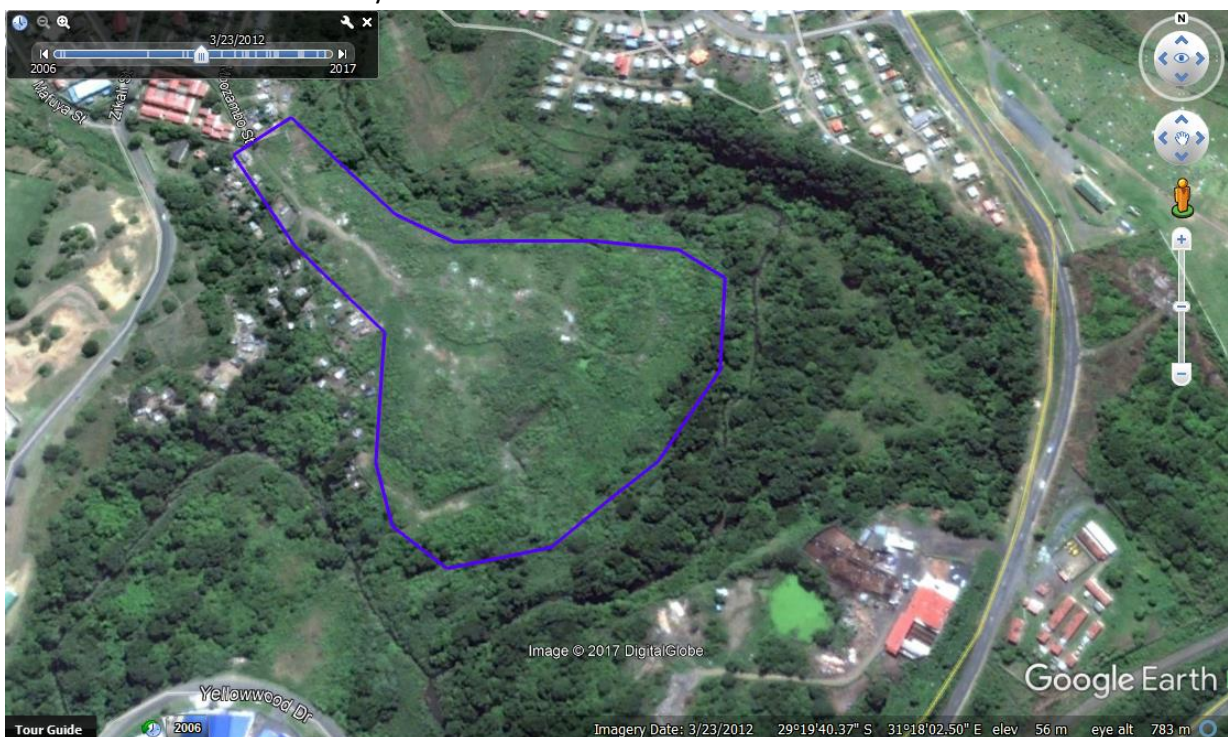


Figure 7: Shakaville landfill aerial Image dated 03/23/2012 (Google Earth)

Figure 8 and 9 of 2016 and 2017 respectively show further increase in the natural rehabilitation of the site and in turn low visibility of waste.

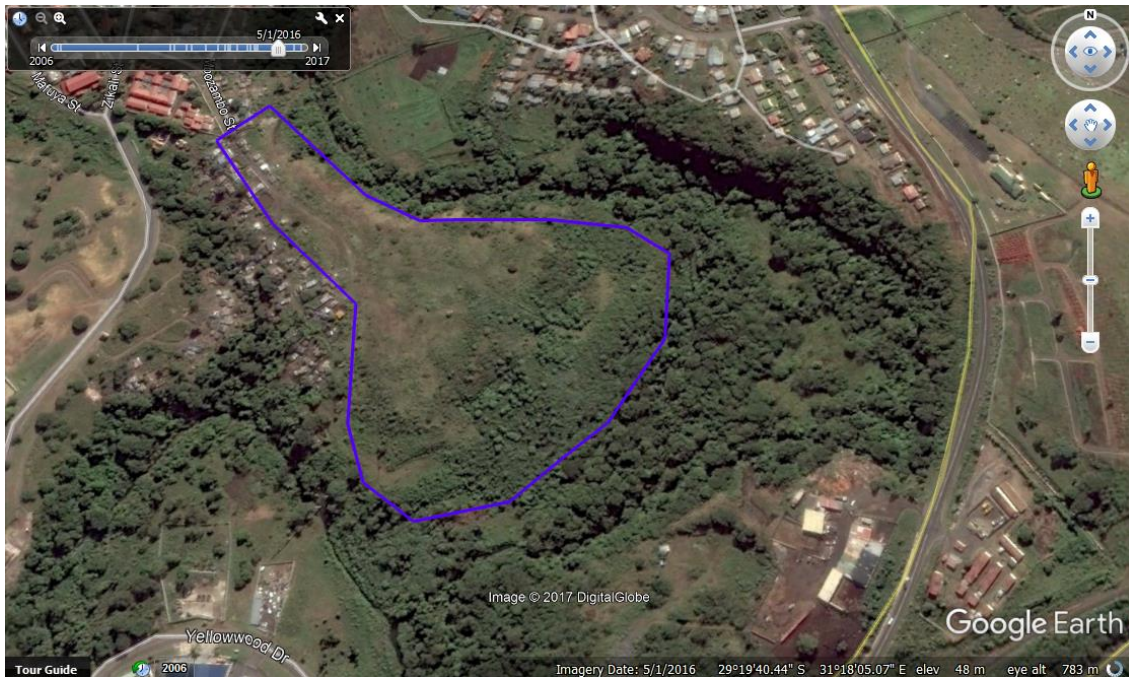


Figure 8: Shakaville landfill aerial image dated 05/01/2016 (Google Earth)

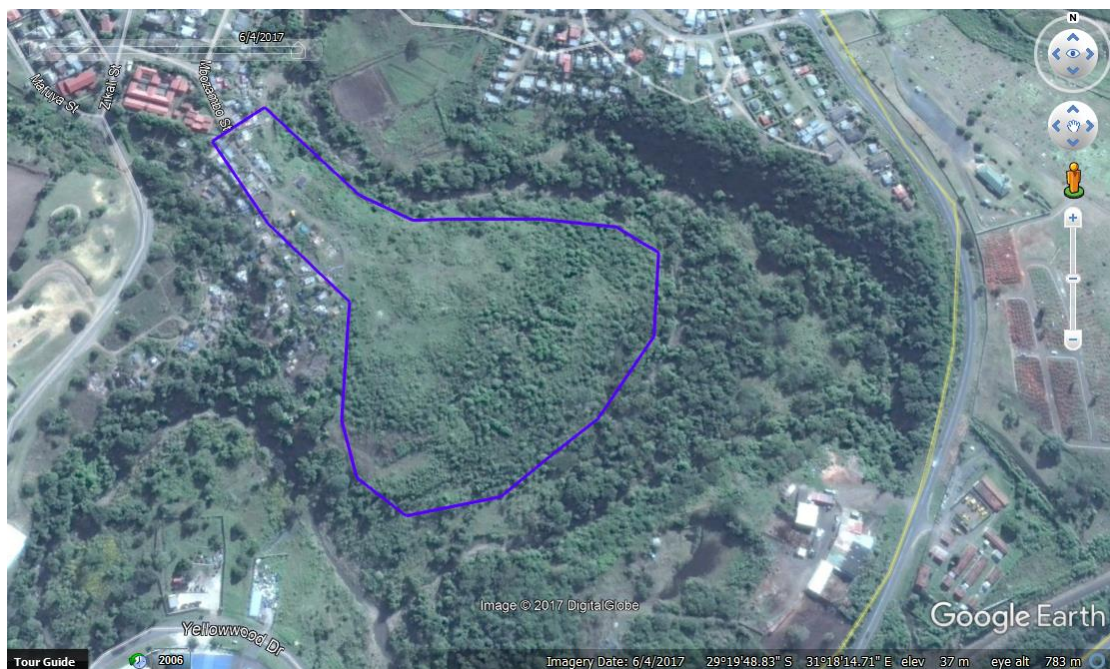


Figure 9: Shakaville landfill aerial image dated 06/04/2017 (Google Earth)

1.2 Status quo of the site and surrounding land uses

The following issues are of importance to note regarding the status quo of the Shakaville landfill site based on site visits undertaken on the 20th September 2017 and 18th October 2017:

- The main access to the site is through a gate from Mbozamo Street (Figure 10);

- Infrastructure noted on site include a gate (according to the landfill residents, the gate is sometimes closed at night), a tap (**Figure 11**), informal housing structures (**Figure 12**); sewer manholes, groundwater monitoring boreholes (one of these is shown in **Figure 13**), and illegal electricity connections;
- The site has naturally rehabilitated and both indigenous plant species as well as invasives occur on site (**Figure 14**);
- Current land use on site include pockets of informal housing infrastructure and the occupants are regarded as historical reclaimers of waste that have since occupied this land when the disposal of waste ceased on this site (**Figure 12**). Approximately 30 families currently occupy the landfill site area. It must be highlighted that the KwaDukuza Local Municipality has previously relocated approximately 14 families and provided them with formal housing. In future, the Municipality intends to relocate other families from the boundaries of the landfill;
- The site is not fenced off to indicate its boundaries;
- Pockets of illegal dumping of waste were evident within the site boundaries (**Figure 15**);
- Businesses such as spaza shops and liquor stores operate within the landfill boundaries; and
- Animal pens in the form of pig sties (**Figure 16**);

Images that provide an overview of the site are indicated in **Figures 10 to 16** Additional photographs are attached in **Appendix B**.



Figure 10: View towards the south east showing the Shakaville landfill gate, note informal housing from

historical reclaimers in the background



Figure 11: View towards the north west showing a communal tap (circled in red) immediately inside the boundaries of the Shakaville Landfill



Figure 12: Examples of informal dwellings within the boundaries of the Shakaville Landfill



*Figure 13: One of the monitoring boreholes within the landfill boundaries at location 29°19'45.67"S;
31°18'7.15"E)*



Figure 14: Examples of Indigenous vegetation (A) and invasive (B) noted on site



Figure 15: Examples of some of the pockets of illegal waste disposal on site



Figure 16: One of the pigsties noted within the boundaries of the Shakaville landfill

Additional Photographs of the site can be referred to in **Appendix B**. The site is bounded by a tributary of the Mbozamo River on all three directions with the exception of the north-western side where the

only access to the site is available. As already discussed, some informal dwelling structures occur within the boundaries of the landfill. Informal structures also occur on the outside the landfill gate on the immediate east and formal housing along the surfaced section of Mbozamo street. The Shakaville hostel is located immediately outside the landfill gate on the immediate west. On the east of the site and across the tributary of the Mbozamo River, small scale agricultural farming occurs.

1.3 Solid Waste Management Services within the KwaDukuza Local Municipality

According to the information provided by the KwaDukuza Local Municipality officials, the waste disposed of at the Shakaville landfill during its operational phase was collected from various areas within the KwaDukuza Local Municipality. The waste that is currently collected by the Municipality is currently disposed of at the privately -owned Dolphin Coast Landfill Management (DCLM) Landfill in the New Guenderland area of KwaDukuza, approximately 9km north east of the Shakaville Landfill as shown in **Figure 17**.



Figure 17: The location of the Shakaville landfill in relation to the DCLM landfill

The DCLM landfill is classified as 'Class A' Landfill according to the NEM:WA National Norms and Standards for the disposal of waste to landfill (Government Notice No. R 636 published in Government Gazette No. 36784 of 23 August 2013). A Class A Landfill caters for Type 0 waste based on the analysis of the chemical content of the waste as outlined in the NEM:WA National Norms and Standards for the assessment of waste (Government Notice No. R 635 published in Government Gazette No. 36784 of 23 August 2013). In terms of the Department of Water Affairs and Forestry (DWA), Minimum Requirements for Waste Disposal by Landfill (2nd Edition, 1998) this landfill could have been classified as an H:H Landfill, a site accepts both General and Hazardous waste and with a Hazard Rating of 1 4 with 1 referring to 'Extreme Hazard' and 4 referring to a 'Low Hazard'. The DCLM landfill is illustrated in **Figure 18**.



Figure 18: Aerial view of the DCLM landfill in KwaDukuza (DCLM, 2017)

Although the Local Municipality does not operate any landfills, two transfer stations are located in Ward 16 and Ward 6 and are both owned by the Municipality. The transfer station in Ward 6 is located less than 1km from the Shakaville landfill is currently being upgraded.



Figure 19: The Shakaville landfill in relation to the Waste Transfer Station (Google Earth)

According to information obtained from the KwaDukuza Local Municipality in 2017, waste is collected from all Municipal Wards. Where waste cannot be collected directly from properties, skips are availed and are then removed by the Municipality for disposal at the DCLM landfill.

1.4 Applicable Waste Management and Environmental Impact Assessment Regulations Listed Activities

The licensing of the Shakaville landfill requires a Waste Management License as per Government Notice 921 of November 2013, as amended. The following *Category A* Waste Management listed activities are thus applicable.

- *Activity 14: The decommissioning of a facility for a waste management activity listed in Category A or B of this schedule.*

In terms of the Environmental Impact Assessment (EIA) Regulations, a Basic Assessment is required as per Activity 27 of Listing Notice 1 (Government Notice 983 of December 2014, as amended in April 2017). The triggered Activity is as follows:

- *The clearance of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for-*
 - (iii) *the undertaking of a linear activity; or*
 - (iv) *maintenance purposes undertaken in accordance with a maintenance management plan*

With regard to this activity, it is likely that during the rehabilitation, pockets of indigenous vegetation especially riparian vegetation located within the south and western boundary of the site can be affected. It is for such reasons that the activity is included. It must however be noted that the current EDTEA EIA Application process does not cater for Integrated Application, the Authority has advised that the Applications be submitted to both the EIA and the Waste Department sections.

In terms of Section 24(1) of NEMA, the potential impact on the environment associated with these listed activities must be considered, investigated, assessed and reported to EDTEA as the competent authority (CA hereafter) as the decision-maker. Furthermore, EDTEA is charged by Section 43(2) of NEM:WA, 2008, as the Licensing Authority for the Shakaville landfill.

This Basic Assessment process was conducted in accordance with Section 19 -20 and Appendix 1 of the NEMA EIA regulations, 2014, as amended. NEMA requires that an EIA or Basic Assessment (BA) be undertaken in order to inform the authorisation process for a listed activity. The NEMA EIA regulations, 2014, as amended (Government Notice R. 982), published in terms of Sections 24(5) and 44 of NEMA, defines the manner in which the BA is to be undertaken. Guideline documents have been published by the Department of Environmental Affairs and these provide further guidance in implementing the EIA Regulations. The guideline documents will be used as reference documents for the purpose of this Basic Assessment.

1.5 Description of Proposed Activities

The activities required for the decommissioning of the Shakaville landfill are based on the DWAF Minimum Requirements for Waste Disposal by Landfill (2nd Edition, 1998). The proposed activities associated with the decommissioning of the Shakaville landfill include the following:

1.6 **Shaping and landscaping of the waste body:** the waste body will be graded to a minimum 2% slope to encourage the flow of water and discourage ponding at the top of the waste body. The sides of the waste body will have a minimum slope of 1:3 to ensure stability and encourage growth of vegetation;

1.6.3 **Capping of the waste body:** The design of the capping layers aims to maximize run off and minimize ingress of water into the waste body. Opportunity for water ingress on the top of the capped landfill is higher on flatter slopes. The proposed capping design is presented in **Figure 20**.

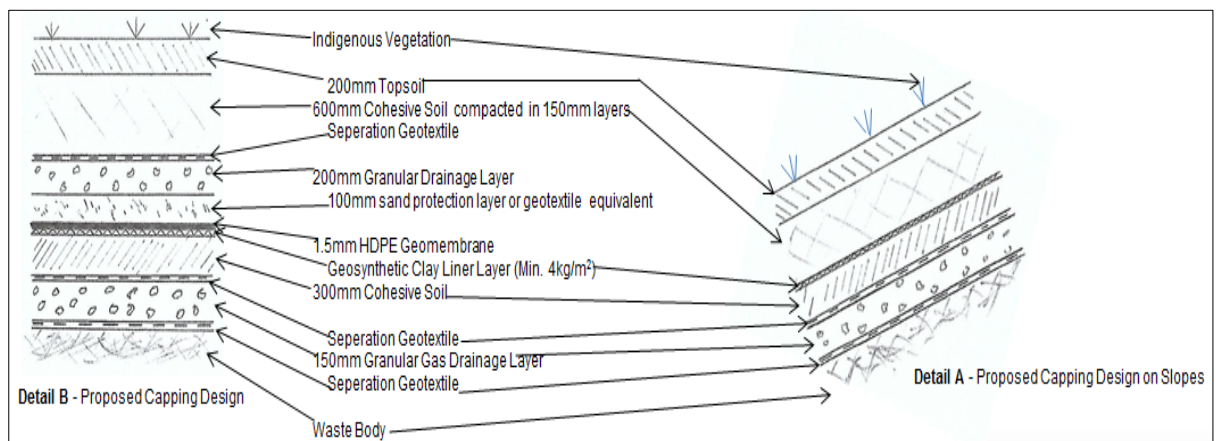


Figure 20: Proposed Capping Design for the Shakaville Landfill (taken from RAP Pienaar Consulting, 2017)

The description of the various levels of the capping layers from the waste body up to the indigenous vegetation that forms is as follows:

- **Separation Geotextile** - separates the waste body from the capping layers and should be a non-woven geotextile with a typical thickness of about 2.5mm and unit weight of at least 1.5kg/m². This layer assists in preventing fine particles from the layer works entering the waste body.
- **150mm Granular Gas Drainage Layer** - This is a landfill gas venting layer having a minimum thickness of 150mm and consisting of single sized stone or gravel of between 25mm and 50mm in size. This layer needs to be connected to a gas management system with gas vents being installed in key areas.
- **Additional Separation Geotextile** - separates the drainage layer from the capping layers
- **Cohesive Soil Layer** - a support layer to the below drainage system and should be 300mm thick consisting of in situ material compacted to a minimum density of 95%
- **Geosynthetic Clay Liner (GCL)** - A GCL is two geotextile layers with a layer of bentonite in the middle that acts as a containment barrier.
- **HDPE Geomembrane Layer (Plato only)** - The High-Density Polyethylene (HDPE) Geomembrane (GM) sheet needs to be in direct contact with the GCL. This layer is only considered for the top of the landfill cover and not the side slopes.
- **Sand Protection Layer (Plato only)** - The protection layer is placed directly above the GM to protect it from mechanical damage and can be in the form of a 100mm layer of fine to medium silty sand or a geotextile equivalent able to provide similar protection to the GM.
- **Granular Drainage Layer (Plato only)** - This system is provided to detect and remove any water leakage that has penetrated the layers above it. The granular drainage layer should

consist of a 200mm thick layer of granular material (crushed stone) having a size of between 38mm and 50mm with perforated HDPE pipes installed at 20m intervals on the plateau of the landfill to direct leakage to the leachate collection system and sump.

