

DRAFT BASIC ASSESSMENT REPORT FOR THE PROPOSED TIJGER VALLEY EXTENTION 14 & 34

On a Part of Portion 5 of the Farm Tyger Valley 334
JR, Pretoria.

GAUT: 002/14-15/0091

APRIL 2015



BOKAMOSO

LANDSCAPE ARCHITECTS AND ENVIRONMENTAL CONSULTANTS

Tel: (012) 346 3810
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P O BOX 11375
MAROELANA
0161



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Application Form

LEBOMBO GARDENS BUILDING
36 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizelleg@mweb.co.za
Website: www.Bokamoso.biz



Landscape Architects, Environmental Consultants,
Environmental Auditing, Water License Applications

**Gauteng Department of Agriculture
and Rural Development
Ground floor SUE Admin Unit
11 Diagonal Street
JOHANNESBURG
2000
Tel: 011 240 3051**

ATTENTION: Bongani Shabangu

21 July 2014

**RE: APPLICATION FORM FOR THE PROPOSED TIJGER VALLEY EXTENSION 14 &
34 SITUATED ON PART OF PORTION 5 OF THE FARM TYGERVALLEY 334 JR**

Please find 3 X hard copies of the Application Form for the abovementioned project.

We trust you find the above in order. Please do not hesitate to contact our office should you have any questions in this regard.

Sincerely,


Ané Agenbacht

**Bokamoso Landscape Architects and
Environmental Consultants CC**



Application Form for Environmental Authorisation in terms of National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010, as amended (version 2)

Kindly note that:

1. This application form is current as of 01 April 2014. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
 2. The application must be typed within the spaces provided in the form. The sizes of the spaces provided are not necessarily indicative of the amount of information to be provided. Spaces are provided in tabular format and will extend automatically when each space is filled with typing.
 3. Incomplete applications may be returned to the applicant for revision.
 4. The use of the phrase "**not applicable**" in the form must be done with circumspection. Should it be done in respect of material information required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the Regulations.
 5. Three copies of this form must be handed in at the offices of the relevant competent authority as detailed below.
 6. No faxed or e-mailed applications shall be accepted. Only hand delivered or posted applications will be accepted.
 7. Unless protected by law, all information filled in on this application will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this application on request, during any stage of the application process.
 8. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
-

For official use only

Application Number:
NEAS Reference number:
Date Received:

1. DEPARTMENTAL DETAILS

Postal Address

Gauteng Department of Agriculture and Rural Development
Attention: Deputy Director: Strategic Administrative Unit of the Sustainable Utilization of the Environment (SUE) Branch
P. O. Box 8769
Johannesburg
2000

Physical Address

Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
Ground floor, Diamond Building, 11 Diagonal Street
Johannesburg

Queries should be directed to the Strategic Administrative Unit at:

Administrative Unit telephone number (011) 240 3051/3052
Administrative Unit fax number (011) 240 3055
Departmental central telephone number (011) 240 2500

View the Department's website at <http://www.gdard.gov.za> for the latest version of the documents

Application for Environmental Authorisation in terms of NEMA

Proof of payment must accompany this application. The application will not be processed without proof of payment unless one of the exclusions provided for in the fee Regulations is applicable **AND** such information in the exclusion section of this application form has been confirmed by this Department.

2. FEES

Gauteng Department of Agriculture and Rural Development' details for the payment of application fees

Payment Enquiries:

Contact person: Boniswa Belot
Tel: (011) 240 3377/3051
Email: Boniswa.Belot@gauteng.gov.za

Department Banking details:

Bank Name: FNB Bank
Account Name: GPG Agriculture and Rural Development PMG
Account Number: 62298144058
Branch Name and Number: Global Transactional Services Johannesburg - 255005

Reference number: EIA – Tiger Valley Extension(2014–7–17) of payment e.g. EIA20140401 (please quote this reference number when making payment)

Application form to be submitted with proof of payment attached- Annexure 1

Tax exemption status:

Status: Tax Exempted

EXCLUSIONS

An applicant is excluded from paying fees if:

- The activity is a community based project funded by a government grant; or
- The applicant is an organ of state.

Applicants are required to tick the appropriate box below to indicate that either proof of payment is attached or that, in the applicant's view, exclusion applies. Proof and a motivation for exclusions must be attached to this application form as **Annexure 2**.

Proof attached

Exclusion applies

TYPE OF EXCLUSION	Tick where applicable. Proper motivation must be attached to the application
The activity is a community based project funded by a government grant	
The applicant is an organ of state	

FEE AMOUNT

Application	Fee
Applications for an environmental authorisation for which basic assessment is required in terms of the Environmental Impact Assessment Regulations	R2 000
Application for an environmental authorisation, for which S&EIR is required in terms of the Environmental Impact Assessment Regulations	R10 000
Applications dealt with in terms of section 24L of the Act (where an environmental authorisation is required in terms of NEMA and a waste management license is required in terms of NEMWA and the same competent authority is dealing with both these applications)	100% of the most expensive application, namely, R10 000 (Ten Thousand Rand) if S&EIR is triggered and R2 000 (Two Thousand Rand) if the basic assessment is triggered; (b) 50% of the other application, namely, R5 000-00 (Five Thousand Rand) if the S&EIR is triggered or R1 000 (One Thousand Rand) if the basic assessment is triggered.

3. PROJECT TITLE

Tijger Valley Extension 14 & 34

4. PROPERTY DESCRIPTION

Proposed Residential Township Development on Part of Portion 5 of the Farm Tygervally 334 JR
--

5. APPLICANT INFORMATION

Project applicant:	André Wright		
Responsible position	Director		
Contact person:	André Wright		
Physical address:	1133 Jan Shoba Street (Duncan Street), Brooklyn, Pretoria		
Postal address:	P O Box 12516, Hatfield		
Postal code:	0028	Cell:	082 554 8098
Telephone:	012-429 7300	Fax:	012-346 8687
E-mail:	Andrew@boogertmanpta.co.za		

Local municipality	City of Tshwane Metropolitan Municipality		
Contact person:	Livhuwani Siphuma		
Postal address:	P Bag X1454, Pretoria		
Postal code:	0001	Cell:	082 772 5450
Telephone:	012 358 8871	Fax:	012 358 8934
E-mail:	livhuwanis@tshwane.gov.za		

Where there is more than one local authority involved, please attach a list of those authorities with their contact details as **Annexure 3**.

Land owner	Pasqua Tamma		
Contact person:	André Wright		
Postal address:	P.O. Box 12516, Pretoria		
Postal code:	1020	Cell:	082 554 8098
Telephone:	082 554 8098	Fax:	086 570 5659
E-mail:	Andrew@boogertmanpta.co.za		

In instances where there is more than one landowner, please attach a list of those landowners with their contact details as **Annexure 4**. If the applicant is not the owner or person in control of the land, proof of notice to the landowner or person in control of the land on which the activity is to be undertaken must be submitted as **Annexure 5**.

6. ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP) INFORMATION

EAP:	Ané Agenbacht
Professional affiliation/registration:	
Contact person (EAP):	Ané Agenbacht
Company:	Bokamoso Landscape Architects & Environmental Consultants

Physical address:

36 Lebombo Road, Lebombo Garden Building, Ashlea Gardens,
0081

Postal address:

P O Box 11375, Maroelana

Postal code:

0161

Cell:

083 533 0420

Telephone:

012 346 3810

Fax:

086 570 5659

E-mail:

lizelleg@mweb.co.za

7. ACTIVITY(S) APPLIED FOR

An application may be made for more than one listed or specified activity that, together, make up one development proposal. All the listed activities that make up this application must be listed.

Number of the Government Notice:	Activity No (s)	Describe each listed activity as per the wording in the listing notices:
R544 of 18 June 2010	Listing Notice 1, Activity 9	The construction of facilities or infrastructure exceeding 1000metres in length for the bulk transportation of water, sewage or storm water: (i) With an internal diameter of 0.36metres or more; or (ii) with a peak throughput of 120m litres per second or more, excluding where: a) such facilities or infrastructure are for bulk transportation of water, sewage or storm water drainage inside a road reserve; or b) where such construction will occur within urban areas but further than 32 metres of a watercourse, measured from the edge of a watercourse.
R544, of 18 June 2010	Listing No. 1, Activity 10	The construction of facilities or infrastructure for the transmission and distribution of electricity- (i) outside urban area or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.
R544, of 18 June 2010	Listing No.1, Activity 11	The construction of: (i) Canals; (ii) Channels; (iii) Bridges; (iv) Dams; (v) Weirs; (vi) Bulk storm water outlets structures;

		<p>(vii) Marinas;</p> <p>(viii) Jetties exceeding 50 square metres in size;</p> <p>(ix) Slipways exceeding 50 square metres in size;</p> <p>(x) Buildings exceeding 50 square metres in size;</p> <p>(xi) Infrastructure or structures covering 50 square metres or more</p> <p>where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>
R. 544, of 18 June 2010	Listing No. 1, Activity 18	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from:</p> <p>A watercourse;</p> <p>The sea</p> <p>The seashore;</p> <p>The littoral active zone, an estuary or a distance of 100 metres inland of the highwater mark of the sea or an estuary, whichever distance is the greater-</p> <p>But excluding where such infilling, depositing, dredging, excavation, removal or moving:</p> <p>Is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or</p> <p>Occurs behind the development setback line</p>
R. 544, of 18 June 2010	Listing No. 1, Activity 22	<p>The construction of a road, outside urban areas,</p> <p>(i) With a reserve wider than 13.5 meters, or</p> <p>(ii) Where no reserve exists where the road is wider than 8 meters, or</p> <p>(iii) For which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010</p>
R. 544, of 18 June 2010	Listing No. 1, Activity 23	<p>The transformation of undeveloped, vacant or derelict land to-</p> <p>Residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed to 5 hectares or more, but less than 20 hectare; or</p>

		Residential , retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares-
		Except where such transformational takes place for linear activities.
R. 544, of 18 June 2010	Activity 26	Any process or activity identified in term of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004).

Listing Notice 3:

R. 546. of 18 June 2010	Listing No.3. Activity 13	<p>The clearance of an area of 1 hectare of more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, expect where such removal of vegetation is required for:</p> <ol style="list-style-type: none"> 1. The undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from this list. 2. The undertaking of a linear activity falling below the thresholds mentioned in Listing Notice 1 in terms of GN No.544 of 2010. 	<p>d. in Gauteng:</p> <ol style="list-style-type: none"> (i) A protected area identified in terms of NEMPAA, excluding conservancies; (ii) National Protected Area Expansion Strategy Focus areas; (iii) Any declared protected area including Municipal or Provincial Nature Reserves as contemplated area including Municipal or Provincial Nature Reserves as contemplated by the Environment Conservation Act 1989 (Act No. 73 of 1989), the Nature conservation Ordinance (Ordinance 12 of 1983); (v) Sensitive area as identified in an environmental management framework as contemplated in chapter 5 of the Act
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			<p>and as adopted by the competent authority;</p> <p>(iv) sites or areas identified in terms of an International Convention;</p> <p>(v) Sites identified as irreplaceable or important in the Gauteng Conservation Plan.</p>
R.546, of 18 June 2010	Listing No.3 Activity 16	<p>The construction of:</p> <ol style="list-style-type: none"> 1. Jetties exceeding 10 square metres in size; 2. Slipways exceeding 10 square metres in size; 3. Building with a footprint exceeding 10 square metre in size; or 4. Infrastructure covering 10 square metres or more 5. Where such construction occurs within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line. 	<p>b. In Gauteng:</p> <p>(i) A protected area identified in terms of NEMPAA., excluding conservancies;</p> <p>(ii) National Protected Area Expansion Strategy Focus areas;</p> <p>(iii) Sensitive areas as identified in an environment framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(iv) Sites or areas identified in terms of an international Convention;</p> <p>(v) Sites identified as irreplaceable or important in the Gauteng Conservation Plan;</p> <p>(vi) Any declared protected area including Municipal or Provincial Nature Reserves as contemplated by the Environment</p>

			Conservation Act, 1989 (Act No.73 of 1989) and the Conservation Ordinance (Ordinance 12 of 1983); (vii) Areas zoned for a conservation purpose.
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Please note that any authorisation that may result from this application will only cover activities applied for.

8. SECTOR BASED PROJECT DESCRIPTION

Please indicate which sector the project falls under by crossing out the relevant block in the table below:

Green economy + "Green" and energy-saving industries		Greenfield transformation to urban or industrial form	X
Infrastructure – electricity (generation, transmission & distribution)		Biodiversity or sensitive area related activities	
Biofuels		Potential of metal fabrication capital & transport equipment – arising from large public investments	
Basic services (local government) – electricity and electrification		Boat building	
Basic services (local government) – area lighting		Manufacturing – automotive products and components, and medium and heavy commercial vehicles	
Infrastructure – transport (roads, land strips)		Manufacturing – plastics, pharmaceuticals and chemicals	
Basic services (local government access roads)		Manufacturing – clothing textiles, footwear and leather	
Basic services (local government) – public transport		Forestry, paper, pulp and furniture	
Infrastructure – water (bulk and reticulation)		Business process servicing	
Basic services (local government) – sanitation		Basic services (local government) – education	
Basic services (local government) – waste management		Basic services (local government) – health	
Agricultural value chain + agro-processing (linked to food security and food pricing imperatives)		Basic services (local government) – housing	
Infrastructure – information and communication technology		Basic services (local government) security of tenure	
Tourism + strengthening linkages between cultural industries and tourism		Other (Stormwater management infrastructure)	
Basic services (local government) – public open spaces and recreational facilities			

9. SOCIO-ECONOMIC VALUES

Provide details on the anticipated socio-economic values associated with the proposed project

Anticipated CAPEX of the project on completion	R45 million
What is the expected annual income to be generated by or as a result of the project?	R 2 million
New skilled employment opportunities created in the development phase of the project	Nil
New skilled employment opportunities created in the construction phase of the project	30 construction workers
New un-skilled employment opportunities created in the development phase of the project	50
New un-skilled employment opportunities created in the construction phase of the project	50
What is the expected value of the employment opportunities during the development and construction phase?	R2,5m
What percentage of this new unskilled and skilled value that will accrue to previously disadvantaged individuals during both development and construction phase of the project?	R1.5m
What percentage of this value that will accrue to previously disadvantaged individuals?	Nil
The expected current value of the employment opportunities during the first 10 years	R3m
What percentage of this value that will accrue to previously disadvantaged individuals?	Nil

10. SITE DESCRIPTION

Farm name and number:

Tygervalley 334 JR

Portion / holding /erf number/

Part of Portion 5

(Where multiple properties (including alternatives) are involved, please attach a list of the properties as Annexure 6).

