Scientific Terrestrial Services

Applying science to the real world

29 Arterial Road West, Oriel, Bedfordview, 2007
Tel 011 616 7893
Fax 011 615 4106 / 086 724 3132
www.sasenvironmental.co.za
admin@sasenvgroup.co.za

Name: Emile van der Westhuizen & Marelie Meintjies
Date: Thursday, 14 December 2017
Ref: STS 170079

GA Environment (Pty) Ltd
Glad Afrika House
Hertford Office Park
90 Bekker Road
Midrand
1686
Cell: +27 (11) 312 2537
Fax: +27 (11) 805 1950
Email: nyaladzin@gaenvironment.com

Attention: Nyaladzi Nleya

Dear Sir,

DESKTOP LEVEL ECOLOGICAL ASSESSMENT AS PART OF THE WASTE AUTHORISATION PROCESS FOR THE PROPOSED DECOMMISIONING (CLOSURE) OF THE UMZIMKHULU LANDFILL, UMZIMKHULU LOCAL MUNICIPALITY, KWAZULU NATAL PROVINCE

Scientific Terrestrial Services (STS) was appointed by GA Environment (Pty) Ltd to conduct a desktop level ecological assessment as part of the Waste Management Licensing Process for the decommissioning (closure) of the uMzimkhulu landfill site, Kwa-Zulu Natal Province. The process is undertaken by the uMzimkhulu Local Municipality, to ensure compliance with the National Environmental Management Waste Act (Act No. 59) of 2008.

Other legislative requirements taken into consideration during the assessment include:

- National Environmental Management Act (NEMA) (Act No. 107 of 1998);
- National Water Act (NWA) (Act No. 36 of 1998); and
- General Notice 509 as published in the Government Gazette 40229 of 2016 as it relates to the NWA (Act 36 of 1998).

The uMzimkhulu landfill occupies an area of approximately 43 000m² (±4 Ha) and is located on Erf 152 uMzimkhulu within the uMzimkhulu Local Municipality and the Harry Gwala District Municipality. The landfill is approximately 5km west of the uMzimkhulu CBD and direct access to the site can be gained from the P601 Road to Franklin (GA Environment, 2017).

As a result of numerous complaints about the state of poorly operated municipal landfills and the associated impacts on the biophysical and social environment, the Department of Environmental Affairs has embarked on an initiative to assist various Municipalities in South Africa with the licensing of the existing illegal waste disposal sites. One of these is the uMzimkhulu landfill site that will require a Waste Management Licence for decommissioning. The initiative by Department of Environmental affairs (DEA) will assist the uMzimkhulu Local Municipality with obtaining a Waste Management Licence which will also serve as a basis to seek funding opportunities and assistance from financial institutions such as Development Bank of South Africa (DBSA) and state departments such Treasury and National Ministries to ensure the closure of the landfill as per the waste legislation (GA Environment, 2017).

The aim of the study is to identify any preliminary areas of increased sensitivity within the uMzimkhulu landfill site, by utilising all relevant desktop databases, such as the National Freshwater Ecosystem Priority Area (NFEPA, 2011) Database, National Threatened Ecosystems (2011), Mucina & Rutherford (2012), and the Kwa-Zulu Natal Biodiversity Spatial Planning Terms and Processes (2016). The study further includes the delineation of all freshwater resources within the uMzimkhulu landfill site and 500m thereof, utilising desktop methods, including digital satellite imagery. Based on the desktop data, areas of higher ecological importance were identified, which should be protected during decommissioning activities.

