BIODIVERSITY AND WETLAND ASSESSMENT FOR THE PROPOSED NEW TONK METER ROAD GLB^{+} WASTE DISPOSAL FACILITY

MAY 2012

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TITLE	:	BIODIVERSITY AND WETLAND ASSESSMENT FOR THE PROPOSED NEW TONK METER ROAD GLB^{+} WASTE DISPOSAL FACILITY
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For BKS (Pty) Ltd

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EXECUTIVE SUMMARY

BKS (Pty) Ltd was appointed by Vereeniging Refractories (Pty) Ltd to conduct a biodiversity and wetland assessment (as part of the Environmental Impact Assessment) for the proposed new Tonk Meter Road GLB+ Waste Disposal Facility in Springs, Gauteng. This report forms part of the ecological study and includes the results from the desktop assessment and field survey.

An ecological assessment was done for the proposed site, namely Areas D, E, F (refer to Figure 1) The proposed waste disposal facility (i.e. landfill) site and surroundings are highly impacted on by mining, industrial and residential developments and no sensitive landscapes or species were identified. The vegetation in certain sections of Area D (now forming part of the buffer area) is still natural, but severely over-utilised and also used for illegal waste dumping and footpaths.

The proposed development site is however important in terms of connecting the landscape. Area D (western portion, (now forming part of the buffer area)) contains some of the last remaining open spaces connecting the two local streams, namely the Klein Blesbokspruit and the Withokspruit. This is likely to provide important corridors that will facilitate the movement of animals and plant seeds. Developments in these areas must be designed in such a way that sufficient natural corridors remain.

In order to provide a buffer zone for the proposed landfill site it was suggested that the western portion of Area D be developed into a cemetery (should this development within the buffer zone be undertaken it will be done under a separate EIA process).

There were no specific features observed during the field survey that will raise any concerns regarding the development of these areas, except for possibly reducing the conductivity of the natural corridors.

Figure 1: Proposed Areas for Tonk Meter WDF

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1. INTRODUCTION

BKS (Pty) Ltd was appointed by Vereeniging Refractories (Pty) Ltd to conduct a biodiversity and wetland assessment for the proposed new private Tonk Meter Road GLB+ Waste Disposal Facility in Springs, Gauteng. This report forms part of the Environmental Impact Assessment (EIA).

The purpose of this investigation was to assess all ecological sensitivities present on the proposed development site through available literature and field assessments. The study also provides recommendations for possible future developments within the buffer zones of the proposed development.

2. PROPOSED DEVELOPMENT SITE

The proposed Tonk Meter Road GLB+ Waste Disposal Facility (WDF) is located in Springs, Gauteng (see **Map 1 in Appendix A**), adjacent to the existing Ekurhuleni Metropolitan Municipality (EMM) Rietfontein Waste Disposal Facility. The proposed WDF site, which was surveyed for ecological sensitivities, is indicated by Areas D, E and F in **Map 2 (Appendix A)**. The existing EMM Rietfontein waste disposal facilities are located within Areas A and C of **Map 2.**

3. APPROACH

3.1 DESKTOP ASSESSMENT

The biodiversity desktop assessment was conducted according to Gauteng Department of Agriculture, Conservation and Environment (GDACE) Requirements for Biodiversity Assessments Version 2 (2008). The Gauteng Conservation Plan (C-Plan, 2011) was used for an overview of sensitive ecosystems. The current literature was utilised to gain an understanding of the environmental influences presently affecting the proposed development site. General information on the veld type, climate, geology, topography and current activity on the site was acquired prior to the field assessment of the property.

A literature review on species with conservational concern was conducted to gain a thorough understanding of the habitat type occupied by these species, as well as their identification in the field. The Gauteng Department of Agriculture and Rural Development (GDARD) provided information regarding the red data species for the proposed development site (GDARD, 2012).

Aerial photographs of the area were studied to assess the possibility of migratory corridors available to any faunal species identified on the property, and to establish connectivity within the proposed development site.

3.2 FIELD ASSESSMENT

Site visits were conducted on 3 and 18 April 2012 by Betsie le Roux and Ina Venter. The aim of the field survey was to determine the presence or possibility of occurrence of red data species, the

present ecological state of the vegetation and the presence and extent of wetlands on the proposed development site.

3.2.1 Biodiversity Assessment

GDARD emphasised the potential occurrence of red data listed plant species of which the species or habitat had to be confirmed. During the field survey the occurrence of migratory corridors and potential habitats for the red data species in question were observed.

A vegetation assessment was done during the field survey and plant species were recorded. Should sensitive species be encountered, it would be recorded and mapped using a Global Positioning System (GPS). Additional site notes were made of any disturbances to the vegetation.

The faunal assessment was undertaken largely as a desktop study. The often secretive and nocturnal nature of many species also makes them difficult and unlikely to find during a diurnal field assessment. During the field assessment, the presence of any faunal species observed either directly (visual observation) or indirectly (scats, tracks, burrows, etc) was noted.

3.2.2 Wetland Delineation

The identification and delineation of wetlands were conducted according to the Department of Water Affairs (DWA) guideline (*A practical field procedure for identification and delineation of wetlands and riparian areas*, DWAF 2005) as well as the National Water Act (1998).

The presence of water is not a good indication of the outer boundary of a wetland due to the dynamic hydrology within wetlands. Wetlands are therefore classified based on the following wetland indicators.

a) Terrain unit indicator

The terrain unit indicator gives an indication of areas in the landscape where wetlands are likely to occur. Wetlands usually occur in a depression or in a valley bottom, but it could also occur higher up in the catchments and on hillside slopes where they are fed by seeps.

b) Soil form indicator

The Champagne, Katspruit, Willowbrook and Rensburg soil forms are always associated with wetlands.

c) Soil wetness indicator

The saturation and dehydration of soil causes chemical changes in the soil, which can be interpreted as follows:

- *Permanent saturation of water, as in the permanent zone of the wetland, causes iron to dissolve and leach from the soil. The soil turns from a reddish or brownish colour to a greyish, greenish or bluish colour. This soil is known as gleyed.*

- *Soils in the seasonal and temporary zones are continuously saturated and dehydrated as the water table fluctuates. As the soil dehydrates, iron is deposited in patches, called high chroma mottles. Mottles are usually bright red in colour.*

d) Vegetation indicator

The species composition of plant communities changes along the wetness gradient as one moves from the centre to the edge of the wetland.