- **Separation Geotextile (Plateau only)** - The separation geotextile separates the drainage layer from the capping layers and should be a non-woven geotextile with a typical thickness of about 2.5mm and unit weight of at least 1.5kg/m². This layer assists in preventing fine particles from the layer works entering the drainage layer.
- **Geocomposite Drainage Layer (Slopes only)** - There are a number of products on the market that could potentially be used. The final design should replicate the specifications of a geocomposite drainage system similar to the ABG Pozidrain® product which consists of a high strength flexible polyethylene cusped drainage core (at least 4mm thick) with a non-woven geotextile filter fabric bonded onto one or either side. The geotextile filters a wide range of materials and is bonded to the core to ensure that it does not deform into the drainage channels under the load of the backfill material. The drainage composite allows fluids and gases to percolate into the core whilst supporting the backfill material. The collected fluids are then transported along the core to the leachate collection system at the landfill toe.
- **Cohesive Soil Layer** - This is a support layer to the below drainage system and should be 600mm thick consisting of in situ material compacted to a minimum density of 95% Standard Proctor maximum dry density at a water content of Proctor optimum to optimum +2%. The layers are to be placed and compacted in 150mm layers and also assist in providing the required pressure for the GCL/HDPE composite to function optimally. As indicated in the Geotechnical report the soils on site are weathered dolerites and shales with a clay content and fairly low permeability. This soil will work well in conjunction with the other layers of the capping system.
- **Topsoil Layer**- This needs to be a minimum of 200mm topsoil layer to assist in the establishment of vegetative cover as soon as possible. The layer needs to be optimally compacted to assist plant growth and can contain a mixture of hydro seeding if required;
- **Indigenous Vegetation**-The vegetation layer assists with stability and run off and needs to be established as soon after construction as possible. The vegetation needs to be indigenous to the area in order to ensure optimal sustainability of the capping system.

1.6.4 Stormwater management infrastructure: This is a critical component of sustainable capping and closure designs of landfills. The proposed Shakaville stormwater management system shall at least include:

- Catchwater banks at the top edge of the landfill to prevent erosion and control the runoff down the side slopes;
- Downchutes to direct the runoff down the side slopes;
- A drainage bench midway down the side slope to reduce the flow velocity and further prevent erosion;
- Reno mattresses at all discharge points to prevent scouring; and
- Gabion baskets along the toe of the landfill to prevent erosion from the adjacent stream and the Mbozamo river.

1.5.4 Leachate management infrastructure: The selected option is to construct a shallow clay cut-off trench and a shallow leachate collection drain around the toe of the landfill that would gravity drain to a leachate collection manhole and will be pumped to sewer infrastructure in closest proximity to

the site. It is, however, proposed as part of this design that the leachate be collected in a leachate sump so that it can be tested prior to release into the sewer system. If leachate is found to be unfit for release to sewer it would have to be drained into a collection tank and disposed of at a licensed hazardous landfill. Alternatively, the leachate can be treated until acceptable for release into the sewer infrastructure.

1.5.5 Gas Management: In order to ensure that the gases on site are managed, gas vents or gas monitoring probes will need to be installed. As landfills produce greenhouse gases such as methane and carbon dioxide gases, these need to be monitored and controlled. Other gases include nitrogen and ammonia.

Additional Information with regard to the Engineering requirements are outlined in the Engineering Needs and Preliminary Closure Design Report in **Appendix F2** as well as the Closure and Rehabilitation Plan in **Appendix H**.

1.7 The objectives of the Basic Assessment Process

The main objectives of the Basic Assessment, in terms of the regulatory requirements stipulated in *Appendix 1* of the 2014 NEMA EIA Regulations, are to:

- (a) determine the policy and legislative context within which the proposed activity is located and how the activity complies with and responds to the policy and legislative context;
- (b) identify the alternatives considered, including the activity, location, and technology alternatives;
- (c) describe the need and desirability of the proposed alternatives;
- (d) through the undertaking of an impact and risk assessment process, inclusive of cumulative impacts which focused on determining the geographical, physical, biological, social, economic, heritage, and cultural sensitivity of the sites and locations within sites and the risk of impact of the proposed activity and technology alternatives on these aspects to determine—
 - (i) the nature, significance, consequence, extent, duration, and probability of the impacts occurring to; and
 - (ii) the degree to which these impacts—
 - (aa) can be reversed;
 - (bb) may cause irreplaceable loss of resources; and
 - (cc) can be avoided, managed or mitigated; and
- (e) through a ranking of the site sensitivities and possible impacts the activity and technology alternatives will impose on the sites and location identified through the life of the activity to—
 - (i) identify and motivate a preferred site, activity and technology alternative;
 - (ii) identify suitable measures to avoid, manage or mitigate identified impacts; and
 - (iii) identify residual risks that need to be managed and monitored.

1.7 Structure of the Basic Assessment Report

This report has also considered the requirements outlined in Appendix 1 with regard to the content of the Basic Assessment report. In addressing these requirements, this Basic Assessment Report (BAR hereafter) is divided into **9 Chapters**, the contents of which will be presented as follows in this report:

- **Chapter 1** introduces the background to the development proposal and profiles its proponents. Furthermore, this chapter provides an indication of the BA process that will be followed as well as providing insights into the legislative requirements that have resulted in the need for this process;
- **Chapter 2** provides the legislative framework for the BA process and the context of the proposed development. The legislative framework includes national and provincial legislation as well as planning framework which will have to be considered in the BA process;
- **Chapter 3** is a detailed description of the adopted Basic Assessment Process;
- **Chapter 4** is a description of the receiving environment associated with the decommissioning of the landfill;
- **Chapter 5** is a description and comparative assessment of the alternatives that were considered for the project;
- **Chapter 6** details the Public Participation Process undertaken for the project. It also summarises key outcomes of the process;
- **Chapter 7** discusses the Impact Assessment Methodology;
- **Chapter 8** is a description and assessment of environmental impacts; and
- **Chapter 9** provides the Environmental Impact Statement conclusion to the report as well as recommendations.

1.8 Project Team

This section of the BAR provides the particulars, including contact details, of the key stakeholders (Applicant's representative, Environmental Assessment Practitioner and the relevant official from the Competent Authority). These details are outlined in **Table 1** below.

Table 1: Application details

Applicant's representative	Environmental Impact Practitioner	Competent Authority Representative
Name: Wilson Mhlongo Designation: Manager: Waste Management Tel: 032 437 5215 e-Mail: WilsonM@kwadukuza.gov.za	Name: Ntsebo Mkhize Designation: Environmental Impact Assessment Practitioner Tel: 011 312 2537 Fax: 011 805 1950 Email: ntsebom@gaenvironment.com/ environment@gaenvironment.com	Name: Nomusa Xaba Designation: Control Environmental Officer Mobile No: 082 8222511 Nomusa.Xaba@kznedtea.gov.za

This BAR was prepared by **Ntsebo Mkhize**, an Environmental Assessment Practitioner (EAP) employed by GA Environment. Her CV is included as **Appendix C** of this report.

Ntsebo Mkhize holds a B.Sc. (Hons) Environmental Management (cum laude) degree. She has 5 years of working experience in the Environmental Management Field and a year in the field of Landscape Architecture. Ntsebo specialises in, among various environmental management tools, Integrated Environmental Management (IEM), Environmental Impact Assessments (EIAs), Basic Assessments (BAs). Miss Mofoka also specialises in Spatial Analyses and Mapping with the use of ArcGIS. She has been involved in projects related to Waste Management, Linear Infrastructure, Mixed-Use developments as well as Conservation Planning and Biodiversity Management. Regarding the licencing of landfills, she has worked on projects in the Northern Cape, North West and KwaZulu Natal.

1.9 Specialist studies

The Basic Assessment process included a number of specialist studies undertaken by the parties whose details are indicated in **Table 2**.

Table 2: Specialist Studies and contact details

Ecological Opinion	Geotechnical and Geohydrological Study	Engineering Needs Assessment and Preliminary Closure Design Study
<p>Company Name: Scientific Terrestrial Services</p> <p>Contact Person Emile van der Westhuizen</p> <p>Contact Details: emile@sasenvgroup.co.za</p>	<p>Company Name: North Arrow Holdings (Pty) Ltd</p> <p>Contact Person Clement Rikhotso</p> <p>Contact Details: clement.rikhotso@northarrowholdings.co.za</p>	<p>Company Name: RAPIenaar Consulting (Pty) Ltd</p> <p>Contact Person Reon Pienaar</p> <p>Contact Details: reon@rapienaar.co.za</p>

The Terms of reference for each of these studies are discussed in **Chapter 8.1** as well as in each of the specialist studies in **Appendix F**.

1.10 Assumptions, Gaps and Limitations

The following gaps, assumptions and limitations were made when conducting the BA:

- Weather patterns will remain relatively stable over time;
- There will not be significant growths in the population over the foreseeable future; and
- The KwaDukuza Local Municipality has the necessary skills and know-how to oversee the construction activities and monitor the landfill site once construction activities associated with closure of the site have been completed. Where the skills are lacking, it is our understanding the specialist sub consultant's services will be sought.
- DEA has spearheaded the funding of the licencing of a number of unlicensed landfill sites in South Africa (with limited budget constraints) as the Municipalities responsible for the management of the landfill has no funds available to undertake the required Environmental studies. It is understood that once the Waste Management License is issued, the

Municipalities can then source funds from funding organisations to undertake detailed studies that may be required by the Competent Authorities. For these reasons, should the Competent Authority require detailed studies associated with the licencing, it is a recommendation of GA Environment has recommended that such be included as conditions of Licencing and the required studies can be undertaken before the upgrading of landfill commences.

- Due to limited budgetary constraints, the specialist studies the ecological study was undertaken on a conceptual/preliminary basis and should therefore be considered as indicative. For these reasons, should the Competent Authority require detailed studies associated with the licencing, such must be included as condition of Licence and the required studies can be undertaken before the upgrading of landfill commences. It must however also be added that in addition to budgetary constraints, it is the EAP's opinion that an ecological opinion will suffice for the landfill as the activities associated with the rehabilitation of the landfill will be undertaken in an area infested with invasive species and highly disturbed, thus a detailed study is not required.
- The composition of the historical waste body is not known with certainty. Based on information obtained from the KwaDukuza Local Municipality, it is assumed that the landfill was historically used for the disposal of general waste and no hazardous waste was disposed on site. As access control was absent during the operation of the landfill, it is possible that some hazardous waste was disposed of on site.
- As the site was commissioned in the 1970's, it is assumed that the site was neither lined nor provide with any other infrastructure associated with the landfill as per the DWAF Minimum Requirements for Waste Disposal by landfill (2nd Edition, 1998).
- Records on water and soil quality monitoring prior to operations and the operational period of the landfill are unknown. The historical impact of waste body on the soil and water quality is unknown.

It can be thus concluded that other than the gaps in knowledge, assumptions provided above and the information presented in various sections of this report, the information used in this report was adequate for the purposes of the current impact assessment.

2 LEGISLATIVE FRAMEWORK

This section of the BAR discusses applicable legal provisions and the legal context for the BA process required for the licensing of the Shakaville landfill. It provides a review of relevant legislation, regulations, policies and guidelines, which are applicable to, or have implications, for the proposed project. The contents of this report are based on a review of the information that was available at the time of the compilation of the report. The discussion in this chapter is by no means an exhaustive list of the legal obligations of the applicant in respect of environmental management for the Shakaville landfill site.

2.1 National Legislation

2.1.1 Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996)

The environmental right is mentioned in Section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996). This states the following:

“...everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that prevent pollution and ecological degradation, promote conservation, and secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development”.

The State must therefore respect, protect, promote and fulfil the social, economic and environmental rights of everyone and strive to meet the basic needs of previously disadvantaged communities. The Constitution therefore recognises that the environment is a functional area of concurrent national and provincial legislative competence, and all spheres of government and all organs of state must cooperate with, consult and support one another if the State is to fulfil its constitutional mandate.

The licensing and correct decommissioning of the Shakaville landfill will ensure that the environmental right enshrined in the Constitution contributes to the protection of the biophysical and social environment.

2.1.2 National Environmental Management Act, 1998 (Act No. 107 of 1998)

In order to bring section 24 of the Constitution of the Republic of South Africa, 1996 (Act No. 108 of 1996) into realisation, the National Environmental Management Act, 1998 (NEMA) (Act No. 107 of 1998) was promulgated to serve to *‘provide for co-operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote cooperative governance and procedures for co-ordinating environmental functions exercised by organs of state; to provide for certain aspects of the administration and enforcement of other environmental management laws; and to provide for matters connected therewith’*. NEMA is main Environmental Legislation in South Africa and other Specific Environmental Management Acts (SEMA’s) support its objectives.

Examples of SEMA’s include the following:

- National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008);
- National Water Act, 1998 (Act No. 36 of 1998);
- National Heritage Resources Act, 1999 (Act No. 25 of 1999);
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004); and

- National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

Some specific Environmental Management Legislation is discussed in Sections 2.1.3 to 2.1.8. The key principles of NEMA as outlined in Section 2 can be summarised as follows:

- sustainability must be pursued in all developments to ensure that biophysical and socio-economic aspects are protected or;
- there must be equal access to environmental resources, services and benefits for all citizens including the disadvantaged and the vulnerable. Adverse environmental impacts shall be distributed fairly among all citizens;
- environmental governance must include the participation of all interested and affected parties who must be catered for to allow their effective participation;
- Environmental management must place people and their needs at the forefront of its concern, and serve their physical, psychological, developmental, cultural and social interests equitably.
- The polluter pays principle must be applied in all cases where any person has caused pollution or undertaken any action that led to the degradation of the environment.

2.1.2.2 National Environment Management Act, 1998 (Amendments)

The National Environmental Management Act (Act No. 107 of 1998) has been amended numerous times to better meet its overall objective of the protection of the environment.

The amendments to NEMA include but are not limited to:

- National Environmental Management Act (Act No. 56 of 2002);
- National Environmental Management Act (Act No. 8 of 2004);
- National Environmental Management Act (Act No. 46 of 2003);

2.1.2.3 NEMA Environmental Impact Assessment Regulations

In terms of section 24(2) of NEMA, the Minister and or any MEC in concurrence with the Minister may identify activities which require authorisation as these activities may negatively affect the environment. The Act requires that in such cases the impacts must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorising, permitting, or otherwise allowing the implementation of an activity. The NEMA EIA Regulations guide the processes required for the assessment of impacts of Listed Activities.

The requirement for the undertaking of Environmental Impact Assessments and Basic Assessments began in 1997 with the promulgation of the EIA Regulations under the Environment Conservation Act, 1989 (ECA) (Act No. 73 of 1989). These were followed by the 2006, 2010 and 2014 regulations. Table 3 is a summary of the progression of the EIA regulations to date.

Table 3: Summary of the South African EIA regulations from inception to date

EIA Regulations	Government Gazette
EIA Regulations promulgated in terms of the ECA, Act No 73 of 1989	GNR 1182 & 1183: Government Gazette No 18261, 5 September 1997
Amendment of the ECA EIA Regulations	GNR 670 and GNR 672 of 10 May 2002, Government Gazette No 23401

EIA Regulations	Government Gazette
2006 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 385, 386 and 387 Government Gazette No 28753, Pretoria, 21 April 2006
2010 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 543, 544, 545 and 546 Government Gazette No 33306, Pretoria, 18 June 2010
2014 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 982, 983, 984 and 985 Government Gazette No 38282, Pretoria, 04 December 2014
<p style="text-align: center; color: red;">Current</p> Amendment of the 2014 EIA Regulations promulgated in terms of the NEMA, Act No 107 of 1998	GNR 982, 983, 984 and 985 Government Gazette No 40772, Pretoria, 07 April 2017

The Basic Assessment for the proposed Shakaville landfill is being undertaken in terms of the NEMA EIA Regulations, 2014, as amended. These came into effect on the 07th April 2017.

2.1.3 National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

A Specific Environmental Management Act was promulgated on 10 March 2009 to govern waste management activities. This Act aims to reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.

The National Environmental Management Waste Act, 2008 (Act No. 59 of 2008) establishes institutional arrangements and planning matters; provides for national norms and standards for regulating the management of waste by all spheres of government; makes provision for specific waste management measures; establishes the procedures for the licensing and control of waste management activities; provides for the remediation of contaminated land; provides for the establishment of the national waste information system; and provides for compliance and enforcement of waste management activities. The proposed decommissioning of the Shakaville landfill is governed by certain key sections of NEM:WA (Chapter 5 and Section 16 (1) as briefly discussed in the sections that follow.

Chapter 5 (Sections 43-59) of NEM:WA discusses the need for the licensing of Waste Management Activities and that any person who wishes to obtain a Waste Management Licence must lodge an application with the relevant CA. The Waste Management Activities are based on Section 19 of NEM:WA where the Minister has been given powers to 'publish a list of waste management activities that have, or likely to have, a detrimental effect on the environment'. The NEM:WA 2008 Waste Management Activities, Government Notice 921 of November 2013, as amended outlines activities that require the undertaking of either a Basic Assessment, an Environmental Impact Assessment or adherence to specific requirements or standards.