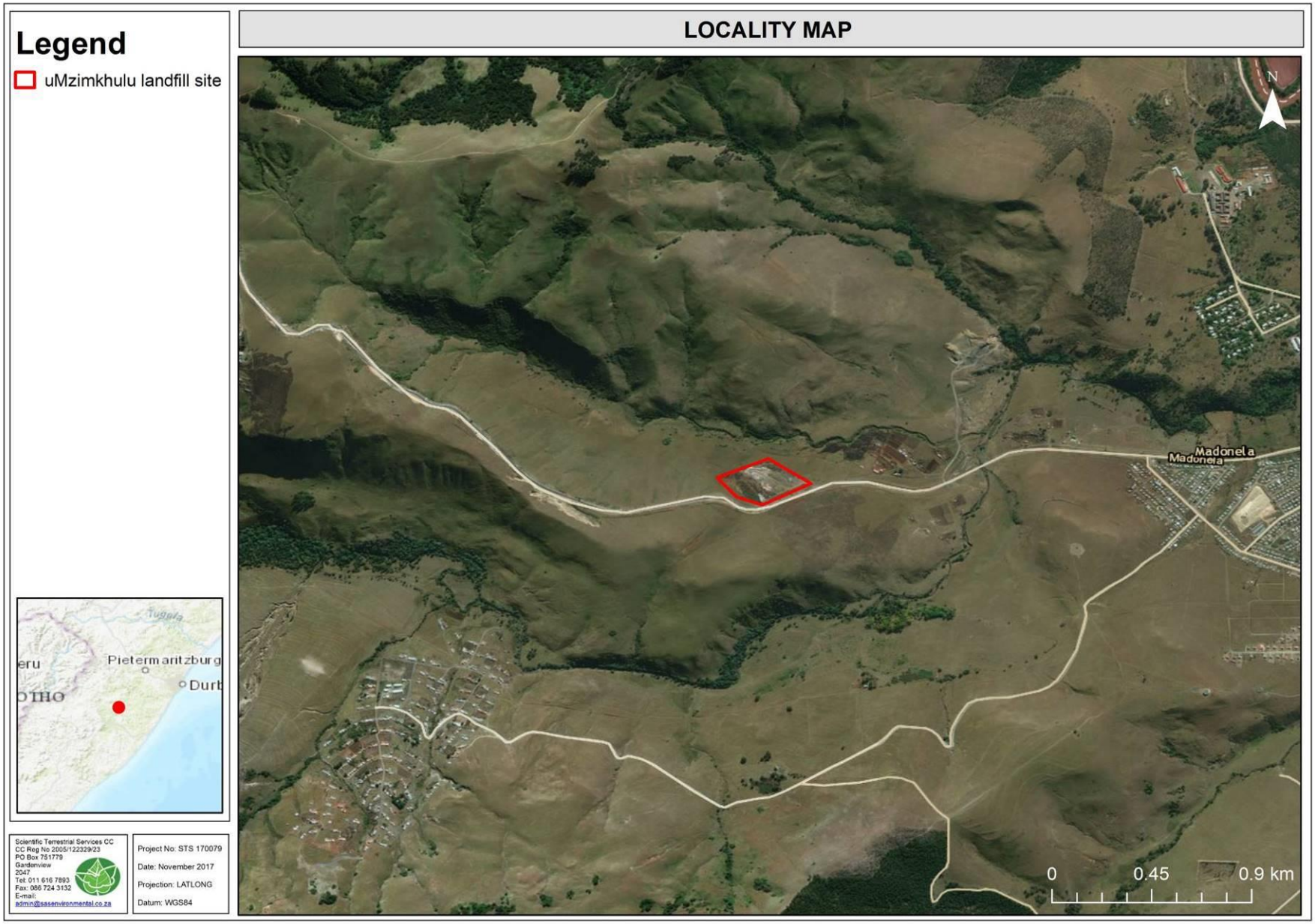

Figure 1: Digital Satellite image depicting the location of the uMzimkhulu landfill site in relation to surrounding areas

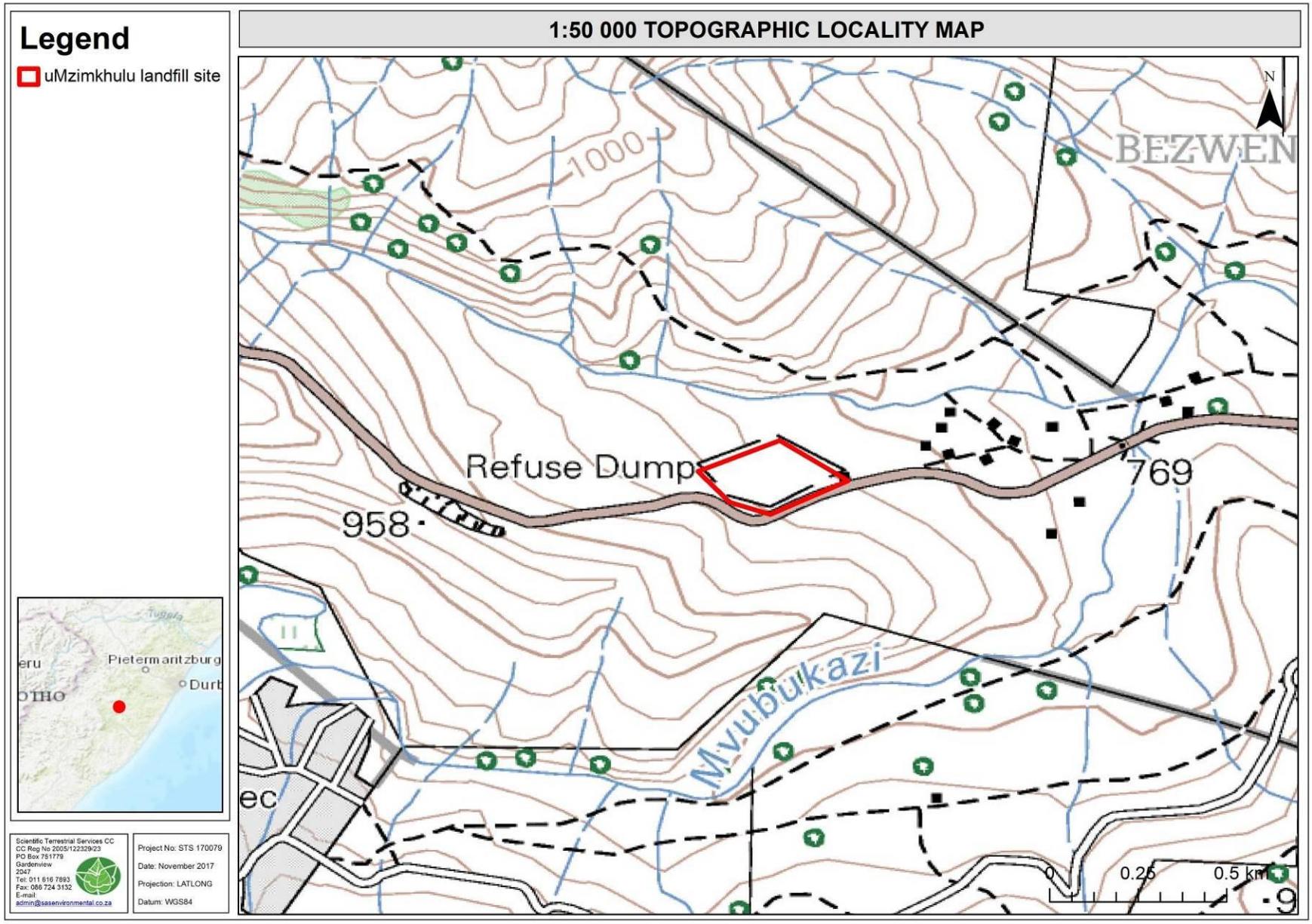

Figure 2: The uMzimkhulu landfill site depicted on a 1:50 000 topographical map in relation to the surrounding area.

1. DESKTOP ASSESSMENT RESULTS

Table 1: Summary of the conservation characteristics for the uMzimkhulu landfill site: Aquatic Datasets