- *Permanent zone: Plants may include sedges, reeds and bulrushes, usually more than 1m tall. Floating or submerged aquatic plants can be present.*
- *Seasonal zone: Hydrophilic sedge, grass and tree species that are restricted to wetlands occur in this zone.*
- *Temporary zone: This zone is mostly composed of grass species. Terrestrial and hydrophilic species are found in this zone.*

A reconnaissance of the study area was undertaken, during which the following data was recorded:

- GPS coordinates.
- Topographic characteristics.
- Soil characteristics.
- Vegetation characteristics.
- General observations.

3.2.3 Present Ecological State (PES)

The PES was determined based on:

- Comparisons between current and historical aerial photographs.
- Current vegetation characteristics compared to those of the original veld type.
- Land uses exerted on the site.
- The degree of soil disturbance.
- Waste disposal.

3.2.4 Ecological Sensitivity

Ecological sensitive aspects of the site were identified, which would typically include the following:

- Sensitive veld types.
- Red data species.
- Good PES.
- Migratory corridors and the degree of connectivity provided by the site.

- The presence and important functioning of wetlands.

3.2.5 Impact Assessment

The significance of the potential impacts will be considered before and after an identified mitigation measure is implemented. The following criteria will be used to evaluate significance:

- ***Nature****: The nature of the impact will be classified as positive, negative or neutral.*
- ***Extent****: The magnitude of the impact is classified as:*
  - *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.*
  - *National: the impact can be considered to be of national importance.*
- ***Duration****: This measures the lifetime of the impact, and is classified as:*
  - *Short term: the impact will be for 0-3 years, or will only last for the period of construction.*
  - *Medium term: the impact will last 3-10 years.*
  - *Long term: the impact will last longer than 10 years or will continue for the entire operational lifetime of the project.*
  - *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, and is classified as:*
  - *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.*
  - *High: functioning of the affected environment is disturbed and can cease.*
- ***Probability****: This is the likelihood or the chance that the impact will occur, and is classified as:*
  - *Unlikely: during the normal operation of the project, no impacts are expected.*
  - *Probable: the impact is likely to occur if mitigation measures are not taken.*
  - *Definite: the environment will be affected irrespectively; in some cases such impact can be reduced.*

- ***Consequence**: A combination of extent, duration and intensity classified as:*
  - *Low: low and medium intensity, short- and medium-term duration and site or local level extent.*
  - *Medium: low and medium intensity, long-term or permanent duration at a region or national level extent; or high intensity, short- to medium-term duration at site or local level.*
  - *High: high intensity, long term or permanent at a regional or national level.*
- ***Significance**: The consequence of the impact, coupled with the probability of its occurrence, is rated as:*
  - *Low: low consequence and unlikely, probable or definite probability; medium consequence and unlikely probability.*
  - *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.*
  - *High: high consequence and probable or definite probability, mitigation is crucial.*
- ***Cumulative Impacts**: The possible cumulative impacts will also be considered. Cumulative impacts have incremental impacts of the activity and others that past, present and future activities will have on a common resource, rated as:*
  - *Low: there is sufficient capacity of the environmental resources within the geographic area to respond to change and withstand further stress.*
  - *Medium: the capacity of the environmental resources within the geographic area to respond to change and withstand further stress is reduced.*
  - *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.*
- ***Reversibility**: This is the ability of the impacted environment to return to its pre-impacted state once the cause of the impact has been removed, classified as:*
  - *Yes, it will return to pre-impacted state.*
  - *No, it will not return to pre-impacted state.*
- ***Irreplaceability**: This determines if an irreplaceable resource is impacted upon and is classified as*
  - *Yes, an irreplaceable resource will be impacted.*
  - *No, an irreplaceable resource will not be impacted or the resource is not irreplaceable.*

- ***Confidence:*** *This is the level of knowledge/information that the environmental impact practitioner or a specialist had in his/her judgement, and is rated as:*
  - *Low: the judgement is based on intuition and not on knowledge or information.*
  - *Medium: common sense and general knowledge informs the decision.*
  - *High: scientific and or proven information has been used to give such a judgement.*

4. DESKTOP RESULTS

4.1 C-PLAN

According to the Gauteng C-Plan **(Map 3, Appendix 1)**, the majority of the proposed development site is within built-up land. A section of the site contains primary vegetation and some areas are considered important.

4.2 LAND USE ON THE PROPOSED DEVELOPMENT SITE AND IN THE CATCHMENT

The proposed landfill site will be constructed on previously mined or disturbed areas, i.e. reclaimed tailings dams, clay quarries, as well as future proposed clay mining areas and is surrounded by industrial and residential areas **(Map 4, Appendix 1).** Aerial photography indicates scattered open spaces in the surroundings.

4.3 CLIMATE

According to AGIS (2007) the Mean Annual Precipitation (MAP) for the proposed development site averages between 601-800 mm. Average maximum temperatures in summer are between 24.7 – 26.9 ˚C, while average minimum winter temperatures are below 3.9˚C. Frost can occur from middle April to early October.

4.4 TOPOGRAPHY

Map 5 (Appendix 1) indicates the contours of the proposed landfill site. The area is relatively flat and situated south of where the Kleinblesbokspruit and north of where the Withokspruit Rivers originate. The landfill site is, however, within the catchment of the Kleinblesbokspruit and may have impacts on the groundwater quality of this river.

4.5 VELD TYPES

As indicated in **Map 6 (Appendix 1)**, the properties earmarked for development and the surrounding area falls within the Tsakane Clay Grassland veld types (Mucina and Rutherford, 2006). The Tsakane Clay Grassland occurs on flat to gently undulating plains with low hills. The vegetation is short and dense grasslands. The presence of *Hyparrhenia hirta* and *Eragrostis chloromelas* indicates past

disturbances in this veld type. The veld type is considered *Endangered* and only 1.5% of the 24% target is currently under conservation (Mucina & Rutherford, 2006).

4.6 RED DATA LISTED SPECIES INFORMATION

Table 4-1 indicates Red Data Listed (RDL) species relevant to the proposed development site, as obtained from GDARD (2012). It also includes habitat requirements, conservation status and the flowering season of plants.

The Mpumalanga Tourism and Parks Agency provided sensitive faunal species for a location within 20 km of the proposed development site (**Table 4-2**).

