

Basic Assessment (BA) process in support of a Waste Management Licence for the Closure of the existing Alton Landfill, City of uMhlatuze Local Municipality, KwaZulu-Natal



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Executive Summary

BACKGROUND TO THE PROJECT

The Department of Environmental Affairs (DEA) commissioned a study in 2007, completed in 2009, that aimed at identifying and determining the number of waste disposal facilities in South Africa that are not licenced. Of a total of 581 sites that were identified, 431 needed to be licenced. It was evident from the study that Local Municipalities (LMs) did not have adequate training or funding for lodging applications to licence their unlicensed waste disposal facilities or the management thereof. The Minister undertook to begin the process of licencing these sites, with a target that all would be licenced by 2013/2014. Subsequently, the DEA has identified an additional 57 municipal waste disposal facilities which must be licenced during the 2014/15 financial year. The licencing of the Alton landfill falls within the scope of this process.

Sustainable Environmental Solutions (Pty) Ltd (SE Solutions), in association with AECOM SA (Pty) Ltd (AECOM), was appointed by the DEA to conduct the required environmental legislative process to apply for a Waste Management License (WML) for the closure of the existing Alton Landfill (the Project), on behalf of the City of uMhlatuze LM.

PROJECT AREA

The existing Alton Landfill is located within the jurisdiction of the City of uMhlatuze LM, approximately 2 km south of Alton in KwaZulu-Natal Province. The South32 Hillside Aluminium smelter is situated approximately 145 m east of the site.

The landfill is situated on Remainder of Erf 5333 Alton, and access to the site is from Alumina Alley road located on the eastern and northern boundary of the site property. The R34 is located along the southern boundary of the landfill site. The site is predominantly surrounded by industrial operations and open areas of land.

PROJECT DESCRIPTION

The existing unlicensed Alton Landfill is operated by the City of uMhlatuze LM, the Applicant and the landowner for the proposed WML. The landfill was in operation for a period of 18 years, from 1984 to 2002. The site received an estimated total amount of 351152 tons of general waste. Although the status of the landfill site is illegal, it has been decommissioned, capped and stormwater management measures implemented with the input of a professional engineer, however this infrastructure is in need of upgrading and maintenance as ground and surface water pollution are detected at the water monitoring points. The site is fenced with gated access control, however a section of the fence is broken and the landfill area is currently being accessed by illegal waste reclaimers and grazing cattle.

The Alton Landfill also has a Record of Decision (dated 02/03/2008) for the operation of a landfill gas collection and power generation system. However, the landfill gas collection infrastructure was removed due to it no longer being viable. The site is currently being operated as a Waste Transfer Station (WTS).

The closure and rehabilitation activities will comply with the Minimum Requirements for Waste Disposal by Landfill (Second Edition, 1998). Closure activities will commence within 12 months from the date of issue on the waste management license.

APPLICATION PROCESS

The Project is considered a waste management activity that may have a detrimental effect on the environment and for which authorisation in the form of a WML is required from the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN EDTEA) in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA). The Project does not comprise activities listed in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) 2014 Environmental Impact Assessment (EIA) Regulations.

Due to the requirement for formal closure of the Alton Landfill site, a Basic Assessment (BA) application process is required in order to obtain the WML.

Basic Assessment:

This report documents the outcomes of the Basic Assessment Process. The draft version of the Basic Assessment Report is presented to registered Interested and Affected Parties (I&APs) for a 30-day review and comment period. The Draft Basic Assessment Report is distributed to the following public venues in the project area from 04 December 2015 to 25 January 2016:

Venue	Address
Umhlathuze Local Municipality Reception	5 Mark Strasse, Central Business District, Richards Bay
Richards Bay Public Library	Kruger Rand Street, Richards Bay North Coast

Ms Bongji Shinga from AECOM can be contacted on bongji@deawaste2015.co.za or Tel. 012 421 3500 during office hours for any queries and/or to submit comment on the DBAR.

Once all comments on the DBAR have been incorporated and addressed, the Final Basic Assessment Report (FBAR) will be submitted to the KZN EDTEA for decision-making. At present, it is not anticipated that specialist studies are required to be conducted in support of the BA Process.

Once a WML (positive or negative) has been issued, all registered I&APs will be notified of the decision and appeal provisions.

Table of Contents

Executive Summary	iii
1. Introduction	1
1.1 Background	1
1.2 The Proposed Project	1
1.3 The Environmental Impact Assessment Process	2
1.3.1 Draft Basic Assessment Report Phase	2
1.3.2 Final Basic Assessment Report Phase	2
1.3.3 Decision-Making Phase	2
1.4 Structure of the Report	3
1.5 Assumptions and Limitations	3
2. Project Team	4
2.1 The Applicant	4
2.2 Environmental Assessment Practitioner	4
2.3 The EIA Project Team	4
3. Overview of the Project	6
3.1 Project Area	6
3.2 Description of the Existing Alton Landfill	6
3.3 Waste Classification of the Landfill Site	8
3.4 Waste Management (Closure) of the Landfill	8
Design Solution	8
Costing of the Proposed Solution	8
3.5 Need and Desirability	9
4. Description of Alternatives	10
4.1 Alternatives Considered	10
4.1.1 Do Nothing Option	10
5. Description of Affected Environment	11
5.1.1 Regional Context	11
5.1.2 Local Context	11
5.2 Physical Environment	11
5.2.1 Climate and Atmospheric Conditions	11
5.2.1 Existing Land Use and Land Cover	11
5.2.1 Topography	12
5.2.2 Geology	14
5.2.3 Soils	14
5.2.4 Hydrology	14
5.3 Biophysical Environment	17
5.3.1 Fauna	17
5.3.2 Flora	17
5.4 Social Environment	18
5.4.1 Population	18
5.4.2 Economy and Employment	18
5.4.3 Education	18
5.4.4 Service Delivery	19
5.5 Cultural Resources	19
6. Legislative Framework	20
6.1 Introduction	20
6.2 Relevant National Legislation	20

6.2.1	The National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)	20
6.2.2	National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended	21
6.2.3	National Water Act, 2008 (Act No. 36 of 2008)	22
6.3	Additional Applicable Legislation	22
6.4	Local Legislation and Policy Framework	23
6.4.1	uMhlathuze Integrated Development Plan Review 2015/2016	23
7.	Public Participation Process (PPP)	25
7.1	Identification and Registration of I&APs	25
7.2	Announcement of the Proposed Project	25
7.2.1	Media	25
7.2.2	On-site Notices	26
7.3	Dissemination of Information	26
7.3.1	Background Information Document	26
7.3.2	Request for Registration and Notification of the Draft Basic Assessment Report Review Period	26
7.4	Comment and Response Report	26
8.	Environmental Impact Assessment	27
8.1	General	27
8.1.1	Planning, Design and Construction Phase	27
8.1.2	Operational Phase	27
8.1.3	Decommissioning and Closure Phase	27
8.2	Impact Assessment Methodology	27
8.3	Impact Assessment	29
8.3.1	Planning, Design and Construction Phase	29
8.3.2	Operational Phase	29
8.3.3	Potential impacts during the decommissioning and closure phase	29
8.4	Environmental Management Programme	35
8.5	Final Basic Assessment Report	36
8.6	Decision-making Phase	36
9.	IMPACT STATEMENT AND Conclusion	37
10.	References	38

List of Figures

Figure 3-1: Detailed Locality of the Alton landfill	7
Figure 5-1: Site Plan of Alton Landfill	13

List of Tables

Table 2-1: Details of the Applicant	4
Table 2-2: Details of the EAP	4
Table 2-3: EIA Project Team	5
Table 3-1: Cost calculation for the Alton landfill	9
Table 6-1: Listed Activities in Terms of Category A and B of GN 37083 of November 2013	21
Table 6-2: Summary of Applicable Legislation	22
Table 7-1: Project Announcement Newspaper Advertisements	25
Table 7-2: Site Notice Locations	26

Table 7-3: Venues for draft Basic Assessment Report..... 26

Appendices

Appendix A:	Public Participation Documentation
Appendix B:	WML Application Form
Appendix C:	Site Photographs
Appendix D:	Project Locality
Appendix E:	Specialist Reports
Appendix F:	Environmental Management Programme
Appendix G:	CVs of the EAP Project Team

List of Abbreviations

°C	Degrees Celsius
CA	Competent Authority
BID	Background Information Document
CBD	Central Business District
CRR	Comment and Response Report
DEA	Department of Environmental Affairs
DBAR	Draft Basic Assessment Report
DWS	Department of Water & Sanitation
EA	Environmental Authorisation
EAP	Environmental Assessment Practitioner
EIA	Environmental Impact Assessment
EMPr	Environmental Management Programme
GIS	Geographical Information System
GN R	Government Notice Regulation
Ha	Hectares
HIA	Heritage Impact Assessment
I&AP(s)	Interested and Affected Party (-ies)
IDP	Integrated Development Plan
km	kilometre
KZN EDTEA	KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs
m	metre
NEMA	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
NEMWA	National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)
NWA	National Water Act, 1998 (Act No. 36 of 1998)
PPP	Public Participation Process
RDL	Red Data Listed
SABAP	South African Bird Atlas Project
SAHRA	South African Heritage Resources Agency
SANBI	South African National Biodiversity Institute
SANS	South African National Standards
SAWS	South African Weather Services
SIA	Social Impact Assessment
WCMR	Waste Classification Management Regulations

WML Waste Management Licence
WUL Water Use Licence

1. INTRODUCTION

1.1 Background

The Department of Environmental Affairs (DEA) commissioned a study in 2007, completed in 2009, that aimed at identifying and determining the number of waste disposal facilities in South Africa that are not licenced. Of a total of 581 sites that were identified, 431 needed to be licenced. It was evident from the study that Local Municipalities (LMs) did not have adequate training or funding for lodging applications to licence their unlicensed waste disposal facilities or the management thereof. The Minister undertook to begin the process of licencing these sites, with a target that all would be licenced by 2013/2014. Subsequently, the DEA has identified an additional 57 municipal waste disposal facilities which must be licenced during the 2014/15 financial year. The licencing of the Alton landfill falls within the scope of this process.

1.2 The Proposed Project

Sustainable Environmental Solutions (Pty) Ltd (SE Solutions), in association with AECOM SA (Pty) Ltd (AECOM), was appointed by the DEA to conduct the required environmental legislative process to apply for a Waste Management License (WML) for the closure of the existing Alton Landfill (the Project), on behalf of the City of uMhlatuze Local Municipality (LM).

Although the status of the landfill site is illegal, it has been decommissioned, capped and stormwater management measures implemented with the input of a professional engineer. However, this infrastructure is in need of upgrading and maintenance as ground and surface water pollution is detected at water monitoring points. Detailed design for the upgrades as laid out in the Environmental Management Programme (EMPr) must commence immediately upon receipt of the closure licence.

The site is currently being operated as a Waste Transfer Station (WTS). Recyclables are collected by private companies, while non-recyclables are transferred to the Empangeni Regional Waste Disposal Facility.