Aquatic ecoregion and sub-regions in which the uMzimkhulu landfill site is located		Detail of the uMzimkhulu landfill site in terms of the National Freshwater Ecosystem Priority Area (NFEPA) (2011) database (Figure 4 & 5)	
Ecoregion	South Eastern Uplands	FEPACODE	The uMzimkhulu landfill site falls within a sub quaternary catchment considered to be an Upstream Management Catchment (FEPACODE = 4), required to prevent the downstream degradation of FEPAS and Fish support areas.
Catchment	Mzimvubu		
Quaternary Catchment	T52C		
WMA	Mvoti to Umzimkulu		
subWMA	Umzimkulu		
Dominant characteristics of the South-Eastern Uplands Level II (16.03) Ecoregion (Kleynhans *et al.*, 2007)		NFEPA Wetlands	According to the NFEPA database there are no wetland features located within the uMzimkhulu landfill site, nor are there any within the immediate vicinity (within 500m)
Dominant primary terrain morphology	Closed hills, Mountains; Moderate and high relief		
Dominant primary vegetation types	Afromontane Forest, Valley Thicket, Short Misbelt Grassland, North-eastern Mountain Grassland	Wetland vegetation Type	The uMzimkhulu landfill site is located within the Sub-Escarpment Grassland Group 3, a critically endangered wetland vegetation type.
Altitude (m a.m.s.l)	300 - 1100	NFEPA Rivers (Figures 3)	According to the NFEPA database there are no Rivers situated within the uMzimkhulu landfill site, nor the immediate vicinity (within 500m)
MAP (mm)	700 to 800	Ecological Status of the most proximal sub-quaternary reach (DWS, 2014)	
Coefficient of Variation (% of MAP)	20 to 30	Sub-quaternary reach	T52D-04948 (Umzimkulu River) (±3.7 km east)
Rainfall concentration index	30 to 50	Assessed by expert?	Yes
Rainfall seasonality	Mid-Summer	Mean Ecological Importance (EI) Class	High
Mean annual temp. (°C)	16 to 18	Mean Ecological Sensitivity (ES) Class	High
Winter temperature (July)	4 – 22 ºC	Stream Order	4
Summer temperature (Feb)	14 – 28ºC	Default Ecological Class (based on median PES and highest EI or ES mean)	B (High)
Median annual simulated runoff (mm)	30 to 180		

Table 2: Summary of the conservation characteristics for the uMzimkhulu landfill site: Terrestrial and Provincial Datasets

Details of the UMzimkhulu landfill site in terms of Mucina & Rutherford (2012)		Description of the vegetation type(s) relevant to the uMzimkhulu landfill site (Mucina & Rutherford 2012)	
Biome	The uMzimkhulu landfill site is situated within the **Grassland Biome.**	**Vegetation Type**	Moist Coast Hinterland Grassland
Bioregion	The uMzimkhulu landfill site is located within the **Sub-Escarpment Grassland Bioregion**	**Climate**	Summer rainfall with some rain in winter
		Altitude (m)	450-900
Vegetation Type	The uMzimkhulu landfill site is situated within the **Moist Coast Hinterland Grassland** vegetation type.	**MAP* (mm)**	800-1160
		Distribution	KwaZulu-Natal and Eastern Cape Provinces
Conservation details pertaining to the uMzimkhulu landfill site (Various databases)		**Conservation**	Statutorily conserved in Vernon Crookes and Entumeni Nature Reserves
NBA (2011)	The uMzimkhulu landfill site falls within an area that is currently **not protected**.	**Geology & Soil**	Acid, leached heavy soils are derived from Karoo Supergroup sediments (including significant Dwyka tillites) and intrusive Karoo dolerites. Shallow sandy soils are derived from Natal Group Sandstone
National Threatened Ecosystems (2011)	The majority of the uMzimkhulu landfill site falls within the remaining extent of the vulnerable Midlands Mistbelt Grassland Ecosystem (Figure 3).		
SAPAD (2017), SACAD (2017) & NPAES (2009)	There are no protected or conservation areas situated within 5 km of the uMzimkhulu landfill site	**Vegetation & landscape features**	Rolling and hilly landscape. Dense tall sour grassland dominated by unpalatable Ngongoni grass (Aristida junciformis) with this mono-dominance associated with low species diversity, when in good condition dominated by Themeda triandra and Tristachya leucothrix
IBA (2015)	The uMzimkhulu landfill site is situated within the KzaZulu-Natal Mistbelt Grassland IBA (Figure 4)		
Detail of the uMzimkhulu landfill site in terms of the KwaZulu-Natal Biodiversity Sector Plans (KZN Biodiversity Spatial Planning Terms and Processes V3.3 (2016)			
The uMzimkhulu landfill site does not fall within any Critical Biodiversity Areas (CBAs) nor any Ecological Support Areas (ESAs), nor within any form of protected or conservation area.			

DWS = Department of Water and Sanitation; EI = Ecological Importance; ES = Ecological Sensitivity; m.a.m.s.l = Metres Above Mean Sea Level; MAP = Mean Annual Precipitation; NFEPA = National Freshwater Ecosystem Priority Areas; WMA = Water Management Area; NBA = National Biodiversity Assessment; SAPAD = South African Protected Areas Database; IBA = Important Bird Area; MAP – Mean annual precipitation; MAT – Mean annual temperature; MAPE – Mean annual potential evaporation; MFD = Mean Frost Days; MASMS – Mean annual soil moisture stress (% of days when evaporative demand was more than double the soil moisture supply).