Section 16(1) of NEM:WA states that "A holder of waste must, within the holder's power, take all reasonable measures to—

- (a) avoid the generation of waste and where such generation cannot be avoided, to minimise the toxicity and amounts of waste that are generated;*
- (b) reduce, re-use, recycle and recover waste;*
- (c) where waste must be disposed of, ensure that the waste is treated and disposed of in an environmentally sound manner;*

- (d) manage the waste in such a manner that it does not endanger health or the environment or cause a nuisance through noise, odour or visual impacts;*
- (e) prevent any employee or any person under his or her supervision from contravening this Act;*
- and*
- (f) prevent the waste from being used for an unauthorised purpose.”*

As the Shakaville landfill will be licenced for closure, Section 16(1)(d) is key as it highlights the responsibility of the KwaDukuza Local Municipality to ensure that the Shakaville landfill will not have any adverse impacts on human health or the environment.

2.1.3.1 Specific Waste Management Legislation

The term “*Specific waste management legislation*” refers to a range of specific laws and guidelines that have been formulated with the aim of dealing with various aspects of waste management, and should be considered in conjunction with NEM: WA. Some key specific Environmental Management Legislation is briefly discussed as follows:

- ***NEM:WA: Waste Classification and Management Regulations***

The NEM:WA: Waste Classification and Management Regulations (Government Notice No. R 634 published in Government Gazette No. 36784 of 23 August 2013) serve the following purposes:

- *to regulate the classification and management of waste in a manner which supports and implements the provisions of the Act;*
 - *to establish a mechanism and procedure for the listing of waste management activities that do not require a Waste Management Licence;*
 - *to prescribe requirements for the disposal of waste to landfill;*
 - *to prescribe requirements and timeframes for the management of certain wastes; and prescribe general duties of waste generators, transporters and managers.*
- ***NEM:WA: National Norms and Standards for the assessment of waste for landfill disposal –***

These Norms and Standards (Government Notice No. R 635 published in Government Gazette No. 36784 of 23 August 2013) allow for the assessment of waste prior to its disposal at a landfill. It discusses the importance of the assessment based on the following key information:

- *Total Concentration (TC) Analysis* (expressed in mg/kg of the total concentration of a specific chemical substance in waste) and the *Total Concentration Threshold(TCT)*;
 - *Leachate Concentration (LC) Analysis* (expressed in mg/l of the total concentration of a specific chemical substance in waste) and the *Leachate Concentration Threshold (LCT)*
 - Classification of Waste types bases on TCT and LCT Limits, and
 - Total Concentration Limits of both.
- ***NEM:WA: National Norms and Standards for the disposal of waste to landfill***

The NEM:WA National Norms and Standards for the disposal of waste to landfill (Government Notice No. R 636 published in Government Gazette No. 36784 of 23 August 2013) aims to classify landfills according to the containment barrier designs based on the various types of waste as discussed in the Norms and Standards for the assessment of waste for landfill disposal (Government Notice No. R 635 published in Government Gazette No. 36784 of 23 August 2013) and the DWAF Minimum Requirements for Waste Disposal by landfill (2nd Edition, 1998).

- ***NEM:WA: National Norms and Standards for the Storage of Waste***

The NEM:WA National Norms and Standards for the storage of waste to landfill (Government Notice No. R 926 published in Government Gazette No. 37088 of 29 November 2013). The documents aims to provide a uniform approach to the management of waste disposal facilities. It outlines matters such as the location and registration of the facility, operational requirements, the need for the training of personnel, the importance of record keeping, etc.

- ***DWAF Minimum Requirements for Waste Disposal by Landfill (2nd Edition, 1998)***

This address various guidelines pertaining to landfill aspects such as site selection, classification, designs, operational requirements, monitoring as well as closure and the associated rehabilitation. The key objectives of the *DWAF Minimum Requirements for Waste Disposal by Landfills* are to ensure that waste disposal standards in South Africa are improved to ensure that landfills do not negatively impact on the biophysical as well as the socio-economic aspects of the environment. This document is key to the proposed decommissioning of the Shakaville landfill as it provided guidance on closure requirements.

- ***DWAF Minimum requirements for the handling, classification and disposal of hazardous waste (2nd Edition, 1998)***

The minimum requirements for handling, classification and disposal of hazardous waste guideline sets out the waste classification system, in which waste is placed in two classes i.e. general or hazardous. The classification of the waste is based on their inherent toxicological properties. Hazardous waste, however, is further subdivided based on the risks the waste poses. The requirements for pre-treatment and disposal of hazardous waste are appropriately set in accordance with the waste classification, and are provided for within the guideline document. According to information obtained from the KwaDukuza Local Municipality, only General waste was disposed of at the Shakaville Landfill. As there was no access control on this site, it is however possible that hazardous waste was illegally disposed of at the facility.

2.1.4 National Water Act, 1998 (Act No. 36 of 1998)

The National Water Act, 1998 (Act No. 36 of 1998) aims to provide for management of the national water resources in order to achieve sustainable use of water for the benefit of all water users. This act requires that the quality of water resources is protected as well as the integrated management of water resources with the delegation of powers to institutions at the regional or catchment level. The purpose of the Act is to ensure that the nation's water resources are protected, used, developed, conserved and managed in ways which take into account:

- Meeting basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest; facilitation social and economic development;
- Providing for the growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety; and
- Managing floods and drought.

In pursuit of these objectives, Chapter 4 of the act regulates water use, while Section 21 lists eleven water use types that are regulated [Section 21 (a) – (k)]. Watercourses and wetlands are protected in terms of this section, as both are regarded as water resources. As the Shakaville landfill is located within 500m of a watercourse as shown in the Locality Map attached as **Appendix A**, the Department of Water and Sanitation will advise of their requirements.

2.1.5 National Heritage Resources Act, 1999 (Act No. 25 of 1999)

The objective of the National Heritage Resources Act, 1999 (Act No. 25 of 1999) is to introduce an integrated system for the management of national heritage resources. The identification, evaluation and assessment of any cultural heritage site, artefact or find in South Africa is required by this Act. Section 38 of this Act pertains to Heritage resources management and Section 38(1) states the following

Subject to the provisions of subsections (7), (8) and (9), any person who intends to undertake a development categorised as—

(a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;

(b) the construction of a bridge or similar structure exceeding 50 m in length;

(c) any development or other activity which will change the character of a site—

(i) exceeding 5 000 m² in extent; or

(ii) involving three or more existing erven or subdivisions thereof; or

(iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or

(iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;

(d) the re-zoning of a site exceeding 10 000 m² in extent; or

(e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority,

must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.

As the Shakaville landfill occupies an area of approximately 80 000m² (8 Ha), the need for consultation with *the responsible heritage resources authority was undertaken as requirements for all activities that occupy an area that exceeds the 5 000m²* based on Section 38 (1)(c)(i) of the National Heritage Resources Act (1999), Amafa aKwaZulu-Natali (Amafa hereafter) is the KwaZulu Natal's Heritage Resources Authority. GA Environment has liaised with this authority and is currently awaiting their comments.

2.1.6 National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)

The National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003) provides for a range of protected areas: protected environments, special nature reserves and nature reserves. South Africa has much valuable biodiversity outside of protected areas, but this is disappearing at an alarming rate. It has been recognised that in order to effectively conserve South Africa's biodiversity, conservation efforts must focus outside of formerly protected reserves, considering 80% of the country's most scarce and threatened habitats are privately owned. It is clearly not possible for government to purchase all the land identified as high priority in terms of habitat or threatened ecosystems to add it to our system of state-owned protected areas. This requires a new approach to conservation extension and a shift away from reactive extension (i.e. responding to problems and enforcing regulations and permitting procedures) to proactive extension (i.e. engaging with a landowner before a problem is created) where stewardship is encouraged. For these purposes, extension officers need to be better equipped with people skills relating to relationship building, conflict resolution, land negotiation, as well as hands-on knowledge, in the form of practical guidelines for managing natural ecosystems.

The Shakaville landfill is not located within a Protected Area. The closest Protected area is the Harold Johnson Nature Reserve located approximately 18 km from south east of the landfill. According to the DWAF Minimum Requirements for disposal of waste by landfill, 2nd Edition, 2008, the location of a sensitive ecological and/or historical area are considered as having inherent fatal flaws.

2.1.7 National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)

The object of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004) (NEM:BA) is to provide for the management and conservation of South Africa's biodiversity within the framework of NEMA; the protection of species and ecosystems that warrant national protection; the sustainable use of indigenous biological resources; the fair and equitable sharing of benefits arising from bio-prospecting involving indigenous biological resources; the establishment and functions of a South African National Biodiversity Institute; and for matters connected therewith. The objectives of NEM: BA are:

- Within the framework of the National Environmental Management Act, to provide for:
 - the management and conservation of biological diversity within the Republic and of the components of such biological diversity;
 - the use of indigenous biological resources in a sustainable manner; and
 - the fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources;
- To give effect to ratified international agreements relating to biodiversity which are binding on the Republic;
- To provide for co-operative governance in biodiversity management and conservation; and

- To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

As the Shakaville landfill area has naturally rehabilitated, it is possible that some vegetation of importance may be encountered. It must however be highlighted that the Shakaville landfill falls within an area that is neither a Critical Biodiversity Area or an Ecological Support Area. Refer to the Ecological Opinion report in **Appendix F1**.

2.1.8 National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)

The aim of The National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004) (NEM: AQA) is to:

- Protect and enhance air quality in the Republic;
- Prevent air pollution and ecological degradation and
- Secure ecologically sustainable development, while promoting justifiable economic and social development.

The NEM: AQA makes provision for the establishment of ambient air quality and emission standards at a national, provincial and local level.

Although the Shakaville Landfill will be licenced for decommissioning, it is noted that the proposed activities are likely to generate dust which according to the National Environmental Management: Air Quality Act, 2004, constitutes air pollution and must therefore be controlled.

2.1.9 Other National Legislation concerning or related to the Environment

Various other laws regarding the protection of the environment that are relevant to this BA include:

- Environment Conservation Act, 1989 (Act No. 73 of 1989) (as amended);
- Hazardous Substances Act, 1973 (Act No. 15 of 1973);
- Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983);
- Land Administration Act, 1995 (Act No. 2 of 1995);
- Water Services Act, 1997 (Act No. 108 of 1997);
- National Forests Act, 1998 (Act No. 84 of 1998); and
- Occupational Health and Safety Act, 1993 (Act 85 of 1993).

2.2 Local Government Guidelines

The closure of the Shakaville landfill will be in line with the KwaDukuza Local Municipality 's Draft KwaDukuza Municipality 2016-2017 Integrated Development Plan (IDP) as well as the Integrated Waste Management Plan (IWMP) which is currently being drafted by the Municipality.

According to the KwaDukuza Municipality's Integrated Development Plan (IDP) (2012- 2017), the implementation of the closure and the rehabilitation of the Shakaville landfill was targeted for the year 2014 and was allocated the project number *MS/41/2012*. To date, the closure and rehabilitation of the site has not been undertaken. It is the intention of the Basic Assessment Process to ensure that the closure of the Shakaville landfill is undertaken in line with the legislative requirements

3 BASIC ASSESSMENT METHODOLOGY

The NEMA Regulations of 2014, as amended identify three separate administrative processes for EIAs, depending on the nature of the activity. A Basic Assessment process (Listing Notice 1) is identified for those activities that have less of a possible detrimental impact to the environment. A Scoping and EIA process (Listing Notice 2) is necessary for those activities, which are identified as having more of a possible detrimental impact on the environment, whereas Listing Notice 3 relates to identified activities that would require environmental authorisation prior to the commencement of those activities in specific identified geographical areas only.

The Basic Assessment process required for the licensing of the Shakaville landfill must in terms of NEM: WA, 2008, undergo this process. It must be noted that no site ranking/site selection studies were undertaken for alternative landfill site as the Shakaville landfill will be licensed for Closure and requires a licence to ensure compliance in terms of applicable legislation and to meet the Department of Environmental Affairs Ministers' objective to licence all illegal landfills in South Africa.

3.1 Stakeholder Pre- Consultation

In order to address the requirements of key stakeholders before the commencement of the Basic Assessment Process, GA Environment held a number of meetings. A pre-application Meeting was held with DEA, EDTEA and the Municipality Representatives on the 01st September 2017. In addition to this, an additional meeting was held with the KwaDukuza Local Municipality officials on the 20th September 2017. The Municipality further requested a presentation on the project to the Council on the 18th September 2017. Site visits with representatives from both the Municipality and EDTEA were also conducted. Please refer to **Appendix E3** for the Minutes of the pre-consultation meetings.

3.2 Registration of the Application with the Competent Authorities

A Waste License Application Form (**Appendix D1**) was completed and submitted to the KZN EDTEA for review and consideration. The letter acknowledging the receipt of the Application Form is attached as **Appendix D2**. The project has been allocated the reference number **DC29/0025/2017**.

3.3 Public Participation Process

A Public Participation Process (PPP) consistent with Chapter 6 of the NEMA EIA Regulations 2014, as amended (Government Notice R. 982 in Government Gazette No. 40772 of 07 April 2017) has been undertaken and will continue throughout the project. This report will be availed for public review as a means of identifying any issues and concerns. The Draft Basic Assessment Report will also be issued out for review to the KwaDukuza Local Municipality as the Project Applicant, the iLembe District Municipality, the Department of Water and Sanitation (DWS), the South African Heritage Resources Agency (SAHRA) and other various relevant authorities. As discussed above, comments received during the review period will be included in the Final Basic Assessment Report that will be submitted to EDTEA for review and authorisation. To date, the PPP undertaken has included the following:

- the identification of Interested and Affected Parties (I&APs);

- the compilation of an I&AP database;
- the placement of site notices at visible and accessible locations close to the site;
- the placement of a newspaper advertisement in a local newspaper
- the distribution of Notification Letters to adjacent land owners and other parties on an on-going basis since the notification period commenced in September 2017.

The details of the PPP undertaken to date is discussed in detail in Chapter 6 of this report. The Draft Basic Assessment Report will be issued out for public review for the Legislated 30 days from **19 January 2018 to 19 February 2018** and will be placed at the KwaDukuza Public Library. Other parties will be provided with copies of the report in hardcopy or softcopy formats. Comments received during the public review will be included in the Final Basic Assessment Report that will be submitted to EDTEA for review and authorisation.

An indication of the PPP undertaken to date can be referred to in **Appendix E**. Please see **Chapter 6** of this report for a detailed description of the PPP undertaken to date.

3.4 Draft Basic Assessment Report

This report represents the Draft Basic Assessment Report (DBAR) for the project and documents the findings of the Basic Assessment process undertaken to date. The report also documents the issues identified through the site visits, consultation with the Competent Authorities and other Stakeholders, the Public Participation Process (PPP) as well as through the professional input of the relevant specialists identified, the project engineers and the GA Environment team.

All comments that will be received during the review of the DBAR will be captured and responded to through a Comments and Response Report that will be included in the report. All Comments received to date have been included in this report. All I&APs registered on the Project database will be informed of the availability of the DBAR for public review. Refer to **Appendix E** for all Public Participation related documents compiled for the project in line with the NEMA EIA Regulations. Specialist studies relevant to the proposed project have been identified and are included in this report.

3.5 Review of the Draft and Final Basic Assessment Report by Competent Authorities

EDTEA as the CA for the listed activity must be provided with a copy of a Final BAR that will have been subjected to at least 30 days of Public and CA Review as per Section 19(1) of the NEMA EIA regulations. The Final BAR must be submitted within 109 days of receipt of the Application Form for Waste Management Licence.

3.6 Specialist Studies

In accordance with the requirements of Appendix 6 of the NEMA EIA Regulations, 2014 as amended, three (03) specialists have been appointed to undertake studies of which the findings have been assessed and discussed in detail in **Chapter 8** of this report.

The Specialist Studies undertaken for this BA are the *Ecological Opinion; the Geotechnical and Geohydrological Study* as well as the *Engineering Needs Assessment and Preliminary Closure Design Study*. The Terms of reference and summary of each of these are discussed below. These reports are attached in **Appendix F** of this BAR.

3.5.1 Ecological Opinion

An Ecological Opinion to determine the impact of the surrounding ecological environment (flora, fauna and wetland) has been undertaken by Scientific Terrestrial Services. The Ecological Opinion is aimed at informing the Waste Licencing Processes regarding the potential impact of the upgrade of landfill on the surrounding ecological environment. The terms of reference for the Ecological opinion study were as follows:

- Analysis of conservation databases;
- Location of Freshwater Ecosystem Priority Areas (FEPAs) in relation to the proposed prospecting area;
- Desktop delineation of wetlands (including GN509 Delineation);
- Highlight sensitive environmental components including watercourses, conservation-worthy vegetation and fauna habitat;
- Discuss potential impacts, mitigation and management procedures relevant to the protection of the conservation-worthy aspects of the site, and also downstream areas; and
- Compile an Ecological opinion report for the Shakaville landfill site.

Based on the desktop ecological assessment, freshwater resource delineations within 500m of the Shakaville landfill site and site photographs, it was determined that the existing Shakaville landfill site, is considered transformed. Although vegetation within the majority of the Shakaville has been re-established, the floral composition is considered to be in a pioneer stage of succession. The area is further associated with an informal settlement, subsistence farming and illegal dumping practices, and as such potential impacts as a result of the decommissioning of the Shakaville landfill site will predominantly be on the freshwater resources associated with the boundaries of the Shakaville landfill site. Refer to **Appendix F1** for the Shakaville Landfill Ecological Opinion Report.

3.5.2 Geotechnical and Geohydrological Investigations

Landfills are known to have impact on the underground water systems due to the levels of surface water leachate generated from landfill site. It is therefore essential that the potential existing and future groundwater pollution and other potential threats to the local aquifer be determined as part of the assessment phase. GA Environment has appointed North Arrow Consulting (Pty) Ltd to undertake Geotechnical Engineering and Hydrogeological Risk Assessment for the Shakaville landfill site. The terms of reference for the Geotechnical and Geohydrological study will cover the following:

- To evaluate geo-technical and geo-hydrological parameters of the sub base soil at the site;
- To review the geotechnical and geo-hydrological requirements for the development of cells and associated infrastructure for a landfill at the site;
- To assess the requirements, and availability and suitability of cover material for the operations of the landfill;
- To assess the requirements, and availability and suitability of capping material for the closure of the landfill;
- To assess and evaluate the requirements, and risk issues for the landfill including, slope stability, and permeability of soil;
- To assess and evaluate the requirements for the landfill containment barrier system (geomembrane lining) in accordance with the current legal framework and make key recommendations in relation to

the above site investigations;

- To identify Geotechnical and Hydrogeological Risks Associated with the site; and
- To develop a suit of site-specific recommendations for consideration during the engineering design of the proposed landfill site and associated infrastructure.