The closure and rehabilitation activities will comply with the Minimum Requirements for Waste Disposal by Landfill (Second Edition, 1998). Closure activities will commence within 12 months from the date of issue on the waste management license. During closure of the existing landfill the following activities will be conducted:

- Closure:
 - Consolidate the waste illegally dumped on site into skips and take to a landfill or the transfer station for disposal;
 - Repair the erosion gullies by filling them up and stabilising them;
 - Remove the vegetation from the site and demolish the existing concrete lined stormwater drains. Stockpile the topsoil;
 - Place an engineered capping system on top of the sand layer;
 - Construct a leachate cut-off drain downstream of the rehabilitated landfill. Install a conservancy tank downstream of the cut-off drain. Collect, pump and treat the leachate;
- Stormwater:
 - Design of stormwater management measures (such as: contouring, berms, trenches, etc.) to comply with Government Notice 704 of the National Water Act, 1998 (Act No. 36 of 1998);
- Final Cover:

- Once the final layer of top soil has been placed on the cap, the site must be seeded with a mixture of indigenous grasses;
- Vegetation establishment must be monitored post decommissioning to ensure successful rehabilitation; and,
- Surface and groundwater monitoring to be conducted.

1.3 The Environmental Impact Assessment Process

The proposed Project is considered a waste management activity that may have a detrimental effect on the environment and for which authorisation in the form of a WML is required from the KwaZulu-Natal Department of Economic Development, Tourism and Environmental Affairs (KZN EDTEA) in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) (NEMWA). The proposed Project does not comprise activities listed in the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA). Due to the nature of the proposed Project, a Basic Assessment (BA) application process is required.

This Environmental Impact Assessment (EIA) process assists the KZN EDTEA, to make an informed decision on whether the proposed licence to close the existing landfill should be issued or not, and under what conditions an authorisation could be granted. In the EIA process, all potentially significant negative and positive impacts (social, economic and biophysical environments) of the activity are identified and assessed. An EIA by way of a BA application process entails the following main phases:

- Draft Basic Assessment Report (DBAR) Phase;
- Final Basic Assessment Report (FBAR) Phase; and,
- Decision-Making Phase.

1.3.1 Draft Basic Assessment Report Phase

The BA application process is currently in the Draft Basic Assessment Report (DBAR) Phase, and its main purpose is to identify and investigate issues related to the proposed Project and assess all potentially significant impacts. Issues and impacts are identified by the project team using theoretical knowledge, experience on similar projects, and consultation with I&APs and other key stakeholders (such as national, regional and local government departments).

To date, public participation was conducted to identify potential I&APs, inviting I&APs to register as well as to notify I&APs of the BA application process to obtain a WML for the existing landfill site (refer to Section 7 for more information on the public participation process).

This DBAR is available for public comment over a period of 30 days (excluding public holidays), from 04 December 2015 to 25 January 2016. The objective of the review and comment period is for I&APs to raise concerns about the Project and to comment on the information contained within the DBAR.

1.3.2 Final Basic Assessment Report Phase

Once the comment and review period on the DBAR has concluded, the report will be updated to a Final Basic Assessment Report (FBAR) and submitted to the KZN EDTEA for decision-making. All comments received on the DBAR will be captured in a Comment and Response Report (CRR) attached to the FBAR.

1.3.3 Decision-Making Phase

The FBAR will be reviewed by the KZN EDTEA and a WML will be drafted with conditions that the City of uMhlatuze LM must adhere to. Once the WML is issued, all registered I&APs will be notified of the decision and appeal provision should they disagree with the decision or any conditions contained therein.

1.4 Structure of the Report

This Basic Assessment report contains the following, in accordance with Appendix 1 of the EIA Regulations (2014):

Chapter	Description
Chapter 1	Introduction
Chapter 2	Project team details
Chapter 3	Overview of the project
Chapter 4	Description of the project alternatives
Chapter 5	Description of the affected environment
Chapter 6	Legislation and guidelines that pertain to the project
Chapter 7	Public Participation Process
Chapter 8	Environmental Impact Assessment
Chapter 9	Conclusion and Recommendations
Chapter 10	References

1.5 Assumptions and Limitations

The following assumptions, limitations and constraints, associated with this project as described above, have been identified for this BA process:

- The BA process is multi-disciplinary, which is informed by the project team. It is thus necessary to assume that the information provided by the project team is accurate and true, at the time.
- Data shown in the maps were supplied by various sources and was used as received. The data was not verified.
- A preliminary site investigation was undertaken by the EAP’s project team in consultation with representatives of the Applicant on 04 September 2015 to identify activities triggered and studies required to be conducted.
- Public Participation Process: every effort was made to inform all possible stakeholders within the Project area. Information presented by the stakeholders is presumed to be accurate and has been presented timeously in the study.

2. PROJECT TEAM

2.1 The Applicant

The City of uMhlatuze LM is applying for a WML for the closure of the existing unlicensed Alton Landfill. The Applicant is also the landowner. Details of the Applicant are provided in Table 2-1.

Table 2-1: Details of the Applicant

Applicant and Landowner	City of uMhlatuze Municipality
Contact Person	Dr NJ Sibeko
Postal Address	Private Bag X1004, Richards Bay, 3880
Telephone	(035) 907 5023
Fax	(035) 907 5444
E-mail Address	SibekoNJ@uMhlatuze.gov.za
Applicant's Representatives	
Dr NJ Sibeko	Municipal Manager SibekoNJ@uMhlatuze.gov.za
Mr Zilindile Masango	Manager: Health and Cleansing (Waste Management Services) Zilindile.Masango@umhlatuze.gov.za
Mr Johannes Mdlalose	Deputy Manager (Waste management officer)

A copy of the WML Application Form can be found in Appendix B.

2.2 Environmental Assessment Practitioner

Details of the Environmental Assessment Practitioner (EAP) are contained in Table 2-2.

Table 2-2: Details of the EAP

Environmental Consultant	Sustainable Environmental Solutions (Pty) Ltd
Environmental Assessment Practitioner	Ms Victoria Napier
Postal Address	Suite 51, Private Bag X108, Centurion, 0046
Telephone	078 278 2898
Fax	086 664 6885
E-mail Address	vici@sesolutions.co.za \

Vici Napier has more than 7 years' experience as an EAP Project Manager, with over 9 years as an EAP. She is highly experienced in managing large multi-disciplinary project teams for various types of environmental assessments and authorisations, and has often been described by colleagues and clients as having specialist Project Management skills. In addition, she has experience in training and skills transfer within the Environmental Management field. Vici is a Registered Professional Natural Scientist with SACNASP (400215/09) and a member of the South African Chapter of the International Association of Impact Assessment (IAIA). The full CV of Ms Napier is presented in Appendix G.

2.3 The EIA Project Team

Details of the Project Team assisting the EAP in conducting the BA application process in support of a WML for the closure of the Alton Landfill are provided in

Table 2-3 below.

Table 2-3: EIA Project Team

Name	Role on Team	Company
Mike Howard	Environmental Executive	AECOM
Johan Hayes	Project Manager	AECOM
Emmanuel Mmotong	Candidate Environmental Technologist	AECOM
Soleil Jones	Environmental Specialist	AECOM
Bongi Shinga	Public Participation Practitioner	AECOM
Mamokete Maimane	Public Participation Practitioner	AECOM

CVs of the EIA project team are presented in Appendix G.

3. OVERVIEW OF THE PROJECT

3.1 Project Area

The existing Alton Landfill is located within the jurisdiction of the City of uMhlathuze LM, on the southern edge of Alton, Richards Bay, in KwaZulu-Natal Province. The South32 Hillside Aluminium smelter is situated approximately 145 m east of the site. Land uses within the immediate vicinity of the Project site include industrial developments and open patches of land.

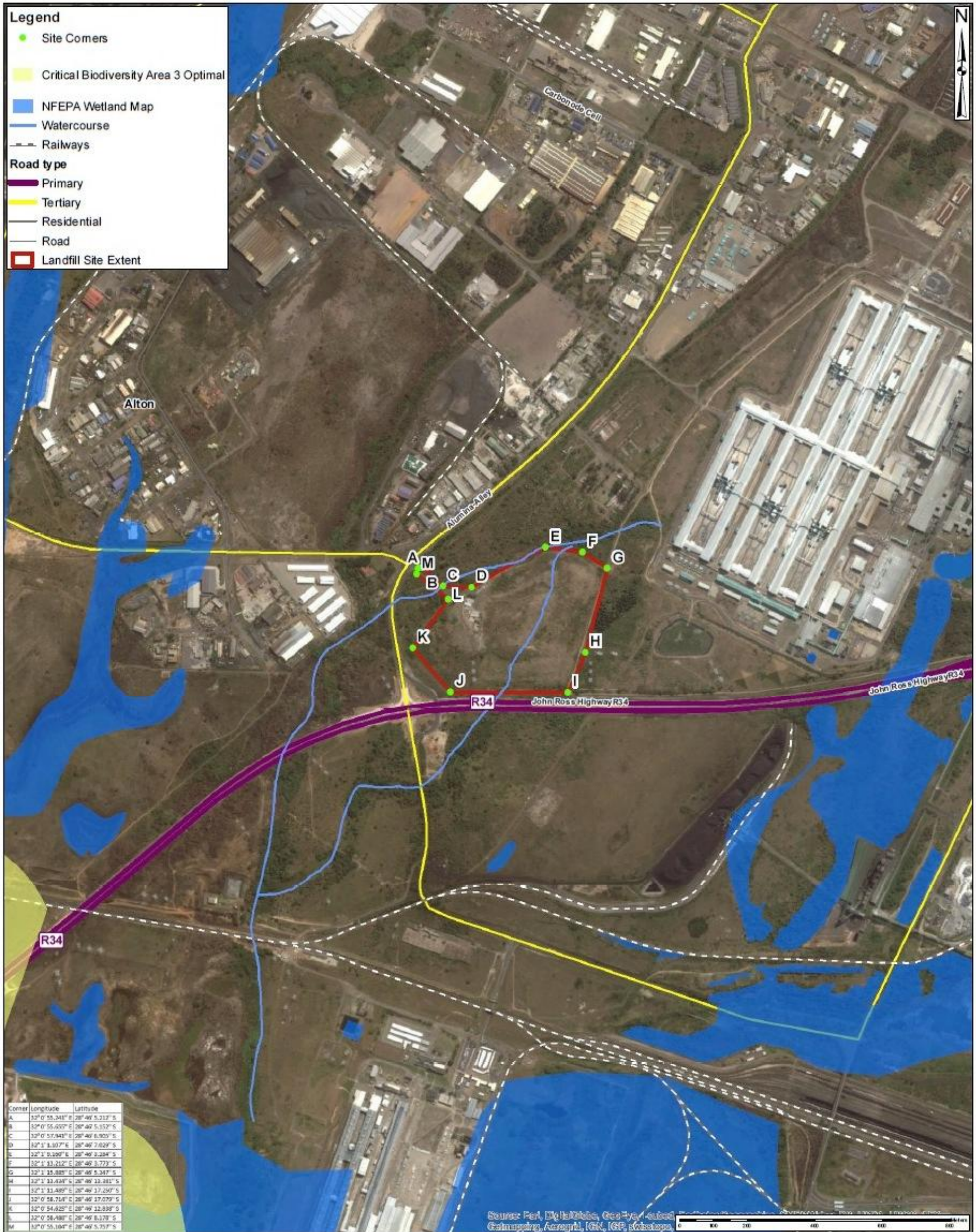
The landfill is situated on Remainder of Erf 5333 Alton (SG21 Digit code: N0GV04210000533300000). Access to the site is from Alumina Alley road to the north-west of the site. Alumina Alley road is accessed from the R34 John Ross Highway to the south (refer to Figure 3-1 and Figure 5-1).