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The coordinates should be in decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative:

Latitude (S):

Longitude (E):

S25.793257°

E28.371 640°

In the case of linear activities:

Latitude (S):

Longitude (E):

- Starting point of the activity
- Middle point of the activity
- End point of the activity

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):	Longitude (E):

SG 21 Digit Code(s) of the properties

(If there are more than 4, please attach a list with the rest of the codes as **Annexure 8**)

Please indicate the proportion of the property/ies to be developed (ecological footprint) as a percentage for each property

T	0	J	R	0	0	0	0	0	0	0	0	0	3	3	4	0	0	0	0	5
1	2			3			4				5									

Should any activities in GN R.546 be applied for, please provide a map indicating the triggering area (e.g. Critical Biodiversity Area, Conservancy Area, etc) overlaid by the study area in **Annexure 9**.

11. LAND USE ZONING

The zoning certificate of the property where the activity is going to be undertaken must be attached as **Annexure 10**

12. PROJECT SCHEDULE

A project schedule, indicating the different phases and timelines of the project, must be attached as **Annexure 11**.

13. OTHER AUTHORISATIONS REQUIRED

LEGISLATION	AUTHORISATION REQUIRED		APPLICATION SUBMITTED	
	YES	NO	YES	NO
SEMA's				
National Environmental Management: Air Quality Act		X		
National Environmental Management: Biodiversity Act		X		
National Environmental Management: Integrated Coastal Management Act		X		
National Environmental Management: Protected Areas Act		X		
National Environmental Management: Waste Act		X		
National legislation				
Mineral Petroleum Development Resources Act		X		
National Water Act	X			X
National Heritage Resources Act		X		
Others: Please specify		X		

Please provide proof of authorisations of submission of applications (if there are any) as **Annexure 12**.

14. LOCALITY MAP

A clear and legible locality map must be submitted with the application as **Annexure 13**

15. LIST OF ANNEXURES

		YES	N/A
Annexure 1	Proof of payment of a fee for this application	X	
Annexure 2	Proof and a motivation for exclusions from paying a fee		X
Annexure 3	List of Local Municipalities (with contact details)		X
Annexure 4	List of land owners (with contact details) and proof of notification of land owners in the event there is more than one land owner.		X
Annexure 5	Proof of notice to the landowner or person in control of the land on which the activity is to be undertaken	X	
Annexure 6	List of properties in the case of multiple properties involved		X
Annexure 7	List of co-ordinates at turning points for linear activities		X
Annexure 8	SGIDs		X
Annexure 9	Map indicating triggered areas for GN R.546	X	
Annexure 10	Land use zoning or zoning certificate of the property	X	
Annexure 11	Project schedule		X
Annexure 12	Proof by way of copies of Environmental Authorisations obtained for the same property or submission of such applications	X	
Annexure 13	Locality map	X	
Addendum 1	Declaration by the applicant	X	
Addendum 2	Declaration by the environmental assessment practitioner	X	

ADDENDUM 1

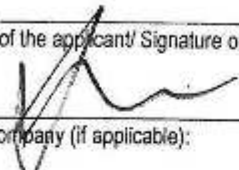
16. DECLARATIONS

DECLARATION OF THE APPLICANT

I Andre Wright, declare under oath that I

- am, or represent, the applicant in this application;
- have appointed / will appoint (delete that which is not applicable) an Environmental Assessment Practitioner (EAP) to act as the independent EAP for this application / will obtain exemption from the requirement to obtain an environmental assessment practitioner;
- will provide the EAP and the competent authority with access to all information at my disposal that is relevant to the application;
- will be responsible for the costs incurred in complying with the Regulations, including but not limited to –
 - costs incurred in connection with the appointment of the EAP or any person contracted by the EAP;
 - costs incurred in respect of the undertaking of any process required in terms of the Regulations;
 - costs in respect of any fee prescribed by the Minister or MEC in respect of the Regulations;
 - costs in respect of specialist reviews, if the competent authority decides to recover costs; and
 - the provision of security to ensure compliance with conditions attached to an environmental authorisation, should it be required by the competent authority;
- will ensure that the EAP is competent to comply with the requirements of the Regulations and will take reasonable steps to verify that the EAP
 - know the Act and the regulations, and how they apply to the proposed development
 - know any applicable guidelines
 - perform the work objectively, even if the findings do not favour the applicant
 - disclose all information which is important to the application and the proposed development
 - have expertise in conducting environmental impact assessments
 - complies with the Regulations
- will inform all registered I&APs of any suspension of the application as well as of any decisions taken by the competent authority in this regard;
- am responsible for complying with the conditions of any environmental authorisation issued by the competent authority;
- hereby indemnify the Government of the Republic, the competent authority and all its officers, agents and employees, from any liability arising out of the content of any report, any procedure or any action which the applicant or EAP is responsible for in terms of these Regulations;
- will not hold the competent authority responsible for any costs that may be incurred by the applicant in proceeding with an activity prior to obtaining an environmental authorisation or prior to an appeal being decided in terms of these Regulations;
- will perform all other obligations as expected from an applicant in terms of the Regulations;
- 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.

Signature of the applicant/ Signature on behalf of the applicant:



Name of company (if applicable):

2014/07/17

Date:



Signature of the Commissioner of Oaths:

2014/07/17

Date:

Designation:

Commissioner of Oaths Official stamp (below)

WILLEM JACOBUS MARX
COMMISSIONER OF OATHS
36 LEBOMBO ROAD
ASHLEA GARDENS
PRETORIA 0081
CHARTERED ACCOUNTANT OF SOUTH AFRICA

ADDENDUM 2

DECLARATION OF THE EAP

I, Ané Agenbacht, declare that -

- I act as the independent environmental practitioner 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 environmental impact assessments, 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 will take into account, to the extent possible, the matters listed in regulation 8 of the Regulations when preparing the application and any report relating to the application;
- 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;
- I will ensure that information containing all relevant facts in respect of the application is distributed or made available to interested and affected parties and the public and that participation by interested and affected parties is facilitated in such a manner that all interested and affected parties will be provided with a reasonable opportunity to participate and to provide comments on documents that are produced to support the application;
- I will ensure that the comments of all interested and affected parties are considered and recorded in reports that are submitted to the competent authority in respect of the application, provided that comments that are made by interested and affected parties in respect of a final report that will be submitted to the competent authority may be attached to the report without further amendment to the report;
- I will keep a register of all interested and affected parties that participated in a public participation process; and
- I will provide the competent authority with access to all information at my disposal regarding the application, whether such information is favourable to the applicant or not
- all the particulars furnished by me in this form are true and correct;
- will perform all other obligations as expected from an environmental assessment practitioner in terms of the Regulations; and
- I realise that a false declaration is an offence in terms of regulation 71 of the Regulations and is punishable in terms of section 24F of the Act.

Ané Agenbacht

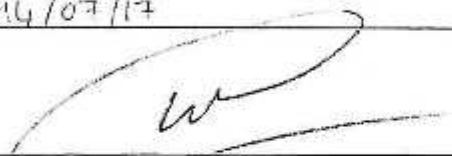
Signature of the Environmental Assessment Practitioner:

Bokamoso Landscape and Environmental Consultants CC

Name of company:

2014/07/17

Date:



Signature of the Commissioner of Oaths:

2014/07/17

Date:

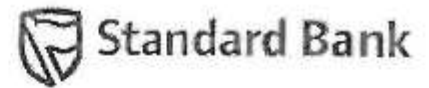
Designation:

Commissioner of Oaths Official stamp (below)

WILLEM JACOBUS MARX
COMMISSIONER OF OATHS
36 LEBOMBO ROAD
ASHLEA GARDENS
PRETORIA 0081
CHARTERED ACCOUNTANT OF SOUTH AFRICA

Annexure 1: Proof of payment of a fee for this application

Payment Receipt



Beneficiary name:	GPG Agriculture and
Bank name:	FIRST NATIONAL BANK
Beneficiary account number:	62298144058
Branch code:	25500500
Branch name:	RMB CORPORATE BANKING JHB
My reference:	Tiger Valley
Beneficiary reference:	EIA-Tygervalley 2014-7-18
Payment date:	2014-07-18
Amount:	R 2,000.00

[Print](#)

[Close](#)

Annexure 2: Proof and a motivation for exclusion from paying a fee

N/A

Annexure 3: List of municipalities with contact details

N/A

Annexure 4: List of land owners with contact details and proof of notification of landowners in the event there is more than one land owner

N/A

Annexure 5: Proof of notice to the landowner or person in control of the land on which the activity is to be undertaken

List of REGISTERED LETTERS
 Lys van GEREgistreerde BRIEWE
 (With an Insurance option/met 'n versekeringsopsie)



Full tracking and tracing/Volledige volg en spoor

Name and address of sender
 Naam en adres van afsender: **Bobarnese P.O. Box 11375,
 Marcelloná 0161,
 Graystone.**

Insurance Number
 Tracking number
 Delivery number
0800 111 502

No	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer only Post Volg-en-Spoor kliëntesleutel
1	Pasqua Tammd 650 Sibelius street, Lukarand, 0181					
2						
3						
4						
5						
6						
7						
8						
9						
10						
Total Totaal		R	R	R	R	

Number of letters posted
 Getal briewe gepos: **1**

Signature of client
 Handtekening van klient: *[Signature]*

Signature of accepting officer
 Handtekening van aanneembampste: *[Signature]*

Date stamp
WENLYN
13 0 JUN 2014
7
0063
 Datumstempel

The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R2 000,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.

LEBOMBO GARDEN BUILDING
38 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizelleg@mweb.co.za
Website: www.bokamoso.biz



Dear Landowner

30 June 2014

Basic Assessment Process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010 (Version 1) for the proposed Residential Township Development on Part of Portion 5 of the Farm Tygervalley 334 JR

We hereby confirm that André Wright, appointed Bokamoso Landscape Architects and Environmental Consultants cc, to undertake a Basic Assessment Process in terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment (EIA) Regulations, 2010 (Version 1) for the proposed Residential Township Development on Part of Portion 5 of the Farm Tygervalley 334 JR as listed above.

In terms of the 2010 amended NEMA EIA Regulations, the applicant, if not the land-owner, must notify the land-owner and tenants of a proposed development planned on a property occupied by the land-owner/tenant. In the case of this application the property occupied by you (as the land-owner/ tenant) forms part of the land-parcel earmarked for the above-mentioned project.

This notification therefore represents the formal notification of land-owners and/or tenants of the proposed project on Part of Portion 5 of the Farm Tygervalley 334 JR. This notification letter will be submitted as part of the formal application to be submitted to the Gauteng Department of Agriculture and Rural Development (GDARD).

This notification also affords you the opportunity to register (at an early stage) as an Interested and Affected Party (I&AP) in the Basic Assessment Process. In order to register you are requested to fill in your full details on the form supplied below and to fax or e-mail your details to Juanita de Beer (public participation co-ordinator of Bokamoso) for the inclusion of your details onto our public participation database.

Once you are registered as an interested and affected party, we will keep you informed of the progress with the application and we will make all correspondence, documents and other information regarding the application available to you throughout the application process.