The summary of the findings for the Shakaville landfill Geotechnical and Geohydrological study as presented by the in the Specialist report is shown in **Table 8**. Refer to the report in **Appendix F2**.

3.5.3. Engineering Needs Assessment and Preliminary Closure Design Report

RAPienaar Consulting (Pty) Ltd has been appointed to provide the design work for the proposed development. The company will be involved throughout the Basic Assessment to advise on issues pertaining project planning and design in order to reduce the risk of unexpected costs and delays later in process. The scope of work for the design engineers will include the following:

- Assess the existing site against standard legislative requirements for landfill design and operations, and develop a suite of conceptual engineering recommendations, which must be considered as license conditions to ensure that the landfill site is designed; and operated within legal compliance;
- Assess and evaluate the requirements for the landfill containment barrier system (geomembrane lining) in accordance with the current legal framework and make key;
- Recommendations in relation to the above site investigations; and
- Develop a suite of site-specific recommendations for consideration during the engineering design of the proposed landfill site and associated infrastructure.

The Engineering Assessment and Designs Report is attached as **Appendix F** of this Basic Assessment Report and outlines the need for adequate capping. The final closure design aims to ensure that any identified pollution risk is mitigated and managed as pollution control is the primary function of the closure design. In addition to capping stormwater management, leachate management as well as gas management measures must be put in place.

3.7 Other Supporting Documents to the Basic Assessment

As part of the Basic Assessment, other supporting documents that have been drafted in the line with NEMA EIA Regulations are the Closure and Rehabilitation Plan as well as the Environmental Management Programme. Each of these are discussed

3.6.1 Closure and Rehabilitation Plan

As part of the Waste Licence Application requirements for the Closure of the Shakaville landfill Site, a closure plan for the site must be compiled to support the application. The Closure and Rehabilitation report will be compiled in consultation with RAPienaar Consulting (Pty) Ltd. The Closure and Rehabilitation report is intended to serve a guide for the formal closure and end use planning for the future closure of the Shakaville landfill site. The closure and end use plan are intended to be implemented along with the rehabilitation of the site.

The report intends to:

- Serve a guide for the formal closure and rehabilitation planning for the Shakaville landfill Site.
- Used as a framework document, which shall guide the development of more detailed specifications for the implementation of engineering scope of works for the closure and rehabilitation of the Shakaville landfill site.
- Form part of the Environmental Management Plan for the Closure of the Shakaville landfill site.
- Guide the KwaDukuza Municipality in making Financial Provisions for the closure and rehabilitation for

the site.

The closure report was prepared in line with the guidance documents on best practice for Closure of Waste Management Facilities, some of which can be found in the Minimum Requirements for Waste Management 2nd Edition, Department of Water Affairs and Forestry (1998), and is intended to ensure compliance with legal and other requirements within the context of Environmental Management Systems and Planning.

The objective of the closure plan is to steer the use of the site during its lifetime toward a desirable end use state that minimizes environmental risk, social risk, and financial or economic risk. The Closure Plan takes all closure requirements into account. The landfill closure plan aims to specify the implementation of requirements for closure of the landfill and would typically include details of rehabilitation measures. The closure report also seeks to specify details of management, inspection, monitoring and maintenance of the site after it is closed. It is however important to bear in mind that this plan is a retrospective Closure Plan as the Shakaville landfill site was never opened formally and not designed as a dumpsite or landfill. The Closure Plan compiled for the Shakaville landfill is attached as **Appendix H**.

3.6.2 Environmental Management Programme

An Environmental Management Programme (EMPr) has been compiled in line with Appendix 4 of the NEMA EIA Regulations, 2014, as amended. The EMPr provides guidelines to the KwaDukuza Local Municipality as the project developers, the Contractor as well as various other members of the technical team on how best to implement the mitigation measures for the decommissioning of the site in order to avoid adverse environmental impacts. Refer to **Appendix I** of this Basic Assessment Report

3.8 Issuing of the Waste Management Licence and Environmental Authorisation

As discussed, since the application will require input from the EIA and Waste Management section of EDTEA, it is understood that following the review of the Basic Assessment Report, A Waste Management License will be issued in terms of Section 49 of the National Environment Waste Management Act (2008). This will be issued to the Applicant, i.e. KwaDukuza Local Municipality. If the activity is authorised, this authorisation will be a single Waste Management Licence covering all activities for which the Licence was granted. It should be noted that a Waste Management License may state that the licensed activity may not commence before specified conditions are complied with. The License may also include any other condition that the competent authority considers necessary for the protection of the environment.

3.9 Appeal Period

After a decision has been reached by EDTEA, Chapter 2 of the National Appeal Regulations 2014 makes provision for any affected person to appeal against the decision. Within 20 days of being notified of the decision by the competent authority, the appellant must submit the appeal to the appeal administrator. An appeal panel may be appointed at the discretion of the delegated or organ of state to handle the case and it would then submit its recommendations to that organ of state for a final decision on the appeal to be reached. GA Environment will communicate the decision of the Provincial Authority and the manner in which appeals should be submitted to the MEC and to all I&APs as soon as reasonably possible after the final decision has been received.

4 DESCRIPTION OF THE AFFECTED ENVIRONMENT

This Chapter serves to describe the environmental setting of the area identified whilst the environmental issues that were identified to be of significance are discussed in **Chapter 8** of this report. The Chapter will also provide a description of the overall character and other sensitivities that were identified in the surrounding environment.

4.1 Site Access

Direct access to the landfill site is available from Mbozambo Street which is located to the north west of the site. Traffic levels on this road is low and for this reason there will be minimal impacts on traffic during the decommissioning activities of the landfill.

4.2 Climatic Conditions

This section will only address the average temperatures and rainfall as key parameters in landfill design due to their impact on the Climatic water balance (B) which aids in determining whether or not leachate management will be required on a landfill site. According to the DWAF Minimum requirements for the disposal of waste to by landfill (2nd Edition,1998), the Climatic Water Balance will be positive i.e. B+. in a high rainfall area with low temperatures. In areas with low rainfall and high temperatures, the Climatic Water Balance will be positive i.e. B-.

According to SAExplorer and as indicated in **Table 3** the highest midday temperatures for the Stanger area reach 28°C in January and February and are in the lowest in July where temperatures drop to 22.4°C. Regarding midnight temperatures, the highest temperatures are reached in February (20°C) and the lowest in July (9.8°C). Shakaville is a summer rainfall area which receives the highest rainfall levels between December and March. Up to 121 mm of rain is received in January and only 16mm in July.

Table 4: Average rainfall from 2000-2017 tabulated from information from SA Explorer (undated)

MONTH IN THE YEAR	MIDDAY TEMPERATURES (°C)	MIDNIGHT TEMPERATURES (°C)	PRECIPITATION (mm)
January	28	19	121
February	28	20	116
March	27	19	112
April	26	16	60
May	24	13	38
June	23	10	19
July	22.4	9.8	16
August	23	11	30
September	24	14	54
October	24	15	85
November	25	17	105
December	27	19	110

4.3 Land Use and Land Cover

The Shakaville landfill was noted to have naturally rehabilitated as vegetation was noted to have been fully established. Current land use on site include pockets of informal housing infrastructure and the occupants are historical reclaimers of waste that have since occupied this land when the disposal of waste ceased on this site. It must be highlighted that the KwaDukuza Local Municipality intends to relocate some of the residents of the landfill to formal houses. This is however only limited to certain criteria used by the Local Municipality and is outside the scope of this Basic Assessment process.

4.4 Geology Soils and terrain conditions

Eight (8) test pits were excavated (to 2m depth) on site on 3 November 2017. Test pits were dug and ended in residual soil or waste body. Some test pits have exposed light brown to khaki residual shale soils and in some cases brownish residual dolerite soils. An *in-situ* exposure of khaki brown shale rock was observed on site.

- *Geology*

The Geological map of Durban shows the site to be underlain by quaternary alluvium, shale and post Karoo dolerite. A fault north-east to south-west striking fault is located approximately 1.5km north west of the proposed landfill site. The fault is however not expected to play a crucial role in the local hydrogeology of the site. The site boundaries are located within the riparian area of a tributary of the Mbozamo River.

- *Soils*

With regards to the soils on site, Laboratory results indicate that in general, the two samples tested comprise the following:

- a) *Weathered khaki/light brown shale*

- Gravel (14%), sand (34%), silt (37%) and clay (14%). The soil is therefore described as sandy silts. In terms of the Unified Soil Classification system the soil classifies mainly as a "CL" soil type, these being clayey sands or silty clays.
 - Permeability (hydraulic conductivity) tests conducted on disturbed samples in the laboratory indicate values of $4.8 \times 10^{-10} \text{m/s}$. *This soil is therefore suitable to use as capping material subject to further consolidation at optimum density and moisture content*

- b) *Brownish weathered dolerite*

- Gravel (9%), sand (56%), silt (21%) and clay (14%). The soil is therefore described as clayey, silty sand. In terms of the Unified Soil Classification system the soil classifies mainly as a "SC" soil type, these being clayey sand.
 - Permeability (hydraulic conductivity) tests conducted in the laboratory on disturbed samples indicate values of $2.2 \times 10^{-8} \text{m/s}$. This soil is therefore suitable to use as capping material subject to further consolidation at optimum density and moisture content.

The summary of the geohydrological findings are presented in Table 5 below. Please also refer to **Appendix F2** for the Geotechnical Study of the report to obtain additional information about the soils on site.

Table 5: Summary of the Geohydrological findings

Aspect	Description of findings
1. Problem soils	There are no potentially problematic soils observed
2. Erodable soils	Slope erosion channels were noted. The erosion channels observed were created by surface runoff dislodging and transporting soils and waste particles downslope into the lower slopes of the waste body and into the river 500m down slope on the valley.
3. Seepage	Potential basal seepage downslope to the river northeast of the site.
4. Construction material	The residual soil down to 2m depth across the test pits is generally moist. It displays some medium expansiveness. These should therefore be noted to constitute problems under conditions of moisture migration.
5. Permeability	The residual soil has been tested to permeability coefficient of 3.5×10^{-9} m/s which is impervious enough to meet minimum capping requirements
6. Excavation	Ease of excavation and ripping - - Based on test pit excavations, a tractor with a backhoe to rip loose from surface down to 2m and deeper depth should enable easy removal of materials (classified as SOFT to INTERMEDIATE in terms of SABS 1200DA) from surface down to 2m depth or deeper. Notwithstanding the above comments, hard rock (hard and competent dolerite and shale) could be encountered at deeper depths and random depths within the residual soils in the form of core stones. No sidewall collapse was observed during the excavation of the trial pits. However, the sidewalls of deeper excavations, may become unstable. The risk of sidewall collapse will increase with increasing soil moisture content. The risk of collapse will have to be assessed on site during construction and shoring must be implemented if considered necessary.
7. Open-cast or underground mines	There is no evidence of mining activity beneath the study area
8. Undermined ground	There are no undermined areas
9. Instability in areas of soluble rock	The proposed site does not reflect any risk for the formation of sinkholes or subsidence caused by the presence of water-soluble rocks (dolomite or limestone) and no evidence of mining activity beneath the study area has been revealed. The site does not reflect any risk for the formation of sinkholes or subsidence caused by the presence of water-soluble rocks (dolomite or limestone)
10. Steep slopes	The current ~10-20m height slopes are relatively steep and require flattening. Some sections show signs of deep erosion
11. Areas of unstable natural slopes	None observed
12. Areas subject to seismic activity	The probability of a seismic event occurring is low
13. Areas subject to flooding	Due to its topographic location, the landfill is not subject to flooding

14. Application of on-site soils for designed base and capping layers in landfills	There is potentially >4m deeply weathered red clayey silty soil which is appropriate material to use as a capping material over the waste. The base of the landfill has not been lined so the prevention of water ingress has to be done from the top of the waste. Geology underlying the landfill is deep red residual/colluvial soil and underlying shale
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4.5 Ecology

As already discussed, the landfill is dominantly covered by aliens that could have grown as a result of the dumping of waste on this site. Although pockets indigenous trees such as acacia species were noted with the central portion of the sites, riparian vegetation was noted in both the south and the western side of the landfill. It is anticipated that such may be impacted during the rehabilitation of the site. The Shakaville landfill site does not fall within any Critical Biodiversity Areas (CBAs) nor any Ecological Support Areas (ESAs), nor within any form of protected or conservation area. The Shakaville landfill site is situated within the KwaZulu-Natal Coastal Belt Grassland vegetation type. Highly dissected undulating coastal plains which presumably used to be covered to a great extent with various types of subtropical coastal forest. Some primary grassland dominated by *Themeda triandra* still occurs in hilly, high-rainfall areas where pressure from natural fire and grazing regimes prevailed. At present the KwaZulu-Natal Coastal Belt is affected by an intricate mosaic of very extensive sugarcane fields, timber plantations and coastal holiday resorts, with interspersed secondary *Aristida* grasslands, thickets and patches of coastal thornveld. Refer to the Ecological Opinion Report attached as **Appendix F1**.

4.6 Hydrology

The boundaries of the site are within the riparian area of a tributary of the Mbozamo River. This tributary has been affected over the years by a variety of land uses including leachate from the landfill, leakages from a sewer pipe as noted during the site visit, pollution from the activities of the informal residents, upstream industries and residents contribute to the pollution levels in the nearby stream and river. **Figures 21 and 22** indicate some of the impacts on the hydrology.



Figure 21: Sewerline across the tributary of the Mbozamo River (refer to top right of the image for the pipe and supporting columns)



Figure 22: Views of some of the informal structures located on the banks of the river

4.7 Socio economic conditions

The KwaDukuza Local Municipality is located within the jurisdiction of the iLembe District Municipality along with the Ndwedwe, Mandeni and Maphumulo Local Municipality Local Municipalities. Some of the main towns within the KwaDukuza Local Municipality are KwaDukuza, Ballito, Darnall, Groutville, Blythedale, Zimbali, Shaka'skraal, uMhlali. The largest town within the KwaDukuza Local Municipality is KwaDukuza which is also the seat of the KwaDukuza Local Municipality and the iLembe District Municipality. During its time of operation, the Shakaville landfill received waste from various parts of the KwaDukuza Local Municipality. The key aspects of the socio-economic conditions of the KwaDukuza Local Municipality and Shakaville population that must be taken into consideration in the licensing of the Shakaville landfill include population, employment levels, refuse removal services and water supply levels. The information presented in the sections and pertaining to these aspects obtained from Statistics South Africa 2011 census are discussed and contextualised to the Shakaville landfill.

4.7.1 Population

According to the 2011 census, the population of the KwaDukuza Local Municipality was 231,187. The majority of the population (78.8%) were Black African people. Indian/Asian people comprised 14.4%, White people 5.6%, Coloured people 1% and 0.6% comprised other population groups. It must be highlighted that the residents of the informal settlement that has been established within the boundaries of the Shakaville landfill are Black Africans. Based on the interviews that the EAP held with these residents, some are former reclaimers of the landfill while others settled in the area from other places after the landfill ceased operations.

4.7.2 Employment levels

From a total of 154 157 people surveyed in 2011, 68 418 (44%) were employed and 22 760 (14.7%) were unemployed. The number of unemployed people excluded discouraged work seekers and those who are not economically active. Refer to **Table 6** and **Figure 23**.

Table 6: 2011 employment levels for KwaDukuza Local Municipality

Employment Status	Number	Percentage
Employed	68418	44.38202612
Unemployed	22760	14.764169
Discouraged work seeker	8023	5.20443444
Not economically active	54956	35.64937045
TOTAL	154157	100

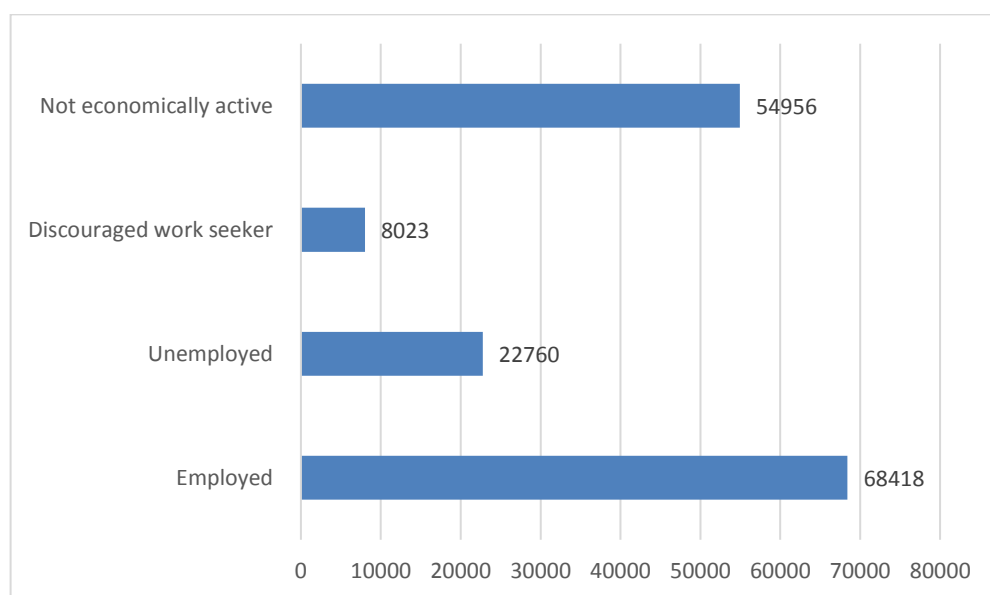


Figure 23: Chart indicating the 2011 KwaDukuza Local Municipality employment status

It must be highlighted that agriculture, mainly sugarcane farming provided the highest level of employment in the KwaDukuza area. Light industry and tourism are also some of the major contributors of employment. It must be noted that some of the residents of the landfill are former reclaimers of the landfill who have had to seek alternative employment or are currently unemployed.