3.2 Description of the Existing Alton Landfill

The landfill was in operation for a period of 18 years, from 1984 to 2002. The site received an estimated total amount of 351152 tons of general waste. The footprint size of the site covers an area of approximately 175 480 m². Although the status of the landfill site is illegal, it has been decommissioned, capped and stormwater management measures implemented with the input of a professional engineer. The stormwater control and the cap are in need of upgrading and maintenance as ground and surface water pollution is detected at water monitoring points. The engineering detail showing the design of the covering of the landfill is currently not available. The site is fenced with gated access control, however a section of the fence is broken and the landfill area is currently being accessed by illegal waste reclaimers and grazing cattle. Detailed design for the upgrades as laid out in the EMP must commence immediately upon receipt of the closure licence.

The site is currently being operated as a Waste Transfer Station (WTS). Garden wastes and some general waste are being accepted and sorted at the WTS by people employed through a Non-Governmental Organisation (NGO) that has a service level agreement with the LM. Recyclables are collected by private companies, while non-recyclables are transferred to the Empangeni Regional Waste Disposal Facility. Even though this application is for the closure of the landfill site, it is the intention of the Applicant to continue operating the WTS, for which a licence was granted in November 2005 (Ref. No.: EIA/5635) (refer to Appendix H, Other Information). The derelict administration block on site is planned to be demolished and rebuilt.

The Alton Landfill also has a Record of Decision (dated 02/03/2008) for the operation of a landfill gas collection and power generation system. However, the landfill gas collection infrastructure was removed due to it no longer being viable. Refer to Appendix C for the photographs of the site that were taken during the site visit.



Project Title: DEA Waste Licenses 2015	Scale 1:10 000 (When page size is A3 portrait)	Figure
Map Title: Detailed Locality Map of Alton Landfill Site	Projection: Transverse Mercator Datum: Habesbeekhoek 1994 Central Meridian: 33.0 Compiled By: GA Maree GIS QC By: TBD Approved By: J Hayes Date Saved: 2015/1/27 Project Number: 60437185 Map Ref: DetailedLocalityMap.mxd Revision: 00 DDP Ref: 7 of 13	Sources: Esri, DigitalGlobe, GeoEye, i-cubed, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aergrid, IGN, IGP, swissstopo, and the GIS User Community © OpenStreetMap & contributors
Whilst every care has been taken in compiling the information on this map, AECOM cannot accept responsibility for any inaccuracies. © Copyright		
Y:\7_Projects\60437185_DEA_Waste_Licenses_2015\mxd\DetailedLocalityMap.mxd		

Figure 3-1: Detailed Locality of the Alton landfill

3.3 Waste Classification of the Landfill Site

The landfill is assessed in terms of the current impact on the environment and the nature of the status of the landfill (Application for Closure). The impacts assessed will cover closure and decommissioning, as the site already exists.

During its operational life, the site received general waste, business waste, garden waste, and likely some hazardous waste, which requires no classification or assessment as per the Waste Classification and Management Regulations (WCMR) promulgated on 23 August 2013 (Government Gazette No. 36784). The WCMR also state that all general domestic waste landfills need to, as a minimum, adhere to the lining requirements for a Class B landfill as described in regulation 636 of the WCMR. For closure and capping design purposes the disposal site will be assessed using the principles contained in the 1998 Department of Water & Sanitation's (then Department of Water Affairs and Forestry) Minimum Requirements for Waste Disposal by Landfill document.

3.4 Waste Management (Closure) of the Landfill

Design Solution

The closure and rehabilitation activities will comply with the Minimum Requirements for Waste Disposal by Landfill (Second Edition, 1998). Closure activities will commence within 12 months from the date of issue on the waste management license. During closure of the existing landfill the following activities will be conducted:

- Closure:
 - Consolidate the waste illegally dumped on site into skips and take to a landfill or the transfer station for disposal;
 - Repair the erosion gullies by filling them up and stabilising them;
 - Remove the vegetation from the site and demolish the existing concrete lined stormwater drains. Stockpile the topsoil;
 - Place an engineered capping system on top of the sand layer;
 - Construct a leachate cut-off drain downstream of the rehabilitated landfill. Install a conservancy tank downstream of the cut-off drain. Collect, pump and treat the leachate;
- Stormwater:
 - Design of stormwater management measures (such as: contouring, berms, trenches, etc.) to comply with Government Notice 704 of the National Water Act, 1998 (Act No. 36 of 1998);
- Final Cover:
 - Once the final layer of top soil has been placed on the cap, the site must be seeded with a mixture of indigenous grasses;
 - Vegetation establishment must be monitored post decommissioning to ensure successful rehabilitation; and,
 - Surface and groundwater monitoring to be conducted.

Costing of the Proposed Solution

The costs for the construction work that needs to be undertaken upon the issuing of a closure licence have been estimated as follows in Table 3-1. Two scenarios have been considered for the Alton site, namely re-capping the landfill, or rehabilitation costs. Note that these costs are approximate and have been calculated according to certain assumptions and the footprint of the site and the landfill.

Closed - recapping and fence

R

Capping	R 30 600 000.00
fence	R 1 586 000.00
picking up litter	R 7 000.00
Contractor P&Gs (5%)	R 1 530 000.00
Conservancy Tank	R 5 000.00
Stormwater and leachate collection	R 50 000.00
Total	R 33 723 000.00

Or Rehabilitation

fence	R 1 586 000.00
picking up letter	R 7 000.00
conservancy tank	5000
Stormwater and leachate collection	R 30 000
labour	23000
Total	R 1 651 000.00

Table 3-1: Cost calculation for the Alton landfill

3.5 Need and Desirability

Service delivery is an issue of national concern / importance. Thus, the licensing of the illegal Alton landfill is considered part of this programme. This licensing process undertaken in terms of the NEMWA is in accordance with an initiative driven by the DEA to ensure the legal compliance of all municipal landfills, which in turn ensures appropriate and effective environmental management of these sites.

The licensing of the Alton landfill is thus crucial to ensure that the landfill is legally closed with good practice environmental management in place. The continued operation of the WTS would also reduce the amount of waste that is finally disposed at landfill through waste recovery and recycling.

The 2014-2015 City of uMhlatuze Integrated Development Plan (IDP) has identified and prioritized the following issues (relating to waste management) as key to meeting its environmental targets and objectives, points 1 and 4 are specifically addressed through this license application:

- To ensure legal compliance of environmental bylaws and legislative requirements by all (Council, Employees, Contractors);
- Regulation of land use and enforcement of usage of land in terms of the town planning scheme and land use management system;
- To minimise air pollution (prevention and reduction) in the municipality through efficient monitoring;
- Reduce overall water pollution within the municipality;
- To ensure the management of soil and land resources in a sustainable manner;
- To ensure the protection of habitats and natural resources; and,
- To comply with the provisions of the NEMWA by appointing of a waste management officer and compilation of a waste management plan for the City of uMhlatuze.

4. DESCRIPTION OF ALTERNATIVES

“Alternatives are different means of meeting the general purpose and need of a proposed activity. The identification, description, evaluation and comparison of alternatives are important for ensuring the objectivity of the assessment process. In cases where there is no objective and thorough assessment of alternatives, the EIA process usually only confirms a chosen activity and the value of the assessment as an input to decision-making may be compromised” (DEAT Guideline 4, 2006).

4.1 Alternatives Considered

The identification of alternatives is an important component of the BA process. However, as the Project entails the licensing of an existing landfill, project location / site alternatives are not currently considered as part of the BA process.

Given that the application entails the closure of an existing landfill site, only the option of not implementing closure is considered

4.1.1 Do Nothing Option

The DEA stresses that the “Do-Nothing” approach should be considered in cases where the proposed activity will have a significant negative impact that cannot be effectively or satisfactorily mitigated.

The “Do-Nothing” approach entails that the existing Alton Landfill remains unlicensed. Should such licensing not take place, the unlawful landfill will continue to appear as a finding of non-compliance with national legislation within the City of uMhlathuze LM’s annual audit reports. Furthermore, negative environmental (such as ground and surface water pollution) and social impacts associated with the status quo will not be rectified and/or mitigated.

5. DESCRIPTION OF AFFECTED ENVIRONMENT

5.1.1 Regional Context

The Project site is located within the City of uMhlathuze LM which is the third largest municipality in KwaZulu-Natal. The municipality is 1 of 6 local municipalities in the uThungulu District Municipality and is situated on the north coast of the KwaZulu-Natal province and is approximately 200km from Durban. The municipality is made up of 2 main towns, namely Empangeni and Richards Bay. The municipality encompasses the country's largest deep-water port and an industrial development zone. The John Ross Parkway (R34), the major access road from the inland provinces, traverses through the City of uMhlathuze LM through Empangeni towards Melmoth. The road boasts the country's longest bridge and has been designed to meet the growing transport needs of the LM in line with the development plans for the CBD and harbour (uMhlathuze LM, Final IDP Review 2014/2015). It is this road that runs along the southern edge of the Project site.

The City of uMhlathuze covers an area of approximately 793 km². The natural environment in this area is highly sensitive and under severe development pressure. The local landscape is characterised by interconnected network of hydrological ecosystems that sustains a combination of locally important habitats and species (Richards Bay Port Expansion EIA, 2015). It also sustains a growing population in an area with very high levels of poverty.

5.1.2 Local Context

The landfill site is located on remainder of Erf 5333 Alton, and access to the site connects from the Alumina Alley road which runs on the eastern and northern boundary of the site property. The R34 road runs immediately adjacent to the south of the landfill site boundary. The site is also mostly surrounded by other industrial operations. Apart from industries, the site is also surrounded by patches of open land. The footprint size of the landfill site covers an area of approximately 175 480 m².

5.2 Physical Environment

5.2.1 Climate and Atmospheric Conditions

The climate of the project area can be described as warm to hot and humid subtropical climate, with warm moist summers. The average daily maximum temperatures range from 29°C in January to 23°C in July. The rainy season is predominantly between October and March. The Mean Annual Precipitation (MAP) is 1 228 mm and most (~80%) of the rainfall occurs during the summer months. Early summer rainfall is derived mainly from deep convective showers and thunderstorm with occasional hailstorms. Late summer rainfalls are less severe with more widespread convective activity associated with sub-tropical easterly circulation patterns. Extreme rainfall events resulting from tropical cyclones and middle-latitude systems have occurred within the Zululand Region, posing a risk to life, property and infrastructure (uMhlathuze LM, Final IDP Review 2014/2015).

5.2.1 Existing Land Use and Land Cover

The project area is dominated mostly by industrial developments (±30%) with special residential development (±16%) as the second dominant land use. The harbour, rail and other facilities account for ±12% of land use in the area (uMhlathuze SFP, 2007). General residential only accounts for ±7% of the land use in Richards Bay. Commercial zoning accounts for less than 1%, and open space accounts for ±9% of the Richards Bay area. Undetermined and unregistered land uses account for ±15% and ±10% respectively in Richards Bay (uMhlathuze SFP, 2007).