Registration as Interested and Affected Party	
Farm Name:	
Erf /Portion Number:	
Street Address:	
Landowner:	Name & Surname: Email address: Telephone: Cell phone: Fax Number: Postal Address:
Tenant Details: (if applicable)	Name & Surname: Email address: Telephone: Cell phone: Fax Number: Postal Address:

Sincerely,

Lizelle Gregory
Bokamoso Landscape Architects and Environmental Consultants cc

Deeds Office Property

TYGER VALLEY, 334, 5 (PRETORIA)

Deeds Office PRETORIA
 Date Requested 2014/06/30 08:46
 Information Source DEEDS OFFICE
 Reference -

Property Type FARM
 Farm Name TYGER VALLEY
 Farm Number 334
 Portion Number 5
 Local Authority KUNGWINI LOCAL MUNICIPALITY
 Registration Division JR
 Province GAUTENG
 Diagram Deed T24178/968
 Extent 21.4133H
 Previous Description -
 LPI Code TQJR0000000033400005

Owner 1 of 1
 Person Type PRIVATE PERSON
 Name TAMMA PASQUA
 ID Number 350226
 Title Deed T49417/1969
 Registration Date 1969/11/13
 Purchase Price (R) -
 Purchase Date -
 Share -
 Microfilm Reference 1989 0666 0474
 Multiple Properties NO
 Multiple Owners NO

#	Document	Institution	Amount (R)	Microfilm
1	NOTICE 1051 OF 1/8/9	7 ACT 70/70 NOT APPLICABLE	UNKNOWN	-

No documents to display

Annexure 6: List of properties
N/A

Annexure 7: List of coordinates at turning points of linear activities

N/A

Annexure 8: SGIDs

N/A

Annexure 9: Map indicating triggered areas for GN R.546



Legend

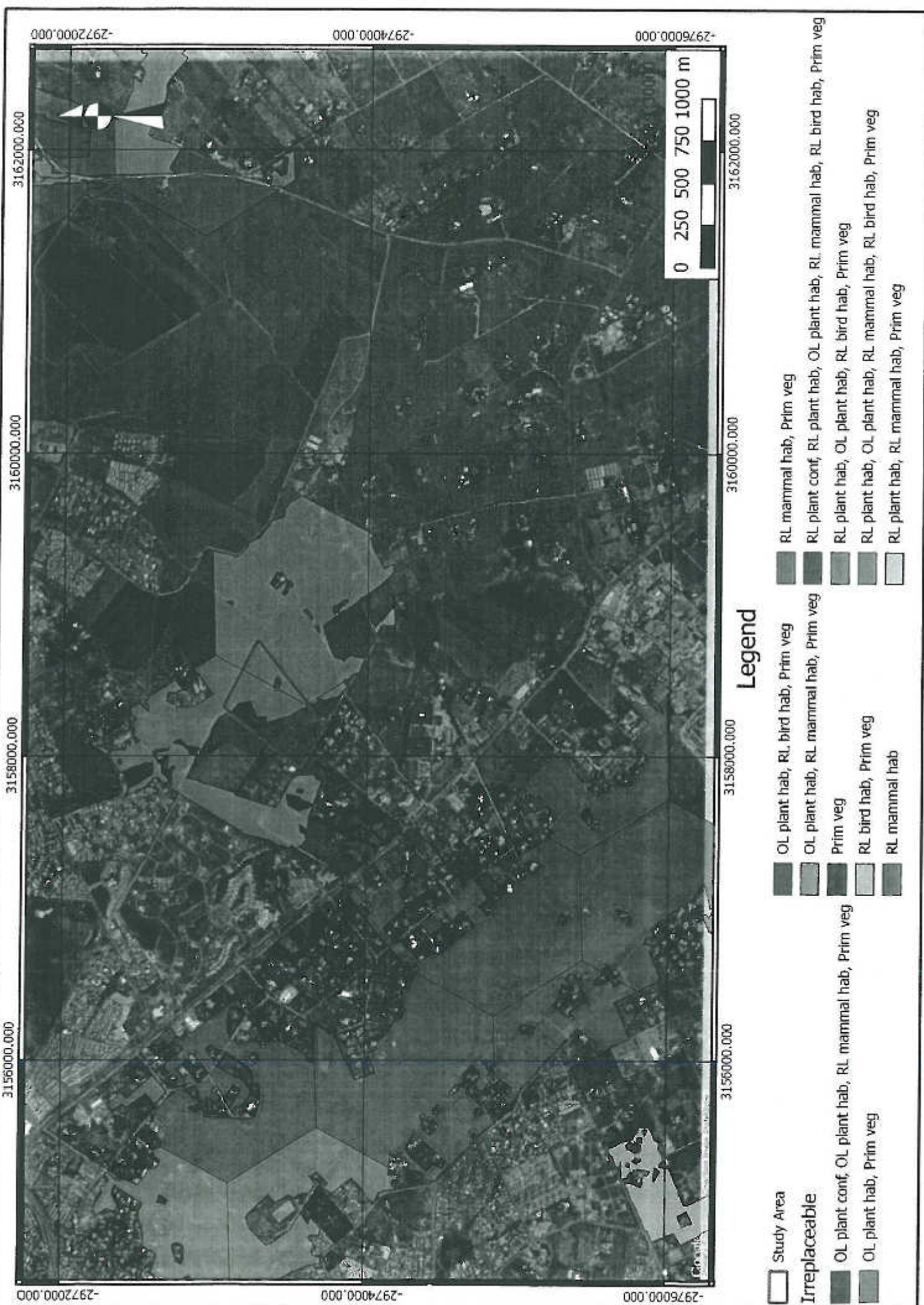
- Study Area
- CPlan Area
- Ecological Support Area
- Important Area
- Irreplaceable Area



-2976000.000 -2974000.000 -2972000.000

3156000.000 3158000.000 3160000.000 3162000.000

3156000.000 3158000.000 3160000.000 3162000.000



Study Area

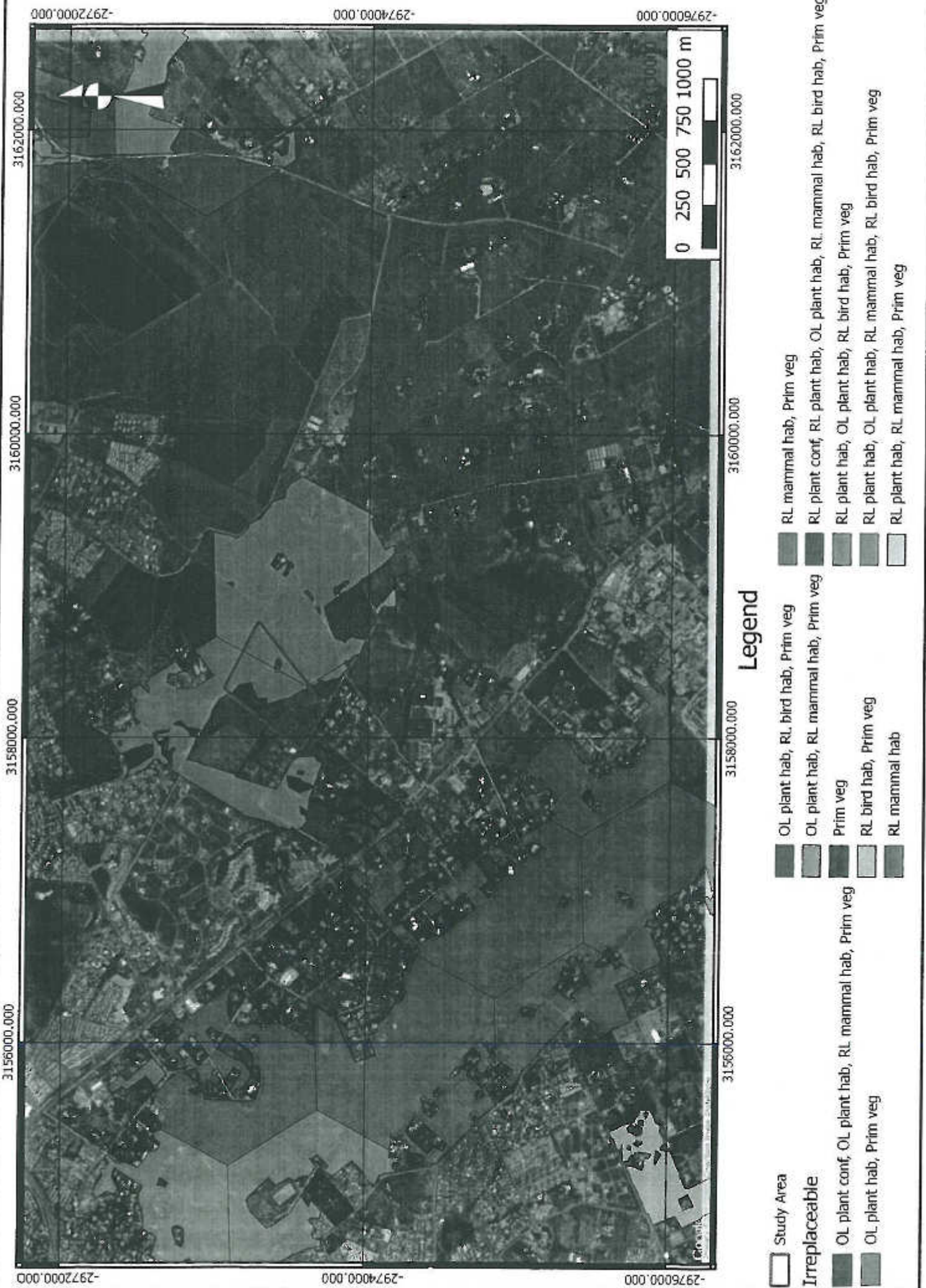
Irreplaceable

- OL plant conf, OL plant hab, RL mammal hab, Prim veg
- OL plant hab, Prim veg

- OL plant hab, RL bird hab, Prim veg
- OL plant hab, RL mammal hab, Prim veg
- Prim veg
- RL bird hab, Prim veg
- RL mammal hab

- RL mammal hab, Prim veg
- RL plant conf, RL plant hab, OL plant hab, RL mammal hab, RL bird hab, Prim veg
- RL plant hab, OL plant hab, RL bird hab, Prim veg
- RL plant hab, OL plant hab, RL mammal hab, RL bird hab, Prim veg
- RL plant hab, RL mammal hab, Prim veg

Legend



Annexure 10: Land use zoning or zoning certificate of the property

1. DESCRIPTION AND PURPOSE OF THE APPLICATION

The purpose of the application is the **Establishment of a Township** in terms of Section 96 (1) of the Town-Planning and Township Ordinance, 1986 (Ordinance 15 of 1986) on the property described here under in order to develop a **Residential Township**, to be known as **Tijger Valley Extension 14**.

2. PARTICULARS PERTAINING TO THE PROPERTY

2.1 Property Description

The proposed township is situated on **Part of Portion 5 of the farm TYGERVALLEY No. 334, Registration Division J.R., district of Pretoria** (vide **Deed of Transfer No. T49417/1969**, attached to the application documents).

2.2 Location of the Property

It is situated approximately 2,7km east of the Tshwane Metropolitan Municipal /Kungwini Local Municipal boundary, 750m north of Lynnwood Road and is south-south-east from Silver Lakes. "The property" measures approximately 9,9525 Ha.

2.3 Existing Zoning and Land Use of the Application Site

"The property" is currently zoned as agriculture and is vacant.

2.4 Registered Owner and Applicant

According to Deed of Transfer No. 49417/1969, "the property" is registered in the name of Pasqua Tamma (born on 26th February 1935). "The property" has been sold to Runtogo (Pty) Ltd. which is also the applicant.

2.5 Topography

The gradient of "the property" on which the residential development will take place, decline in a north-eastern direction towards the "spruit" with a mean gradient of approximately 10% (1:10).

3. PROPOSED DEVELOPMENT AND CONTROL MEASURES

3.1 Proposed Zoning

As indicated on the Layout Plan No. 15/4/218/3/1, attached to the application documents, the proposed township consists of streets, open space and erven with the following zoning:

- 37 erven for residential purposes to be zoned "Residential 1", for the erection of one dwelling unit per erf with no limitation on

Annexure 11: Project Schedule

N/A

Annexure 12: Proof by way of copies of Environmental Authorisations obtained for the same property or submissions of such applications



AGRICULTURE, CONSERVATION AND ENVIRONMENT

Office of the Head of Department

Diamond Corner Building, 88 Bloff & Market Street, Johannesburg
P O Box 8769, Johannesburg, 2000

Telephone: (011) 355-1900

Fax: (011) 333-0667

Email: trishh@gpp.gov.za

Website: <http://www.dacel.gpp.gov.za>

Reference: Gaut 002/03-04/185

Enquiries: Unine van den Berg

Telephone: (011) 355 1286

E-mail: unine.vandenberg@gauteng.gov.za

Andre Wright
Runtogo (Pty) Ltd
P. O. Box 12516
HATFIELD
0028

Fax: (012) 346 8687

BY FACSIMILE/ REGISTERED MAIL

Dear Sir/Madam

GRANTING OF CONDITIONAL AUTHORIZATION FOR PROJECT REFERENCE GAUT 002/03-04/185: PROPOSED TOWNSHIP DEVELOPMENT ON PORTION 5 OF THE FARM TYGER VALLEY 334 JR: GRAYSTONE ESTATE

Please find attached the Record of Decision in respect of your application for authorisation in terms of Regulations R1182 and R1183 (as amended) promulgated under sections 21, 22, 26 and 28 of the Environment Conservation Act (Act 73 of 1989).

Yours faithfully

Dr. S. F. Cornelius
Head of Department

Department of Agriculture, Conservation and Environment

Date: 15/05/2006

CC: Bokamoso Landscape Architects & Attn: Lizelle Gregory
Environmental Consultants Fax: (012) 460 7079
Kungwini Local Municipality Attn: Lynn Feneysey
Fax: (012) 809 0871



AGRICULTURE, CONSERVATION AND ENVIRONMENT

Diamond Corner Building, 68 Eloff & Market Street,
Johannesburg
P O Box 8769, Johannesburg, 2000

Telephone: (011) 355-1900
Fax: (011) 355-1000

Website: <http://www.gdace.gpg.gov.za>

RECORD OF DECISION FOR PROJECT REFERENCE GAUT 002/03-04/185

By virtue of the powers delegated by the Minister in terms of Section 22 of the Environment Conservation Act (Act 73 of 1989) ("the Act"), the Department of Agriculture, Conservation and Environment ("the Department") hereby authorises Runtogo (Pty) Ltd to undertake the activity specified/ detailed below subject to the indicated conditions.

1. DESCRIPTION, EXTENT AND LOCATION OF THE ACTIVITY:

The proposed activity is the change of land use to allow for township development which falls within the ambit of sub regulation 2(c) of Government Notice R1182 (as amended) promulgated under sections 21, 26 and 28 of the Act.

The township development is proposed to take place on Portion 5 of the farm Tyger Valley 334 JR to be known as Graystone Estate. The site falls within the jurisdiction of Kungwini Local Municipality of the Metsweding District Municipality.

2. KEY FACTORS INFORMING THE DECISION:

In reaching its decision in respect of the application, the Department has taken, *inter alia*, the following into consideration:

- a) The information contained in the:
 - Plan of Study for Scoping dated 7 July 2003.
 - Scoping Report dated June 2005.
 - The final layout plan drawn by Vlietsra Town and Regional Planning 15 February 2006.
 - Supporting document dated 20 March 2006.
- b) Information obtained from the Departmental information base including *inter alia*:
 - Geographical Information System (GIS).
 - Gauteng Open Space Programme (GOSP).
 - Kungwini Local Municipality's Integrated Development Plan.
 - Departmental Ridge Policy.
- c) Compliance with applicable departmental, provincial and national legislation, policies and guidelines including the principles set out in section 2 of the National Environmental Management Act 1998 (Act 107 of 1998).
- d) The findings of the site visit undertaken by Olivia Rakobela and Rosemary Maswakhoma on 18 October 2005.