4.7.3 Refuse Removal Services

As discussed in Chapter 1, waste is collected from all Wards located within the municipality jurisdiction. This waste is disposed of at the Dolphin Coast Landfill Management (DCLM) landfill. The disposal of waste at this landfill commenced after the Shakaville Landfill ceased operations.

According to information from Statistics South Africa, 60.7% of the waste generated within the KwaDukuza Local Municipality is removed by the local authority/private company at least once a week from households and businesses at least once a week. 2.7% of the waste is removed by the above-mentioned entities less

often. The remaining 1.6% of households and businesses dispose of their waste through various other means or do not have rubbish disposal facilities. Refer to **Table 7**.

Table 7: KwaDukuza Local Municipality 2011 refuse services

Refuse Disposal	Percentage
Removed by local authority/private company at least once a week	60,7%
Removed by local authority/private company less often	2,7%
Communal refuse dump	4,1%
Own refuse dump	26,5%
No rubbish disposal	5,4%
Other	0,6%

Within the Shakaville landfill, pockets of illegal dumping of waste was noted as shown in **Figure 15** and **24**.



Figure 24: Examples of the waste illegally dumped within the boundaries of the disused Shakaville Landfill

It is assumed that some of the waste originates from the households within the boundaries of the landfill as well as some areas close to the boundaries of the landfill.

4.7.4 Sources of water

Within the KwaDukuza Local Municipality, 83.4% of water is provided by the Regional/ Local water scheme. 7% is obtained boreholes, 3% from rivers, 1% from a Spring. 5.6% of water is obtained from various other sources.

Table 8: Sources of water within KwaDukuza

Source of water	Percentage
Regional/Local water scheme (operated by municipality or other water services provider)	83,4%
Borehole	7%
Spring	1%
Rain water tank	0,9%
Dam/Pool/Stagnant water	0,9%
River/Stream	3%
Water vendor	0,7%
Water tanker	1,6%
Other	1,5%

The impacts of the landfill as well as other land uses on the adjacent tributary of the Mbozamo River negatively impacts the quality of water obtained from boreholes as well as rivers/streams. It must be noted that the informal dwellers of the Shakaville landfill obtain water from a single municipality tap located close to the site gate as shown in **Figure 11** in Chapter 1 of this report.

4.7.5 Toilet facilities

According to the 2011 Census, flushing toilet facilities (connected to sewerage system or with a septic tank) were only available to 38.9% of KwaDukuza Residents, 46.4% utilised pit toilets with or without ventilation, 7.8% used Chemical Toilets, 1.1 % used bucket toilets, 1.5% used other means and 4.4% had no toilet facilities. Refer to **Figure 25**.

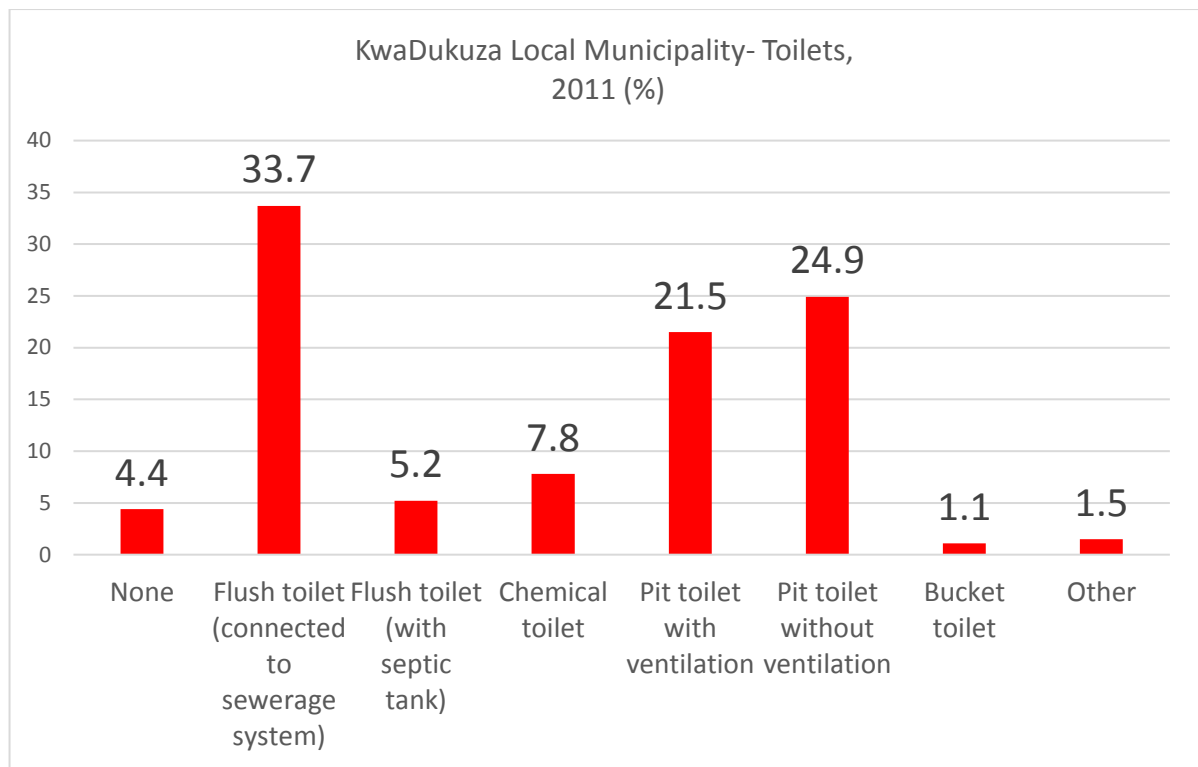


Figure 25: Census data on the availability of toilets within the KwaDukuza Local Municipality

It must be highlighted that the majority of the dwellers of the informal structures within the boundaries of the Shakaville landfill do not have toilet facilities. For this reason, the residents relieve themselves in secluded spots as noted by evidence of defaecation was noted during the site walkabout. Some residents have however constructed pit latrines as shown in **Figure 26**.



Figure 26: A pit latrine noted (to the left) at one of the households within the landfill boundaries

4.7.6 Heritage and Cultural Features

Although no cultural and heritage features were noted during the site visits undertaken to the Shakaville landfill, it is possible that unknown features or artefacts of heritage value may be exposed during the proposed rehabilitation activities and should thus be appropriately protected. The Draft Basic Assessment Report will be provided to Amafa, the KwaZulu Natal Heritage Resource Agency, for comments.

4.7.7 Noise and Air Quality

As the Shakaville landfill is disused, neither noise nor air quality issues were noted on site. It must however be noted that the construction activities associated with the proposed decommissioning of the landfill may bring about noise and air quality impacts which can be mitigated. These will be discussed in greater detail in Chapter 7 as well as in the EMPr attached as **Appendix I**.

4.7.8 Visual and Aesthetic Features

As the Shakaville landfill is disused and has naturally rehabilitated with a mixture of indigenous as well as alien species, negative visual impacts that were commonly associated with poorly managed landfills are absent. The proposed construction activities to ensure that the rehabilitation of the landfill is according to NEMWA, 2008 and the DWAF Minimum Requirements for disposal of waste by landfill (2nd Edition, 1998) is likely to result in adverse impacts which must be mitigated according to the measures discussed in the Environmental Management Programme (EMPr) in **Appendix I**.

5 ALTERNATIVES

In terms of the EIA Regulations published in Government Notice (GN) R982 of 2014, as amended in 2017, feasible and reasonable alternatives must be identified and considered within the Basic Assessment process. According to GN R 982 of the EIA Regulations (2014), an alternative is defined as “...in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

- (a) property on which or location where it is proposed to undertake the activity;
 - (b) type of activity to be undertaken
 - (c) design or layout of the activity;
 - (d) technology to be used in the activity;
 - (e) operational aspects of the activity; and
- Includes the option of not implementing the activity.”*

In terms of Section 24 of NEMA, the proponent is required to demonstrate that alternatives have been described and investigated in sufficient detail during the BA process. The feasible alternatives identified for the proposed upgrade of the Shakaville landfill are limited to various process alternatives and not an alternative location as it the intention of the KwaDukuza Local Municipality to licence the Shakaville landfill. These alternatives are as follows:

5.1 The No-Go Option

The no-development alternative would entail continuing with the *status quo*, i.e. a situation where the Shakaville landfill although disused does not meet the legal requirements in terms of the closure of the site. This could lead to major environmental liability as the KwaDukuza Local Municipality must take responsibility for adequate closure and rehabilitation of the landfill in line with the legislative requirements. The *status quo* of the Shakaville landfill is currently presenting a potential pollution risk to the surrounding environment and limits the potential for alternative use of the landfill subsequent to rehabilitation.

The need to license many of the unlicensed Waste Disposals in South Africa is regarded as one of key projects towards a cleaner environment by the Minister of Environmental Affairs. Further delays in implementing the project will mean that the current adverse impacts from the Shakaville landfill will continue. This initiative of the licensing of the landfill will aid in achieving the Minister’s service delivery agreement Outcome 10 (Output 1 to 4) deliverable target/indicator that serves to ensure that environmental assets and natural resources are well protected and are continually enhanced.

It must be noted that site ranking/site selection studies were not undertaken for alternative sites as the Shakaville landfill site although disused, requires a decommissioning licence to ensure compliance in terms of applicable Legislation. Based on the reasons provided above, there is therefore a definite need to formally license the Shakaville landfill site to meet all applicable legislative requirements.

5.2 Proposed and Preferred Alternative (Closure and Rehabilitation of the Shakaville landfill)

The disused Shakaville landfill has not been decommissioned as per the legislative requirements. The licensing of this landfill will aid with adherence to the Minimum Requirements for Waste Disposal by Landfill, 2nd Edition (DWAF, 1998), and the National Norms and Standards for the disposal of waste

to landfill (Government Notice No. R 636 published in Government Gazette No. 36784 of 23 August 2013). The rationale behind the project serves to address the following issues:

- The need to license many unlicensed waste disposal facilities existing within each municipality is in line with the Minister of Environmental Affairs' initiative towards attaining a cleaner environment;
- The current environmental problems such as such as leaching and in turn contamination of underground water as well as the water course in close proximity to the Shakaville landfill;

This is the **preferred** option for the proposed licensing of the Shakaville landfill site and will ensure that the site is environmentally and publicly acceptable and that it complies with the Minimum Requirements for Waste Disposal by Landfill, 2nd Edition (DWAF, 1998), and the National Norms and Standards for the disposal of waste to landfills promulgated in November 2013. The closure and rehabilitation of the site will entail the following:

- Shaping and landscaping of the waste body;
- The construction of storm water management infrastructure;
- Capping of the waste body in accordance with the Minimum Requirements;
- Concrete palisade fencing;
- The maintenance of access roads;
- Vegetative cover of the final landform;
- The construction of the required end-use infrastructure (once finalised); and
- Post closure environmental monitoring where necessary.

The closure of the Shakaville landfill will be in line with the KwaDukuza Local Municipality 's Draft KwaDukuza Municipality 2016-2017 Integrated Development Plan (IDP) as well as the Integrated Waste Management Plan (IWMP) which is currently being drafted by the Municipality. Furthermore, the closure of the landfill will prevent illegal land invasion, continued dumping, pollution of nearby water resources, etc.

5.3 End Use Planning

An end-use plan shall guide what would be the most suitable land use for the area. The choice of type of end use is dependent on the urban or rural spatial planning of the area in which the landfill is situated. The type of end-use can also related to the potential vulnerability, expressed in the average number of hours per day that people are spending at the location. The longer the time that humans spend at or near the site, the higher the chance on potential exposure to any residual effects of the landfill site and the higher the potential vulnerability.

In meetings held between the KwaDukuza Local Municipality and GA Environment, the Municipality stated that they would like to use the current landfill site area for a large stadium. According to the DWAF 1998 Minimum Requirements for Waste Disposal by landfill, the most common use of an area formally occupied by a landfill is an open space that can be used for sport and recreation although with light and not heavy infrastructure that can be affected by settlement and methane gas that is common in former landfills. Based on this, the Municipality must ensure that all the relevant environmental authorisations are undertaken prior to the construction of the proposed stadium which

does not form part of the current scope of work.

5.4 Landfill Capping Design

The proposed Capping design for the landfill is shown in **Figure 27**. Details of each of the layers are discussed in the Engineering need and Assessment report. According to the Landfill Design Engineer, the proposed design is deemed the most suitable for the Shakaville Landfill as it offers the maximum protection against Leachate. The design is therefore the preferred option for the project.

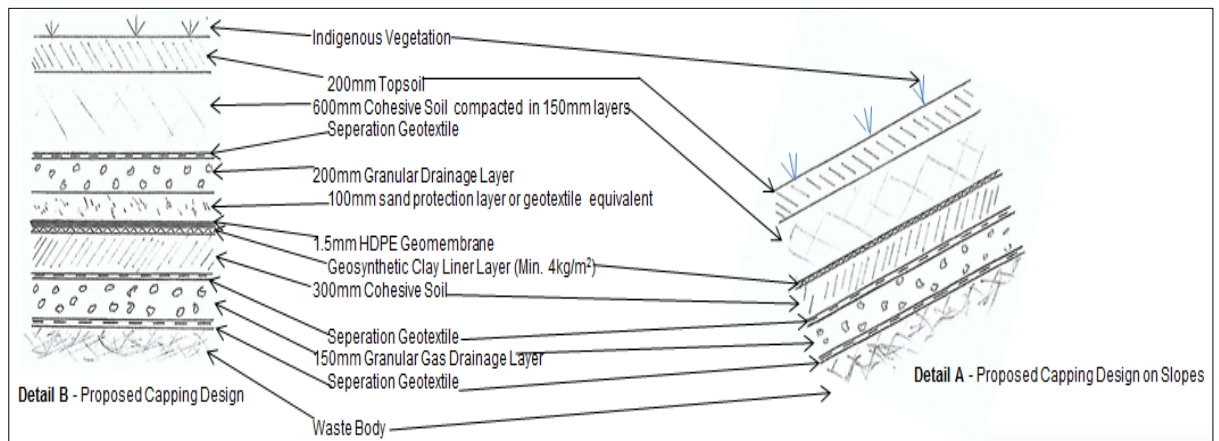


Figure 27: Proposed Capping Design for the Shakaville Landfill

The landfill capping designs indicated in **Figure 28** and **Figure 29** are alternatives for closure sites but were not deemed suitable for the Shakaville landfill as they not be able to offer adequate protection against leachate generation.

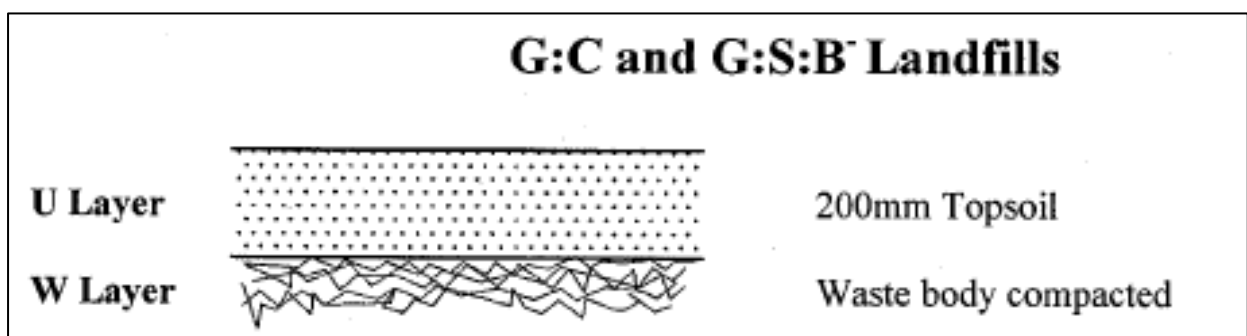


Figure 28: Capping Designs alternative A (DWAF, 1998)

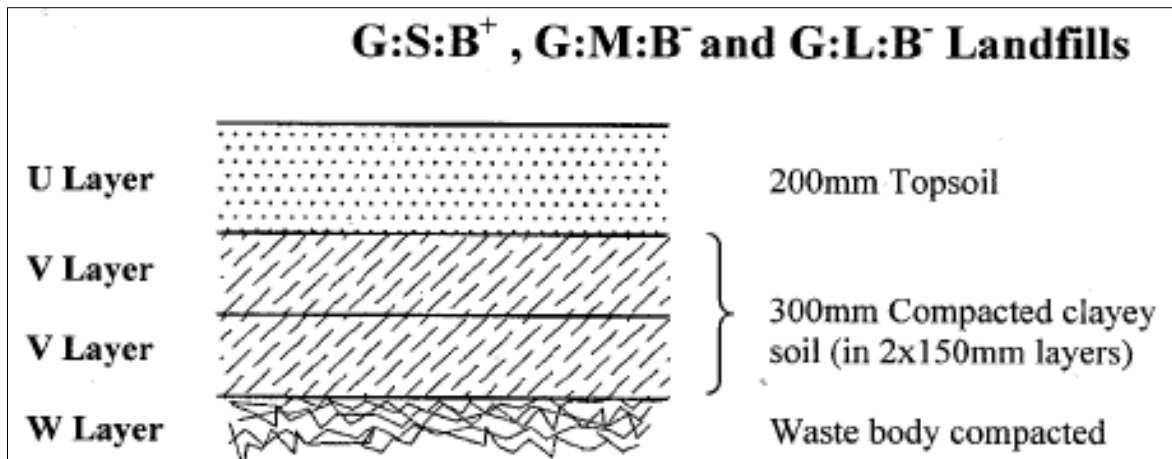


Figure 29: Capping Designs alternative B (DWAF, 1998)

6 PUBLIC PARTICIPATION PROCESS

The NEMA (1998) EIA Regulations, 2014, as amended, prescribe that the Basic Assessment process must include the undertaking of public participation in accordance with the Chapter 6 of the Regulations. The purpose of the Public Participation Process is to provide all potential and / or registered Interested and Affected Parties (I&APs), including the competent authority and any other stakeholder or organ of state, an opportunity to become involved in the Basic Assessment process and provide comments during the various phases of the project. Involvement by I&APs is critical, as it contributes to a better understanding of the proposed project among I&APs, raises important issues that need to be assessed and provides local insight that will enhance the Basic Assessment process.