The site is located within an industrial area and is surrounded by industrial developments and a highway and electrical pylons to the south. According to the Land Cover data obtained (Figure 5-1),

the land cover within the project area is interspersed with shrubland and is surrounded by plantation and grassland. The conditions observed on site are that the site is surrounded by tracts of open space with indigenous shrubland and grassland, albeit in a disturbed condition in some places, while the vegetation on site is grassed over landfill. The infrastructure on the site displays on the land cover map as 'urban'. Refer to Figure 5-1 below.

5.2.1 Topography

The topography of the project area is generally flat and is situated on a coastal plain, however, west towards Empangeni the terrain rises and becomes undulating (uMhlatuze LM, Final IDP, 2012/2017). The elevation on site is approximately 30 metres above sea level (masl).

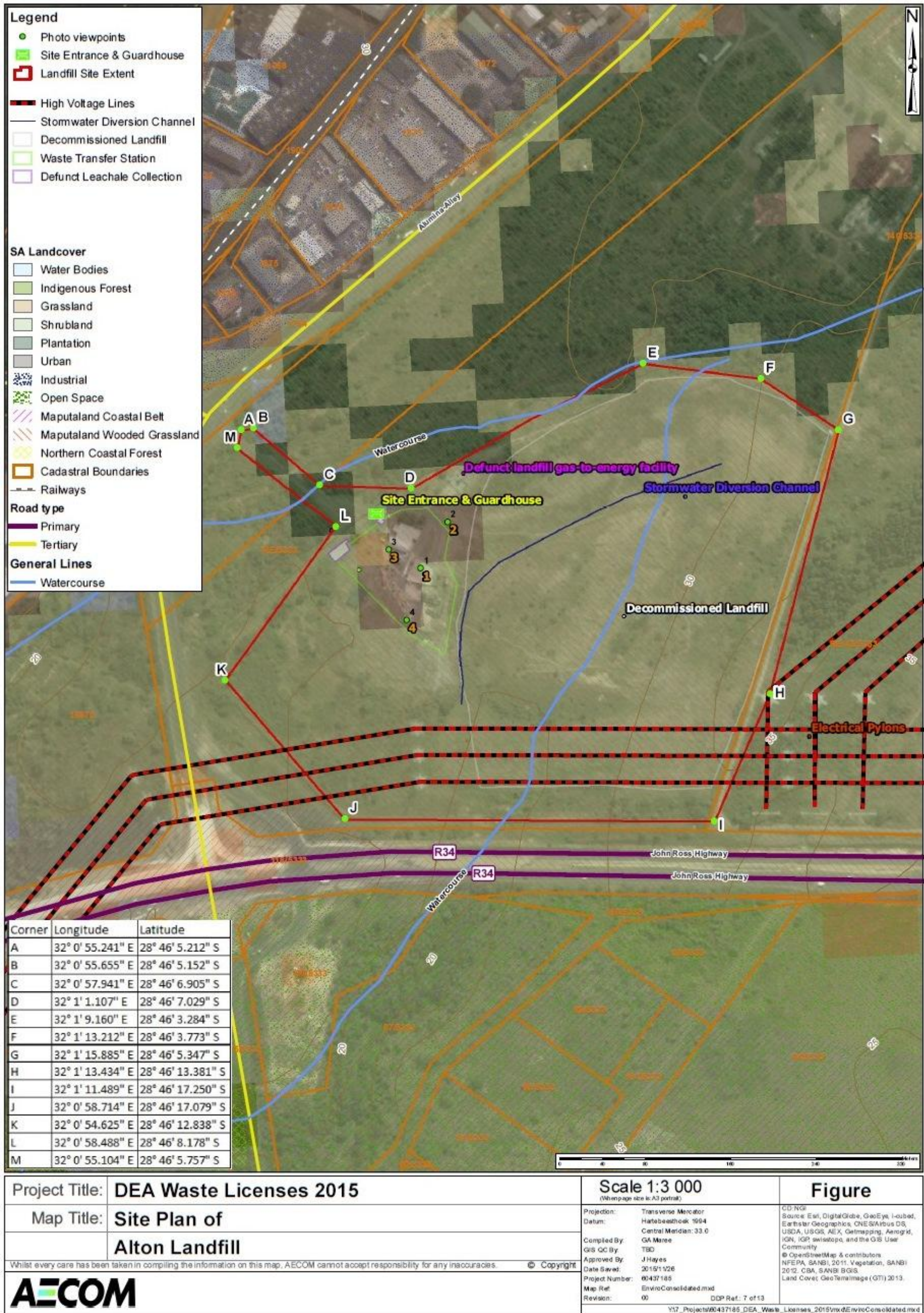


Figure 5-1: Site Plan of Alton Landfill

5.2.2 Geology

The underlying physical geological foundation of the area gives rise to specific landscape features. It controls the occurrence, distribution and type of water resources in the area, including the groundwater. The geology underlying the area forms part of the Kalahari Group of the Cenozoic Period.

Refer to the Geology Map in Appendix D.

5.2.3 Soils

The soils in the area are closely related to the geology and landforms and comprise three main land types. The soils occurring in the area can be described as deep grey sands, deep alluvial soils and red and yellow adepal soils. The soil underlying the Maputaland Coastal Belt areas, were formed up to 18 000 years ago and are of marine origin. The soils are highly leached and are therefore characterised by poor nutrition. The depressions between the dunes are sometimes organically-rich due to the collection of sediments in these areas (Mucina and Rutherford, 2006).

5.2.4 Hydrology

The geology and geomorphology of the area influences the transport, storage of water and ultimately the hydraulic functions of the ground water system. Additionally, the soils are permeable allowing rainfall to easily infiltrate into the groundwater. The water is then temporarily stored before being discharged into the streams, lakes and wetlands. The streams generally become perennial and seldom stop flowing even in drought conditions. This also creates a large underground storage reservoir that consistently sustains the coastal lakes which form the main water supply resources of the LM (uMhlathuze LM, Final IDP Review 2014/2051). The Project area is characterised by a widespread system of wetlands and natural water features such as Lakes Cubhu, Mzingazi, Nsezi and Nhlabane. A non-perennial stream transects the area where the landfill is located. The river was not visible during the time of the site visit.

Richards Bay is located within the Mhlathuze Sub-Water Management Area (NFEPA) within the Usuthu-Mhlathuze Water Management Area. Water users within the Water Management Area include mining, industry, irrigation and domestic users.

A desktop study was conducted, whereby the DWS groundwater monitoring network database revealed the existence of four groundwater level monitoring boreholes within a 10-km radius of the landfill site. The locations of these monitoring points is not ideal due to their position in relation to the Alton landfill (all the boreholes lie north and east of the site), however with this information the geohydrologist could deduce a generalised flow direction of the groundwater to be south westerly. Due to their locations in relation to the Alton site, none of the four boreholes could be used as monitoring wells for the site, as the plume is hypothesized to move from the site in a south westerly direction. (AECOM, Groundwater Desktop Study, 2015). This direction of flow of the plume is also hypothesized within the Risk Assessment summarised below.

The Council for Scientific and Industrial Research (CSIR) Durban Branch was commissioned by the City of uMhlathuze LM to manage the Alton landfill site project. In line with this, CSIR contracted GCS (Pty) Ltd to undertake the required hydrogeological risk assessment (Appendix E).

The main objective of the hydrogeological risk assessment was to examine the quality of groundwater within the study area in order to determine the level of contamination (of particular importance is bacterial contamination), and seasonal variations thereof, resulting from landfill activity.

The methodology consisted of the following activities:

- Gathering of hydrogeological and geological information on a desktop level and hydrochemistry data for all monitoring boreholes within the site.

- Undertaking a fieldwork assessment to obtain groundwater samples from existing boreholes for hydro-chemical analysis, and conduct a hydro-census within a 1km radius from the site.
- Conducting permeability testing on the down gradient side of the landfill to obtain hydraulic permeability of the unsaturated zone.
- Conducting aquifer testing in existing monitoring boreholes to obtain the hydraulic conductivity of the saturated zone.
- Obtaining soil samples for chemical analysis to determine if the landfill is impacting the soils onsite, the extent of the impact, and to supply recommendations regarding remediation measures.

Limitations and data gaps identified by the geohydrological specialist include:

- Information regarding the original construction of the landfill site was unavailable; including technical design and site selection criteria.
- Due to the age of the site, it cannot be proved with certainty what has been historically dumped at the site.
- The water monitoring protocol applied did not allow for any groundwater level monitoring. Therefore, no time-series data exists, creating gaps in the overall scientific approach and understanding of the site.
- No borehole logs for the monitoring boreholes were supplied. As a result the onsite geology of the landfill site is unknown.

Main findings: field observations

- During the fieldwork assessment, it was observed that the landfill is covered by permeable sand. Furthermore, it was observed that the top of the landfill is vegetated with grass and this will increase the recharge into the landfill. Diggings were visible all around the site, possibly dug by scavengers searching for steel and other wastes from the landfill. The sand cover and diggings may influence natural groundwater recharge patterns as exposed areas will result in higher recharge values. Higher recharge, in turn, may play a significant role in contaminant transport and overall pollution to the area due to steeper aquifer heads.
- Leachate and subsequent ponding, down gradient of the landfill and behind the non-operational pump station, was observed during the site assessment phase. The leachate had a strong smell and was brownish in colour.
- A non-perennial stream flows through the site on the western area down to borehole GL7 down gradient of the landfill site. The stream joins the main river further south of the landfill site.

Main findings: fieldwork assessment

- The results of the Aquifer testing conducted in two monitoring boreholes outside the landfill area (across the R34 road) indicate that hydraulic conductivity ranges between 0.1 and 0.3 m/day. This range suggests that any pollution plume originating from the landfill will move at an average rate of 0.2 m/day and in one year it would have moved in the order of 73m away from the landfill. This further suggests that the top, shallow aquifer is characterised by moderate to high hydraulic conductivity.
- Permeability testing results on the unsaturated zone within the site, close to the land on the down gradient side, showed a coefficient of between 0.0864 m/s to 1.7280 m/s. Based on these values it appears that the permeability class of the unsaturated zone down gradient of the landfill ranges from semi-permeable to permeable.

Main Findings: groundwater quality

- Faecal coliforms were detected at borehole GL1 located along the eastern boundary of the landfill site. This borehole as well as boreholes GL8, GL15, GL17, GL18, GL20 and GL22 exhibited a high total coliform count.

- No Escherichia coli (E. coli), chromium VI, cyanide, mercury, cadmium or lead, were detected in the groundwater samples, with the exception of very low chromium concentrations at GL18 and GL19.
- Consistently high iron, chemical oxygen demand (COD) and sulphate concentrations above the general limits set by DWAF (1999) are observed at all monitoring boreholes.
- Neutral pH conditions exist at most of the boreholes, with the exception of slightly acidic conditions recorded at GL12 and GL19.
- High phenol concentrations are observed at GL7 and GL20 (before and after the R34 road), and could have adverse effects to downstream groundwater users.
- High ammonia concentrations above the DWAF (1999) general limits are observed at GL7, GL8, GL9, GL15, GL17, GL20, GL21 and GL22.
- It is clear that there is diffusion and advection of the chemical constituents at the site. Concentrations seem to be highest at the centre of the site (at GL15) migrating downstream towards the receiving stream (close to GL7). The concentrations of constituents also decreases the further one moves away from the receiving stream. GL1 also indicates that a plume might be moving to the east of the site.
- The water quality of the site is poor with respect to the outflowing seepage towards the receiving stream to the south of the site.
- Further details regarding the soil chemistry can be found in the geohydrological risk assessment (Appendix E).