In reviewing this information, the Department made the following findings:

- 1.1 The application entails the township development indicated as phase 1 on Portion 5 of the farm Tyger Valley 334 JR to be known as Graystone Estate.
- 1.2 The site is 21.41ha in extent and the proposed development will occupy 6.2706ha.

- 1.3 A river traverses the subject property.
- 1.4 The Gauteng Agricultural Potential Atlas – (GAPA 2002) indicates that part of the site has a moderate to low agricultural value.
- 1.5 The Gauteng Open Space Programme (GOSP) indicates that a part of the site is located on a class 2 ridge.
- 1.6 The proposed development falls outside of the urban edge, as demarcated in the Gauteng Spatial Development Framework (2002). The proposed development is nevertheless consistent with the surrounding development in the area and is accordingly not considered as constituting urban sprawl.

Based on the above, the Department's conclusion is that this activity will not lead to substantial detrimental impact on the environment, alternatively, that potential detrimental impacts resulting from this activity can be mitigated to acceptable levels and that the principles contained in section 2 of NEMA can be upheld.

The Department has accordingly decided, to grant Runtogo (Pty) Ltd authorisation in terms of Regulations R1182 and R1183 (as amended) promulgated under sections 21, 22, 26 and 28 of the Environment Conservation Act (Act 73 of 1989) subject to the conditions and provisions listed below.

3. CONDITIONS

3.1. Description and extent of the activity

The authorisation applies in respect of the change of land use to allow for township development on Portion 5 of the farm Tyger Valley 334 JR to be known as Graystone Estate.

The above activity falls within the ambit of sub regulation 2(c) of Government Notice R1182 (as amended) promulgated under sections 21, 26 and 28 of the Act.

The proposed township development will occupy 6,2706ha of the 21,41ha site and will be developed at a minimum nett density of 17 units per hectare.

3.2. Specific conditions

1. This authorisation is for Phase 1 development as described in 3.1 above.
2. No further development will be allowed on the property due to its ecological and biodiversity characteristics.
3. The development must adhere to the recommended buffer zone of 25 metres along the heritage site as indicated in the report. Any archaeological sites exposed during construction must not be disturbed during or after the construction period prior to authorisation from the South African Heritage Resources Agency (SAHRA). The removal, exhuming, destruction, altering or any other disturbance of heritage sites must be authorised by SAHRA in terms of the National Heritage Resources Act (Act No. 25 of 1999).
4. The development must adhere to all applicable Municipal by-laws.
5. To ensure that noise does not constitute a disturbance during construction it is instructed that construction activity may only take place between the hours of 8H00 and 17H00 weekdays, 8H00 and 13H00 Saturdays and no operation on Sundays and Public holidays.
6. The Department's Directorate of Conservation must be notified if any Red Data species found in the study area.
7. An Environmental Control Officer (ECO) must be appointed. The ECO, Developer and Contractor must be responsible for ensuring compliance with all the conditions of the Record of Decision, the provisions of the Environmental Management Plan (EMP) and other recommendations of the Environmental Impact Assessment (EIA) process. These people must also be familiar with the EMP.
8. A palisade fence must be erected to allow the movement of faunal species in the area not earmarked for the development during the construction phase.
9. A rehabilitation plan must be implemented during and after the construction activities so as to restore areas of natural vegetation. The disturbed areas must be covered with topsoil and re-vegetated with indigenous plant species, if all possible vegetated areas must be left undisturbed.

10. Provision for adequate facilities for the storage of oil, diesel etc. Such facilities must be designed in a way that would not pose threat to the environment. If any spillages occur, appropriate remediation must be followed.
11. To prevent release of hydrocarbon pollutants into the ground as well as storm water, no vehicle repairs must be undertaken on site during the construction phase.
12. If any groundwater or surface water pollution incident occurs, DWAF must be notified.
13. No development must be installed within the 1:50 and 1:100 year flood lines.
14. Water may not be extracted from a river for any activities related to the construction and operational phase of the development without the necessary permits from DWAF.
15. All recommendations made in the Report dated June 2005 and supporting documents with respect to the mitigation of potential environmental impacts must be strictly implemented. These recommendations are seen as an extension of this ROD and non-compliance therewith will constitute non-compliance with the conditions of this ROD.

3.3. General conditions

- a) Any changes to, or deviations from, the project description set out in this letter must be approved, in writing, by the Department before such changes or deviations may be effected. In assessing whether to grant such approval or not, the Department may request such information as it deems necessary to evaluate the significance and impacts of such changes or deviations.
- b) This Department may review the conditions contained in this letter from time to time and may, by notice in writing to the applicant, amend, add or remove a condition.
- c) The applicant must notify the Department, in writing, at least 10 (ten) days prior to the change of ownership, project developer or the alienation of any similar rights for the activity described in this letter. The applicant must furnish a copy of this document to the new owner, developer or person to whom the rights accrue and inform the new owner, developer or person to whom the rights accrue that the conditions contained herein are binding on them.
- d) Where any of the applicant's contact details change, including the name of the responsible person, the physical or postal address and/ or telephonic details, the applicant must notify the Department as soon as the new details become known to the applicant.
- e) Authorisation for the activity is granted in terms of the Environment Conservation Act, 1989 (Act 73 of 1989) only and does not exempt the holder from compliance with other relevant legislation.
- f) The applicant shall be responsible for ensuring compliance with the conditions contained in this letter by any person acting on his behalf, including but not limited to, an agent, servant, or employee or any person rendering a service to the applicant in respect the activity, including but not limited to, contractors and consultants.
- g) Departmental officials shall be given access to the property referred to in 1 above for the purpose of assessing and/ or monitoring compliance with the conditions contained in this document at all reasonable times.
- h) The applicant must notify the Department within 24 (twenty four) hours if any condition of this authorisation cannot, or is not, adhered to. The notification must be supplemented with reasons for non-compliance.

3.4. Duration of authorisation

If the activity authorised by this letter does not commence within 2 (two) years from the date of signature of this letter, the authorisation will lapse and the applicant will need to reapply for exemption or authorisation in terms of the above legislation or any amendments thereto.

4. CONSEQUENCES OF NON-COMPLIANCE

The applicant must comply with the conditions set out in this letter. Failure to comply with any of the above conditions may result in, *inter alia*, the Department withdrawing the authorisation, issuing directives to address the non-compliance – including an order to cease the activity – as well as instituting criminal and/or civil proceedings to enforce compliance.

5. APPEALS:

Appeals in respect of this decision must be directed to the MEC, Mr Khabisi Mosunkutu, Agriculture, Conservation and Environment, Gauteng Provincial Government within 30 (Thirty) days of the date of this decision. Appeals can be submitted utilizing one of the following methods:

By facsimile: (011) 333 0620;
 By post: P.O. Box 8769, Johannesburg 2000;
 By hand: 11th Floor, Diamond Corner Building, 68 Eloff Street, Johannesburg.

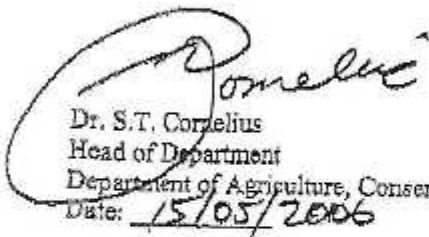
Please note that all appeals must comply with Section 35 of the Environment Conservation Act, Act No 73 of 1989, read together with Regulations R1182 and R1183 of 5 September 1997. In terms of the above section and regulations, your appeal must set out all the facts as well as the grounds of appeal. Furthermore, all the relevant documents or copies thereof must accompany the appeal and a commissioner of oaths must certify them as true.

The applicant is required to inform all registered interested and affected parties of the decision contained in this Record of Decisions as well as the process for appeal described above within 7 (Seven) calendar days of the date of signature of this Record of Decision. Failure to inform interested and affected parties within the stipulated time period will constitute non-compliance with this Record of Decision.

Should the applicant wish to appeal any aspect of this decision, the applicant must notify all registered interested and affected parties of the intended appeal, and furnish them with copies of the appeal on request. Proof of such notification must be submitted to the MEC with the appeal. Failure to comply with this provision may result in the MEC refusing to consider the appeal.

Please note that any development that commences prior to the expiry of the time period allowed for the submission of appeals, or before the MEC has reached a decision on an appeal submitted, is done so solely at the applicant's risk.

Yours faithfully


 Dr. S.T. Cornelius
 Head of Department
 Department of Agriculture, Conservation and Environment
 Date: 15/05/2006

CC: Bokamoso Landscape Architects & Environmental Consultants
 Kungwini Local Municipality
 Attn: Lizelle Gregory
 Fax: (012) 460 7079
 Attn: Lynn Feneysey
 Fax: (012) 809 0871



AGRICULTURE, CONSERVATION AND ENVIRONMENT

Office of the Head of Department

Diamond Corner Building, 58 Eloff & Market Street, Johannesburg
P O Box 5769, Johannesburg, 2000

Telephone: (011) 355-1900

Fax: (011) 333-0667

Email: steven.cornellus@gauteng.gov.za

Website: <http://www.gdacel.gpg.gov.za>

Reference: Gaut 002/03-04/185

Enquiries: Tinyko Malungani

Telephone: 011 355 1675

E-mail: Tinyko.malungani@gauteng.gov.za

Andre Wright
Runtogo (Pty) Ltd
P. O. Box 12516
HATFIELD
0028

Fax: (012) 346 8687

BY FACSIMILE / REGISTERED MAIL

Dear Sir/Madam

AMENDMENT OF THE RECORD OF DECISION ISSUED ON 15 MAY 2006 GRANTING AUTHORISATION FOR PROJECT REFERENCE GAUT002/03-04/185: PROPOSED RESIDENTIAL DEVELOPMENT ON PORTION 5 OF THE FARM TYGER VALLEY 334 JR: GRAYSTONE ESTATE

The above-mentioned project and the letter from Bokamoso Landscape Architects and Environmental Consultants, dated 16 December 2006 refer.

In terms of section 28 A (5) of the Environment Conservation Act, 1989 (Act 73 of 1989) ("the Act") the competent authority is entitled, as the case may be, may from time to time review any authorisation issued or condition determined and if it deems it necessary, withdraw such authorisation or delete or amend such condition.

In light of the above, condition 3.2 (2) of the Record of Decision (RoD) issued on 15 May 2006, which read "no further development will be allowed on the property due to its ecological and biodiversity characteristics" is hereby amended to read as follows:

- Only limited development on the less sensitive part of the site would be considered taking into account the applicable departmental policies and guidelines including the Ridges guidelines and the Red List Plant and Animal Species guidelines.

Relative to the layout plan submitted for the proposed Phase 2 development, please note that:

- Development will only be considered within the disturbed area and to the south of the road. No development will be allowed north of the road, i.e. stands 2 – 13 as indicated in your accompanying layout plan. A revised layout plan taking into account the restrictions on the development area must be submitted to the Department for approval.

Should you have queries pertaining to this letter, please contact the responsible official at the number mentioned above.

Yours faithfully



Dr S. T. Cornelius
Head of Department
Department of Agriculture, Conservation and Environment
Date: 03/04/2007

CC:	Bokamoso Landscape Architects & Environmental Consultants	Attn: Lizele Gregory Tel: (012) 346 3810 Fax: (012) 460 7079
	Kungwini Local Municipality	Attn: Lynn Schindler Tel: (012) 809 0563 Fax: (012) 809 0871