This chapter of the report provides details on the Public Participation Process followed during the Basic Assessment process for the proposed decommissioning of the Shakaville landfill site.

6.1 Stakeholder Pre- Consultation

In order to address the requirements of key stakeholders before the commencement of the Basic Assessment Process, GA Environment held a number of meetings. A pre-application Meeting was held with DEA, EDTEA and the Municipality Representatives on the 01st September 2017. In addition to this, an additional meeting was held with the KwaDukuza Local Municipality officials on the 20th September 2017. The Municipality further requested a presentation on the project to the Council on the 18th September 2017. Site visits with representatives from both the Municipality and EDTEA were also conducted. Please refer to **Appendix E3** for the Minutes of the pre-consultation meetings.

6.2 Identification of Interested and Affected Parties

Interested and Affected Parties (I&APs) were identified through various means from the inception phase of the project. These means included the placement of an advertisement in a local newspaper the placement of Site Notices and the distribution of Notification Letters. Each of these are discussed below.

6.3 Newspaper Advertisement

Regulation 41(2)(c) and (d) of the NEMA (1998) EIA Regulations, 2014, as amended requires that PPP includes the placement of a Newspaper Advertisement to notify all potential I&AP's about the proposed project and to invite them to register as I&APs and provide comments on the project. An advertisement was therefore placed on page 14 of the *Stanger Weekly* newspaper published on Wednesday 18th October 2017. The proof of the placement of the Newspaper Advertisement is included in **Appendix E5**.

6.4 Notice Boards/Site Notices

In accordance with the NEMA (1998) EIA Regulations, 2014, as amended, a notice board detailing the proposed activity as well as the contact details of the EAP was placed on site. The size of the notice board was 60cm by 42cm (i.e. A2 Site Notices) as per 41(4)(a) the Notice Board. For this reason, A2

Site Notices were placed along the boundaries of the Shakaville Landfill site. Three of these were placed in conspicuous places included the section of the fence closest to the site gate. In addition to these A3 Notices were prepared and placed at various locations in Shakaville and at the KwaDukuza Local Municipality Offices. The notice boards were all placed on the 18th October 2017. The Notice Board and proof of its placement is included in **Appendix E4**.

6.5 Notification Letters

Regulation 41(2)(b) of the NEMA (1998) EIA Regulations, 2014, as amended requires that written notification be given to various parties who include the following:

- (i) the occupiers of the site and, if the proponent or applicant is not the owner or person in control of the site on which the activity is to be undertaken, the owner or person in control of the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
- (ii) owners, persons in control of, and occupiers of land adjacent to the site where the activity is or is to be undertaken and to any alternative site where the activity is to be undertaken;*
- (iii) the municipal councillor of the ward in which the site and alternative site is situated and any organisation of ratepayers that represent the community in the area;*
- (iv) the municipality which has jurisdiction in the area;*
- (v) any organ of state having jurisdiction in respect of any aspect of the activity;*
and
- (vi) any other party as required by the competent authority;*

The Notification Letter that was compiled for the Shakaville landfill and distributed to all residents of the landfill on the 18th October 2017 is attached as **Appendix E1**. The document outline provided a background on the landfill, the proposed activities as well as information on how one can register as an Interested and Affected Party (I&AP) on the project in order to be able to be kept abreast of all developments related to the licensing of the facility.

6.6 Public and Focus Group Meetings

No public or focus group meetings have been held to date with I&APs. The need of the public meeting was determined following the nature of issues raised by the I&APs and other stakeholders after the review of this report. It must be highlighted that the NEMA EIA Regulations do not mention meetings as a necessity to the PPP.

6.7 Availability of Draft Basic Assessment Report (BAR)

This Draft Basic Assessment will be provided to numerous Interested and Affected parties for review and comment. These includes the Competent Authority.

6.8 Placement of Draft BAR for Comment

The Draft BAR will be placed for public comment at the Public Library in KwaDukuza. Based on Regulation 40(1) of the NEMA (1998) EIA Regulations, 2014, as amended, the report will be placed at this facility for the legislated period of at least 30 days. The placing of the Draft BAR will allow I&APs adequate time to review the details of the project and provide, in writing, comments and concerns relating to the proposed decommissioning of the Shakaville landfill site. All registered I&APs will be informed of the availability of the report through various means and proof of this will be kept.

6.9 Interested and Affected Parties Register and Comments on the project

From the onset of the project, a database of persons, organizations and organs of state identified as I&APs or registered as I&APs was opened and is constantly being maintained. The I&APs register is included in **Appendix E8**. It must be highlighted that it is only the Shakaville residents that provided the EAP with comments during the notification phase. With the exception of a response from an Official of the KwaZulu Natal Department of Health, comments were not received from any other stakeholders notified of the project during the initial Notification Phase. With regards to the Department of Water and Sanitation, it must be highlighted that comments from the relevant regional officers are still awaited as they were unable to attend the project Inception meeting nor undertake a site visit with the EAP.

Comments on the project are still awaited from the following stakeholders included the following:

- Ezemvelo KZN Wildlife;
- Amafa a KwaZulu Natali;
- Department of Cooperative Governance and Traditional Affairs;
- Department of Human Settlements;
- Wildlife and Environment Society of South Africa (WESSA);
- Afriforum;

The Comments and Responses Report is attached as **Appendix E7**.

6.10 Authority Liaison

Consultation with National DEA and the KwaZulu Natal Department of Environment and Nature Conservation (EDTEA) will be on-going and will continue from the communications established during the project initiation stages. Due to the nature of the project, the Department of Water and Sanitation will be provided with an opportunity to comment of the proposed activities. The need for a Water Use Licence Application (WULA) will then be determined. If any additional permits or requirements are identified at any time during the Basic Assessment process, the relevant competent authority will be notified and be provided with the opportunity for involvement in the process.

6.11 Public and Focus Group Meetings

No public or focus group meetings have been held to date with I&APs. The need of the public meeting was determined following the nature of issues raised by the I&APs and other stakeholders after the end of the draft BAR review period.

7 IMPACT ASSESSMENT METHODOLOGY

The main objective of this section is to provide independent and scientifically sound information on the impacts identified during the BA. Based on the requirements of the impact assessment, impacts identified and issues and concerns raised are assessed with regard to their significance. The impact assessment is aimed at determining the impacts associated with the proposed development and the prescription of mitigation measures. Other impacts associated with the proposed development are discussed in detail in this section. The significance of the potential impacts is described in terms of their nature, extent, duration, intensity and probability.

In this report, impacts with a low significance are considered to have no influence on the decision to proceed with the proposed development. Impacts with a moderate significance will influence the decision, unless they can be effectively mitigated to a low significance, whereas impacts with a high significance - despite mitigation - would influence the decision to proceed with the proposed development.

7.1 Impact Assessment Methodology

In accordance with Government Notice R. 982, promulgated in terms of Section 24 of the National Environmental Management Act, 1998 (Act 107 of 1998), the EAP is required to assess the significance of potential impacts in terms of the following criteria:

- Nature of the impact;
- Extent of the impact;
- Intensity of the impact;
- Duration of the impact;
- Probability of the impact occurring;
- Reversibility of impacts; and
- Impact on irreplaceable resources; and
- Cumulative impacts.

Activities within the framework of the proposed development and their respective construction/decommission and rehabilitation phases, give rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into three phases from which impacting activities can be identified, namely:

Construction/Decommission phase:

This phase refers to all the construction related activities on site during closure of the site, until the contractor leaves the site. This includes all activities associated with the closure and decommissioning of the proposed development, including any removal of infrastructure and rehabilitation that may need to occur.

Monitoring phase:

This includes all activities undertaken to ensure that the environmental integrity of the site is maintained and preserved after Rehabilitation has taken place.

The assessment of the impacts will be conducted according to a synthesis of criteria required by the integrated environmental management procedure. The methodology that will be used comprises of the following four steps:

- Step 1: Identification of positive and negative impacts of the project;
- Step 2: Identification of the significance rating of the impact before mitigation;
- Step 3: Identification of the mitigation measure and the mitigation efficiency; and
- Step 4: Identification of the significance rating of the impact after mitigation;

Activities that will be undertaken to give effect to the proposed development gives rise to certain impacts. For the purpose of assessing these impacts, the project has been divided into the following phases discussed in **Table 9**. For the purpose of this impact assessment, the phrase '*construction*' and '*decommission*' will be used interchangeably as it is understood that construction activities will take place during the decommissioning process.

Table 9: Project phases in a development

PHASES OF A PROJECT IN WHICH IMPACTS WILL OCCUR
Status Quo
The study area as it currently exists.
Preconstruction/ decommission phase
All activities undertaken before construction/decommission phase including specialist studies and assessments
Construction/decommission phase (pre- rehabilitation phase)
All activities on site up to the start of construction, not including the transport of materials, but including the initial site preparations. This also includes the impacts that would be associated with planning.
Rehabilitation phase (closure and rehabilitation phase)
All activities undertaken to ensure the site is restored to its original state as humanely possible.
Monitoring phase (post-closure phase)
All activities after Rehabilitation, including the operation and maintenance of the proposed development.
The activities arising from each of the relevant phases have been included in the impacts assessment tables. The assessment endeavours to identify activities that would require environmental management actions to mitigate the impacts arising from them. The criteria against which the activities were assessed are given in the next section.

8.3.1. Assessment Criteria

The assessment of the impacts has been conducted according to a synthesis of criteria required by the guideline documents to the EIA regulations (2006) and integrated environmental management series published by the Department of Environmental Affairs and Tourism (DEAT) currently Department of Environmental Affairs (DEA). In addition to this, it is a requirement of the National Environmental Management Act (NEMA) 2014 Regulations as amended, Appendices 1 and 2 that an Impact and Risk Assessment process be undertaken for Basic Assessments and Environmental Impact Reporting. The Assessment Criteria is based on the following:

- Nature of impact;
- Extent;
- Duration;
- Intensity;
- Probability;
- Determination of significance; and
- Reversibility of impact.

Each of these are explained in **Table 10**.

Table 10: Assessment Criteria

ASSESSMENT CRITERIA	
i). Nature of Impact	This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. The description should include what is being affected, and how.
b) Extent	The physical and spatial size of the impact. This is classified as: <ul style="list-style-type: none"> i) Site The impact could affect the whole, or a measurable portion of the site. ii) Local The impacted area extends only as far as the activity, e.g. a footprint of the specific activity iii) Regional The impact could affect areas such as neighbouring farms, transport corridors and the adjoining towns.
c) Duration	The lifetime of the impact; this is measured in the context of the lifetime of the proposed project. <ul style="list-style-type: none"> i) Short term The impact will either disappear with mitigation or will be mitigated through natural process in a span shorter than any of the phases. ii) Medium term

The impact will last up to the end of the phases, thereafter it will be entirely negated.

iii) Long term

The impact will continue or last for the entire operational life of the development, but will be mitigated by direct human action or by natural processes thereafter.

iv) Permanent

The only class of impact which will be non-transitory. Mitigation either by man or natural processes will not occur in such a way or in such a time span that the impact can be considered transient.

d) Intensity

Is the impact destructive or benign? Does it destroy the impacted environment, alter its functioning, or slightly alter it? These are rated as:

i) Low

The impact alters the affected environment in such a way that the natural processes or functions are not affected.

ii) Medium (Moderate)

The affected environment is altered, but function and process continue, albeit in a modified way.

iii) High

Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases. This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

e) Probability

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:

i) Improbable

The possibility of the impact occurring is very low, due either to the circumstances, design or experience.

ii) Probable

There is a possibility that the impact will occur to the extent that provisions must be made.

iii) Highly probable

It is most likely that the impacts will occur at some or other stage of the development. Plans must be drawn up before the undertaking of the activity.

iv) Definite

The impact will take place regardless of any prevention plans, and mitigation actions or contingency plans are relied on to contain the effect.

f) Reversibility of impact

Natural or human aided intervention:

(i) Irreversible

The impact will be permanent.

(ii) Short term

The impact is reversible within two years after construction.

(iii) Long term

The impact is reversible within 2 to 10 years after construction.
g) The degree to which the impact can cause irreplaceable loss of resources
<p>(i) Low The impact result in the loss of resources but the natural, cultural and social processes/functions are not affected.</p> <p>(ii) Medium The loss of resources occur but natural cultural and social processes continue, albeit in a modified manner.</p> <p>(iii) High The impact result in irreplaceable loss of resource.</p>
h) Significance of impact with or without mitigation
<p>Significance is determined through a synthesis of impact characteristics. Significance is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. The classes are rated as follows:</p> <p>i) No significance The impact is not substantial and does not require any mitigation.</p> <p>ii) Low The impact is of little importance, but may require limited mitigation.</p> <p>iii) Medium (Moderate) The impact is of importance and therefore considered to have a negative impact. Mitigation is required to reduce the negative impacts to acceptable levels.</p> <p>iv) High The impact is of great importance. Failure to mitigate, with the objective of reducing the impact to acceptable levels, could render the entire development option or entire project proposal unacceptable.</p>

In order to maintain consistency, all potential impacts that have been identified during the BA process will be listed in impact assessment tables. The assessment criteria used in the tables will be applied to all of the impacts and a brief descriptive review of the impacts and their significance provided in the text of the report. The overall significance of impacts will be determined by considering consequence and probability.

8 DESCRIPTION AND ASSESSMENT OF ENVIRONMENTAL IMPACTS

A Basic Assessment Report (BAR) must contain all the information that is necessary for a good understanding of the nature of issues identified during the Basic Assessment (BA) process. The BAR must include a description of environmental issues and potential impacts, including cumulative impacts, mitigation measures that have been identified and other aspects as outlined in Appendix 4 of the NEMA EIA Regulations, 2014 as amended. This chapter also describes the environmental issues and impacts as identified during the BA Process for the closure of the Shakaville Landfill. The proposed mitigation measures are discussed in this Chapter as well as in the Environmental Management Programme attached as **Appendix H** of this report.

The main objective of this section is to provide independent and scientifically sound information on the impacts identified during the Basic Assessment (BA) Process for the closure and rehabilitation of the Shakaville Landfill. Based on the requirements of the impact assessment, impacts identified and issues and concerns raised are assessed with regard to their significance. The impact assessment is aimed at determining the impacts associated with the proposed development and the prescription of mitigation measures. Other impacts associated with the proposed development are discussed in detail in this section.

In both themes, the potential impacts for all construction (activities related to rehabilitation) as well as the Monitoring phases of the projects are assessed. It must be noted that the Impact Assessment Methodology as presented in Chapter 7 of this report will be used to assess the impacts in terms of:

- nature, significance and consequences of the impact and risk;
- extent and duration of the impact and risk;
- probability of the impact and risk occurring;
- the degree to which the impact and risk can be reversed;
- the degree to which the impact and risk may cause irreplaceable loss of resources; and
- the degree to which the impact and risk can be avoided, managed or mitigated.

The cumulative impacts of the project will also be discussed.

In this report, impacts with a *low significance* are considered to have no influence on the decision to proceed with the proposed development. Impacts with a *moderate significance* will influence the decision unless they can be effectively mitigated to a low significance, whereas impacts with a *high significance* despite mitigation would influence the decision to proceed with the proposed development. The impacts discussed in this section were identified by the Project Team (including specialists) and were augmented by input from the I&APs during the public review of the Environmental Impact Report. The potential impacts identified and elaborated on in this chapter have been presented as follows:

- Theme 1: Impacts on the Biophysical Environment; and
- Theme 2: Impacts on the Human Environment.

For the purposes of this assessment, this impact assessment will only focus on the impacts that are likely to occur during the decommissioning phase (capping and closure) of the landfill site. It must also be noted that, the phrase 'decommissioning' and 'construction' will be used interchangeably as it is understood that although

the site will be decommissioned, construction activities such as excavation, backfilling and levelling related to the 'decommissioning'/ 'closure' will be undertaken.

8.1. Theme 1: Impacts on the Biophysical Environment

8.1.1 Impacts on adjacent watercourses

As the boundaries of the Shakaville landfill site are located within the riparian area of a tributary of the Mbozamo River, it is crucial that this resource is protected during all project phases through. The potential threats to the watercourse may arise from numerous activities such dredging and during the capping, poor management and placement of stockpiles for cover material. This activities if poorly managed are likely to cause erosion, siltation and sedimentation problems that will negatively affect the nearby watercourses. Other impacts that may include the unnecessary removal of the riparian and remaining pockets of indigenous vegetation, poor placement of site facilities such as toilets and fuel, etc. **Table 11** is an assessment of the potential impacts of the proposed rehabilitation on watercourse.

Table 11: Assessment of impacts on adjacent watercourses

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Regional	Long Ter m	Medium	Probable	Short term	Medium	High	Low
Monitoring	Negative	Local	Short Term	Low	Improbable	Short term	Low	Low	Low

Proposed mitigation measures to manage potential impacts on the ecological integrity of the watercourse are as follows:

- The nearby river must be treated as “no go” area and impacts on all surrounding watercourse be avoided
- Construction within the site must take place under the supervision of a Professional Civil Engineer;
- Sporadic leachate resulting from the site must be directed to a control point, through suitably lined drains or collection pipes. Collected leachate must be treated to quality standard that complies with relevant legislation before being released into the system.
- The site conditions must be investigated before construction including water quality, surface water, groundwater. Groundwater monitoring system must be installed as well as a water quality monitoring program established.
- Increased run-off during construction must be managed using suitable structures as required to ensure flow velocities are reduced; this must be done in consultation with the Resident engineer as well as the ECO. Stormwater, wherever possible, should be allowed to soak into the land in the area on which the water fell e.g. retention ponds
- In the event of pollution caused as a result of construction activities, the contractor, according to section 20 of NWA is be responsible for all costs incurred by organisations called to assist in pollution control and / or to clean up polluted areas.
- The contractor must ensure that excessive quantities of sand, silt and silt-laden water do not enter the watercourse. Design of the stormwater drainage system must ensure that the local and surrounding natural systems are not negatively impacted. Appropriate measures, e.g. erection of silt

traps, or drainage retention areas to prevent silt and sand entering drainage or watercourses must be taken. These measures must be reviewed and audited by the ECO.