Recommendations:

- The landfill must be properly fenced and warning signs placed to prevent human traffic through the site and subsequent excavations.
- Three deep monitoring boreholes must be added to the current monitoring network. These boreholes need to reach depths of at least 5m into the bedrock or underlying impermeable/confining layer; i.e. the boreholes should not partially but instead fully penetrate the aquifer. This will enable a better understanding of the geology, deeper groundwater quality and aquifer dynamics. Two boreholes will be located within the site and one outside the site (hydraulically down gradient of the landfill).
- Water level measurements must be obtained during every sampling event on the site and be added to the database. It is important that monitoring staff be adequately trained, that the SABS and DWS guidelines be followed and that the correct equipment be utilized.
- Two surface water monitoring points must be added to the current monitoring network; one upstream and the other downstream of the landfill. This will help to determine whether or not the landfill is impacting on the non-perennial stream flowing through the site.

Risk assessment

Based on the available data received from the LM and data obtained during the desktop and fieldwork assessments it appears that a medium to high risk rating can be assigned to groundwater and surface water contamination based on current conditions of the landfill and the location of the surface water bodies in relation to the landfill. It is also believed that the identified risk can be reduced to a medium rating if the correct management plans and monitoring systems are applied as stipulated in Waste Management Series (Minimum Requirements for Waste Disposal by Landfill and Minimum Requirements for Water Monitoring at Waste Management Facilities) documents published by the Department of Water Affairs and Forestry (DWAF) in 1998. Refer to Appendix E for a copy of the full Geohydrological Risk Specialist Study.

5.3 Biophysical Environment

5.3.1 Fauna

Richards Bay is a coastal town located in an area surrounded by wetlands and a diversity of vegetation types. This means the area may comprise a high diversity of fauna, particularly birds and amphibians. The existing Alton Landfill was operational for 18 years before being decommissioned and a Waste Transfer Station is currently being operated; therefore, it is not anticipated that significant faunal communities exist on the site. However, the site is surrounded by patches of open land in the immediate vicinity.

Several species that are listed as Threatened in terms of the Southern African Bird Atlas Project (Avifauna) and other southern African assessments (mammals, reptiles and amphibians) from the Animal Demography Unit (<http://www.adu.org.za/>) may occur within the surrounding areas.

Several bird species that may occur in the area and are on the IUCN Threatened List, include Rudd's Apalis *Apalis ruddi* (Near-endemic & Near-Threatened; SABAP2); Black-bellied Bustard *Lissotis melanogaster* (Near-Threatened; SABAP2); Denhams Bustard *Neotis denhami* (Vulnerable; SABAP2); Cape Cormorant *Phalacrocorax capensis* (Breeding endemic & Near-Threatened; SABAP2); African Crowned Eagle *Stephanoaetus coronatus* (Near-Threatened; SABAP2); Martial Eagle *Polemaetus bellicosus* (Vulnerable; SABAP2); Spotted Ground-Thrush *Zoothera guttata* (Endangered; SABAP2); Blackthroated Wattle-eye *Platysteira peltata* (Near-Threatened; SABAP2); Lesser Flamingo *Phoenicopterus minor* (Near-Threatened; SABAP2) and Grey Crowned Crane *Balearica regulorum* (Vulnerable; SABAP2). Other Threatened bird species that may occur in the project area include the Green Barbet *Stactolaema olivacea* (Vulnerable; SABAP2); Bateleur *Terathopius ecaudatus* (Vulnerable; SABAP2); Saddle-billed Stork *Ephippiorhynchus senegalensis* (Endangered; SABAP2); Woodward's Batis *Batis fratrum* (Near-Threatened; SABAP2); Cape Vulture *Gyps coprotheres* (Vulnerable; SABAP2); Tawny Eagle *Aquila rapax* (Vulnerable; SABAP2); and Black Coucal *Centropus grillii* (Near-Threatened; SABAP2). Threatened mammals such as the Blue Duiker *Philantomba monticola* (Vulnerable; Friedman et al. 2004) and the Side-striped Jackal *Canis adustus* (Near-Threatened; Friedman et al. 2004) could potentially occur.

Threatened and important reptiles that may occur in the surrounding areas of the project site includes Natal Black Snake *Macrelaps microlepidotus* (Near Threatened; SARCA 2014); Green Mamba *Dendroaspis angusticeps* (Vulnerable; SARCA 2014); uMlalazi Dwarf Chameleon *Bradypodion caeruleogula* (Endangered; SARCA 2014); KwaZulu Dwarf Chameleon *Bradypodion melanocephalum* (Vulnerable; SARCA 2014); Bourquin's Dwarf Burrowing Skink *Scelotes bourquini* (Vulnerable; SARCA 2014); and the Large-scaled Grass Lizard *Chamaesaura macrolepis* (Near Threatened; SARCA 2014). Variable Hinged Terrapin *Pelusios rhodesianus* (Vulnerable; SARCA 2014); and the Nile Crocodile *Crocodylus niloticus* (Vulnerable; SARCA 2014) also occurs within the area, specifically in Lake Mzingazi. Threatened reptiles that may potentially occur within the area are the Striped Harlequin Snake *Homoroselaps dorsalis* (Near Threatened; SARCA 2014); Gaboon Adder *Bitis gabonica* (Near Threatened; SARCA 2014); and the Pygmy Wolf Snake *Lycophidion pygmaeum* (Near Threatened; SARCA 2014).

In terms of Threatened amphibian species, Pickersgill's Reed Frog *Hyperolius pickersgilli* (Endangered; Minter et al., 2004); Natal Leaf-folding Frog *Africalus spinifrons* (Vulnerable; Minter et al., 2004); and the Spotted Shovel-nosed Frog *Hemisus guttatus* (Vulnerable; Minter et al., 2004) occur within the study area. The Kloof Frog *Natalobatrachus bonebergi* (Endangered; Minter et al., 2004); and the Plain Stream Frog *Strongylopus wageri* (Near Threatened) may potentially occur within the project area, in areas surrounding the landfill site (Minter et al., 2004).

5.3.2 Flora

The City of uMhlatuze LM falls within the Maputaland-Pondoland-Albany Biodiversity hotspot. The hotspot is recognized as the second floristic region in Africa: containing approximately 80% of South

Africa's remaining forests, rich birdlife and many other significant flora and fauna species (uMhlatuze LM, Final IDP Review 2014/2015).

Alton landfill is situated within the Maputaland Wooded Grassland (CB2), which falls within the Indian Ocean Coastal Belt. The Maputaland Wooded Grassland has been classified as Endangered. This vegetation type is limited to the Maputaland Centre of Endemism occurring along the coastal plain of northern KwaZulu-Natal and southern Mozambique (Van Wyk & Smith 2001, cited by Siebert *et al.*, 2011). The 'woody grasslands of Maputaland' (Myre 1964, cited by Siebert *et al.*, 2011), or 'the underground forests of Africa' (White, 1977, cited by Siebert *et al.*, 2011), are characterised by a prevalence of geoxylic (often rhizomatous) suffrutices. Geoxylic suffrutices are often referred to as 'underground' or 'stunted' trees, and have annual or short-lived woody shoots sprouting from massive or extensive woody, perennial, underground axes (White 1977). Common examples of geoxylic suffrutices that occur in the Maputaland Woody Grasslands are *Ancylobotrys petersiana*, *Diospyros galpinii*, *Elephantorrhiza elephantina*, *Eugenia albanensis*, *E. capensis*, *Maytenus nemorosa*, *Pachystigma venosum*, *Parinari capensis* subsp. *incohata* and *Salacia krausii*. Maputaland Wooded Grassland is also rich in plant species that are endemic to the Maputaland-Pondoland-Albany hotspot, which is one of the eight most important biodiversity regions in Africa (Steenkamp *et al.* 2005, cited by Siebert, 2011).

The Alton site lies approximately 2km north-east of a Critical Biodiversity Area (Category 3: Optimal). The vegetation observed on site consists mostly of grass and weedy species associated with a disturbed environment. Occasional stands of indigenous shrubs occur around the site, predominantly in the south-west corner. Refer to the Site Plan in Appendix D / Figure 5-1 and site photographs in Appendix C.

5.4 Social Environment

5.4.1 Population

The population of the City of uMhlatuze LM was estimated at 334 459 with about 86 609 households (Statistics SA, 2011 census). This makes the average household size 4.2 persons per household. The population within the LM has grown since 2001. The municipal population has increased by, on average, 1.45% per annum from 2011. The growth within the municipality is reportedly higher than that experienced by the uThungulu DM and the province.

5.4.2 Economy and Employment

The LM possesses both rich environmental assets and a flourishing industrial development zone. The municipality is home to the country's largest deep-water port and provides an attractive reference point and essential socio-economic amenities and facilities. The port is the main economic attraction of the area (uMhlatuze IDP, 2013/2014).

The highest percentage of employment correlates with the developed urban areas of Richards Bay and Empangeni. Unemployment levels are highest in areas that are developing (densifying) on the urban peripheries of Esikhaleni and Nseleni. However, the level of unemployment for the City of uMhlatuze LM is below that reported for the uThungulu DM and KwaZulu-Natal, but is higher than the national average (uMhlatuze IDP, 2013/2014).

5.4.3 Education

The number of persons that do not have any education (no schooling) declined between 2001 and 2011. Although there has been a slight increase in the primary enrolment levels at national and district level, it remains a concern that, in some instances, nearly 10% of children of school going age are not attending school. Reasons could relate to access, affordability and other poverty related factors such as HIV/Aids (Stats SA, Census 2011).

5.4.4 Service Delivery

5.4.4.1 Health Services

Primary health care services are provided at two main clinics, being Richards Bay and Empangeni. 6 satellite clinics form part of the health care services system in the municipal areas (uMhlathuze IDP, 2013/2014).

5.4.4.2 Electricity

In terms of electrification, the municipality does not have any electricity backlogs. Electricity is distributed to communities by the City of uMhlathuze LM through the purchasing of electricity from Eskom (uMhlathuze IDP, 2013/2014).

5.4.4.3 Waste Management and recycling

The City of uMhlathuze LM provides basic services such as solid waste removal (refuse collection) and sanitation internally and not through external service providers (uMhlathuze IDP, 2013/2014).

5.4.4.4 Water Supply and Sanitation

The LM receives water supply through Lake Mzingazi, Lake Cubhu, Nseleni River (Nsezi Lake) and the Mhlathuze River. Seasonal changes in the water quality supplied from the lakes have caused operational issues. There are concerns about the long term sustainable supply of water to sustain economic growth. The LM receives funding through the Municipal Infrastructure Grant (uMhlathuze IDP, 2013/2014). 57.91 % households have access to the basic level of service for sanitation. The basic (RDP) level is one ventilated improved pit (VIP) toilet per household (uMhlathuze IDP, 2013/2014).

5.4.4.5 Housing

The municipal area experiences a shortage of suitable land for housing development. The municipality is in the process of implementing Rural Housing Projects in the KwaMkhawanzi, Dube, Kwakhoza and Madlebe Traditional Authority and various other housing projects are planned (uMhlathuze IDP, 2012/2017).