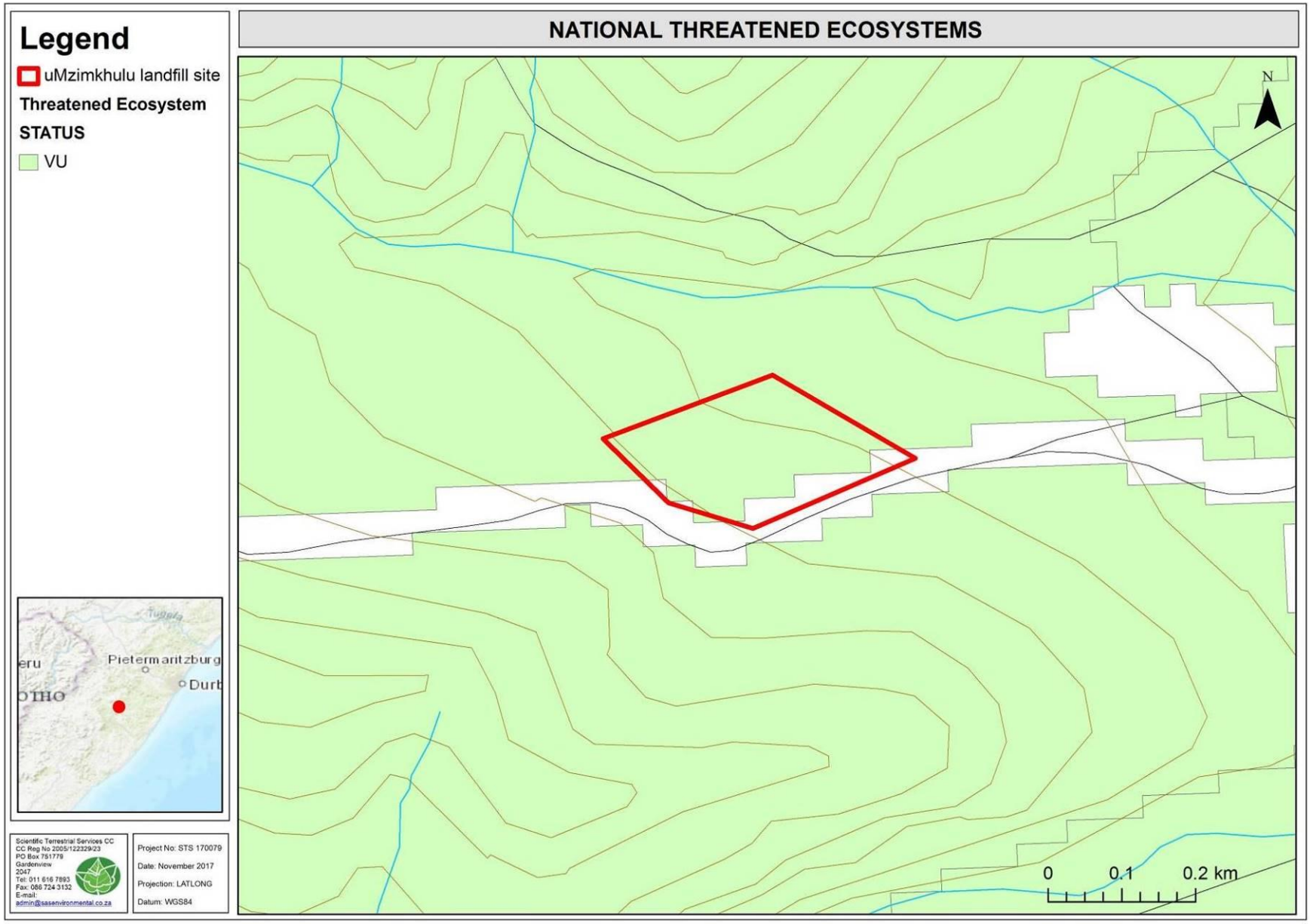

Figure 3: Vulnerable ecosystem, associated with the uMzimkhulu landfill site according to the National Threatened Ecosystem Database (2011).

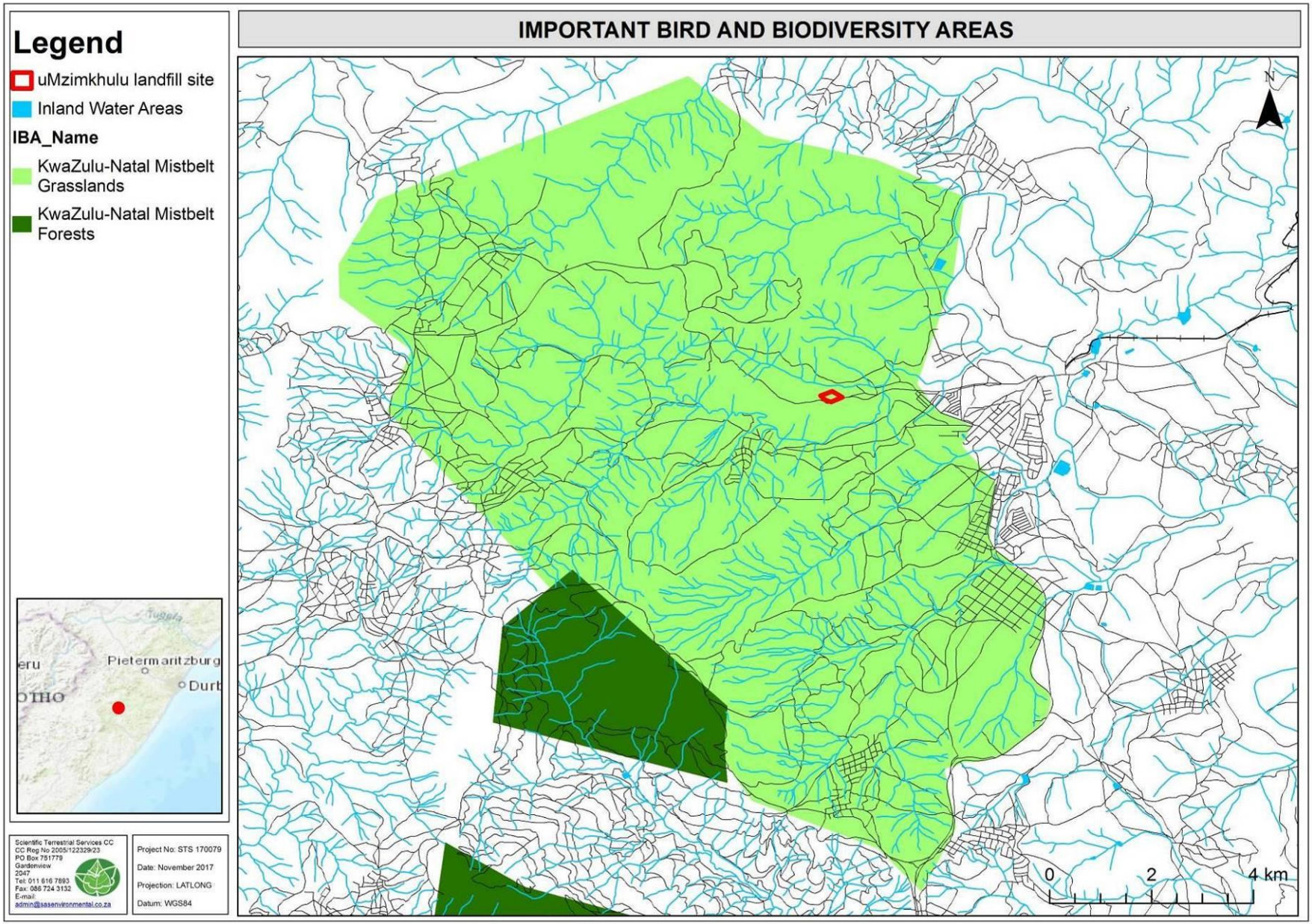

Figure 4: The uMzimkhulu landfill site situated within the KwaZulu-Natal Mistbelt Grassland IBA (IBA, 2015)

2. SENSITIVITY OF THE RECEIVING ENVIRONMENT

From the desktop assessment, it is evident that the landfill site does not fall within a critically endangered or endangered ecosystem, nor is it associated with any wetlands or Rivers, nor are there any freshwater resources situated within 500m of the uMzimkulu landfill site according to the NFEPA dataset. The uMzimkulu landfill site is further not associated with any CBA or ESAs, nor with any protected or conservation areas, however the site is situated within the unprotected KwaZulu-Natal Mistbelt Grassland IBA.