Annexure 13: Locality Map

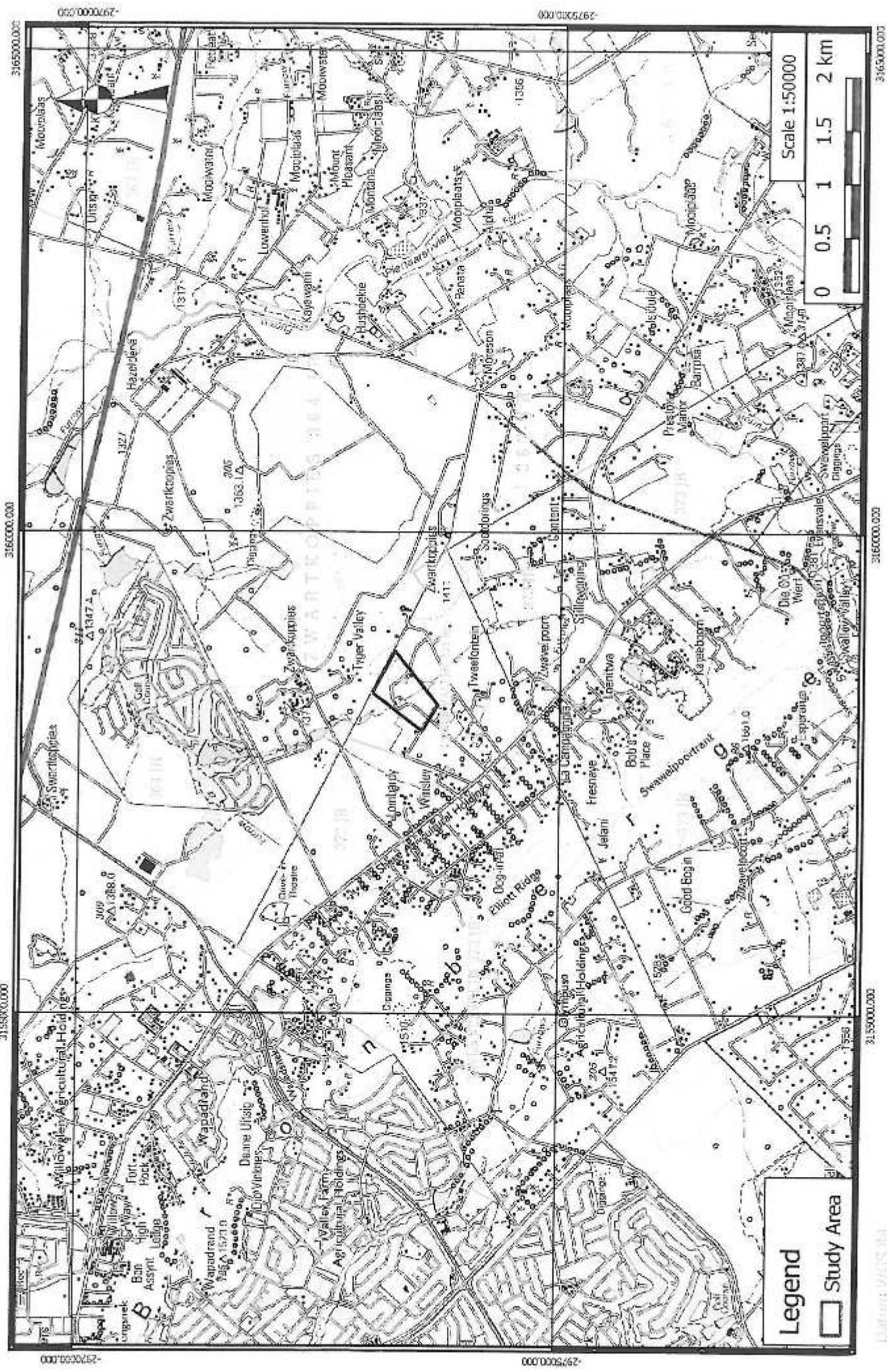


Figure 1: Study Area

Source: WGS 84

**Acknowledgement Letter
From GDARD**



agriculture and rural development

Department: Agriculture and Rural Development
GAUTENG PROVINCE

11 Diagonal Street, Diamond Building, Newtown, Johannesburg
P O Box 8769, Johannesburg, 2000

Telephone: (011) 240-2500

Fax: (011) 240-2700

Website: <http://www.gdard.gpg.gov.za>

Reference:	Gaut: 002/14-15/0091
Enquiries:	Faith Mlambo
Telephone:	(011) 240-3053
Email:	Faith.mlambo@gauteng.gov.za

Bokamoso Landscape Architects & Environmental Consultants

Email/Fax. lizelleg@mweb.co.za

Dear Sir / Madam

Application for Environmental Authorisation: Tijger Valley Extension 14 & 34

The Department acknowledges having received the application form for environmental authorisation of the above-mentioned project on 22/07/2014, but final amendments were made on 20/08/2014.

The application has been assigned the reference number Gaut: 002/14-15/0091. Kindly quote this reference number in any future correspondence in respect of the application.

Please circulate the draft report to any state department that administers a law relating to a matter affecting the environment to comment.

You are required to submit two (2) copies (full colour CDs-PDF) of the Draft Basic Assessment Report as well as proof of submission to state departments referred to above.

In order to determine whether a biodiversity assessment is required and, if so, which specialist studies are required, please send a shapefile (WGS84 datum; geographic co-ordinate system) of the application site to our biodiversity information service (GDACE_BiodiversityInfo@gauteng.gov.za), the e-mail clearly indicating the project reference number. Where biodiversity assessment is required; please ensure that it is

conducted consistent with the *GDACE Requirements for Biodiversity Assessments*. A copy of this document can be obtained by e-mailing GDACE_BiodiversityInfo@gauteng.gov.za

In terms of Regulation 67(1) (2) of the NEMA EIA Regulations 2010, this application will lapse should you fail to submit the requested information within 6 months of the date of signature of this letter, except in the case where the Department has received and accepted written explanation for failure to submit such information.

Please draw the applicant's attention to the fact that the activity may not commence prior to an environmental authorisation being granted by the Department.

Yours faithfully



Boniswa Belot

Deputy Director: Strategic Administration Support

Date: 21/08/2014

CC: André Wright

Att: A Wright

Email/Fax: andrew@boogertmanpta.co.za

Bianca

From: Bianca <user11@bokamoso.net>
Sent: 13 February 2015 08:18 AM
To: Faith.Mlambo@gauteng.gov.za
Subject: TIJGER VALLEY X 14 & 34
Attachments: Tijger valley extention.pdf

**RE: PROPOSED RESIDENTIAL TOWNSHIP DEVELOPMENT ON PART OF PORTION 5 OF THE FARM TYGERVALLEY 334
JR: GAUT: 002/14-15/0091**

Good day Faith,

Attached please find a formal letter of request for an extension of time of three months before we submit the DRAFT BAR REPORT, of the above mentioned Project to your Department. Please confirm receipt of this attached document as well as this e-mail. The formal letter of request will be hand delivered to your Office on the 16th February 2015 by the Company ARAMEX.

Kind Regards

Bianca Reyneke

Junior Environmental Assessment Practitioner



**Landscape Architects &
Environmental Consultants**

T: (+27)12 346 3810 | F: (+27) 86 570 5659 | E: lizelleg@mweb.co.za | www.bokamoso.biz
36 Lebombo Street, Ashlea Gardens, Pretoria | P.O. Box 11375 Maroelana 0161

LEBOMBO GARDENS BUILDING
36 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizelleg@mweb.co.za
Website: www.Bokamoso.biz

Bokamoso
ENVIRONMENTAL

Landscape Architects, Environmental Consultants,
Environmental Auditing, Water License Applications

**GAUTENG DEPARTMENT OF
AGRICULTURE AND RURAL DEVELOPMENT
DIAMOND CORNER BUILDING
11 DIAGONAL STREET
JOHANNESBURG
2000**

ATTENTION: FAITH MLAMBO

13 February 2015

**RE: PROPOSED RESIDENTIAL TOWNSHIP DEVELOPMENT ON PART OF PORTION
5 OF THE FARM TYGERVALLEY 334 JR.**
GAUT: 002/14-15/0091

We kindly request an extension of **3 months' time** to complete and submit this above mentioned project's draft BAR. We are waiting on information and will finalize the report as soon as the information is available.

Kindly review our request for an extension of time and it would be much appreciated if you can confirm whether this extension of time had been granted, by formal letter of confirmation.

Please do not hesitate to contact us should you need any additional information.

Kind regards

P.P. Beyneke
Anè Agenbacht

Bianca

From: Bianca <user11@bokamoso.net>
Sent: 13 February 2015 08:18 AM
To: Faith.Mlambo@gauteng.gov.za
Subject: TIJGER VALLEY X 14 & 34
Attachments: Tijger valley extention.pdf

**RE: PROPOSED RESIDENTIAL TOWNSHIP DEVELOPMENT ON PART OF PORTION 5 OF THE FARM TYGERVALLEY 334
JR: GAUT: 002/14-15/0091**

Good day Faith,

Attached please find a formal letter of request for an extension of time of three months before we submit the DRAFT BAR REPORT, of the above mentioned Project to your Department. Please confirm receipt of this attached document as well as this e-mail. The formal letter of request will be hand delivered to your Office on the 16th February 2015 by the Company ARAMEX.

Kind Regards

Bianca Reyneke

Junior Environmental Assessment Practitioner



**Landscape Architects &
Environmental Consultants**

T: (+27)12 346 3810 | F: (+27) 86 570 5659 | E: lizelleg@mweb.co.za | www.bokamoso.biz
36 Lebombo Street, Ashlea Gardens, Pretoria | P.O. Box 11375 Maroelana 0161

Bianca

From: Bianca <user11@bokamoso.net>
Sent: 13 March 2015 12:34 PM
To: Faith.Mlambo@gauteng.gov.za
Cc: user2@bokamoso.net
Subject: FW: TIJGER VALLEY X 14 & 34
Attachments: Tijger valley extention.pdf; doc00484620150313122740.pdf

**RE: PROPOSED RESIDENTIAL TOWNSHIP DEVELOPMENT ON PART OF PORTION 5 OF THE FARM TYGERVALLEY 334
JR: GAUT: 002/14-15/0091**

Good day Faith

I trust that you are well.

As per our telephonic conversation today (13/03/2015) I would like to confirm that I arranged with you to submit the Draft BAR for the above mentioned project on Monday the **16th of March**. Please confirm the receipt of the email.

Kindly find attached a formal letter of request for an extension of time of three months that was sent to your Department on the 13th of February 2015. Also please find attached the signed acknowledgment of receipt letter.

Hope this finds you well.

Please do not hesitate to contact us should you have any questions in this regard

Kind Regards

Bianca Reyneke

Junior Environmental Assessment Practitioner



**Landscape Architects &
Environmental Consultants**

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Kind Regards

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Website: www.Bokamoso.net



Landscape Architects, Environmental Consultants,
Environmental Auditing, Water License Applications

Acknowledgement of Receipt

GAUTNEG DEPARTMENT OF
AGRICULTURE AND RURAL DEVELOPMENT
11 DIAGONAL STREET
JOHANNESBURG
2000
Tel: 011 240 3396

ATTENTION: FAITH MLAMBO

13 February 2015

RE: PROPOSED RESIDENTIAL TOWNSHIP DEVELOPMENT ON PART OF PORTION
5 OF THE FARM TYGERVALLEY 334 JR.
GAUT: 002/14-15/0091

Please find the **request for extension of time** for the Draft Basic Assessment Report for the proposed **Tyger Valley Residential Development**.

By Hand

Name and Surname : J Cham
(Receiver)

Date: 19/02/15

Where: JLB

Signature: [Signature]

Sender: Anè Agenbacht



REG NO: CK 2010/087490/23
VAT REG NO: 4080260872

BOKAMOSO LANDSCAPE ARCHITECTS AND ENVIRONMENTAL CONSULTANTS CC

MEMBER: Lizelle Gregory

Basic Assessment



Gauteng Department of Agriculture and Rural Development (GDARD)

Basic Assessment Report in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended, and the Environmental Impact Assessment Regulations, 2010

List of all organs of state and State Departments where the draft report has been submitted, their full contact details and contact person

Kindly note that:

1. This **Basic Assessment Report** is the standard report required by GDARD in terms of the EIA Regulations, 2010 and must be submitted together with the application form.
 2. This application form is current as of 2 August 2010. It is the responsibility of the EAP to ascertain whether subsequent versions of the form have been published or produced by the competent authority.
 3. **A draft Basic Assessment Report must be submitted to all State Departments administering a law relating to a matter likely to be affected by the activity to be undertaken; the submission of such a draft report to such State Departments must be done on the day of submission of the draft report to the competent authority, this Department. (Attach a signed proof of such submission). signed**
 4. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
 5. Selected boxes must be indicated by a cross and, when the form is completed electronically, must also be highlighted.
 6. An incomplete report may be returned to the applicant for revision.
 7. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
 8. Five (5) copies (3 hard copies and 2 CDs-PDF) of the final report and attachments must be handed in at offices of the relevant competent authority, as detailed below.
 9. No faxed or e-mailed reports will be accepted. Only hand delivered or posted applications will be accepted.
 10. Unless protected by law, and clearly indicated as such, all information filled in on this application will become public information on receipt by the competent authority. The applicant/EAP must provide any interested and affected party with the information contained in this application on request, during any stage of the application process.
-

DEPARTMENTAL DETAILS

Gauteng Department of Agriculture and Rural Development
Attention: Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
P.O. Box 8769
Johannesburg
2000

Administrative Unit of the Sustainable Utilisation of the Environment (SUE) Branch
18th floor Glen Cairn Building
73 Market Street, Johannesburg

Admin Unit telephone number: (011) 355 1345
Department central telephone number: (011) 355 1900

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

(For official use only)

File Reference Number:						
Application Number:						
Date Received:						

(i) Submission to State Department (Section 3 above)

(A) Has a draft report for this application been submitted to all State Department administering a law relating to a matter likely to be affected as a result of the activity? **YES**

(B) Is a list of State Departments referred to in section A above been attached to this report, **YES**

if no, state reasons for not attaching the list.

[Empty box for reasons]

SECTION A: ACTIVITY INFORMATION

1. ACTIVITY DESCRIPTION

Project title (must be the same name as per application form):

Tijger Valley Extension 14 & 34

Select the appropriate box

The application is for an upgrade of an existing development

The application is for a new development

Other, specify

Describe the activity and associated infrastructure, which is being applied for, in detail

The proposed development is for the establishment of a residential township. This proposed township will have the following zoning:

- 37 erven zoned as **Residential 1** - For the erection of one dwelling unit per erf with no limitation on coverage and FSR (floor space ratio);
- 13 erven zoned as **Special** - For dwelling units at different densities:
 - Erven 13, 18-20, 30, 32 and 41 - maximum density of 25 dwelling units per hectare;
 - Erf 17 – maximum density of 30 dwelling units per hectare;
 - Erven 14-16, 39 and 40 – maximum density of 40 dwelling units per hectare.

- 1 erf zoned as **Special** - For access and access control;
- 1 erf zoned as **Special** – For clubhouse, open space, sport and recreational facilities and for such other uses as the Local Authority may permit. The clubhouse is intended to be built on erf 31 for use by the proposed township's inhabitants, which will consist of sport facilities such as tennis courts.
- 8 erven zoned as **Private Open Space** – This will be for an area of 2.4941 hectare; and
- **Streets.**

Please note: A Record of Decision (RoD) was previously issued on 15 May 2006 for the development of a residential township on Portion 5 of the farm Tyger Valley 334 JR. This development did not commence with construction within the given timeframe due to limited funds available at that stage and as a result thereof the environmental authorisation that was issued therefore lapsed.

As the developer has previously identified a need and desirability for development in this area and recently experienced a boost in the economy which will enable them to commence with development, a new application for consideration of environmental authorisation was again submitted in 2014. The reference number, Gaut: 002/14-15/0091, was then assigned to this project. The project application and terms of reference has not changed as the developer wishes to obtain environmental authorization for exactly the same activities and layout as that was previously approved by GDARD.