Table 4-1: Red Data Plant Species for the proposed development site (GDARD, 2012) and additional information (GDARD, 2009)

SPECIES	FLOWERING SEASON	SUITABLE HABITAT	CONSERVATION STATUS
Plants Recorded within 5 km of Proposed Development Site			
Trachyandra erythrorrhiza	September-November	Marshy areas, grassland, usually in black turf marshes.	Near Threatened
Plants Recorded in Quarter Degree Square 2628AD, in which the site is located			
Adromischus umbraticola subsp. umbraticola	September-January	Rock crevices on rocky ridges, usually south-facing, or in shallow gravel on top of rocks, but often in shade of other vegetation.	Near Threatened
Boweia volubilis subsp. volubilis	September-April	Shady places, steep rocky slopes and in open woodland, under large boulders in bush or low forest.	Vulnerable
Cineraria longipes	March-May	Grassland, on koppies, amongst rocks and along seepage lines, exclusively on basalt on south-facing slopes.	Vulnerable
Delosperma leendertziae	October-April	Rocky ridges; on rather steep south facing slopes of quartzite in mountain grassveld.	Near Threatened
Dioscorea sylvatica	October-January	Wooded places with fair to reasonably good rainfall, such as the moister bushveld areas, coastal bush and wooded mountain kloofs.	Vulnerable
Eucomis autumnalis	November-April	Damp, open grassland and sheltered places.	Declining
Eulophia coddii	Early December	Steep hillsides on soil derived from sandstone, grassland or mixed bush.	Vulnerable
Gnaphalium nelsonii	October-December	Seasonally wet grasslands.	Rare / sparse
Gunnera perpensa	October-March	In cold or cool, continually moist localities, mainly along upland streambanks.	Declining
Habenaria barbertoni	February-March	In grassland on rocky hillsides.	Near Threatened
Habenaria bicolor	January-April	Well-drained grasslands at around 1600m.	Near Threatened
Holothrix micrantha	October	Terrestrial on grassy cliffs, recorded from 1500 to 1800m.	Endangered
Hypoxis hemerocallidea	September-March	Occurs in a wide range of habitats, from sandy hills on the margins of dune forests to open rocky grassland; also grows on dry, stony, grassy slopes, mountain slopes and plateaux; appears to be drought and fire tolerant.	Declining
Ilex mitis var. mitis	October-	Riverbanks, streambeds, evergreen forests	Declining

SPECIES	FLOWERING SEASON	SUITABLE HABITAT	CONSERVATION STATUS
	December		
Khadia beswickii	July-April	Open areas on shallow surfaces over rocks in grassland.	Vulnerable
Kniphofia typhoides	February-March	Low-lying wetlands and seasonally wet areas in climax Themeda triandra grasslands on heavy black clay soils, tends to disappear from degraded grasslands.	Near Threatened
Lithops lesliei subsp. lesliei	March-June	Primary habitat appears to be the arid grasslands in the interior of South Africa where it usually occurs in rocky places, growing under the protection of surrounding forbs and grasses.	Near Threatened

Table 4-2: Red Data Fauna Species for the surrounding environment with additional information on habitat (MTPA, 2012)

COMMON NAME	SCIENTIFIC NAME	HABITAT	CONSERVATION MTPA
Birds			
African Grass-Owl	*Tyto capensis*	Wetlands, tall grass	Vulnerable
Black-winged Pratincole	*Glareola nordmanni*	Open areas, near water	Near Threatened
Corn Crake	*Crex crex*	Moist Grassland (Birdlife International, 2010)	Least Concern
Invertebrates			
Marsh Sylph Butterfly	*Metisella meninx*	Wetland, *Leersia hexandra* (food plant)	Vulnerable
Reptiles			
Transvaal grass lizard	*Chamaesaura aenea*		Vulnerable
Amphibians			
Bullfrog	*Pyxicephalus adspersus*	Drier savannahs. Temporary waters in pools, pans and ditches.	Vulnerable
Large mammals			
Serval	*Leptailurus serval* (Schreber)	Well-watered long-grass savannah, particularly reedbeds (Breitenmoser *et al,* 2008).	Near Threatened

5. FIELD SURVEY RESULTS

The site for the proposed landfill is highly impacted on by intensive mining activities. Of the original vegetation, very little remains on the site. Areas E, F and the eastern portion of D is dominated by alien invasive plants. The western portion of Area D (now forming part of the buffer area) is more natural with some of the original grassland species present. However, this portion of Area D is impacted on by heavy grazing and illegal waste dumping.

The topography of the site is altered by numerous excavations and dumping of material. The natural flow of water through the system is altered by numerous furrows. Under these conditions it is not possible to determine the original extent of natural wetlands that may have occurred on the site. Water accumulates in every excavation on the site. Although wetland vegetation grows in these excavations and water birds utilise these sites, the excavations are not natural wetlands.

The ecological assessment identified no sensitivities in terms of biodiversity and wetlands on the proposed development site. However, the site currently connects other open spaces and river networks and therefore acts as a migratory corridor. This connection will be lost through the proposed development, unless mitigated.

5.1 PROBABILITY OF OCCURRENCE OF RED DATA LISTED SPECIES

No red data species were observed on the proposed development site and due to the degree of overutilization, disturbance and pollution sensitive species are not expected. However, the food plant, *Leersia hexandra*, for the sensitive Marsh Sylph Butterfly, *Metisella meninx,* was recorded on the site. It is therefore possible that the sensitive butterfly could occur on this site. The butterfly was, however not observed during the field survey.

5.2 GENERAL VEGETATION AND FAUNA DESCRIPTION

Animal species on site was restricted to cattle and birds that are adapted to live in very disturbed environments. The only sensitive animal species that might occur on the site is the Marsh Sylph Butterfly.

Plant species on the study site have been recorded and are listed in **Table 5-1** and **Table 5-2**. No species of conservation significance were recorded.

Table 5-1: Plant species recorded in Areas E, F and the eastern portion of D.