From photographs taken by GA Environmental at the uMzimkhulu landfill site, it is evident that the area has been cleared of vegetation, and as such is considered to be transformed, comprising of bare soils, and waste disposal, (Figure 6 below). From a terrestrial ecological perspective, it is therefore highly unlikely that any floral Species of Conservation Concern (SCC) will be present within the area; however, it is possible for such species to occur within the adjacent natural area. As the landfill site falls within an IBA, it is possible for threatened bird species, such as *Sagittarius serpentarius* (Secretary Bird), *Gyps coprotheres* (Cape Vulture), *Polemaetus bellicosus* (Martial Eagle) and *Circus ranivorus* (African Marsh Harrier) (Birdlife South Africa, 2016) to temporarily reside within the uMzimkhulu landfill site; however, it is unlikely for such species to permanently reside within the landfill site due to the transformed nature of the area.

Figure 5: Representative photographs of the uMzimkhulu landfill site (GA Environment)

A new landfill site has been licensed for the uMzimkhulu municipality and as such, the existing uMzimkulu landfill site will be decommissioned. It is therefore advised that appropriate rehabilitation measures be implemented during decommissioning of the uMzimkhulu landfill site, to prevent the spread of alien invasive species to the surrounding natural area, and to ensure the ongoing functioning of the area.

Although the NFEPA database does not indicate any wetlands or river systems to be situated within the uMzimkhulu landfill site, nor within 500m thereof, it is evident from digital satellite imagery that a watercourse forming part of the uMzimkhulu River catchment is situated approximately 80m north of the uMzimkhulu landfill site. As such, all freshwater resources within 500m of the uMzimkhulu landfill site were identified and delineated making use of desktop methods and digital satellite imagery, in accordance with General Notice 509 of 2016 as it relates to the National Water Act (NWA) of 1998. This was done to identify all potential freshwater resources that might be affected by the uMzimkhulu landfill site, as well as to determine whether a Water Use Authorisation (WUA) procedure as per the National Water Act (NWA) of 1998 would have to be undertaken. The 500m buffer around the UMzimkhulu landfill site, will henceforth be referred to as the “investigation area”

The freshwater resources were not field verified and as such, the delineations as presented in this letter are regarded as a best estimate of the temporary zone boundaries based on digital signatures such as:

- Identification of linear features indicating riverine crossings or valley bottom wetlands;
- Changes in vegetation coverage, often to greener more lush hues
- Changes in texture often related to more dense vegetation or altered vegetation types associated with wetland and riverine features;
- Presence of surface water often indicated by white reflections or dark colours in the active channel; and
- Topographic changes determined through the utilisation of contour lines.

Legislative requirements were taken into consideration when determining a suitable buffer zone for the watercourse located within the investigation area. The definition and motivation for a regulated zone of activity as well as buffer zone for the protection of the freshwater resources can be summarised as follows:

- The extent of a watercourse as per the Water Use Authorisation (WUA) in terms of the NWA, 1998 (Act 36 of 1998) defines a watercourse as

  (a) a river or spring;

  (b) a natural channel in which water flows regularly or intermittently;

  (c) a wetland, lake or dam into which, or from which, water flows; and

  (d) reference to a watercourse includes, where relevant, its bed and banks".

  - Further to this GN 509 of 2016 defines a regulated area of a watercourse for section 21 (c) or (i) of the Act water uses as

    "(a) the outer edge of the 1 in 100 year flood line and/or delineated riparian habitat, whichever is the greatest distance, measured from the middle of the watercourse of a river, spring, natural channel, lake or dam;

    (b) in the absence of a determined 1 in 100 year flood line or riparian area the area within 100 m from the edge of a watercourse where the edge of the watercourse is the first identifiable annual bank fill flood bench; or

    (c) a 500 m radius from the delineated boundary (extent) of any wetland or pan will trigger a WUA in terms of section 21 (c) and (i) of the NWA, 1998 (Act 36 of 1998).

As such, a 100m zone of regulation around the watercourse is applicable, the uMzimkhulu landfill site is situated within a 100m Zone of Regulation (Figure 8) as described by GN 509, and as such, a DWS Risk Assessment will have to compiled. A WUA process will need to be followed for the decommissioning of the uMzimkhulu landfill site, based on the outcome of the DWS Risk Assessment.