5.5 Cultural Resources

A considerable amount of archaeological heritage sites have been recorded within the LM. However, there are gaps in the availability of data on the local heritage. These archaeological sites range from the Stone Age Period to the recent historic period. No heritage or cultural sites are believed to be located within the landfill site boundary.

6. LEGISLATIVE FRAMEWORK

6.1 Introduction

The overarching legal framework pertinent to the licensing of the Alton landfill site is NEMA and the associated Specific Environmental Management Acts (SEMA). This section provides an overview of the policy and legislative context including the identification of all legislation, policies, plans, guidelines, spatial tools, municipal development frameworks and instruments applicable to the activity and which are to be considered in the EIA process.

6.2 Relevant National Legislation

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

6.2.1.1 Overview

NEMWA regulates waste management in order to protect human health and the environment, by providing reasonable measures for the prevention of pollution and ecological degradation, and for securing ecologically sustainable development. It also provides for national norms and standards for regulating the management of waste by all spheres of government, providing for specific waste management measures for licensing and the control of waste management and remediation activities associated with contaminated land. This legislation provides for compliance and enforcement of the above requirements.

6.2.1.2 National Standards for Disposal of Waste to Landfill

The DEA promulgated Regulations and Standards under NEMWA to regulate various aspects of waste management, including the design and classification of landfills. In addition to the existing Minimum Requirements, the following Regulations will also be applicable:

- Government Notice R.634 – Waste Classification and Management Regulations;
- Government Notice R.635 – National norms and standards for the assessment of waste for landfill disposal; and
- Government Notice R.636 – National norms and standards for disposal of waste to landfill.

As a result of the above, the design and classification of the Alton Landfill will take these new Regulations on Norms and Standards into account.

6.2.1.3 Activities applicable to NEMWA

The closure of the Alton Landfill includes activities listed in Categories A of Government Notice (GN) 37083 of November 2013, published in terms of Section 19(1) of NEMWA, as waste management activities that may have a detrimental effect on the environment and for which authorisation is required in the form of a Waste Management Licence. The relevant listed activities are provided in Table 6-1 for which authorisation by means of a BA application process must be obtained.

Table 6-1: Listed Activities in Terms of Category A and B of GN 37083 of November 2013

No. and Date of the Relevant Notice	Category A or B	Activity Number	Description of the Listed Activity
GNR 37083 of 29 November 2013 in terms of Section 19(1) of NEMWA	A	2	The sorting, shredding, grinding, crushing, screening or bailing of general waste at a facility that has an operational area in excess of 1000m ² .
		14	The decommissioning of a facility for a waste management activity listed in Category A or B of this Schedule.

6.2.2 National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended

NEMA provides a framework for cooperative environmental governance between the various spheres of government, by establishing principles for decision-making on matters relating to the environment. Furthermore, NEMA promotes Integrated Environmental Management (IEM) to ensure sustainable resource utilisation and development and requires that the DEA be the lead agent in ensuring effective custodianship of the environment. It also provides that sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where subjected to significant human resource usage and development pressure. The NEMA principles, contained in Section 2, clearly emphasize the need to protect threatened ecosystems and are binding on all organs of state including the local authorities. Furthermore, the principles essentially guide the interpretation, administration and implementation of the Act and any other law concerned with the protection of the environment. An overarching emphasis is the principle that development must be environmentally, socially and economically sustainable.

Section 23 of NEMA further determines that IEM should be employed when any policies, programmes, plans or projects are drawn up to minimise the impact on the environment. The duty of officials to prevent pollution and ecological degradation, to promote conservation and secure ecologically sustainable development and use of natural resources, originates from the Constitution and NEMA.

For a range of listed activities and depending on the scope of the activity, the responsibility to ensure compliance with NEMA and its suite of SEMAs has been devolved to the nine provincial departments.

Sections 24 and 44 of NEMA make provision for the promulgation of regulations that identify activities which may not commence without an Environmental Authorisation (EA). Thus, the EA application process and activities were detailed within the 2014 Environmental Impact Assessment (EIA) Regulations listed in Government Gazette No. 10328 of 4 December 2014 (GN 982, 983, 984 and 985). All activities listed in the abovementioned regulations shall be subject to an EIA process (i.e. Basic Assessment (BA) or Scoping and Environmental Impact Reporting (S&EIR) application processes) and will require EA from the relevant Competent Authority (CA). Section 24F of the NEMA prohibits the undertaking of identified listed activities except by virtue of being undertaken under the control of an EA from the relevant CA.

At this stage, no applicable NEMA activities have been identified as having been triggered by the application. The scope of this project is to license the closure of the existing landfill.

6.2.3 National Water Act, 2008 (Act No. 36 of 2008)

The National Water Act, 1998 (Act No. 36 of 1998) (NWA) provides a framework to protect, develop, conserve and manage the nation’s water resources. Water use is defined broadly in terms of NWA, and includes taking and storing water, activities which reduce stream flow, waste discharges and disposals, controlled activities (activities which impact detrimentally on a water resource), altering a watercourse, removing water found underground for certain purposes, and recreation. In general a water use must be licensed (in terms of Section 21) unless it is listed in Schedule 1, is an existing lawful use, is permissible under a general authorisation, or if a responsible authority waives the need for a licence. Section 21 of the NWA lists the water uses for which authorisation under the Act is required.

In terms of Section 19 of the NWA “An owner of land, a person in control of land or a person who occupies or uses the land on which ... any activity or process is or was performed or undertaken; or ... any other situation exists, which causes, has caused or is likely to cause pollution of a water resource must take all reasonable measures to prevent any such pollution from occurring, continuing or recurring”. These measures may include, but are not limited to:

- Measures to cease, modify, or control any act or process causing the pollution.
- Compliance with any prescribed waste standard or management practice.
- Containment or prevention of the movement of pollutants.
- Remediation of the effects of the pollution.
- Remediation of the effects of any disturbance to the bed and banks of a watercourse.

The NWA also provides for pollution prevention measures, with particular emphasis on water resource pollution. In accordance, the licensee shall ensure that activities impacting upon water resources and effluent releases are monitored for compliance with the applicable regulations. Emergency incidents involving water resources are included in the Act, requiring the polluter to remediate and mitigate the impacts of such an emergency incident.

The DWS will provide a Record of Decision in terms of the NWA and any other associated policies, plans, programmes, guidelines and regulations to the Competent Authority as part of the WML application process.

6.3 Additional Applicable Legislation

Additional legislation applicable to the Project is listed in Table 6-2.

Table 6-2: Summary of Applicable Legislation

Relevant Legislation	Sections	Applicability to the Project
Constitution of South Africa, 1996 (Act No. 108 of 1996)	Chapter 2	Bill of Rights
	Section 24	Environmental rights
	Section 25	Rights in property
	Section 32	Administrative justice
	Section 33	Access to information
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)	Sections 56 and 57	Protection of threatened or protected species
	Sections 65 -73	The control of alien species, invasive species and genetically modified organisms.

Relevant Legislation	Sections	Applicability to the Project
Conservation of Agricultural Resources Act, 1983 (Act No. 43 of 1983) and regulations	Section 5, 6	Implementation of control measures for alien and invasive plant species, especially in urban areas
National Environmental Management: Air Quality Act, 2004 (Act No. 39 of 2004)	Section 32	Control of dust
	Section 34	Control of noise
	Section 35	Control of offensive odours
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993) and regulations	General Administration Regulations GN R929 of June 2003	Material Safety Data Sheets must be made available at the request of any Interested and Affected Party (I&AP)
	Section 8	General duties of employers to their employees
	Section 9	General duties of employers and self-employed persons to persons other than their employees
Hazardous Substances Act, 1973 (Act No. 15 of 1973) and regulations	As Type 2, 3 and 4 waste may be disposed of at the existing Landfill, the controls of the Hazardous Substances Act must thus be complied with	
Fertilisers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, 1947 (Act No. 36 of 1947) and regulations	Sections 3 to 10	Control of the use of registered pesticides, herbicides (weed killers) and fertilisers. Special precautions must be taken to prevent workers from being exposed to chemical substances during alien vegetation control programmes
National Veld and Forest Fire Act, 1998 (Act No. 101 of 1998)	Chapter 4, 5	Fire prevention, management and control measures to be implemented
National Building Regulations and Building Standards Act, 1977 (Act No. 103 of 1977)	Section 4	Local Authority approval of plans to erect buildings like weighbridges, admin buildings, etc.

6.4 Local Legislation and Policy Framework

The EIA process must consider the planning policies that govern the study area to ensure that the scale, density and nature of activities/developments are harmonious and in keeping with the sense of place and character of the area. The proposed environmental and infrastructure modifications must be viewed in the context of the planning policies from the following documents:

- Refuse (Solid Waste) and Sanitary By-Law;
- By-Law for the Prevention and Suppression of Nuisances; and,
- By-Law for Preventing Conditions Likely to Cause or Further the Spread of Fires.

6.4.1 uMhlatuze Integrated Development Plan Review 2015/2016

The City of uMhlatuze specifies compliance with the provisions of NEMWA by appointing a waste management officer and compilation of a waste management plan for the City of uMhlatuze as an

environmental priority. The LM has appointed a consultant to assist with reviewing the Integrated Waste Management Plan for the Waste Management Division of the Municipality. The plan was last reviewed in 2005 (City of uMhlathuze IDP Review, 2015/2016). Although, the licensing of the Alton landfill site is a project spearheaded by the DEA, it will address the LM's commitments within the IDP in terms of better waste management within the LM.

7. PUBLIC PARTICIPATION PROCESS (PPP)

The Public Participation Process (PPP) is an integral part of the EIA process. The objectives of PPP in an environmental process are to provide sufficient and accessible information to stakeholders in an objective manner to assist them to:

- Raise issues of concern and suggestions for enhanced benefits;
- Verify that their issues have been recorded and considered in the environmental investigations;
- Assist in commenting on feasible alternatives;
- Contribute relevant local information and knowledge to the environmental assessment; and,
- Comment on the findings of the environmental assessment.

The approach towards any PPP is dependent on the details of the project. Each project has a particular geographic and technical nature, and hence the PPP should be structured accordingly. Where possible, and within the required statutory frameworks, it is also desirable to structure such a process to address the process needs of I&APs.

7.1 Identification and Registration of I&APs

At the time of compiling this report, the database contained 50 stakeholders across a range of sectors and spheres of government, including:

- National Government;
- Provincial Government;
- Local Government;
- Landowners;
- Agriculture;
- Business and Industry (mining and commercial); and
- Environmental groups.

AECOM made an effort to ensure that individuals and/or organisations were identified from an institutional as well as a geographical point of view. Note that the I&AP database reflects all stakeholders for all allocated landfills to be licensed within KwaZulu-Natal province. Refer to **Appendix A** for the I&AP Database.

7.2 Announcement of the Proposed Project

Various mechanisms were used to create public awareness of the proposed WML closure application for the existing Alton landfill. An opportunity to participate in the EIA process and to register as an I&AP was announced as indicated below:

7.2.1 Media

Newspaper advertisements notifying the public about the environmental application and opportunities to participate in the EIA process for the proposed WML application for the existing Alton landfill were placed in the following newspapers:

Table 7-1: Project Announcement Newspaper Advertisements

Newspaper	Distribution	Language	Date
Zululand Observer	Local	English	11 September 2015
The Mercury	Regional	English	11 September 2015

Copies of the Newspaper Advertisements are included in **Appendix A**.