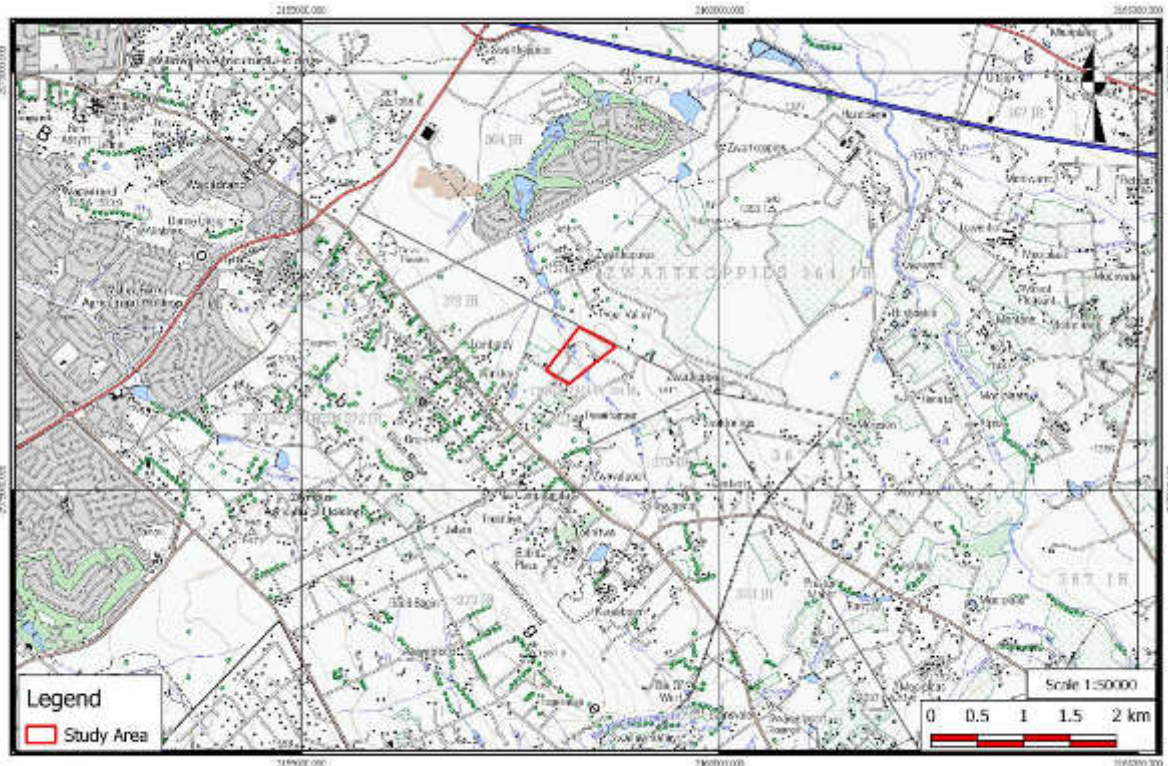


Figure 1: Locality Map



Figure 2: Aerial Map

Activities Applied for

Indicate the number and date of the relevant Government Notice:	Activity No (s) (in terms of the relevant notice):	Describe each listed activity:
Listing Notice 1, R544, 18 June 2010	Activity 9	<p>The construction of facilities or infrastructure exceeding 1000metres in length for the bulk transportation of water, sewage or storm water:</p> <ul style="list-style-type: none"> (i) With an internal diameter of 0.36metres or more; or (ii) with a peak throughput of 120m litres per second or more, <p>excluding where:</p> <ul style="list-style-type: none"> a) such facilities or infrastructure are for bulk transportation of water, sewage or storm water drainage inside a road reserve; or b) where such construction will occur within urban areas but further than 32 metres of a watercourse, measured from the edge of a watercourse.
R544, of 18 June 2010	Listing No. 1, Activity 10	<p>The construction of facilities or infrastructure for the transmission and distribution of electricity-</p> <ul style="list-style-type: none"> (i) outside urban area or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.
Listing Notice 1, R544, 18 June 2010	Activity 11	<p>The construction of:</p> <ul style="list-style-type: none"> (i) Canals; (ii) Channels; (iii) Bridges; (iv) Dams (v) Weirs; (vi) Bulk storm water outlet structures; (vii) Marinas; (viii) Jetties exceeding 50 square metres in size; (ix) Slipways exceeding 50 square metres in size; (x) Buildings exceeding 50 square metres in size; or

		<p>(xi) Infrastructure or structures covering 50 square metres or more</p> <p>Where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>
Listing Notice 1, R544, 18 June 2010	Activity 18	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from:</p> <p>(i) A watercourse; (ii) The sea (iii) The seashore; (iv) The littoral active zone, an estuary or a distance of 100 metres inland of the highwater mark of the sea or an estuary, whichever distance is the greater-</p> <p>But excluding where such infilling, depositing, dredging, excavation, removal or moving:</p> <p>(a) Is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or (b) Occurs behind the development setback line</p>
R. 544, of 18 June 2010	Listing No. 1, Activity 22	<p>The construction of a road, outside urban areas,</p> <p>(i) With a reserve wider than 13.5 meters, or (ii) Where no reserve exists where the road is wider than 8 meters, or (iii) For which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in Notice 545 of 2010</p>
R. 544, of 18 June 2010	Listing No. 1, Activity 23	<p>The transformation of undeveloped, vacant or derelict land to-</p> <p>(i) Residential, retail, commercial, recreational, Industrial or institutional use, inside an urban area, and</p>

		<p>where the total area to be transformed to 5 hectares or more, but less than 20 hectare; or</p> <p>(ii) Residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares-</p> <p>Except where such transformational takes place –</p> <p>(i) for linear activities; or</p> <p>(ii) for purposes of agriculture of afforestation, in which case Activity 16 of Notice No. R. 545 applies.</p>
R. 544, of 18 June 2010	Activity 26	Any process or activity identified in term of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No.10 of 2004).
R. 546. of 18 June 2010	Listing No.3. Activity 13	<p>The clearance of an area of 1 hectare of more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation, except where such removal of vegetation is required for:</p> <p>1. The undertaking of a process or activity included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste act, 2008 (Act No. 59 of 2008), in which case the activity is regarded to be excluded from</p>
		<p>d. In Gauteng:</p> <p>(i) A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>(ii) National Protected Area Expansion Strategy Focus areas;</p> <p>(iii) Any declared protected area including Municipal or Provincial Nature Reserves as contemplated area including Municipal or Provincial Nature Reserves as contemplated by the Environment Conservation Act 1989 (Act No. 73 of 1989), the Nature conservation Ordinance (Ordinance 12 of 1983);</p> <p>(v) Sensitive area as identified in an environmental</p>

		<p>this list.</p> <p>2. The undertaking of a linear activity failing below the thresholds mentioned in Listing Notice 1 in terms of GN No.544 of 2010.</p>	<p>management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>(iv) sites or areas identified in terms of an International Convention;</p> <p>(v) Sites identified as irreplaceable or important in the Gauteng Conservation Plan.</p>
<p>Listing Notice 3, R546, 18 June 2010</p>	<p>Activity 16</p>	<p>The construction of:</p> <p>i. Jetties exceeding 10 square meters in size;</p> <p>ii. Slipways exceeding 10 square meters in size;</p> <p>iii. Building with a footprint exceeding 10 square meters in size; or</p> <p>iv. Infrastructure covering 10 square meters or more</p> <p>Where such construction occurs within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.</p>	<p>In Gauteng:</p> <p>i. A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>ii. National Protected Area Expansion Strategy Focus areas;</p> <p>iii. Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p> <p>iv. Sites or areas identified in terms of an International Convention;</p> <p>v. Sites identified as irreplaceable or important in the Gauteng Conservation Plan;</p>

			<p>vi. Any declared protected area including Municipal or Provincial nature Reserves as contemplated by the Environment Conservation Act, 1989 (Act No. 73 of 1989) and the Nature Conservation Ordinance (Ordinance 12 of 1983);</p> <p>vii. Areas zoned for a conservation purpose.</p>
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Please take note that the 2010 NEMA EIA Regulations were replaced by the Amended 2014 NEMA EIA Regulations on 4 December 2014, but due to the fact that the application was submitted in terms of the 2010 NEMA EIA Regulations, this application will be dealt with in terms of such Regulations. Once the Decision has been issued in terms of the 2010 NEMA EIA Regulations, such Decision will be regarded as a Decision issued in terms of the New 2014 EIA Regulations and all following procedures (i.e. Amendment Applications, Appeals etc. must be made/submitted in terms of the 2014 NEMA EIA Regulations. Refer to Chapter 8 – Transitional Arrangements and Commencement of the 2014 NEMA EIA Regulations).

Regulation 53 (3) of the 2014 NEMA EIA Regulations furthermore states “Where an application submitted in terms of the previous NEMA EIA Regulations, is pending in relation to the activity of which a component of the same activity was not identified under the previous NEMA Notices, but is now identified in terms of Section 24 (2) of the Act, the competent authority must dispense of such application in terms of the previous NEMA regulations and may authorise the activity identified in terms of Section 24 (2) as if it was applied for, on condition that all impacts of the newly identified activity and requirements of these Regulations have also been considered and adequately assessed.”

Section 24(2) Activities to be considered by GDARD:

We perused the Amended 2014 NEMA EIA Regulations and decided to list the activities that will most probably be triggered in terms of such Regulations **(Refer to the table below)**. The activities identified are very similar to that activities applied for in terms of the 2010 NEMA EIA Regulations and we therefore feel confident that all the activities as listed have been assessed.

Due to the fact that the 2014 Regulations are still new, we recommend that GDARD rather dispense this application in terms of the 2010 NEMA EIA Regulations.

2014 Amended NEMA EIA Regulations: Listed Activities that will most probably be triggered:

Listing Notice 1:		
R.983	Activity 9	The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for bulk transportation of water or storm water or storm water drainage inside a road reserve; or (b) where such development will occur within an urban area.
	Activity 10	The development and related operation of infrastructure exceeding 1000 metres in length for the bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes (i) with an internal diameter of 0,36 metres or more; or (ii) with a peak throughput of 120 litres per second or more; excluding where- (a) such infrastructure is for bulk transportation of sewage, effluent, process water, waste water, return water, industrial discharge or slimes inside a road reserve; or (b) where such development will occur within an urban area.
	Activity 11	The development of facilities or infrastructure for the transmission and distribution of electricity-

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

		<p>(i) outside urban areas or industrial complexes with a capacity of more than 33 but less than 275 kilovolts; or (ii) inside urban areas or industrial complexes with a capacity of 275 kilovolts or more.</p>
	<p>Activity 12</p>	<p>The development of-</p> <p>(i) canals exceeding 100 square metres in size; (ii) channels exceeding 100 square metres in size; (iii) bridges exceeding 100 square metres in size; (iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size; (vi) bulk storm water outlet structures exceeding 100 square metres in size; (vii) marinas exceeding 100 square metres in size; (viii) jetties exceeding 100 square metres in size; (ix) slipways exceeding 100 square metres in size; (x) buildings exceeding 100 square metres in size; (xi) boardwalks exceeding 100 square metres in size; or (xii) infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs-</p> <p>(a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse; - excluding-</p> <p>(aa) the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour; (bb) where such development activities are related to the development of a port or harbour, in which case activity 26 in Listing Notice 2 of 2014 applies; (cc) activities listed in activity 14 in Listing Notice 2 of 2014 or activity 14 in Listing Notice 3 of 2014, in which case that activity applies; (dd) where such development occurs within an urban area; or (ee) where such development occurs within existing roads or road reserves.</p>
	<p>Activity 19</p>	<p>The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-</p> <p>(i) a watercourse; (ii) the seashore; or (iii) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater- but excluding where such infilling, depositing , dredging, excavation, removal or moving-</p> <p>(a) will occur behind a development setback; (b) is for maintenance purposes undertaken in accordance with a maintenance management plan;</p>

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

		or (c) falls within the ambit of activity 21 in this Notice, in which case that activity applies.	
	Activity 24	The development of- (i) a road for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 or activity 18 in the Government Notice 545 of 2010; or (ii) a road with a reserve wider than 13,5 meters, or where no reserve exists where the road is wider than 8 metres; but excluding- (a) roads which are identified and included in activity 27 in Listing Notice 2 of 2014; or (b) roads where the entire road falls within an urban area.	
	Activity 27	The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for- (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan	
	Activity 28	Residential, mixed, retail, commercial, industrial or institutional developments where such land was used for agriculture or afforestation on or after 01 April 1998 and where such development: (i) will occur inside an urban area, where the total land to be developed is bigger than 5 hectares; or (ii) will occur outside an urban area, where the total land to be developed is bigger than 1 hectare; excluding where such land has already been	
	Activity 30	Any process or activity identified in terms of section 53(1) of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004).	
Listing Notice 3:			
R. 985	Activity 12	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of required for maintenance purposes undertaken in accordance with a maintenance management plan.	(c) In Mpumalanga: i. Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; ii. Within critical biodiversity areas identified in bioregional plans;