Trees	Forbs		Grass
Terrestrial land			
Acacia karroo *Celtis sinensis** *Eucalypthus sp** *Melia azedarach** *Rhus lancea* *Schinus molle** *Tipuana tipu**	*Asclepias fruticosa* *Bidens formosa** *Bidens spinosa** *Chenopodium album** *Cirsium vulgare** *Conyza sp** *Cucumus sp* *Cyperus esculentus** *Datura*	*Plantago lanceolata** *Senecio inornatus* *Schkuhria pinnata** *Tagetes minuta** *Taraxacum officinale** *Tithonia rotundifolia** *Verbena bonariensis**	*Chloris virgata* *Cymbopogon validus* *Cynodon dactylon* *Eragrostis chloromelas* *Hyparrhenia hirta* *Themeda triandra* *Paspalum dilatatum** *Pennisetum clandestinum** *Sporobolus africanus*

	*stramonium** *Ipomoea purpurea** *Phytolacca octandra**	*Verbena brasiliensis**	
Excavations (wet areas)			
*Eucalypthus sp **	*Typha capensis* *Persicaria sp** *Berkheya radula* *Verbena bonariensis** *Schoenoplectus corymbosus*	*Wahlenbergia caledonica*	*Phragmites australis* *Cortaderia selloana** *Hyparrhenia hirta* *Sporobolus africanus* *Leersia hexandra* *Andropogon eucomus*

*Alien Invasive Species

Table 5-2: Plant species recorded in the western portion of Area D.

Trees	Forbs		Grass
Terrestrial land			
*Eucalypthus sp**	*Cirsium vulgare** *Conyza sp** *Datura stramonium** *Felicia muricata* *Gladiolus sp* *Helichrysum nudifolium* *Hypoxis iridifolia* *Indigofera sp* *Ipomoea purpurea**	*Mirabilis jalapa** *Schkuhria pinnata** *Solanum mauritianum** *Tagetes minuta** *Verbena bonariensis** *Verbena brasiliensis** *Vernonia oligocephala* *Zinnia peruviana**	*Aristida congesta* *Sporobolus africanus* *Themeda triandra*
Excavations (wet areas)			
	Mariscus sp	*Schoenoplectus corymbosus*	*Leersia hexandra* *Paspalum dilatatum**

*Alien Invasive Species

The abundance of alien plant species in Areas E, F and the eastern portion of D (**Table 5-1**) indicates poor ecological conditions and significant disturbances to the soil.

The western portion of Area D (now forming part of the buffer area) had fewer disturbances in terms of excavations, but the vegetation is impacted by heavy grazing and trampling. The site is used for illegal dumping of general waste materials and informal housing. However, more indigenous forbs remain in the grassland of the western side of Area D (now forming part of the buffer area).

5.3 WETLAND DELINEATION

The proposed development site is located on the edge of the catchment draining into the Klein Blesbokspruit. The identification of wetlands on the proposed development site was complicated by mining activities, which disturbed the soil profile through excavations and material dumping (including reclaimed tailings dams). All excavations contain water, supporting wetland plant species, but these are not natural wetlands. Wetlands were also not identified in the less disturbed areas. Although no natural wetlands were identified on the proposed development site, the assessment could not accurately determine the presence of natural wetlands prior to the mining activities.

5.4 DISCUSSION

5.4.1 Sensitive Aspects of the Proposed Development Site

There are no important sensitivities in Areas D, E and F. Although the western portion of Area D (now forming part of the buffer area) is currently degraded, the area can be rehabilitated. Considering the near adjacent informal and formal settlements it is unlikely that the site would be rehabilitated without the proposed development, unless access is effectively restricted.

The proposed development site is however important in terms of connecting the landscape. Area D (western portion (now forming part of the buffer area)), contain some of the last remaining open spaces connecting the two local streams, namely the Klein Blesbokspruit and the Withokspruit. This is likely to provide important corridors that will facilitate the movement of animals and plant seeds. Developments in these areas must be designed in such a way that sufficient natural corridors remain.

5.4.2 Future Developments

In order to provide a buffer zone to the proposed landfill site, it was suggested that the western portion of Area D be developed into a cemetery.

6. RECOMMENDATIONS AND MITIGATORY MEASURES

The following recommendations and mitigatory measures will reduce the impacts of the development on the relevant ecosystems.

- Management practices should be in place to prevent sediments, waste, leachates or any other pollution from the landfill site to enter the groundwater and surrounding ecosystems.

- The remaining natural areas should be incorporated into an open space system in terms of spatial planning on a large scale.

- An independent, suitably qualified individual (at least a B. Sc. (Hons) in the natural sciences) must act as the environmental control officer.

- Monthly audit reports are required for the duration of the construction and rehabilitation phase.

- Erosion control measures should be implemented in the construction area.

- All invasive species should be controlled, as stipulated by CARA (Act No 43 of 1983), and an on-going monitoring programme is required.

7. IMPACT ASSESSMENT

Table 7-1: Assessment of the Environmental Impact during Construction

Impact:	Erosion and / or sedimentation due to excavation, removal of vegetation and access roads during construction										
Impact Source:	Activities, workers and vehicles accessing the site during the construction phase										
Impact Assessment	**Nature**	**Extent**	**Duration**	**Intensity**	**Probability**	**Significance**		**Cumulative**	**Reversibility**	**Irreplaceability**	**Confidence**
						Without Mitigation (Section 6)	With Mitigation (Section 6)				
Proposed landfill site	Negative	Local	Short term	Medium	Probable	Medium	Low	Low	Yes	No	High

Table 7-2: Assessment of the Environmental Impact during the Operational Phase

Impact:	Reduction in ecosystem connectivity										
Impact Source:	Removal of all natural vegetation and restrictive walls										
Impact Assessment	**Nature**	**Extent**	**Duration**	**Intensity**	**Probability**	**Significance**		**Cumulative**	**Reversibility**	**Irreplaceability**	**Confidence**
						Without Mitigation (Section 6)	With Mitigation (Section 6)				
Proposed landfill site	Negative	Regional	Long-term	Medium – high	Probable	Medium - High	Low	High	Yes	No	High

8. CONCLUSIONS

The proposed development site is degraded and generally not sensitive. There were no specific features observed during the assessment that will raise any concerns regarding the development of these areas, except for possibly reducing conductivity as described in the previous section. Therefore, the layout and landscaping of the proposed development must allow for migratory corridors in the western portion of Area D forming part of the buffer zone and remain intact.