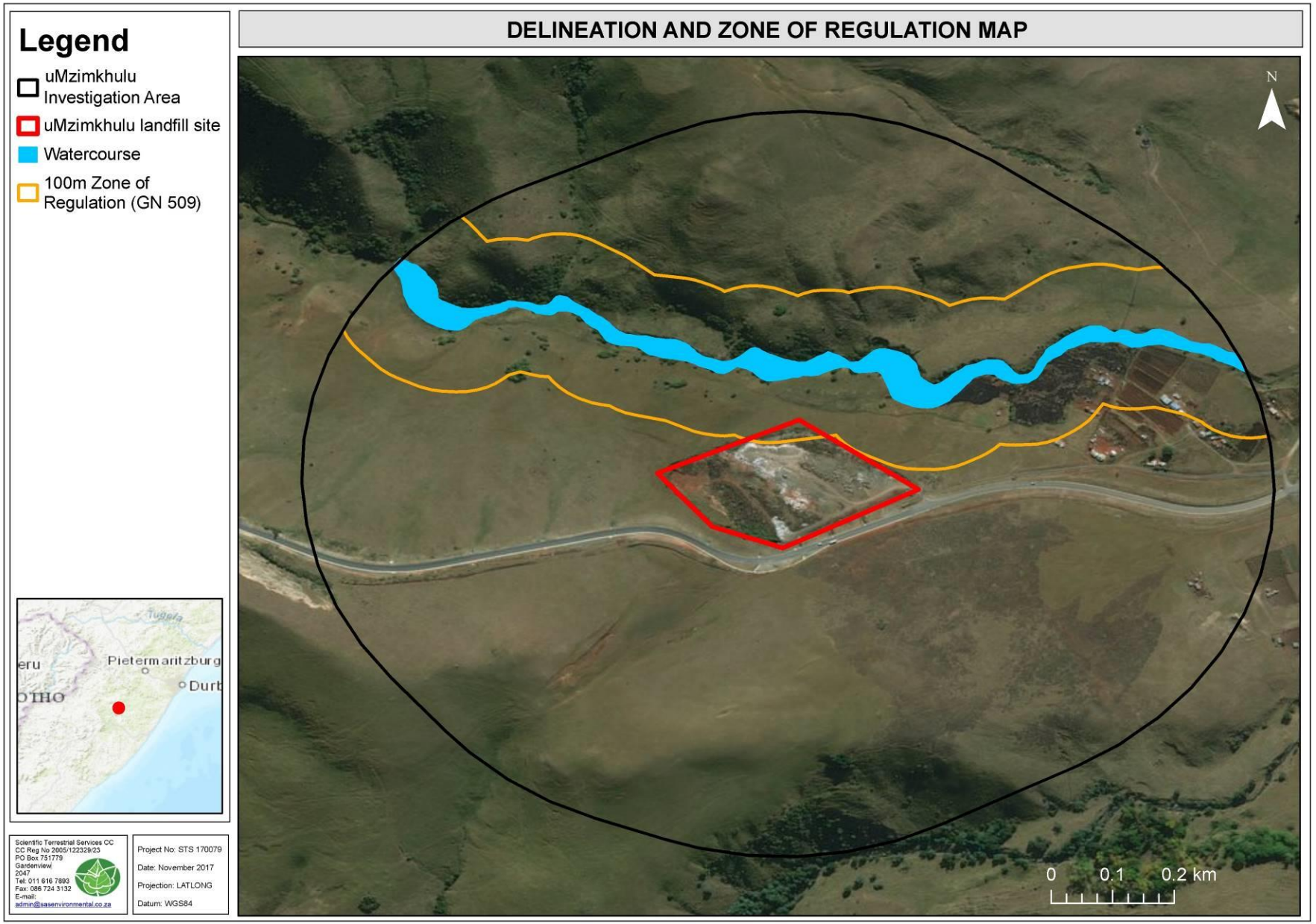

Figure 6: The uMzimkhulu landfill site falling within the 100m Zone of Regulation as per GN 509 of a watercourse situated to the north.

3. POTENTIAL IMPACTS AND PROPOSED MITIGATION

3.1 Potential Impacts

As the uMzimkhulu landfill site is considered transformed, the anticipated impacts associated with the decommissioning of the site is considered to be on the surrounding natural environment and include but may not be limited to:

- Increase in stormwater runoff and sedimentation into the drainage feature as a result of inefficient rehabilitation, resulting in an alteration of the hydrology, geomorphology and water quality;
- Post closure seepage of contaminated water into the watercourse situated to the north of the uMzimkhulu landfill site; and
- Increase in alien proliferation of the surrounding natural environment, which can further alter the diversity and sensitivity of this area as a result of ineffective rehabilitation.

3.2 Proposed Mitigation

Based on the above mentioned potential impacts, the following mitigation measures are proposed to lower the impact on the surrounding area during the decommissioning of the uMzimkhulu landfill site:

- The use of Sustainable Drainage Systems (SUDs) to manage stormwater is considered critical in order to prevent significant impacts on the hydrological functioning and water quality of the watercourse situated to the north of the uMzimkhulu landfill site. In this regard, it is highly recommended that a suitably qualified engineer be consulted with regards to the use of SUDs. Examples of these, which may be applicable to this development, include rainwater harvesting, soakaways, and bio-retention facilities or attenuation ponds.
- Waste on site should be compacted, capped and the soil profile reintroduced according to best practise guidelines, with the final layer comprising of a good quality topsoil of at least 30cm deep. The area should be reseeded, with an indigenous seed mixture, such as Mayford's Biomosone Sour Bushveld Reclamation Mixture, at a density of 24kg/ha to prevent erosion and ensure adequate vegetation cover. [Contact details online available: http://mayford.co.za/veld-grass/];
- Alien vegetation should be removed, and monitored regularly (at least twice a year), within the decommissioned area, as well as the surrounding area (within at least a

100m buffer), to prevent the spread of alien invasive species. This should be conducted for a period of at least 3 years post decommissioning. Specific mention is made of Category 1b species in line with the NEMBA Alien and Invasive Species Regulations (2016)

- A rehabilitation, management and monitoring plan should be implemented with specific focus on storm water management, and alien invasive species control.

4. CONCLUSION

Based on the desktop ecological assessment, freshwater resource delineations within 500m of the uMzimkhulu landfill site, and site photographs, it was determined that the existing uMzimkhulu landfill site, is considered transformed, with no natural vegetation remaining, and as such potential impacts as a result of the decommissioning of the uMzimkhulu landfill site is on the surrounding natural area, and the watercourse situated to the north of the uMzimkhulu landfill site. With appropriate mitigation implemented, the potential impact on the watercourse and surrounding natural area is considered to be low during the decommissioning phase. It is the opinion of the specialist therefore that the proposed decommissioning of the landfill site be considered favourably, particularly as the continuance of an unlicensed landfill site will have more detrimental effects on the surrounding ecology.

We trust that we have interpreted your requirements correctly. Please do not hesitate to contact us if there are any aspects you would like to discuss further.

Yours Faithfully,

Emile van der Westhuizen
SACNASP REG.NO: 100008/15
(B.Sc. Hons Plant Ecology)

Marelie Meintjies
(MSc Medicinal Plant Science)

5. REFERENCES

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APPENDIX A – Specialist Declarations

edtea
Department :
Economic Development, Tourism and Environmental Affairs
PROVINCE OF KWAZULU-NATAL

Details of specialist and declaration of interest

in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), and the Environmental Impact Assessment Regulations, 2014

Reference number:	3/WML/0022/2017
Project title:	*ic Assessment for the proposed Decommissioning (Closure) of the uMzimkhulu Landfill, uMzimkhulu Local Municipality, KwaZulu Natal Province*

Specialist:	Emile van der Westhuizen		
Name of company:	Scientific Terrestrial Services		
Postal address:	29 Arterial Road West, Oriel, Bedfordview		
Postal code:	2007	Cell:	082 850 7753
Telephone:	011 616 7893	Fax:	086 724 3132
E-mail:	emile@sasenvgroup.co.za		
Qualifications:	BSc(Hons). Plant Science (University of Pretoria) BSc. Botany and Environmental Management (University of Pretoria)		
Professional affiliations:	Member of the South African Council for Natural Scientific Professions (SACNASP) (Reg. Number 100008/15)		
Expertise:	More than 10 years experience in Terrestrial Ecology, Floral, Faunal and Wetland Assessment		