			<p>iii. Within the littoral active zone or 100 metres inland from high water mark of the sea or an estuarine functional zone, whichever distance is the greater, excluding where such removal will occur behind the development setback line on erven in urban areas; or</p> <p>iv. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning or proclamation in terms of NEMPAA.</p>
	<p>Activity 14</p>	<p>The development of-</p> <p>(i) canals exceeding 10 square metres in size ;</p> <p>(ii) channels exceeding 10 square metres in size;</p> <p>(iii) bridges exceeding 10 square metres in size;</p> <p>(iv) dams, where the dam, including infrastructure and water surface area exceeds 10 square metres in size;</p> <p>(v) weirs, where the weir, including infrastructure and water surface area exceeds 10 square metres in size;</p> <p>(vi) bulk storm water outlet structures exceeding 10 square metres in size;</p> <p>(vii) marinas exceeding 10 square metres in size;</p> <p>(viii) jetties exceeding 10 square metres in size;</p> <p>(ix) slipways exceeding 10 square metres in size;</p> <p>(x) buildings exceeding 10 square metres in size;</p> <p>(xi) boardwalks exceeding 10 square metres in size; or</p> <p>(xii) infrastructure or structures with a physical footprint of 10 square metres or more; where</p>	<p>(b) In Gauteng:</p> <p>i. A protected area identified in terms of NEMPAA, excluding conservancies;</p> <p>ii. National Protected Area Expansion Strategy Focus Areas;</p> <p>iii. Gauteng Protected Area Expansion Priority Areas;</p> <p>iv. Sites identified as Critical Biodiversity Areas (CBAs) and Ecological Support Areas (ESAs) in the Gauteng Conservation Plan or in bioregional plans;</p> <p>v. Sites identified within threatened ecosystems listed in terms of the National Environmental Management Act: Biodiversity Act (Act No. 10 of 2004);</p> <p>vi. Sensitive areas identified in an environmental management framework adopted by relevant environmental authority;</p> <p>vii. Sites or areas identified in terms of an International Convention</p> <p>viii. Sites managed as protected areas by provincial authorities, or declared as nature reserves in terms of the</p>

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

	<p>such development occurs (a) within a watercourse (b) in front of a development Setback, or (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse</p> <p>excluding the development of infrastructure or structures within existing ports or harbours that will not increase the development footprint of the port or harbour.</p>	<p>Nature Conservation Ordinance (Ordinance 12 of 1983) or the National Environmental Management: Protected Areas Act (Act No. 57 of 2003);</p> <p>ix. Sites designated as nature reserves within municipal SDFs; or</p> <p>x. Sites zoned for conservation or public open space or equivalent zoning.</p>
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2. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations:

Title of legislation, policy or guideline:	Administrating Authority:	Promulgation Date:
National Environmental Management Act No. 107 of 1998 (as amended)	National & Provincial	27 November 1998

The NEMA is primarily an enabling Act in that it provides for the development of environmental implementation plans and environmental management plans. The principles listed in the act serve as a general framework within which environmental management and implementation plans must be formulated.

The Minister of Environmental Affairs and Tourism passed (in April 2006) Environmental Impact Assessment Regulations¹ (the Regulations) in terms of Chapter 5 of the National Environmental management Act, 1998² (NEMA). The new Regulations came into effect on 3 July 2006.

The Minister of Environmental Affairs passed (in June 2010) the Amended Environmental Impact Assessment Regulations in terms of Chapter 5 of the National Environmental Management Act, 1998 (Act 107 of 1998) (NEMA). The Amended Regulations came into effect on 2 August 2010, and therefore all new applications must be made in terms of the Amended NEMA regulations and not in terms of the 2006 NEMA Regulations or the New Regulations of the ECA. The purpose of this process is to determine the possible negative and positive impacts of the proposed development on the surrounding environment and to provide measures for the mitigation of

negative impacts and to maximize positive impacts.

Earlier on in the report an explanation was given why this application is still done within the Amended 2010 NEMA Regulations and not within the Amended 2014 NEMA Regulations. It was also explained that Bokamoso did consult and consider the Amended 2014 NEMA Regulations.

Notice **No. R 544, R 545 and R 546** of the Amended 2010 NEMA Regulations list the activities that indicate the process to be followed. The activities listed in Notice No. R 544 requires that a Basic Assessment process be followed and the Activities listed in terms of Notice No. R 545 requires that the Scoping and EIA process be followed. Notice No. 546 has been introduced to make provision for Activities in certain geographical and sensitive areas.

Subsequently, Listing (R. 546) requires that a Basic Assessment Process be followed. It should however be noted that the Draft Guideline Document of DEA [Department of Environmental Affairs, previously known as the Department of Environmental Affairs and Tourism] states that if an activity being applied for is made up of more than one listed activity, and the Scoping and EIA process is required for one or more of these activities, the Scoping and EIA process must be followed for the whole application.

Implications for the development:

Significant – The application for the proposed residential township consist of activities listed under Notice R. 544 (Listing No. 1) and R. 546 (Listing No. 3) according to the 2010 NEMA EIA Regulations and therefore a Basic Assessment Report will be submitted to GDARD for consideration.

National Water Act (Act No. 36 of 1998)	National & Provincial	20 August 1998
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The purpose of this Act is to ensure that the Nation's water resources are protected, used, developed, conserved, managed and controlled in ways that take into account, amongst other factors, the following:

- ❑ Meeting the basic human needs of present and future generations;
- ❑ Promoting equitable access to water;
- ❑ Promoting the efficient, sustainable and beneficial use of water in the public interest;
- ❑ Reducing and preventing pollution and degradation of water resources;
- ❑ Facilitating social and economic development; and
- ❑ Providing for the growing demand for water use.

In terms of the section 21 of the National Water Act, the developer must obtain water use licences if the following activities are taking place:

- a) Taking water from a water resource;
- b) Storing water;
- c) Impeding or diverting the flow of water in a water course;
- d) Engaging in a stream flow reduction activity contemplated in section 36;
- e) Engaging in a controlled activity identified as such in section 37(1) or declared under section 38(1);
- f) Discharging waste or water containing waste into a water resource through a pipeline, canal, sewer, sea outfall or other conduit;
- g) Disposing of waste in a manner which may detrimentally impact on a water resource;
- h) Disposing in any manner which contains waste from or which has been heated in any industrial or power generation process;
- i) Altering the bed, banks, course or disposing of water found underground if it is necessary for the safety of people;
- j) Removing, discharging, or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and
- k) Using water for recreational purposes.

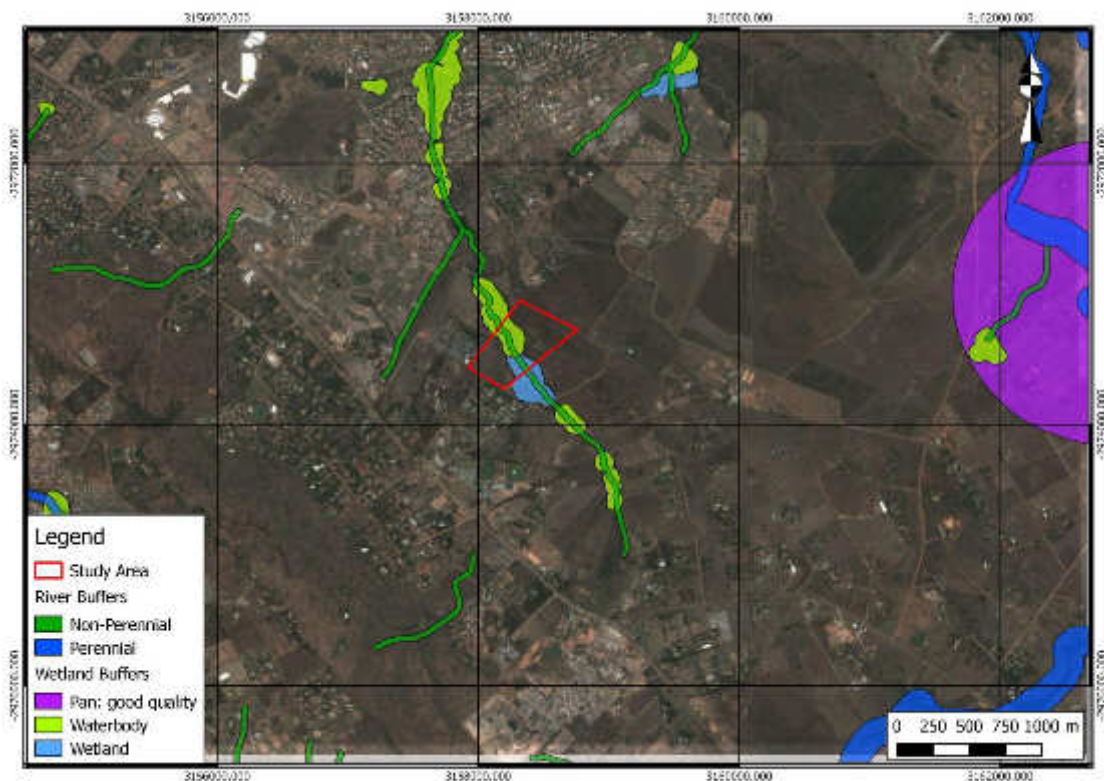


Figure 3 – Hydrology Map

The National Water Act also requires that (where applicable) the 1:50 and 1:100 year flood line be indicated on all the development drawings (even the drawings for the external services) that are submitted for approval.

Implications for the development:

The proposed residential development is subject to flood lines (non-perennial river) as the proposed residential township is planned to border the 1:100 year flood line, thus it will be less than 500 meters away from the river. The drainage line area will be private opens space and apart for a road crossing there will be no construction in this area. **(Refer to Figure 3 – Hydrology Map)**

National Environmental Management: Air Quality Act (Act 39 of 2004)	National & Provincial	2004
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The NEMA: AQA serves to repeal the Atmospheric Pollution Prevention Act (45 of 1965) and various other laws dealing with air pollution and it provides a more comprehensive framework within which the critical question of air quality can be addressed.

The purpose of the Act is to set norms and standards that relate to:

- ❑ Institutional frameworks, roles and responsibilities
- ❑ Air quality management planning
- ❑ Air quality monitoring and information management
- ❑ Air quality management measures
- ❑ General compliance and enforcement.

Amongst other things, it is intended that the setting of norms and standards will achieve the following:

- The protection, restoration and enhancement of air quality in South Africa.
- Increased public participation in the protection of air quality and improved public access to relevant and meaningful information about air quality.
- The reduction of risks to human health and the prevention of the degradation of air quality.

The Act describes various regulatory tools that should be developed to ensure the implementation and enforcement of air quality management plans. These include:

- Priority Areas, which are air pollution 'hot spots'.
- Listed Activities, which are 'problem' processes that require an Atmospheric Emission Licence.
- Controlled Emitters, which includes the setting of emission standards for 'classes' of emitters, such as motor vehicles, incinerators, etc.
- Control of Noise.
- Control of Odours.

On 22 November 2013 the list of activities which result in atmospheric emissions that have or may have a detrimental effect on the environment, was amended.

Implications for the development:

During the construction phase, dust and the generation of noise can become a significant factor, especially to the surrounding landowners. However, if the development is well planned and the mitigating measures are successfully implemented the proposed township's contribution to air pollution and the generation of air pollution can become less significant. None of the listed activities, according to this Act, have been triggered.

National Heritage Resources Act (Act No. 25 of 1999)	National & Provincial	1999
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The National Heritage Resources Act legislates the necessity and heritage impact assessment in areas earmarked for development, which exceed 0.5ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).

Implications for the development:

No features of Heritage importance are expected to be found on the proposed study area. If any such features are discovered during construction activities and clearing of the application site, the correct "procedures for an Environmental incident" **(at the end of EMP, Appendix H)** must be followed.

National Environmental Management Protected Areas Act (Act No. 57 of 2003)	National	2003
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The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological biodiversity and its natural landscapes.



Figure 4 – Protected areas

Implications for the development:

The study area is not situated within any protected areas.

National Environmental Management: Biodiversity Act, (Act 10 of 2004)	National	2004
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The Biodiversity Act, provides for the management and protection of the country's biodiversity within the framework established by NEMA. It provides for the protection of species and ecosystems in need of protection, sustainable use of indigenous biological resources, equity and bioprospecting, and the establishment of a regulatory body on biodiversity- **South African National Biodiversity Institute.**

Objectives of the Act:

(a) With the framework of the National Environmental Management Act, to provide for:

- (i) The management and conservation of biological diversity within the Republic and of the components of such biological diversity;
- (ii) The use of indigenous biological resources in a sustainable manner; and
- (iii) The fair and equitable sharing among stakeholders of benefits arising from bio-prospecting involving indigenous biological resources;

- (b) To give effect to ratified international agreements relating to biodiversity which are binding on the republic;
- (c) To provide for co-operative governance in biodiversity management and conservation; and
- (d) To provide for a South African National Biodiversity Institute to assist in achieving the objectives of this Act.

Under this Act notices are published in terms of alien and invasive species or threatened ecosystems in order to promote the biodiversity of natural resources and protect species endemic to South Africa.

Implications for the development:

The proposed development is situated within the Marikana Thornveld vegetation type according to Mucina and Rutherford (2006). The area south-west of the Degraded Drainage Line was identified as a Disturbed Moist Secondary Grassland and not considered sensitive. The drainage line was not considered sensitive during the specialist assessment. The orange-listed plant species, *Hypoxis hemerocallidea*, occur on the site and the specialist recommended that they be relocated to an area where they can be preserved.