9. REFERENCES

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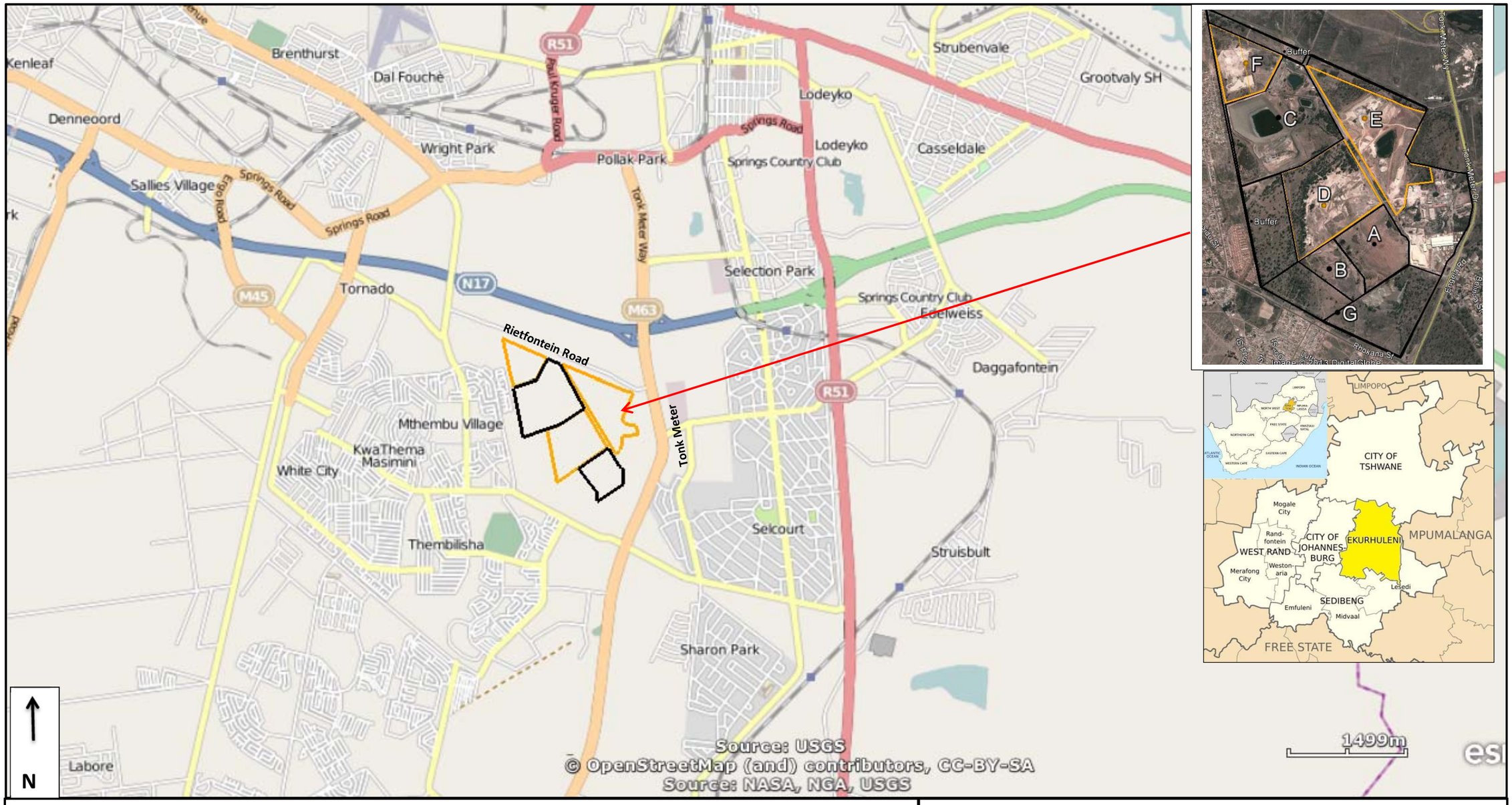
Appendix A: Maps