EAP:	Nyaladzi Nleya		
Name of company:	GA Environment (Pty) Ltd		
Postal address:	P.O Box 6723, Halfway House		
Postal code:	1685	Cell:	0761479451
Telephone:	011 312 2537	Fax:	27 11 805 1950
E-mail:	environment@gaenvironment.com / nyaladzin@gaenvironment.com		

Declaration by the specialist

I, **Emile van der Westhuizen** , declare that --

- I act as the independent specialist in this application;
- I do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the EIA Regulations, 2014;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Waste Act and NEMA, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Waste Act and NEMA, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- **all the particulars furnished by me in this form are true and correct; and**
- **I am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of subregulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B(1) of the National Environmental Management Act, 1998 (Act 107 of 1998).**

Signature of the specialist

Scientific Terrestrial Services

Name of company

12/12/17

Date

edtea
Department :
Economic Development, Tourism and Environmental Affairs
PROVINCE OF KWAZULU-NATAL

Details of specialist and declaration of interest

in terms of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008), and the Environmental Impact Assessment Regulations, 2014

Reference number:	3/WML/0022/2017
Project title:	*ic Assessment for the proposed Decommissioning (Closure) of the uMzimkhulu Landfill, uMzimkhulu Local Municipality, KwaZulu Natal Province*

Specialist:	Marelie Meintjies		
Name of company:	Scientific Terrestrial Services		
Postal address:	29 Arterial Road West, Oriel, Bedfordview		
Postal code:	2007	Cell:	074 888 8717
Telephone:	011 616 7893	Fax:	086 724 3132
E-mail:	marelie@sasenvgroup.co.za		
Qualifications:	MSc. Medicinal Plant Science (University of Pretoria) BSc(Hons). Medicinal Plant Science (University of Pretoria) BSc. Biotechnology (University of Pretoria)		
Professional affiliations:			
Expertise:	Three years experience in GIS, and Floral Ecological Assessments		

EAP:	Nyaladzi Nleya		
Name of company:	GA Environment (Pty) Ltd		
Postal address:	P.O Box 6723, Halfway House		
Postal code:	1685	Cell:	0761479451
Telephone:	011 312 2537	Fax:	27 11 805 1950
E-mail:	environment@gaenvironment.com / nyaladzin@gaenvironment.com		

Declaration by the specialist

I, **Marelie Meintjies** , declare that --

- I act as the independent specialist in this application;
- I do not have and will not have any vested interest (either business, financial, personal or other) in the undertaking of the proposed activity, other than remuneration for work performed in terms of the EIA Regulations, 2014;
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Waste Act and NEMA, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Waste Act and NEMA, regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing - any decision to be taken with respect to the application by the competent authority; and - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- **all the particulars furnished by me in this form are true and correct; and**
- **I am aware that a person is guilty of an offence in terms of Regulation 48 (1) of the EIA Regulations, 2014, if that person provides incorrect or misleading information. A person who is convicted of an offence in terms of subregulation 48(1) (a)-(e) is liable to the penalties as contemplated in section 49B(1) of the National Environmental Management Act, 1998 (Act 107 of 1998).**

Signature of the specialist

Scientific Terrestrial Services

Name of company

12/12/17

Date

SCIENTIFIC TERRESTRIAL SERVICES (STS) – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF EMILE BASSON VAN DER WESTHUIZEN

PERSONAL DETAILS

Position in Company	Director, Ecologist, Botanist
Date of Birth	30 May 1984
Nationality	South African
Languages	English, Afrikaans
Experience	> 10 years

MEMBERSHIP IN PROFESSIONAL SOCIETIES

Member of the South African Council for Natural Scientific Professions (SACNASP) (Reg. Number 100008/15).

EDUCATION

Qualifications

BSc (Hons) Plant Science (University of Pretoria)	2012
B.Sc. Botany and Environmental Management (University of South Africa)	2010

Short Courses

Grass Identification – Africa Land Use Training	2009
Wild Flower Identification – Africa Land Use Training	2009

COUNTRIES OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, North West, Limpopo, KwaZulu-Natal, Free State, Eastern Cape.

Mozambique (Tete, Sofala and Manica Provinces)

Angola (Zaire and Cabinda Provinces)

Democratic Republic of the Congo (Katanga and Kivu Provinces)

Ghana (Western and Greater Accra Provinces)

Sierra Leone

SELECTED PROJECT EXAMPLES

Floral Assessments

- Floral assessment for the proposed Modikwa Platinum Mine South 2 Shaft Project, Burgersfort, Limpopo Province.
- Floral assessment for the proposed New Clydesdale Colliery Stoping Project, Vandyksdrift, Mpumalanga Province.

- Floral assessment as part of the EIA process for the proposed Harriet's Wish PGM Project, Limpopo Province.
- Floral assessment as part of the environmental authorisation process for the proposed Shanduka Coal Argent Colliery in the vicinity of Argent, Mpumalanga.
- Floral assessment for the Auroch Resources Manica Gold Mining Project, Manica, Mozambique.
- Floral assessment for the Namoya Gold Mine project in Namoya, Democratic Republic of Congo.
- High level floral risk assessment and alternatives analysis for the proposed new Tete Airport, Tete, Mozambique.
- Floral assessment for the proposed Richardsbay Harbour Compactor Slab development, Richardsbay, Kwa-Zulu-Natal Province.
- Site walkdown and floral ecological input prior to the construction of the proposed 180km Mfolozi-Mbewu powerline, Richardsbay, Kwa-Zulu-Natal Province.
- Floral assessment as part of the EIA process for the proposed Peerboom Colliery, Lephalale, Limpopo Province.
- Floral assessment as part of the EIA process for the proposed Overvaal Underground Coal Mine Project, Ermelo, Mpumalanga Province.
- Floral assessment as part of the EIA process for the proposed King's City Takoradi 3000 hectare development, Takoradi, Ghana
- Floral assessment as part of the EIA process for the proposed Aquarius Platinum Fairway Platinum Mine, Steelpoort, Mpumalanga Province.
- Floral assessment as part of the EIA process for the proposed Geniland Lubumbashi City 4000 hectare development, Likasi, Katanga Province, Democratic Republic of Congo.
- Floral, faunal, aquatic and wetland assessment as part of the EIA process for the proposed Appollonia City Accra 3000 hectare development, Accra, Ghana.
- Floral assessment as part of the EIA process for the proposed Leeuw Colliery, Utrecht, Kwa-Zulu Natal Province.
- Floral assessment as part of the EIA process for the proposed Lubembe Coppermine Project, Lubumbashi, Katanga Province, Democratic Republic of Congo.
- Floral assessment as part of the EIA process for the proposed Kinsenda Coppermine Project, Lubumbashi, Katanga Province, Democratic Republic of Congo.
- Floral assessment as part of the EIA process for the proposed Lonshi Coppermine Project, Lubumbashi, Katanga Province, Democratic Republic of Congo.
- Floral assessment as part of the EIA process for the proposed Jozini Shopping Mall, Jozini, Kwa-Zulu Natal Province.
- Floral assessment as part of the Biodiversity Action Plan for the Assmang Chrome Dwarsrivier Mine, Steelpoort, Mpumalanga Province.