- No wastewater may run freely into any of the surrounding streets or naturally vegetated areas. Runoff containing high sediment loads must not be released into natural or municipal drainage systems or nearby watercourses.
- Approval must be obtained from DWA for any activities that require authorisation in terms of Section 39 of NWA and engagement with the Department of Water and Sanitation with regard the applicable water use requirements for the landfill;
- As far as possible, avoid any activities within the riparian area or 100m from the edge of the watercourse
- Implement best management practise for earthwork activities;
- Ensure that adequate sanitation facilities are provided and located outside the watercourse and the within the riparian area or 100m from the edge of the watercourse
- Carrying out routine vehicle maintenance and washing at a maintenance workshops instead of at the construction site;
- Utilisation of drip trays to prevent oil or fuel spills in case of on-site emergency maintenance;
- Minimisation of quantities of fuel, and other hazardous material kept at the construction site;
- Ensure effective stormwater management principles to reduce the loss soils and discharge of contaminated water from the construction site into the groundwater and well as surface water
- The use of Sustainable Drainage Systems (SUDs) to manage stormwater is considered critical in order to prevent significant impacts on the hydrological functioning and water quality of the freshwater resources associated with the boundaries of the Shakaville landfill site. In this regard, it is highly recommended that a suitably qualified engineer be consulted with regards to the use of SUDs. Examples of these, which may be applicable to this development, include rainwater harvesting, soakaways, and bio-retention facilities or attenuation ponds.

8.1.2 Impacts on the riparian area of the watercourse

As part of the rehabilitation of the Shakaville Landfill, some of the activities (dredging and excavation) will be undertaken within the riparian area of the watercourse. According to Government Notice No. 40229 published in the Government Gazette of 26 August i.e. the General Authorisation in terms of Section 39 of the National Water Act, 1998 (Act No. 36 of 1998) for water uses as defined in section 21(c) or section 21(i), in the absence of a of a determined 1 in 100 year flood line or riparian area, the area within 100m from the edge of a watercourse where the edge of the watercourse serves as the regulated area. **Table 12** is an assessment of the impacts associated with the removal of indigenous plant species from the riparian area of the Shakaville Landfill site.

Table 12: Assessment of impacts related to the riparian area

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Medium	Medium	Probable	Short term	Medium	Moderate	Low
Monitoring	Negative	Site	Short term	Medium	Probable	Short term	Low	Low	Low

- The portion of the riparian area that falls outside the planned construction areas, should be fenced off prior to construction as “No Go” zones and all construction related impacts / activities should be prohibited within these zones
- The construction site, offices, ablution facilities and storage facilities must be located within the site boundaries and not within the 1:100 flood line or within 100m from the edge of any watercourses or the riparian habitat, whichever is the greatest.
- No fires should be allowed near or adjacent to the edge (riparian habitat) of the watercourse.
- The ECO must ensure ongoing monitoring of any construction activities along the riparian area.

8.1.3 Impacts on Fauna

Although there was no sensitive fauna identified on the site during the EAP’s site Assessment, the existing fauna must be protected. As already discussed, landfill sites have the potential to attract and negatively affect fauna if any edible waste remains uncovered and available. Vertebrates of all sizes attracted to small animals as prey, or larger species to carcasses, etc. Birds in general are mobile and therefore able to vacate areas should adverse environmental conditions prevail. With regard to the mammal species, the disturbed nature of the area results in very few naturally occurring habitats and no animal species were observed during the site visit. The transformed areas may be a suitable habitat for some mammal species. Most mammal species are likely to vacate areas when environmental conditions during the upgrade of the landfill become unfavourable. Other possible disturbances include killing and snaring of mammal and reptile species by labourers during the construction phase. Most species are however likely to move away from the construction site and it is unlikely that they would suffer any long-term effect. The impact assessment for the impacts on fauna is shown in **Table 13**.

Table 13: Assessment of impacts related to fauna

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Medium	Medium	Probable	Short term	Medium	Medium	Low
Monitoring	Negative	Local	Long Term	Medium	Probable	Short term	Low	Low	Low

The proposed mitigation measures for the protection of the fauna that possibly occurs on site are as follows;

- All activities on site must comply with the regulations of the Animal Protection Act, 1962 (Act No. 71 of 1962) [APA].
- The extent of the construction site must be demarcated and no vegetation that could be the habitat for faunal species must be removed outside of this zone.
- All construction workers must be informed that the intentional killing of any animal, including snakes, is not permitted as faunal species are a benefit to society. Poaching is illegal and it must be a condition of employment that any employee caught poaching will be dismissed.
- Employees must be trained on how to deal with fauna species as intentional killing will not be tolerated. In the case of a problem animal e.g. snake, a specialist must be called in to safely relocate the animal or selected workers must be trained in snake-handling.

- Intentional killing of faunal species, including snakes, should be avoided by means of awareness programmes presented to the labour force. The labour force should be made aware of the conservation issues pertaining to the species occurring on the study site.
- All construction activities must be limited to daylight hours.

8.1.4 Impacts on groundwater

Operational Landfills are known to influence and have significant potential impacts on ground water. Although the Shakaville landfill is disused, it is possible that leachate from the waste could be impacting on the landfill. No water seepage was encountered in any of the trial holes excavated as part of the Geotechnical and Geohydrological Study (**Appendix F2**), however, moist conditions were noted in the test pits. A shallow, perched water table may be encountered on the waste layers during the rainy season.

During construction, pollutants may find their way into the surface and underground water systems. Typical sources of pollution include oils and fuels from construction vehicles and materials such as detergents, paints and other chemicals. Improper design of the lining system for the landfill could also provide a pathway for the contamination of the groundwater resources. Careful management and implementation of an appropriate EMP at the site, including environmental awareness training for all construction staff, would reduce the risk of pollution. The groundwater impacts are assessed in **Table 14**.

Table 14: Assessment of groundwater impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Regional	Long Term	Medium	Probable	Short term	Low	Medium	Low
Monitoring	Negative	Regional	Long Term	Medium	Probable	Short term	Low	Medium	Low

- Should groundwater be encountered during the undertaking of activities, the Contractor must ensure that this is adequately managed and protected
- The Contractor must provide method statements for the management of stormwater
- The Contractor must provide method statements for the management of groundwater, including methods for dewatering and storage of the groundwater subsequent to dewatering. Any contaminated water must be treated or disposed of at a registered facility
- A monitoring program for groundwater must be established.
- Monitoring boreholes upstream and downstream from the landfill site must be established and monitored.

8.1.5 Impacts on the removal of alien invasive species

It was noted that numerous invasive species occur within the boundaries of the Shakaville Landfill. For this reason, these must be eradicated as part of the rehabilitation of the landfill. The eradication must form part of the construction phase of the project and where necessary, form part of the monitoring phase. Table 15 shows an assessment of the impacts associated with the removal of alien plant species from the Shakaville Landfill site.

Table 15: Assessment of impacts related to alien invasive species

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Positive	Site	Short term	Medium	Probable	Short term	N/A	Medium	Low
Monitoring	Positive	Site	Short term	Medium	Probable	Short term	N/A	Medium	Low

The proposed mitigation measures to avoid adverse impacts arising as result of the removal of alien species is as follows:

- The removal of the alien vegetation must be undertaken according to the Alien Eradication Plan in Appendix 1 of this EMPr.
- The removal of alien invasive vegetation must be undertaken in the dry winter months so that the bare patches of ground from which the aliens have been removed will not be easily eroded by water.
- Alien invasive species within the study site should be removed prior to construction-related soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation.
- All alien seedlings and samplings must be removed as they become evident for the duration of construction and the monitoring phase

8.1.6 Impacts on the removal of indigenous plant species

As part of the rehabilitation of the Shakaville Landfill, it is highly probable that some indigenous plant species may need to be removed to allow for adequate capping of the landfill. **Table 16** shows an assessment of the impacts associated with the removal of indigenous plant species from the Shakaville Landfill site

Table 16: Assessment of impacts related to the removal of indigenous plant species

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Short term	Medium	Probable	Short term	N/A	Medium	Low
Monitoring	Negative	Local	N/A	N/A	N/A	N/A	N/A	N/A	N/A

- Clearing of vegetation should only be limited to large trees and shrubs as well as all invasive plant species within the area planned for rehabilitation. The clearing of invasive must also include a buffer area of 10m outside the landfill area. In the buffer area, any trees or shrubs must only be removed if they will interfere with construction activities;
- Clearing of vegetation should be minimal within and outside the landfill boundaries.
- In order to avoid unnecessary clearing/uprooting of plants, all plants that are not trees or shrubs must be trimmed to a height of at least 10cm and covered with soil to inhibit growth
- Construction workers may not remove flora or collect seed from any plants outside the areas on which vegetation clearing has been planned.
- Only Indigenous plants must be used in the landscaping of the site.
- Open fires on site must only be permitted in demarcated areas within the site camp. A fire extinguisher should be available in close proximity to any areas demarcated for open fires
- All construction vehicles and equipment as well as construction material should be free of plant material.

- Rehabilitation / restoration of remaining indigenous vegetative cover and grassland during and after rehabilitation.
- Management of point discharges during construction activities to avoid unnecessary soil erosion.
- Provision of adequate sanitation facilities located outside of the wetland/riparian area or its associated buffer zone during construction activities.
- Prevention of erosion, and where necessary rehabilitation of eroded areas.
- Rehabilitation of disturbed vegetation as soon as undertaken as soon as construction has ended in the area that has been disturbed

8.2 Theme 2: Impacts on the Socio-Economic Environment

8.2.1 Community disruptions due to relocation of informal settlers and provision of housing

Based on the EAP's communication with the KwaDukuza Local Municipality, it was established that it is not all dwellers of the landfill who qualify for relocation and the subsequent provision of alternative good quality housing. Based on the observations of the site visits undertaken by the EAP, it was established that approximately 30 families reside within the boundaries of the landfill. Of these, it is only about 12-15 who qualify for housing. Based on this, it is possible that those who do not qualify for housing but who must be relocated to allow for the rehabilitation activities of the landfill may express their dissatisfaction through protests. The community disruptions are considered a negative impact without mitigation. The assessment of this impact is summarised in Error! Reference source not found..

Table 17: Assessment of impacts related to relocation and provision of housing

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Medium	High	Highly Probable	Short term	Medium	High	Low
Monitoring	Negative	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

The proposed mitigation measures to avoid community disruptions by residents are as follows:

- The KwaDukuza Local Municipality must consult with all current dwellers on site about the proposed site rehabilitation before commencement
- The KwaDukuza Local Municipality must ensure that the residents of the informal settlement who may need to be relocated and provided with new housing to allow for the construction of the landfill are informed of the planned relocation no later than four months before the commencement of construction activities. Records of all communication must be kept;
- Alternative housing must be provided for residents who do not qualify for new housing but whose informal dwellings are located within the area planned for the rehabilitation of the landfill as per the engineering designs. These parties must be informed of their relocation at least six months before the commencement of construction
- Where financially viable, the Municipality must assist residents with the removal of their belongings to the new area/s to which relocation is planned;
- All adjacent landowners, who will not be offered relocation, must be informed of construction activities at least two months before the commencement of construction activities;

8.2.2 Community disruptions due to possible job opportunities

The rehabilitation of the Shakaville landfill site is likely to create temporary job opportunities for the local people. It is imperative that the KwaDukuza Local Municipality and the Contractor/s consider the use of labour intensive methods as far as possible. Where locals are not provided with job opportunities, disruptions can occur within the community and in turn jeopardize the undertaking of the project. The community disruptions are considered are negative impact without mitigation. The assessment of this impact is summarised in **Table 18**.

Table 18: Assessment of impacts related to disruptions related to job opportunities

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Medium	High	Highly Probable	Short term	Medium	High	Low
Monitoring	Negative	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

This potential impact is considered to be of *moderate significance* without mitigation. Typical mitigation measures are the following:

- Using local labourers where applicable;
- The appointed Contractor should maximise the use of local labour and local contractors where possible by developing a strategy to involve local labour in the tender and construction processes.
- Unrealistic job expectations should not be created. A communication strategy should be implemented to guard against rumours about employment creation opportunities
 - Training construction workers to respect the property and needs of the affected communities; and
 - Ensure that adequate lines of communication are implemented to deal with any public grievances.

8.2.3 Traffic on local roads and within the boundaries of the landfill

The movement of construction vehicles during the construction phase of the landfill can result in an increase in traffic congestion on local roads. Furthermore, the access road into the Shakaville landfill allows for the movement of one vehicle at a time further affecting traffic congestion. In addition to the above, the movement of construction vehicles through the informal settlement (should some residents still be residing in the area at the time of the start of construction) will pose a risk to the residents. Traffic is considered are negative impact without mitigation. The assessment of this impact is summarised in **Table 19**.

Table 19: Assessment of possible impacts as a result of traffic

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Regional	Short term	Medium	Probable	Short term	Medium	Medium	Low
Monitoring	Negative	Site	Short term	Low	Improbable	N/A	N/A	Low	Low

The proposed mitigation measures for the management of traffic brought about by the Construction activities are as follows:

- The Contractor must compile a Traffic Management Plan indicating the routes that construction vehicles must adhere to, the speed limits of the vehicles as well as the locations for the placement of warning signs. These routes must be communicated to all sub-contractors;
- There must be an erection of signage warning motorists and pedestrians about the presence of construction vehicles as well and the need to reduce speeds;
- Contractor must communicate road safety to community members through the Community Liaison Officer (CLO);
- Construction activities must be limited to daytime hours. Where this must extend to any time after dark, the Contractor must ensure that community members that are most likely to be affected are informed of this and proof of their consultation kept;
- Construction vehicles must not exceed speeds on 10km within the construction site
- Construction vehicles travelling on public roads must adhere to speed limits;
- Construction vehicles must not dispose of soil or other material on roads. Where this occurs, the material must immediately be removed before the end of the working day.

8.2.4 Health and Safety

The Construction activities planned for the Shakaville landfill will bring about various impact that can affect Health and Safety. It must be highlighted that the detailed impacts and mitigation measures for Health and Safety will be assessed by the relevant Health and Safety Personnel for the project. The assessment overall of this impact is summarised in **Table 20**.

Table 20: Assessment of possible health and safety issues

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Medium	Medium	Probable	Short term	Irreplaceable	Moderate	Low
Monitoring	Negative	Local	Medium	Medium	Probable	Short term	Irreplaceable	N/A	N/A

The Generic Mitigation Methods to ensure the Health and safety of all site personnel as well the public are as follows:

- Contractor must a Health and Safety Officer for the construction phase of the project;
- Ensure that adjacent residents are informed of the proposed construction activities. Contractor must communicate road safety to community members through the Community Liaison Officer (CLO);
- Signs in appropriate local languages must be erected on site to warn people of the potential risks of entering the site;
- The site and any excavations within it must be fenced off as safety mechanisms;
- Personal Protective Equipment (PPE) must be worn at all times by all employees undertaking work that requires them to do so;
- All visitors to the site must report to the site office and wear PPE where required;

- Detailed Health and Safety issues will be addressed in reports compiled by the most relevant parties.

8.2.5 Impacts on existing infrastructure

The proposed activities could result in damage to infrastructure both within the landfill boundaries as well as outside the boundaries. Some of the infrastructure noted on site include monitoring boreholes as well sewer manholes. The sewer manhole is connected to a sewer pipe which transects the landfill. The exact servitude of this pipe is however unknown and information could not be obtained from the KwaDukuza Local Municipality. Any damage to the existing infrastructure is considered negative and mitigation measures must therefore be out in place to ensure the protection of the infrastructure. **Table 21** is an assessment of the impacts on infrastructure.

Table 21: Assessment of possible impacts on existing infrastructure

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Site	Medium	High	Probable	Short term	Medium	Moderate	Low
Monitoring	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

The proposed mitigation measures to ensure the protection of infrastructure are as follows;

- The Contractor shall ensure that existing services e.g. sewer pipes, manholes, etc are not damaged or disrupted. Prior to construction, the Contractor must obtain drawings indicating required by the contract and with the permission of the service provider;
- The Contractor shall be responsible for the repair and reinstatement of any existing infrastructure that is damaged or services which are interrupted;
- Such repair or reinstatement will be to the Contractor's cost and shall receive top priority over all other activities;
- A time limit for any repairs may be stipulated by the RE in consultation with the Contractor;
- Where infrastructure outside the boundaries of the construction is damaged due to construction activities, e.g. movement of construction vehicles, the owner of the infrastructure must be consulted and arrangements for repairs made by the Contractor

8.2.6 Visual impacts

Construction sites are unsightly and can affect an area's sense of place. Although the areas of the Shakaville landfill on which activities are proposed is well hidden from most of the public, visual impacts must be mitigated against. **Table 16** is an assessment of the project visual impacts.

Table 22: Assessment of possible impacts on visual impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Short term	Medium	Probable	Short term	N/A	Medium	Low
Monitoring	Positive	Local	Short term	Low	Probable	Short term	N/A	Medium	Low

In order to mitigate the potential Visual Impacts, the following measures are proposed:

- Shade cloth must be utilised to conceal and minimise the visual impact of the construction site.
- Keep dust levels down by regularly wetting dirt roads and exposed soil areas inside the site.
- Clearly demarcate the construction site to limit the area of disturbance.
- Remove all waste, including cleared vegetation from site as soon as possible unless the material will be reused on site. A dedicated area for the placement of waste that will either be removed or reused must be identified.
- Domestic waste generated from the site camp must be kept in bins with lids and removed every week or more often as the need arises and be disposed of at a registered landfill (if there is no space available).
- Keep the construction site neat and tidy at all times. Remove any waste from the site or contain it in an enclosed area out of the sight from sensitive viewpoints.

8.2.7 Dust and Air Quality Impacts

The proposed construction activities for the rehabilitation of the Shakaville Landfill will bring about dust and air quality impacts. This will mainly arise from the capping materials that will be extensively used on site. An assessment of the potential dust and air quality impacts of the construction activities are shown in **Table 23**.