Legend

Proposed Tonk Meter Road Waste Disposal Facility

Existing EMM Rietfontein Waste Disposal Facilities

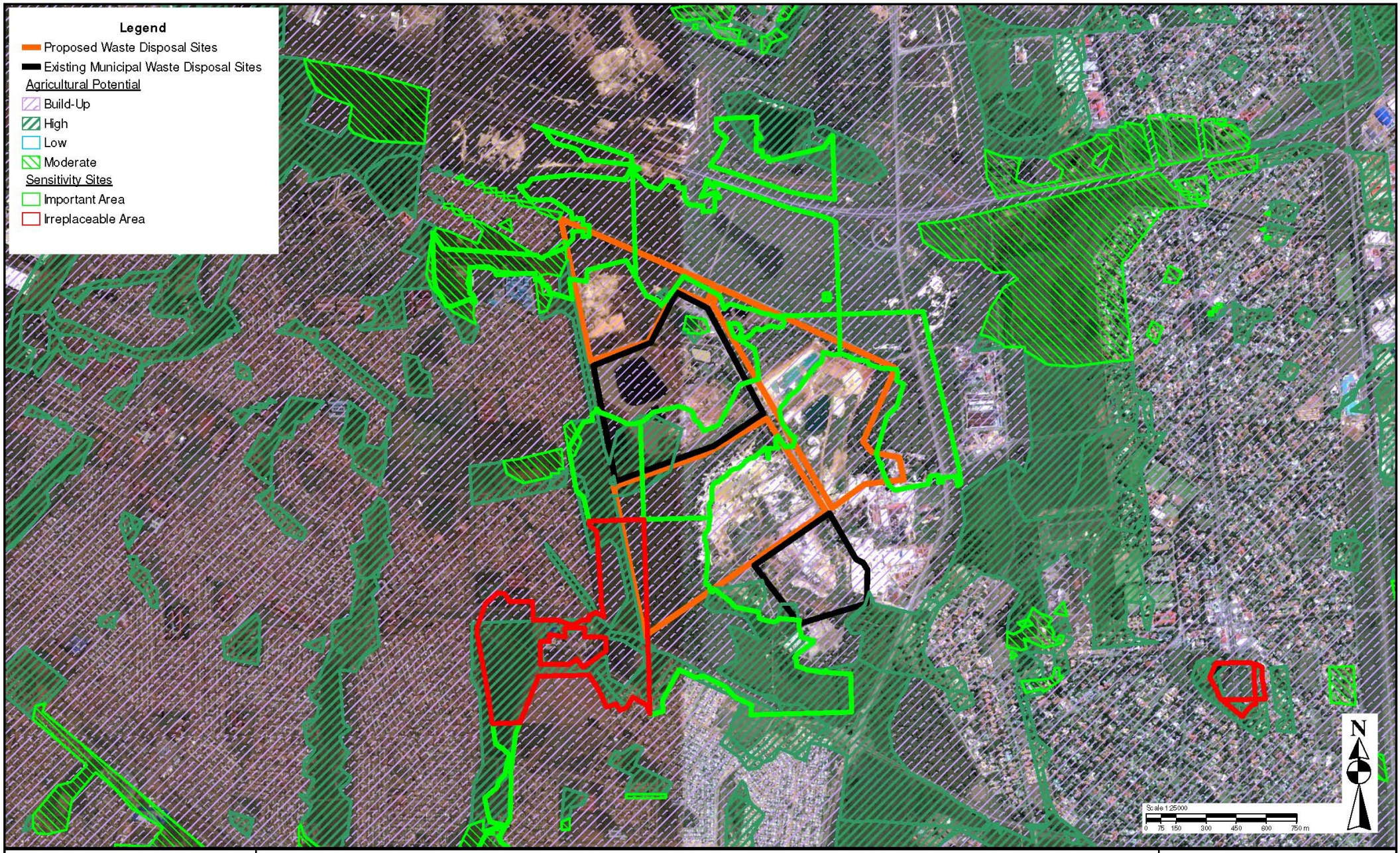
MAP 1

PROPOSED NEW TONK METER ROAD GLB^{+} / CLASS B WASTE DISPOSAL FACILITY AT RIETFONTEIN, SPRINGS

LOCALITY MAP – Regional and Local Context

MAP 2:

Proposed Areas for Tonk Meter Road WDF

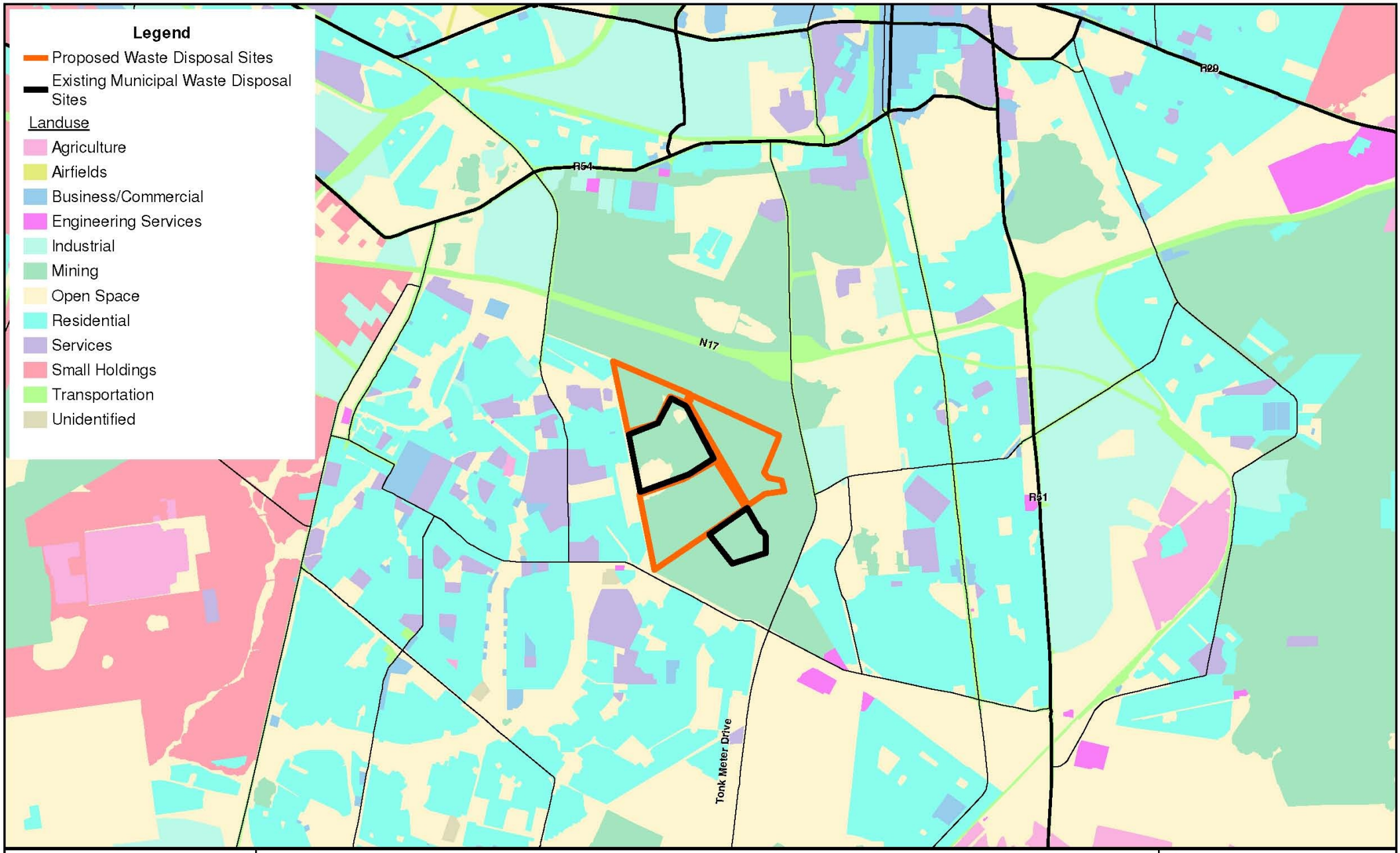


PROPOSED NEW TONK METER ROAD GLB+ / CLASS B
WASTE DISPOSAL FACILITY AT RIETFONTEIN, SPRINGS

GAUTENG C-PLAN MAP

MAP 3

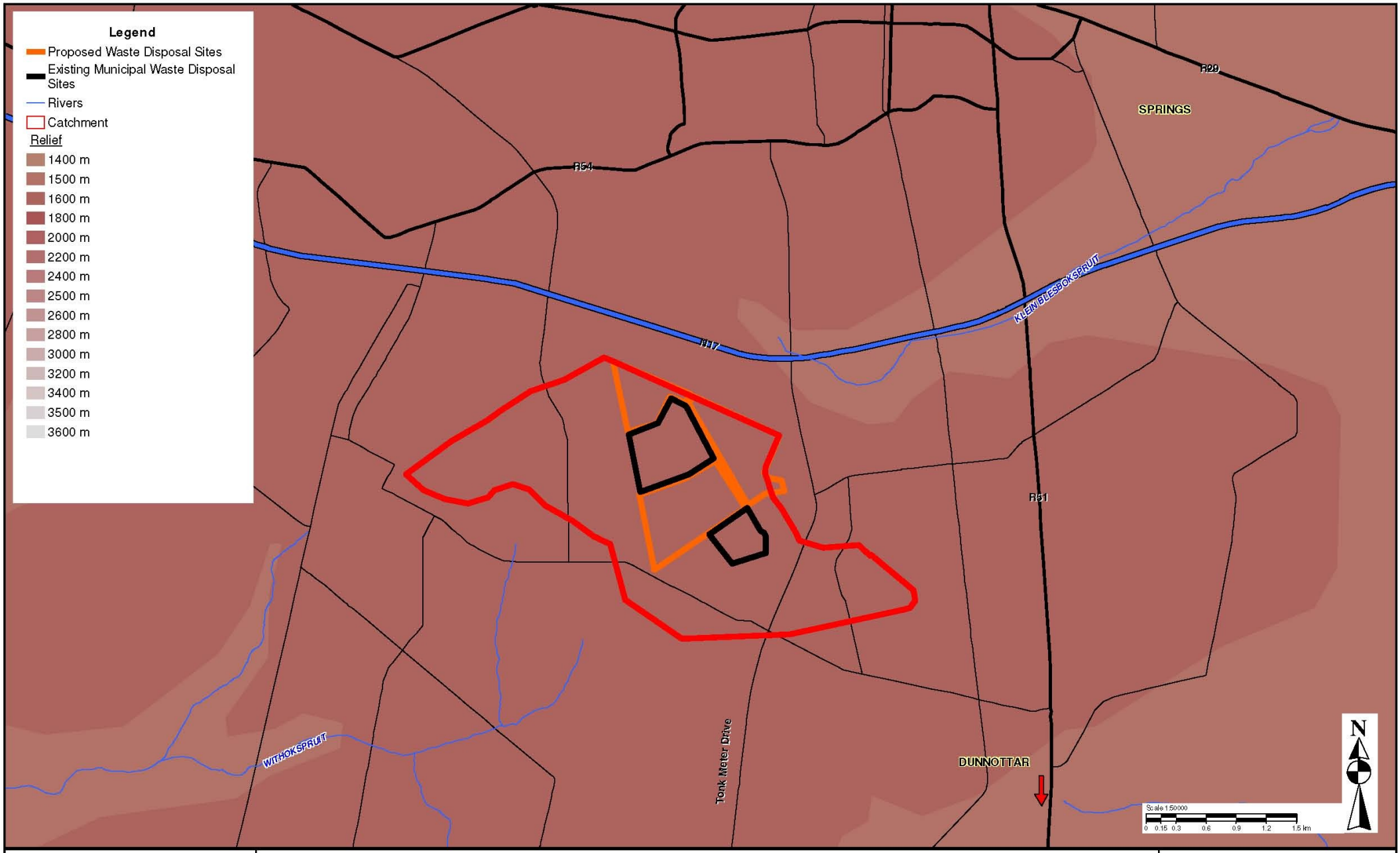
Drawn:	LC Gallagher
Checked:	B le Roux
Approved:	B le Roux
Date:	2012_01_17
Map Ref:	.../Environ/Verif Rietfontein Landfill
View Ref:	Gauteng C-Plan Map



LANDUSE MAP

MAP 4

Drawn:	LC Gallagher
Checked:	B le Roux
Approved:	B le Roux
Date:	2012_01_17
Map Ref:	.../Environ/Verf Rietfontein Landfill
View Ref:	Landuse Map