SCIENTIFIC TERRESTRIAL SERVICES (STS) – SPECIALIST CONSULTANT INFORMATION

CURRICULUM VITAE OF MARELIE MEINTJIES

PERSONAL DETAILS

Position in Company	Junior Field Biologist
Date of Birth	8 July 1986
Nationality	South African
Languages	English, Afrikaans
Joined SAS	April 2015

EDUCATION

Qualifications

MSc Medicinal Plant Science (University of Pretoria)	2014
BSc (Hons) Medicinal Plant Science (University of Pretoria)	2012
BSc Biotechnology (University of Pretoria)	2011

COUNTRIES OF WORK EXPERIENCE

South Africa – Gauteng, Mpumalanga, Limpopo, Free State, Northern Cape, Western Cape, Eastern Cape

SELECTED PROJECT EXAMPLES

Terrestrial Assessments

- Floral Ecological Assessment as part of the Environmental Assessment and Authorisation Process for the proposed Leslie 2 underground coal mining operation, Gauteng Province.
- Floral Ecological Assessment as part of the Environmental Assessment and Authorisation Process for the proposed development of Zwavelpoort 373-JR Portions 116 and 130, Pretoria, Gauteng Province
- Floral Ecological assessment for the Jeannette Expansion Project at the Taung Gold International Mine near Welkom, Free State Province.
- Terrestrial Sensitivity Scan as part of the Environmental Authorisation Process for the proposed Sagewood Ext 17 development within the Summerset Area, Gauteng
- Terrestrial Sensitivity Scan as part of the Environmental Authorisation Process for the proposed Kyalami X4 development, Midrand, Gauteng Province
- Terrestrial Ecological Sensitivity Scan as part of the Environmental Assessment and Authorisation Process for the proposed development on erf 199, Witfield, Boksburg, Gauteng Province
- Terrestrial Ecological Scan as part of the Environmental Authorisation Process for the proposed development of Witfontein Ext 87, Gauteng province
- Terrestrial Sensitivity Scan as part of the environmental impact assessment and authorisation process for the proposed development of a pipeline in Kriel, Mpumalanga Province.

Wetland Assessments

- Riparian Zone Ecological Assessment as well as a Riparian Rehabilitation and Management Plan for the proposed maintenance activities associated with the LC de Villiers Sports Campus of the University of Pretoria, Gauteng Province.
- Wetland Ecological Assessment as part of the Environmental Assessment and Authorisation Process for the Proposed Expansion of the Cambrian Cemetery, Gauteng Province
- 'Wetland Ecological Assessment as part of the Environmental Assessment and Authorisation Process for the Proposed Expansion of the Kromvlei Cemetery, Gauteng Province

Wetland Rehabilitation and Monitoring Plans

- Wetland Rehabilitation and Management Plan for the wall construction within the Riversands Estate, Midrand, Gauteng Province
- Freshwater Resource Rehabilitation and Management Plan as part of the Water Use Authorisation for the Proposed Belhar Potable Water Pipeline over the Kuils River, Western Cape Province
- Wetland Rehabilitation and Management Plan for the wetland and open space area associated with the Carlswald Valley Residential Development, City of Johannesburg, Gauteng Province.
- Wetland Rehabilitation and Management Plan for the wetland resource within the Carlswald Valley Residential Development, Kyalami, Gauteng Province

Desktop Ecological Assessments

- Aquatic and Wetland Scoping Assessment as part of the Environmental Assessment and Authorisation Process for the Proposed Witfontein Mining Project, near Bethal, Mpumalanga Province
- Freshwater Resource Scoping Assessment as part of the Environmental Assessment and Authorisation Process for the Proposed Photovoltaic Solar Energy Facility on the Heuningklip Farm near Vredenburg, Western Cape Province
- Desktop Ecological Assessment and Site Sensitivity Report as part of the Environmental Assessment and Authorisation Process prior to Prospecting Activities on the Farm Zeekoebaart 306 Rd, Postmasburg, Northern Cape Province
- Desktop Ecological Assessment as part of the environmental assessment and authorisation process for the Genet Manganese (Pty) Ltd prospecting area on the farm Lemoenkloof No 456, Northern Cape Province.

Screening Assessment

- Desktop Ecological Assessment and Field Verification Report as part of the Screening Assessment for the Proposed Soweto Power Park Ext 3, Gauteng Province

Water Use Applications

- General Authorisation Application Process to obtain authorisation from the Department of Water and Sanitation for the water uses related to the proposed road upgrades associated with the Pearl Valley Phase II Development, Paarl, Western Cape Province

Miscellaneous Projects

- Desktop Ecological Assessment and Site Sensitivity Report as part of the Elikhulu TSF Facility site selection process, Evander, Mpumalanga Province
- Ecological Screening Assessment, Ground Truthing and Site Sensitivity Report for the Proposed Tubatse SEZ. Steelpoort, Limpopo Province
- Identification of Important Medicinal Plant Species to be rescued and relocated as part of the Rescue and Relocation Plan for the area earmarked for surface infrastructure at the Yzermyn Colliery near Dirkiesdorp, Mpumalanga
- Biodiversity Survey for the BMW Group South Africa at the Rosslyn Manufacturing Plant, Rosslyn, Gauteng Province
- Biodiversity and Ecosystem Health for Limpopo Province, South Africa Thematic Chapter as part of Limpopo Environmental Outlook Report
- Literature Review and Initial Assessment on the control of Alien and Invasive Plants associated with aquatic environments within the City of Johannesburg