7.2.2 On-site Notices

Two (2) A2-sized site notices were erected at various public places in the project area on the 4th of September 2015. The site notices were written in English and were placed at the following locations around the affected area:

Table 7-2: Site Notice Locations

Site Notice No	Location
1	Alton Landfill Entrance Fence
2	Umhlatuze Local Municipality Reception, 5 Mark Strasse, Richards Bay

Copies and photographs of the site notices are provided in **Appendix A**.

7.3 Dissemination of Information

Information was disseminated to registered I&APs primarily by means of a Background Information Document (BID) and Notification letters. No issues have been raised nor comments received from I&APs as yet.

7.3.1 Background Information Document

The BID has been useful in providing background information to the public on the proposed waste licence application for the existing Alton landfill. Furthermore, it provided information on the processes that have been followed and the contact details of the PPP Consultant. The BID was distributed to all registered I&APs. A copy of the BID is provided in **Appendix A**.

7.3.2 Request for Registration and Notification of the Draft Basic Assessment Report Review Period

A notification letter announcing the WML application and requesting I&APs to register and/or review and comment on the DBAR was distributed to all identified and registered I&APs on the project’s database. A copy of the notification letter is provided in **Appendix A**.

The DBAR will be available for a thirty (30) calendar day review period from 04 December 2015 – 25 January 2016 (excluding public holidays and the period from 15 December to 05 January). The DBAR will be available at the following venues:

Table 7-3: Venues for draft Basic Assessment Report

Venue	Address
Umhlatuze Local Municipality Reception	5 Mark Strasse, Central Business District, Richards Bay
Richards Bay Public Library	Kruger Rand Street, Richards Bay North Coast

Electronic copies of the DBAR are available on the project website www.deawaste2015.co.za. Refer to **Appendix A** for a copy of the notification letter.

7.4 Comment and Response Report

All issues and concerns raised by I&APs during the BA process, will be recorded and responded to in the Comments and Responses Report (CRR) which will form part of the FBAR. No comments have been received to date.

8. ENVIRONMENTAL IMPACT ASSESSMENT

8.1 General

The purpose of this section is to provide an assessment of each of the identified potentially significant impacts and risks associated with the Project, i.e. the closure of the Alton landfill site. The following environmental impacts have been identified.

8.1.1 Planning, Design and Construction Phase

As this application is for the closure/ decommissioning of an existing illegal landfill site no impacts are associated with the planning, design and construction phase of the Project.

8.1.2 Operational Phase

The landfill site is to be closed, thus the operational phase has already occurred and ended.

8.1.3 Decommissioning and Closure Phase

Impacts that may result from the decommissioning and closure phase:

- Impacts on geographical and physical aspects
 - Soil pollution
 - Water pollution
 - Fire
- Impact on biological aspects
 - Fauna and flora
- Impacts on air quality
 - Dust fallout
- Impacts on socio-economic aspects
 - Health and Safety
 - Employment (positive)
 - Illegal dumping
- Visual impacts (positive and negative)
- Noise impacts

The negative impacts will be discussed in the impact assessment below. Engineering and management requirements for closure are included in the EMP (Appendix F).

8.2 Impact Assessment Methodology

The impact assessment methods used are in accordance with the requirements of the 2014 EIA Regulations published in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

The methodology for assessing impacts was practised by using techniques for Risk Assessment as found in the South African National Standard (SANS) 31010 of 2010. The National standards are identical to IEC/ISO 31010:2009 and are adopted with the permission of the International Electrotechnical Commission and the International Organisation for Standardization.

Risk assessment does not make use of one method alone; there are various tools available for assessing impacts. The Leopold Matrix is utilised, whereby criteria are mainly used to determine factors such as – probability, duration, extent etc. This method was practised by making use of P.J.

Aucamp (2009) (A practical guide for the discerning practitioner, page 74, based on the previous EIA regulations for risk assessment).

The Leopold Matrix is a qualitative Environmental Impact Assessment (EIA) method developed in 1971. The system consists of a matrix with columns representing the various activities of the project, and rows representing the various environmental factors to be considered. The intersections are filled in to indicate the magnitude (from -10 to +10) and the importance (from 1 to 10) of the impact of each activity on each environmental factor.

“Measurements of magnitude and importance tend to be related, but do not necessarily directly correlate. Magnitude can be measured, in terms of how much area is affected by the development and how badly, but importance is a more subjective measurement. While a proposed development may have a large impact in terms of magnitude, the effects it causes may not actually significantly affect the environment as a whole. The example given by Leopold is of a stream that significantly alters the erosion patterns in a specific area, which will have a significant magnitude, but may not be important, provided the stream in question is swift moving and transports large amounts of soil anyway. In this case, an impact of significant magnitude may not actually be important to the environment in question” (Leopold *et al*, 1971).

It should be noted that there is currently in South Africa no mention of a right or wrong way of assessing impacts. The method used is decided upon by the Environmental Assessment Practitioner (EAP). Hence the following definitions are applied to the assessment criteria used to assess the significance of potential impacts pre- and post- mitigation.

ASSESSMENT CRITERIA	CHARACTERISTICS
Extent	The physical and spatial scale of the impact. Site: the impacted area is only at the site – the actual extent of the activity; Local: the impacted area extends to the surrounding, the immediate and the neighbouring properties; Regional: the impacted area could be as wide as the municipal area or at a provincial level; and National: the impact can be considered to be of national importance.
Duration	The lifetime of the impact is measured in relation to the lifetime of the proposed development. Short term: the impact will be for 0 – 3 years, or only last for the period of construction; Medium term: three to ten years; Long term: longer than 10 years or the impact will continue for the entire operational lifetime of the project; and Permanent: this applies to the impact that will remain after the operational lifetime of the project.
Intensity	This is the degree to which the project affects or changes the environment. Low: the change is slight and often not noticeable, and the natural, cultural or social functions and processes are minimally affected; Medium: the environment is remarkably altered, but still functions in a modified way; and High: functioning of the affected environment is disturbed and can cease.
Probability	This is the likelihood or the chances that the impact will occur. Low: during the normal operation of the project, no impacts are expected; Medium: the impact is likely to occur if extra care is not taken to mitigate them; and High: the environment will be affected irrespectively; in some cases such impact can be reduced.
Nature	Description of the impact as positive, negative or neutral.
Confidence	The level of information/knowledge available to the EAP for impact assessment purposes. Low: the judgement is based on intuition and not on knowledge or information; Medium: common sense and general knowledge informs the decision; and High: scientific and or proven information has been used to give such a judgement.
Consequence	A combination of extent, duration and intensity. Low: low and medium intensity, short and medium term duration and site or local level extent;

ASSESSMENT CRITERIA	CHARACTERISTICS
	<p>Medium: low and medium intensity, long term or permanent duration at a region or national level extent; OR low and medium intensity, long term or permanent duration and site or local level extent; OR high intensity, short to medium term duration at site or local level; OR high intensity, long term or permanent duration at site or local level; and</p> <p>High: high intensity, long term or permanent at a regional or national level.</p>
Significance (before and after mitigation)	<p>A synthesis of the characteristics described above and assessed as low, medium or high. A distinction will be made for the significance rating without the implementation of mitigation measures and with the implementation of mitigation measures.</p> <p>Low: low consequence and unlikely, probable or definite probability; medium consequence and unlikely probability;</p> <p>Medium: medium consequence and probable or definite probability or high consequence and unlikely probability. The impacts require attention and mitigation is required to reduce the negative impacts; and</p> <p>High: high consequence and probable or definite probability. Mitigation is crucial.</p>
Cumulative Impacts	<p>The possible cumulative impacts will also be considered. Cumulative impacts have incremental impacts of the activity and other that past, present and future activities will have on a common resource.</p> <p>Low: there is sufficient capacity of the environmental resources within the geographic area to respond to change and withstand further stress;</p> <p>Medium: the capacity of the environmental resources within the geographic area to respond to change and withstand further stress is reduced; and</p> <p>High: the capacity of the environmental resources within the geographic area to respond to change and withstand further stress has been or is close to being exceeded.</p>

8.3 Impact Assessment

8.3.1 Planning, Design and Construction Phase

As this application is for the closure/ decommissioning of an existing illegal landfill site no impacts are associated with the planning, design and construction phase of the Project.

8.3.2 Operational Phase

The landfill site is to be closed, thus the operational phase has already occurred and ended. Engineering and management requirements for closure are included in the EMPr (Appendix F).

8.3.3 Potential impacts during the decommissioning and closure phase

Potential impacts on geographical and physical aspects:	It is not foreseen that the closure of the landfill will have any negative impacts on geographical or physical aspects as the project area has already been altered / disturbed. However, it is foreseen that the closure of the landfill will have positive impacts on the physical environment, as the landfill area will be decommissioned to mitigate and minimise surface and groundwater contamination and leachate production.
Potential impact on biological aspects:	It is not foreseen that the closure of the landfill will have any negative impacts on biological aspects as the project area has already been altered / disturbed. Positive impacts are anticipated from the closure of the existing landfill, as the area will be rehabilitated to blend in with the surrounding environment.
Potential impacts on socio-economic aspects:	Closure and rehabilitation activities will lead to the positive impact of additional (albeit temporary) employment opportunities within the City of uMhlatuze LM.
Potential impacts on cultural-historical aspects:	It is not foreseen that the closure of the landfill will have any impact on cultural-historical aspects as the project area has already been altered / disturbed.

Potential visual impacts:	It is anticipated that the decommissioning of the existing closed landfill will have a neutral to positive impact on the visual environment, as the site will be rehabilitated.
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Potential noise impacts:	
Nature of impact:	Noise generated as a result of machinery used and personnel required to implement the closure/ decommissioning activities on site.
Extent and duration of impact:	Site and Short Term
Probability of occurrence:	Definite
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	N/A
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	Medium
Proposed mitigation:	<ul style="list-style-type: none"> • Servicing of all vehicles and machinery to ensure good working order; and, • Use of silencers and mufflers on potentially noisy equipment.
Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Potential impacts due to air and dust emissions:	
Nature of impact:	<p>Emissions from vehicles transporting waste to and from the Alton waste transfer station, as well as other vehicles and equipment on site may cause a temporary decrease in air quality within the immediate surroundings.</p> <p>Similarly, dust generated during closure and rehabilitation activities may negatively impact on the surrounding areas ambient air quality.</p>
Extent and duration of impact:	Local and Short-Term
Probability of occurrence:	Low
Degree to which the impact can be reversed:	Low
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	N/A
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	Medium
Proposed mitigation:	<ul style="list-style-type: none"> • All reasonable measures should be taken to minimise air emissions in the form of smoke, dust and gases from vehicles/ equipment used on site. • No fires are allowed. • The Landfill Supervisor shall implement measures to restrict the generation of dust during rehabilitation activities. • The Landfill Supervisor shall control dust from spoil dumps or stockpiles by ensuring that they are kept covered or must have a suitable dust palliative applied (such as water or commercial dust suppressants) to prevent windborne dust pollution.

Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Potential socio-economic impacts due to cattle grazing on the landfill

Nature of impact:	<ul style="list-style-type: none"> Potential socio-economic impacts due to the health risk posed to cattle grazing on the landfill
Extent and duration of impact:	Local
Probability of occurrence:	Medium
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	N/A
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium-High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> All existing fencing shall be maintained to prevent access by cattle.
Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Potential impacts due to illegal waste mining

Nature of impact:	<p>Illegal waste mining may occur increasing environmental, health and safety impacts and risks including:</p> <ul style="list-style-type: none"> Burning of waste leading to impacts on the local air quality; Excavation of waste resulting in the increased exposure to vermin and insects; Health and Safety risks increasing because of changes to ground stability.
Extent and duration of impact:	Local
Probability of occurrence:	Medium-High
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	N/A
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium-High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> All existing fencing shall be maintained to prevent access for illegal dumping and waste mining. The local community shall be informed of the site closure and made aware of alternatives through public meetings, the placement of notices in local newspapers, etc. The Municipal Manager shall ensure placement of signage close to the road informing the public of site closure and providing details on alternative disposal sites or facilities. Maintain security at the site for a short period after closure to prevent potential illegal dumping and / or vandalism.
Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Potential impact on health and safety:

Nature of impact:	Health and safety incidents to workers during closure and
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	rehabilitation activities.
Extent and duration of impact:	Local
Probability of occurrence:	Medium
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	High
Cumulative impact prior to mitigation:	N/A
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	High
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> • Safety training of staff is required to minimize accidents. • All staff are required to wear the required Personal Protective Equipment (PPE) at all times.
Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Potential impact on health and safety:	
Nature of impact:	Movement of operational vehicles and equipment or danger associated with open areas (trenches, unstable ground etc.) may lead to potential safety impacts to the public if not demarcated as no go zones.
Extent and duration of impact:	Site
Probability of occurrence:	Medium
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	N/A
Cumulative impact prior to mitigation:	N/A
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> • The site must have access control. The public will not be allowed near the landfill. • On site vehicles will be fitted with reversing horn. • Staff on site will wear PPE and reflective clothing. • Open excavations will be marked with danger tape.
Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Potential impact on surface water and soils:	
Nature of impact:	Contamination of soils and surface water due to hydrocarbon spills from vehicles/ equipment used during rehabilitation.
Extent and duration of impact:	Local
Probability of occurrence:	Medium
Degree to which the impact can be reversed:	Medium
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Cumulative impact prior to mitigation:	N/A
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be mitigated:	Medium
Proposed mitigation:	<ul style="list-style-type: none"> • Precautionary measures must be taken to prevent any form of pollution. • Accidental pollution incidents shall be reported to the Municipal Manager immediately after they occur and shall be cleaned up (to the satisfaction of the ECO) by

	<p>the Landfill Supervisor or a nominated clean-up organisation.</p> <ul style="list-style-type: none"> • Vehicle and plant maintenance shall be confined to the areas demarcated for this purpose. Should any amount of fuel, oil, transmission or hydraulic fluids be spilled onto the soils, the Municipal Manager or ECO shall be informed immediately. Tests must be conducted to determine the extent of soil contamination as soon as a spillage occurs. The polluted soil shall be rehabilitated or remediated to the satisfaction of the ECO. • On-site stormwater management shall be to the satisfaction of the ECO. • Any spillage of waste, caused by any party during the closure activities, shall be cleaned up immediately and appropriately disposed of.
Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Potential impact on water resources:	
Nature of impact:	Surface and groundwater water pollution may occur after closure if the engineering design/ instructions are not correctly implemented on site.
Extent and duration of impact:	Local
Probability of occurrence:	Medium
Degree to which the impact can be reversed:	Medium
Degree to which the impact may cause irreplaceable loss of resources:	Medium
Cumulative impact prior to mitigation:	Low
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be mitigated:	Medium
Proposed mitigation:	<ul style="list-style-type: none"> • A professional engineer must provide detailed closure drawings and oversee and sign off on the closure of the landfill. • Maintenance of the site is ongoing until vegetation establishment has been completed. • The installation of stormwater management measures, such as intercept drains and conservancy tanks, must be regularly checked for damage and proper functioning. • Water collected in the conservancy tank (if applicable) must be analyzed for potential contamination. • Shaping and capping of the site is to be done to reduce the potential for future water pollution. • A leachate collection system is to be installed and monitored for 18 months. • A geohydrological monitoring programme needs to be implemented consisting of: <ul style="list-style-type: none"> ○ Three monitoring boreholes must be added to the current monitoring network. These boreholes need to reach depths of at least 5m into the bedrock or underlying impermeable/confining layer; i.e., the boreholes should not partially but instead fully penetrate the aquifer. ○ Two boreholes are to be located within the site and one outside the site (hydraulically down gradient of the landfill). ○ Water level measurements must be obtained during every sampling event on the site and be added to the database.

	<ul style="list-style-type: none"> ○ Monitoring staff are to be adequately trained to ensure compliance reporting in line with the SABS and DW&S guidelines. ● Two surface water monitoring points must be added to the current monitoring network; one upstream and the other downstream of the landfill.
Cumulative impact post mitigation:	Unknown
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Potential illegal dumping/ littering impacts:

Nature of impact:	<p>Night-time and / or weekend fly tipping (illegal dumping) may result in dumping of unacceptable waste streams increasing environmental, health and safety impacts and risks including:</p> <ul style="list-style-type: none"> ● Changes in the expected composition of leachate from the waste disposal facility resulting in the pollution of soil and water resources. ● Changes in expected landfill gas emissions resulting in flammability, toxicity, asphyxiation and other hazards as well as objectionable odour negatively impacting on on-site personnel (and other on-site persons) health and safety. ● The increase of the landfill footprint in instances of uncontrolled dumping of wastes.
Extent and duration of impact:	Local
Probability of occurrence:	High
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	N/A
Cumulative impact prior to mitigation:	N/A
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Medium
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> ● All existing fencing shall be maintained to prevent access for illegal dumping. ● The local community shall be informed of the site closure and made aware of alternatives through public meetings, the placement of notices in local newspapers, etc. ● The Municipal Manager shall ensure placement of signage close to the road informing the public of site closure and providing details on alternative disposal sites or facilities. ● Maintain security at the site for a short period after closure to prevent potential illegal dumping and / or vandalism. ● Placement of skips near the community residential areas / notices informing community members of the waste transfer station for use to safely dispose of their waste.
Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	Low

Potential impact of alien invasive plants	
Nature of impact:	Alien plant species may establish on site post closure/ decommissioning of the landfill site. This may interfere with the capping layer making it less able to control the ingress of water, resulting in leachate.
Extent and duration of impact:	Local
Probability of occurrence:	Medium
Degree to which the impact can be reversed:	High
Degree to which the impact may cause irreplaceable loss of resources:	Low
Cumulative impact prior to mitigation:	Medium (increased potential in spreading of alien invasive plants in the area)
Significance rating of impact prior to mitigation (Low, Medium, Medium-High, High, or Very-High)	Low
Degree to which the impact can be mitigated:	High
Proposed mitigation:	<ul style="list-style-type: none"> • Maintenance of the site is ongoing until indigenous vegetation has successfully established on site. • Any alien plants identified must be removed from site and destroyed. • Care must be taken not to control indigenous species.
Cumulative impact post mitigation:	N/A
Significance rating of impact after mitigation (Low, Medium, Medium-High, High, or Very-High)	No impact

8.4 Environmental Management Programme

A Draft EMPr is included as part of the DBAR (refer to Appendix F) which is made available for public review; after which, it will be finalised and submitted as part of the FBAR to the KZN EDTEA. The EMPr outlines the impacts and associated mitigation measures for the closure and decommissioning phase of the project. The EMPr comprises:

- Summary of Impacts: The predicted negative environmental impacts for which mitigation is required, and positive impacts requiring enhancement.
- Description of mitigation measures: The EMPr identifies feasible and cost-effective mitigation measures to reduce significant negative environmental impacts to acceptable and legal levels. Mitigation measures are described in detail and will be accompanied by designs, equipment descriptions, and operating procedures, where appropriate, as well as descriptions of technical aspects of implementing the mitigation measures.
- Description of monitoring programme: The monitoring programme indicates the linkages between impacts, indicators to be measured, measurement methods and definition of thresholds that will signal the need for corrective actions.
- Emergency Action Plan: The identification of possible accidents during the construction and closure phase of the project, with measures on how they will be prevented and/or managed.
- Institutional arrangements depict and define the responsibilities for mitigation and monitoring actions.
- Legal enforceability: The key legal considerations with respect to the EMPr are:
 - Legal framework for environmental protection.
 - Legal basis for mitigation.
- Implementation schedule and reporting procedures that specify the timing, frequency and duration of the mitigation measures.
- Description of requirements for record keeping, reporting, review, auditing and updating the EMPr.

8.5 Final Basic Assessment Report

Following the review period, the DBAR will be updated with comments received from the public to produce a FBAR. The FBAR will be submitted to the KZN EDTEA for consideration and decision-making.

8.6 Decision-making Phase

Once the WML (positive or negative) has been issued, all registered I&APs will be notified of the decision and have the opportunity to appeal the decision should they not agree with the authorisation issued or any conditions of authorisation.

9. IMPACT STATEMENT AND CONCLUSION

Based on the findings of the Basic Assessment process, no impacts of high significance or environmental fatal flaws will result from the granting of a NEMWA WML (i.e. Closure License) for the existing landfill facility at Alton. Minimal socio-economic impacts are expected as the landfill is already closed and the waste transfer station is already operating. Noise and dust pollution during closure and rehabilitation will be limited due to the limited remediation/ rehabilitation/ mitigation measures required and industrial nature of the immediate surrounding environment.

The closure and rehabilitation of the defunct landfill will have positive impacts in that the site will be repaired and re-shaped, re-capped and revegetated to minimise further ingress of water resulting in water contamination. A surface and groundwater monitoring programme should be implemented, as indicated in the EMPr and the Geohydrological Specialist Report. All potential impacts during the closure phase of the Alton landfill facility can be minimised through the implementation of the practical and appropriate mitigation measures contained in the EMPr (Appendix F).

The no-go alternative would imply that the current state of the landfill site would remain as it is. In other words the condition of the landfill and its impacts on groundwater would remain, and the site would not be rehabilitated. Current leachate generation will continue to pollute soil and water resources and negative health and visual impacts on site would remain into the future.

Thus, based on the above, the EAP is of the opinion that the WML for the closure of the Alton landfill site should be granted to the Applicant, with the following license conditions/ recommendations:

- Compliance to the mitigation measures and recommendations as indicated in the Geohydrological Risk Report and EMPr (Appendix F).
- An Environmental Control Officer (ECO) is to be appointed to audit compliance with the EMPr and WML. Once the closure of the site has been signed off by the Professional Engineer, the ECO is to submit a final audit report with findings and recommendations to the KZN EDTEA. The Department may decide to amend the frequency of future monitoring based on the results of the audit.
- All conditions contained within the DWS Record of Recommendation (RoR) should be captured as conditions of the WML issued.

The licensing of the illegal Alton landfill is in accordance with an initiative driven by the DEA to ensure the legal compliance of all municipal landfills, which in turn ensures appropriate and effective environmental management of the sites. The application process is currently in the Draft Basic Assessment Report Phase, and its main purpose is to seek the input and comments from registered I&APs on the impact assessment conducted. Comments received during the public review period will be incorporated into FBAR, to be submitted to the KZN EDTEA for their approval.

10. REFERENCES

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