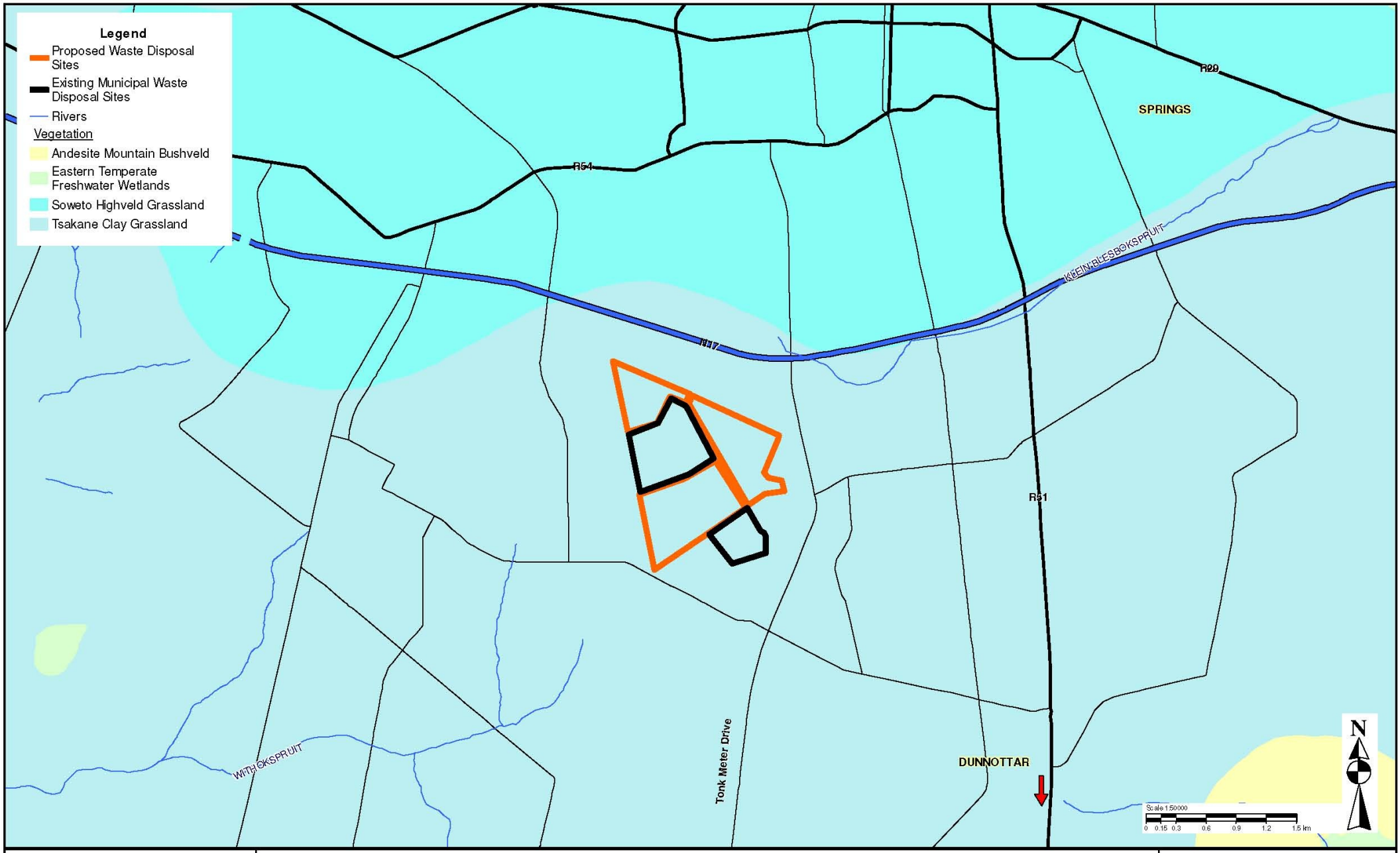


BKS

TOPOGRAPHY, RIVERS MAP

MAP 5

Drawn:	LC Gallagher
Checked:	B le Roux
Approved:	B le Roux
Date:	2012_01_17
Map Ref:	.../Environ/Verf Rietfontein Landfill
View Ref:	Topography, Rivers Map



VEGETATION MAP

MAP 6

Drawn:	LC Gallagher
Checked:	B le Roux
Approved:	B le Roux
Date:	2012_01_17
Map Ref:	.../Environ/Verrf Rietfontein Landfill
View Ref:	Vegetation Map

Appendix B: Specialist Declaration Form

SPECIALIST DECLARATION FORM

PROJECT TITLE

GDARD REF NO.: GAUT 002/11-12/W0016 & GAUT 002/11-12/E028

PROPOSED NEW TONK METER ROAD GLB+ WASTE DISPOSAL FACILITY AT RIETFONTEIN, SPRINGS

Specialist:	Plant scientist and wetland delineation		
Contact person:	Betsie le Roux		
Postal address:	PO Box 3173; Pretoria		
Postal code:	0001	Cell:	072 983 7976
Telephone:	012 421 3579	Fax:	-
E-mail:	betsielr@bks.co.za		
Professional affiliation(s) (if any)	N/A		

Project Consultant:	BKS (Pty) Ltd		
Contact person:	Lucille Behrens		
Postal address:	P.O. Box 272, Port Elizabeth		
Postal code:	6000	Cell:	082 922 1645
Telephone:	041 585 2514	Fax:	041 585 8478
E-mail:	lucilleb@bks.co.za		

The specialist appointed in terms of the Regulations_

I, Betsie le Roux , declare that --

General declaration:

- I act as the independent specialist in this application
- 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
- I declare that 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 Act, regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, 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 realise that a false declaration is an offence in terms of Regulation 71 and is punishable in terms of section 24F of the Act.

bRax

Signature of the specialist:
BKS (Pty) Ltd

Name of company (if applicable):
10 September 2012

Date:

CURRICULUM VITAE

CAROLINA ELIZABETH (BETSIE)

Environmental Scientist

NATIONALITY:
South African

EQUITY GROUP:
White female – no disabilities

YEARS OF EXPERIENCE:
5 years

YEARS WITH FIRM:
4 years

CIVIL STATUS:
Married

DATE OF BIRTH:
18 December 1983

KEY QUALIFICATIONS:
M.Sc Plant Sciences

EDUCATION:

Degree	Institution	Specialty	Year
M.Sc	University of Pretoria	Plant Science	2007

EMPLOYMENT HISTORY:
BKS (Pty) Ltd, Environmental Management Department
2008 - Present
Ecologist

Plan Practice
2007
Assistant Environmental Scientist

CURRICULUM VITAE

RELEVANT PROJECT EXPERIENCE:

Ecological and wetland assessments

- Wetland delineation for a Water Use License Application (WULA) for a proposed bridge over the Mooi River. 2008. Potchefstroom.
- Vegetation assessment for an EIA for an Ammunition Demilitarization Facility. 2009. De Aar, Northern Cape
- Vegetation assessment and wetland delineation for an EIA for a proposed Msukaligwa landfill site. Ermelo, 2009. Mpumalanga.
- Ecological and wetland delineation for a proposed landfill site. 2011. Secunda, Mpumalanga.
- Ecological and wetland delineation for a proposed waste transfer station. 2011. Rustenburg, North West.
- Ecological and wetland delineation for a proposed landfill site. 2012. Delmas, Mpumalanga.
- Komati Water Scheme Augmentation Project. Vegetation assessment, wetland delineation and wetland rehabilitation for baseline studies and amendment EIA. 2009. Kriel, Mpumalanga.
- Vegetation assessment & wetland delineation for EIA. 2009. Majuba Power Station, Mpumalanga.
- Fibre optic cable. Ecological study for Basic Assessment. 2009. N1 from Musina to Midrand.
- Ecological assessment and wetland delineation for the Basic Assessment; construction of feeder main for water supply. 2010. Sekampaneng, Hammanskraal.
- Ecology and wetland delineation for a Land Assessment. 2011. Lethabo Power Station, Free State.
- Biodiversity chapter for an EMF. Gert Sibande District Municipality, 2009.Mpumalanga.
- Biodiversity chapter for SoER. West Rand District Municipality. Gauteng. 2010.
- Ecological assessment for ESI for the proposed nCwabeni Off Channel Storage Scheme. 2011. Port Shepstone, KwaZulu-Natal.
- Biodiversity chapter for the SoER. Bojanala Platinum District Municipality, North West. 2011.

Water quality assessments

- Water quality chapter for a trans-boundary catchment management plan. 2009. Limpopo River Basin, which is shared between South Africa, Mozambique, Zimbabwe and Botswana.
- Water quality chapter for a trans-boundary catchment management plan. 2009. Inkomati River Basin, which is shared between South Africa, Lesotho and Mozambique.
- Water quality chapter for an EMF. Gert Sibande District Municipality, Mpumalanga. 2009.
- Water chapter for SoER. West Rand District Municipality. Gauteng. 2010.
- Water chapter for the SoER. Bojanala Platinum District Municipality, North West. 2011.
- Selection of disposal sites for Acid Mine Drainage. 2011. Johannesburg, Gauteng.
- Limnological assessment for ESI for the proposed nCwabeni Off Channel Storage Scheme. 2011. Port Shepstone, KwaZulu-Natal.

COURSES / SYMPOSIUMS / CONFERENCES ATTENDED:

Wetland and riparian delineation course for consultants, 2008, DWA

AWARDS:

Margaretha Mes Award, RSA - best third year female student in Botany

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