Table 23: Assessment of possible impacts on air quality

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Short term	Medium	Probable	Short term	N/A	Low	Low
Monitoring	Negative	Local	Short term	Medium	Probable	Short term	N/A	Low	Low

The proposed mitigation measures for dust and air quality as discussed as follows:

- Implement dust suppression measures (wetting or application of soil binding compound) in all areas that will be affected by construction activities and where dust will be generated. Dust suppression must also be undertaken during windy and dry weather conditions.
- A continuous dust monitoring process needs to be undertaken during construction.
- Speed restriction of no more than 10km/h must be implemented for all construction vehicles within the construction site.
- All vehicles transporting friable materials such as sand, rubble etc. must be covered by a tarpaulin or wetted down should the need arise

8.2.8 Noise Impacts

Construction sites are synonymous with noise impacts. High noise levels can have an adverse impact on both site labourers as well as the public, including occupiers of adjacent land. The assessment of noise impacts that may occur during the construction activities for the Shakaville landfill are presented in **Table 24**.

Table 24: Assessment of possible noise impacts

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Local	Short term	Medium	Probable	Short term	N/A	Low	Low
Monitoring	Negative	Local	Short term	Medium	Probable	Short term	N/A	Low	Low

The proposed mitigation measures to address noise impacts in the undertaking of construction activities are as follows:

- The working hours stipulated in the Construction permit where applicable must be adhered to. Where this is not applicable, the following working hours must be adhered to: **Monday to Friday** 07:00 – 17:00 for week days. Working hours during weekends must be agreed between the Developer, the Contractor and Community Liaison Officer (CLO)
- All construction vehicles must be in a good working order to reduce possible noise pollution.
- Noise reduction is essential and Contractors must endeavour to limit unnecessary noise, especially loud talking, shouting or whistling, radios, sirens or hooters, motor revving, etc.
- Where necessary, site personnel must be provided with adequate PPE to avoid damage to hearing
- Noisy activities must take place only during working hours. The Contractor must inform all I&APs in writing 24 hours prior to any planned activities that will be unusually noisy or any other activities that could reasonably have an impact on the neighbouring residents.

8.2.9 Heritage impacts

Construction activities such as clearing, excavations and grading could expose or damage features of heritage and cultural value beneath the surface. No features of heritage value e.g. graves were observed during the site visits. As the Shakaville landfill occupies an area of approximately 80 000m² (8 Ha), the need for consultation with the responsible heritage resources authority was undertaken as requirements for all activities that occupy an area that exceeds the 5 000m² based on Section 38 (1)(c)(i) of the National Heritage Resources Act, 1999 (Act No. 25 of 1999), Amafa aKwaZulu-Natali (Amafa hereafter) is the KwaZulu Natal's Heritage Resources Authority. GA Environment has liaised with this authority and is currently awaiting their comments. Based on the site visit, heritage resources (e.g. graves or structures older than 60 years were not identified by the EAP. Refer to table 25 for an assessment of potential impacts on heritage resources.

Table 25: Assessment of impacts on possible heritage resources

Project phase	Nature of impact	Extent	Duration	Intensity	Probability	Reversibility	Irreplaceable loss of resources	Significance without mitigation	Significance with Mitigation
Construction	Negative	Site	Short term	Medium	Probable	Short term	N/A	Low	Low
Monitoring	Negative	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

In order to protect Heritage Resources on site, the following mitigation measure is proposed:

- Should any historically significant finds (e.g. artefacts, human remains or sites of cultural or archaeological importance) be located, work must cease and the Provincial Heritage Resources Authority, Amafa aKwaZulu-Natali (033 394 6543) must be must be contacted immediately through

the ECO. Work in the area can only be resumed once the site has been completely investigated and the Amafa aKwazulu- Natal has given permission to the Developer/ Contractor to resume activities.

Key issues and general potential environmental impacts likely to be associated with the construction activities associated with the decommissioning of the landfill are summarised in **Table 7**.

8.2.10 Cumulative Impacts

The NEMA EIA Regulations (2014) defines a “cumulative impact” in relation to an activity, as the past, current and reasonably foreseeable future impact of an activity, considered together with the impact of activities associated with that activity, that in itself may not be significant, but may become significant when added to the existing and reasonably foreseeable impacts eventuating from similar or diverse activities. This is required on the basis that the impact of an activity that in itself may not be significant but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area

The environmental impacts that will emanate from the licencing of the landfill have already been discussed in this BAR. The impacts on the adjacent watercourse and riparian area are considered to be the most significant. These impacts can create cumulative impacts by affecting other watercourses in the KwaDukuza area. The additional

Mitigation measures to ameliorate these impacts during the construction and monitoring phases of the project have been discussed in some sections of this chapter and are prescribed in detail in the Environmental Management Programme attached as **Appendix H** of this report

Table 26: Summary of potential Impacts and Impact Assessment Criteria associated with the proposed activities at the Shakaville landfill

Activity	Aspect	Nature of Impact	Description of Impact	Criteria						
THEME 1: BIOPHYSICAL ENVIRONMENT				Extent	Duration	Intensity	Probability	Determination of significance	Reversibility	Irreplaceable loss of resources
Construction Phase as part of the rehabilitation activities										
Rehabilitation of landfill	Surface and groundwater contamination	Negative	Hydrocarbon leakages from plant vehicles and poor management of sources of hydrocarbon leakages has a potential to pollute underground and surrounding resources.	Local	Long Term	High	Probable	Medium	Short Term	Medium
	Loss of vegetation (within and outside the riparian area)	Negative	The rehabilitation of the Shakaville landfill will result in the clearing of vegetation alien invasive species as well as some indigenous species	Local	Medium Term	Medium	Improbable	Medium	Short Term	Medium
	Soil contamination	Negative	Contamination of surrounding soil resources through spillages and overflows emanating from the construction activities may result in the contamination of soil	Site	Short Term	High	Probable	Medium	Short Term	Medium

Activity	Aspect	Nature of Impact	Description of Impact	Criteria						
The status of the biophysical environment within the Shakaville landfill boundary site has already been highly transformed. The potential impact on the biodiversity in the area is considered to be of low significance as the site is largely devoid of vegetation.										
Monitoring Phase of rehabilitated areas										
Rehabilitation of landfill	Alien species infestation	Negative	The decommissioning of the Shakaville landfill may result in the encroachment of alien invasive species.	Site	Short Term	Medium	Highly Probable	High	Short Term	Medium
	Leachate and Gas Monitoring	Negative	Leachate and gas generation will have adverse impacts of the environment	Local	Short Term	Medium	Highly Probable	High	Short Term	Medium
Theme 2: Human Environment				Extent	Duration	Intensity	Probability	Determination of Significance	Reversibility	Irreplaceable loss of Resources
Construction Phase										
Relocation of informal settlement dwellers	Community unrest	Negative	It is possible that community members who do not qualify for housing but have to be relocated to allow for the rehabilitation activities of the landfill may express their dissatisfaction through protests.	Local	Short Term	High	Highly Probable	Medium	Short Term	Medium

Activity	Aspect	Nature of Impact	Description of Impact	Criteria						
				Site	Long Term	High	Highly Probable	High	Long Term	Medium
Rehabilitation of the Shakaville Landfill	Efficient solid waste disposal services	Positive	The proposed project is of strategic importance and serves to provide adequate solid waste disposal infrastructure is in line with the Municipality's IDP requirements.	Site	Long Term	High	Highly Probable	High	Long Term	Medium
	Services disruption	Negative	The construction activities may result in the disruption of services where the infrastructure is located within the boundaries of the landfill	Site	Short Term	Low	Probable	High	Short Term	Low
	Local Economy	Positive	Creation of short term employment opportunities for locals	Regional	Long Term	Medium	Highly Probable	High	Long Term	Medium
	Land use	Positive	The rehabilitation of the landfill will ensure that the adverse impacts of the landfill in its current state are mitigated and that the landfill site is availed for other suitable land uses.	Site	Long Term	Low	Highly Probable	Low	Long Term	High
	Noise generation	Negative	The use of heavy machinery during construction will result in the	Local	Short Term	Low	Probable	Low	Short Term	Low

Activity	Aspect	Nature of Impact	Description of Impact	Criteria						
				Extent	Duration	Intensity	Probability	Determination of Significance	Reversibility	Irreplaceable loss of Resources
			generation of noise on site where levels are currently low.							
	Visual & Aesthetic	Negative	Visual and aesthetic impacts activities such as excavation, stockpiling of construction material, waste and rubble handling of materials will occur.	Local	Short Term	Medium	Probable	Medium	Short Term	Low
	Air quality (dust)	Negative	Dust emanating from construction related activities will result in the generation of dust.	Local	Short Term	Medium	Highly Probable	High	Short Term	Medium
				Extent	Duration	Intensity	Probability	Determination of Significance	Reversibility	Irreplaceable loss of Resources
	Air quality - odour	Negative	Odours associated with the decomposed waste	Site	Long Term	Low	Highly Probable	High	Short Term	Medium
	Traffic and access to site	Negative	The movement of construction vehicles to and from the site can result in an increase in traffic congestion on local roads. Furthermore, the access road into the Shakaville landfill allows for the movement of one vehicle at a time further affecting traffic congestion.	Local	Short Term	Low	Probable	Medium	Short Term	Low

Activity	Aspect	Nature of Impact	Description of Impact	Criteria						
				Site	Short Term	Low	Probable	High	Short Term	High
	Health and safety	Negative	Due to the location of an informal settlement within the boundaries of the landfill, the residents of this area will be adversely impacted by the proposed construction activities for the rehabilitation of the landfill.							
Monitoring Phase										
				Extent	Duration	Intensity	Probability	Determination of Significance	Reversibility	Irreplaceable loss of Resources
Rehabilitated landfill	Elimination of current environmental problems	Positive	The upgrade of the Shakaville landfill will reduce the current environmental problems (visual, odour, health etc.) as the landfill will be decommissioned in line with applicable legislation.	Local	Long Term	High	Highly Probable	High	Long Term	Low
	Availability of land for other purposes	Positive	Once rehabilitated, the area currently occupied by the landfill will be available for other uses	Local	Long Term	High	Highly Probable	High	Irreversible	Low

9 CONCLUSION AND RECOMMENDATION

The Shakaville landfill was operating illegally (without a licence) for about 30 years until waste disposal facilities ceased operations between 2007 and 2010 after approximately 30 years of operation. The KwaDukuza Local Municipality intends to apply for a licence to legally decommission the facility. According to the KwaDukuza Municipality's Integrated Development Plan (IDP) (2012- 2017), the implementation of the closure and the rehabilitation of the Shakaville landfill was targeted for the year 2014 and was allocated the project number *MS/41/2012*.

The proposed Licencing of the Shakaville landfill will allow the used for alternative end uses. The issuing of the licence for the landfill will allow the KwaDukuza Local Municipality to obtain funding for the undertaking of the decommissioning activities to ensure compliance with the DWAF Minimum Requirements for disposal of waste by landfill (2nd Edition, 1998), the National Norms and Standards for disposal of waste to landfill (Government Notice No. R 636 in Government Gazette No. 36784 of August 2013) and other Environmental requirements.

Based on the summary of environmental observations of the site, it is a conclusion of this report that the proposed upgrade of the Shakaville landfill will have moderate impacts on the bio-physical environment, all of which can be fully mitigated and managed, and where possible prevented. The proposed decommissioning activities on the site are not likely to negatively affect local ecological function as noted during the Basic Assessment Process.

Regarding comments from Interested and Affected, these were mainly related to concerns about loss of the informal housing infrastructure. It is hoped that additional comments will be obtained subsequent to the public review of this Draft Basic Assessment Report. It must be highlighted that although the project did not draw sufficient attention to warrant public meetings, consultation with all the key stakeholders was undertaken to inform them about the proposed project.

Based on the summary of environmental observations, it is a conclusion of this Basic Assessment Report that the proposed activities associated with the decommissioning will have low impacts on the bio-physical environment, all of which can be fully mitigated and managed.

9.1 Environmental Impact Statement

Decommissioning activities are disruptive in nature, and some impacts pertaining thereto will remain regardless of how closely the decommissioning phase is managed. Fortunately, the impacts resulting from decommission activities are usually short-lived and site specific such that management of these once identified in the planning phase will most likely have a temporary effect on the wider environment.

The decommissioning process will entail the capping of the waste body and merging the capping of the landfill into the natural topography. For the capping design it is proposed to use a restricted moisture cap without HDPE barrier layer in order to minimise the ingress of rain water and isolate the waste body from the atmospheric environment.

Rehabilitation will then commence taking appropriate action to ensure that the site is left in a suitable condition. In this regard the condition of the site should not limit the current and future land-use in line with the existing land-use zoning and rights.

Once licensed, the site can therefore be decommissioned in line with the applicable guideline documents and any other statutory requirements. The licencing of the landfill will ensure that the final condition of the site is environmentally acceptable and that there will be no adverse long-term effects emanating from the waste disposal activities.

All mitigation and management measures should be guided by the Environmental Management Program and the Closure Plan attached as **Appendix H** and **Appendix I** and will be updated with additional conditions from the Environmental Authorities. It is therefore a conclusion of the EAP that the applicant's preferred alternative (licencing of the Shakaville landfill) for decommissioning be approved, provided the essential mitigation measures are implemented.

The key environmental impacts that may arise as result of the proposed activities include biophysical impacts such as: sedimentation of the watercourse, impacts on the riparian area, the removal of indigenous vegetation, effects on surface and groundwater pollution. The Socio-economic impacts include community disruptions due to competition for job opportunities and as a result of the lack of provision of housing for some non-qualifying residents of the informal structures of the Shakaville Landfill. Each of these can however be mitigated through the measures indicated in the in Chapter 8 as well as in the EMPr in **Appendix 8** of this BAR.

9.2 EAP Recommendations

This BA has provided a comprehensive assessment of the potential environmental impacts associated with the proposed activity. These impacts have been identified by the EAP. The key findings of the BA are discussed in this Report. The decommissioning of Shakaville landfill site is considered the only viable alternative, based on the minimal impacts of the proposed licencing on the bio-physical environment.

No unacceptable impacts of high significance are foreseen once proper mitigation measures have been implemented. It is therefore recommended that the environmental authorities subject the proposed application to the following conditions:

The Planning Phase:

- a. Detailed designs must be compiled for the project as the designs provided in the report are preliminary;
- b. Financial Provision for the project (approximately 19 985 880) must be made for the project as indicated the Preliminary Engineering Design Cost Estimate as detailed in the Engineering Needs Assessment and Preliminary Closure Design Report in **Appendix F3**.
- c. All adjacent landowners must be informed of construction activities at least 30 days before their commencement;
- d. Final planning must be undertaken in accordance with applicable legislation. All necessary registration, permits and licenses must be acquired as necessary. The

includes any licences or authorisations required by the Department of Water and Sanitation, Amafa or any other authorities.

- e. Site specific work plans addressing environmental and personnel safety must be drawn up for each work area before commencing with decommissioning activities. Work plans to specify required Equipment, Staffing, and Practices for Safe Handling of waste, Protective Equipment, Monitoring and reporting and Feedback. Refer to the EMPr in **Appendix H**.
- f. Draw up a Construction Plan indicating how the construction site will operate in terms of access and activities, during project planning.
- g. An independent Environmental Control Officer (ECO) should be appointed to monitor construction activities;
- h. Develop and maintain a forum for communicating with adjacent land owners for information sharing, complaints and problem solving throughout the project lifecycle.
- i. The KwaDukuza Local Municipality must initiate projects to raise awareness on waste management and reduction strategies in communities;
- j. Alien invasive species within the study site should be removed prior to construction-related soil disturbances. By removing these species, the spread of seeds will be prevented into disturbed soils which could thus have a positive impact on the surrounding natural vegetation. A suitably qualified person (botanist / horticulturist) should survey the final development footprint immediately prior to construction to confirm if the plants to be removed are invasive.
- k. Additional studies should be carried out to ascertain the potential for pollution originating from the existing waste site. The additional geohydrological work entails further detailed studies of the existing geological and geohydrological information available for the site and the surrounding areas. The aim of the additional geohydrological work for this phase of the investigation will be three-fold and include the following:
 - Clarify the groundwater flow and the likely migration of a pollution plume around landfill and determine the groundwater conditions to the northwest of the existing site towards the dam and river.
 - Establish a more comprehensive groundwater monitoring system around the entire.
 - Further determine the geotechnical and geohydrological properties of the soils and underlying bedrock.

The Construction phase associated with the Decommissioning Phase of the project:

- a. Compliance with the mitigation measures outlined in this BA report, the EMPr, the Closure Plan, the Ecological Opinion Report and the Engineering Needs Assessment and Preliminary Closure Design Report;
- b. An independent Environmental Control Officer (ECO) should be present during construction of the new infrastructure to ensure the works are undertaken in an environmental sensitive manner;
- c. Adhering to the mitigation measures outlined in the
- d. Operational of Plant and site vehicles should be done with care to minimize any

accidental spills of hazardous and harmful materials. Swift reaction and remedial actions will limit the local risk of polluting groundwater.

- e. The Applicant must appoint an engineer to compile detailed designs for the capping layers. The proposed landfill must be carefully designed to avoid significant ground water and visual impacts.
- f. The 1:50 and 1:100 flood lines should be mapped in relation to the site;
- g. If it should be determined that the site is within 500m of the watercourse or 1:100 flood zone; then appropriate Water Use Authorization should be obtained for (i) altering the bed, banks, course or characteristics of a watercourse; and/or (c) impeding or diverting the flow of water in a watercourse;
- h. Storm water must be prevented from mixing with the leachate and disposal of Leachate should not adversely affect water quality is water resources;
- i. The dirty water pond should not be located within the 1:100 year flood-line or within a horizontal distance of 100 metres from any watercourse or estuary, or a borehole which is utilized for drinking water or stock watering, whichever is further. Additionally, the site should not overly a major Aquifer;
- j. The Contractor must be trained to recognise heritage and paleontological objects (including human remains). Should there be a sign of such objects, construction must halt in that area immediately and a suitably qualified heritage specialist must be called to investigate through the ECO;
- k. Compliance with all legal requirements in relation to environmental management and conditions of the authorisation issued by EDTEA.

Based on the environmental assessment of the conditions, the proposed closure of the site has emerged as the most viable option as it is in line with the KwaDukuza Local Municipality IWMP and IDP. It is therefore strongly advised that the Recommendations highlighted in this section be included as Conditions of Authorisation by both the Department of Water and Sanitation and the KwaZulu Natal Department of Economic Development, Tourism and Environmental Affairs. It is therefore a recommendation of this Basic Assessment that the site be licensed for closure for a period of at least 3 years and the Municipality be granted a Waste Management License.

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