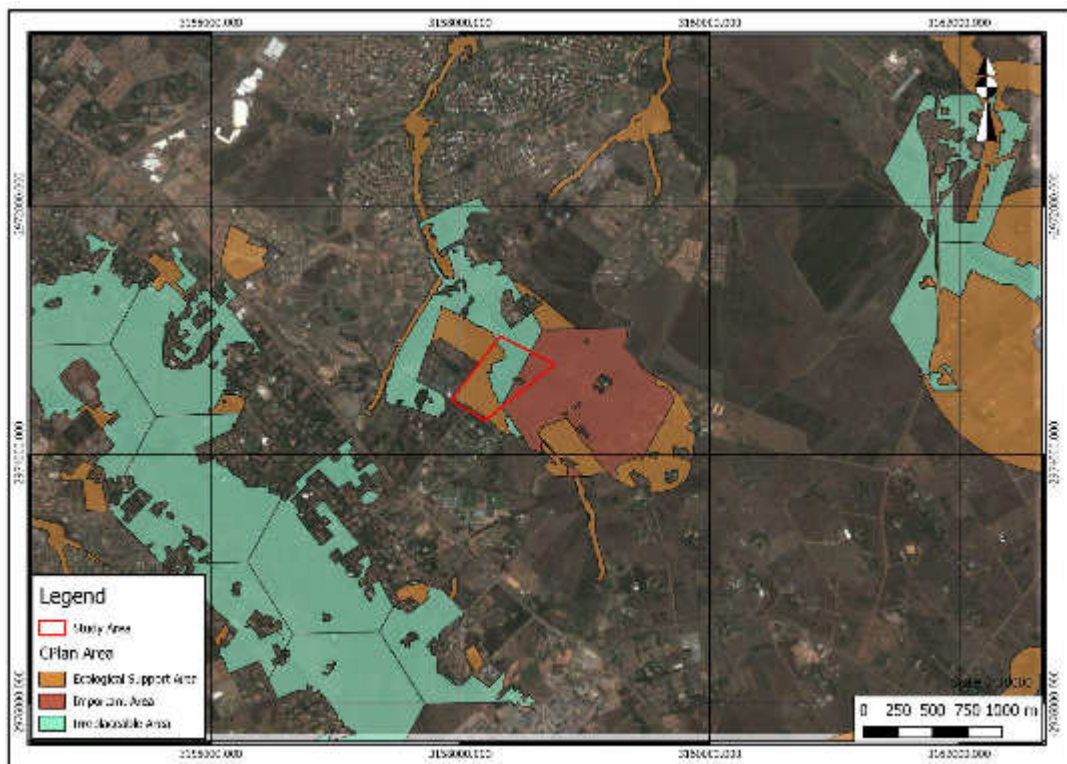


Figure 5 – GDARD C-Plan Areas

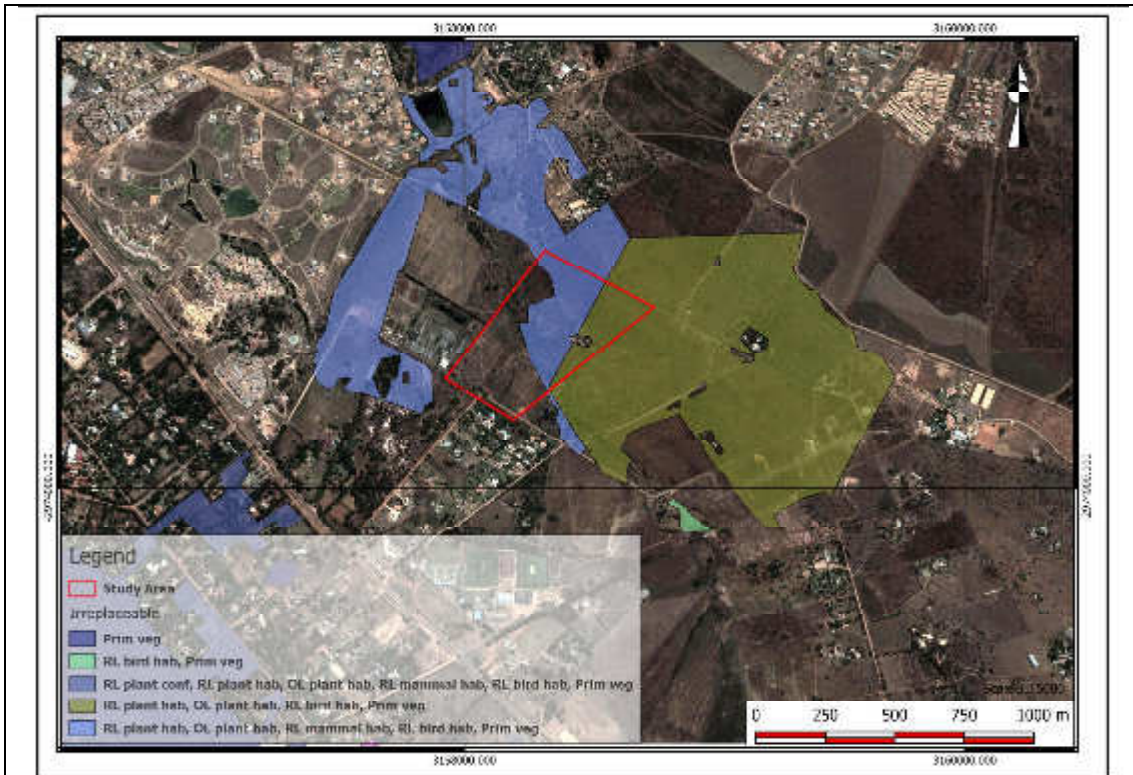


Figure 6 – Irreplaceable Areas

GDARD Draft Ridges Policy	Provincial	2001
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The biodiversity and socio-cultural value of ridges and their essential role in ecosystem processes will be established in order to show why it is absolutely imperative that the Department adopts a no-go development policy for the ridges of Gauteng. It is important to remember that the quartzite ridges of Gauteng, together with the Drakensberg Escarpment, should be regarded as one of the most important natural assets in the entire region of the northern provinces of South Africa. They are characterized by a unique plant species composition that is found nowhere else in South Africa or the world (Bredenkamp & Brown, 1998). Ridges are important for biodiversity hotspots, red data/threatened species, invertebrates, wildlife corridors, ecosystem processes and socio-cultural value (aesthetic value).

A ridge is defined as any topographic feature in the landscape that is characterized by slopes of 5° or more, as determined by means of a GIS digital elevation model.

Implications for the development:

There is a ridge situated on the north-eastern section of the larger study area. The proposed township will however not be developed on this ridge area. **(Please refer to the layout maps in Annexure C)**

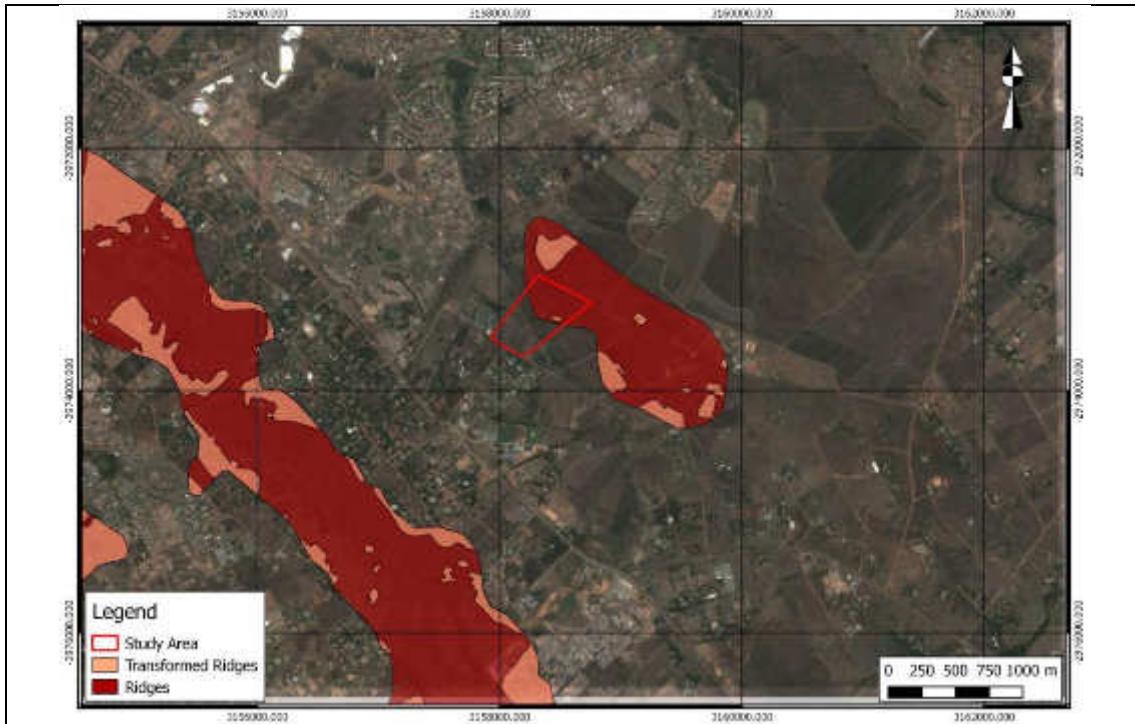


Figure 7 – Ridges

Conservation of Agricultural Resources Act (Act No. 43 of 1983)	National	1 June 1983
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This act provides for control over the utilization of natural agricultural resources of South Africa in order to promote the conservation of soil, water sources and the vegetation as well as the combating of weeds and invader plants; and for matters connecting therewith.

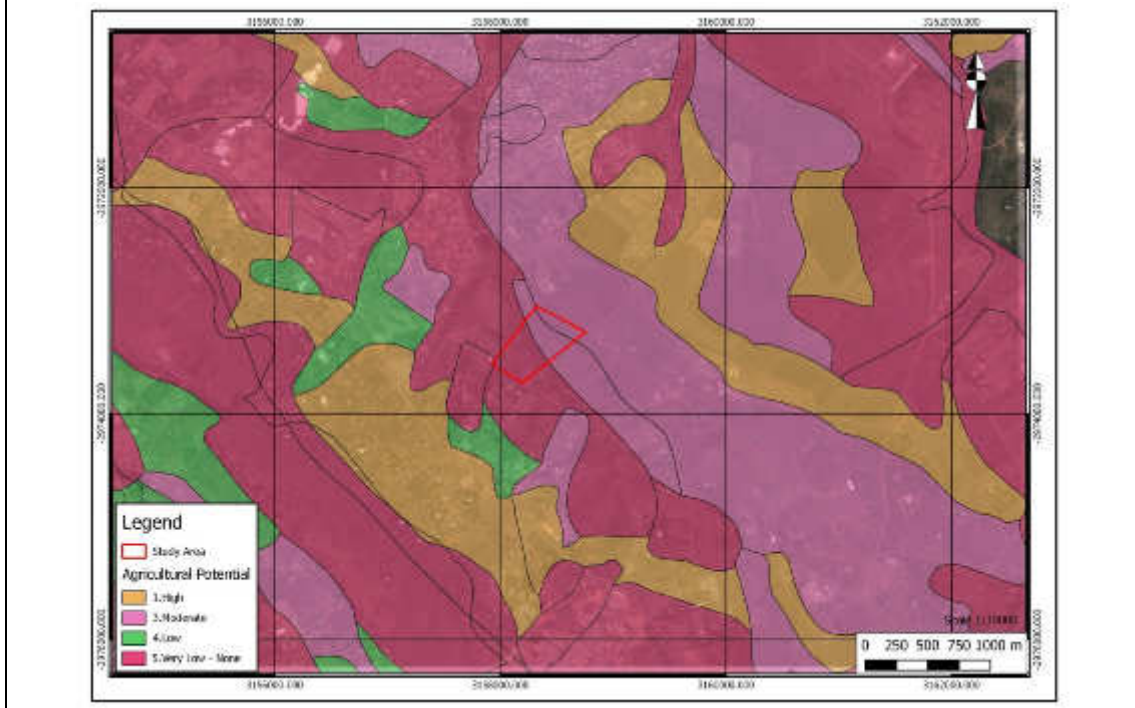


Figure 8 – Agricultural Potential

Implications for the development:

Not Significant – According to the Gauteng Agricultural Potential Atlas (GAPA 3), Tijger Valley Extension 14 and 34 is located on land with very low agricultural potential. The study area does not fall within any of the Seven Agriculture Hubs identified for the Gauteng province.

GDARD Agricultural Hub Policy	Provincial	2006
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GDARD identified 7 Agricultural Hubs in Gauteng province. These hubs are earmarked for agricultural activities and there are policies and guidelines that should be taken into consideration when one plans to develop in these hubs areas. Urban development is usually not supported in these hubs.



Figure 9 – Agricultural Hubs

Implications for the development:

Not significant - The study area is not situated within any of the 7 agricultural hubs identified for Gauteng.

Gauteng Urban Edge	Provincial	2010
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According to Mr. Neels du Toit of the Gauteng Department of Economic Development the urban edge is now delineated on a yearly basis and it is the responsibility of the local authorities to request for a yearly amendment to the urban edge.

Implication for the development:

The proposed study area is not included into the urban edge as indicated on the spatial development framework, the 2007 provincial urban edge and into the revised 2010 urban edge. During recent discussions with GDARD it was confirmed that the Urban Edge was not adopted by the MEC of GDARD. However, the development is surrounded by urban developments.



Figure 10 – Urban Edge

National Environmental Management: Waste Act (Act 59 of 2008)	National	2008
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This Act aims to consolidate waste management in South Africa, and contains a number of commendable provisions, including:

- The establishment of a national waste management strategy, and national and provincial norms and standards, for amongst other, the classification of waste, waste service delivery, and tariffs for such waste services;
- Addressing reduction, reuse, recycling and recovery of waste;

- The requirements for industry and local government to prepare integrated waste management plans;
- The establishment of control over contaminated land;
- Identifying waste management activities that requires a license, which currently include facilities for the storage, transfer, recycling, recovery, treatment and disposal of waste on land;
- Co-operative governance in issuing licenses for waste management facilities, by means of which a licensing authority can issue an integrated or consolidated license jointly with other organs of state that has legislative control over the activity; and
- The establishment of a national waste information system.

On 29 November 2013 the Minister of Environmental Affairs and Tourism amended the list of waste management activities that might have a detrimental effect on the environment.

Implication for the development:

Not significant – No waste management license will be required during the construction or operational phases of the proposed residential township. Due to the fact that a small amount of solid construction waste will be stored and handled on the site, before it is hauled away and dumped at the nearest registered landfill site.

Red List Plant Species Guidelines	Provincial	26 June 2006
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The purpose of these guidelines is to promote the conservation of Red List Plant Species in Gauteng, which are species of flora that face risk of extinction in the wild. By protecting Red List Plant Species, conservation of diverse landscapes is promoted which forms part of the overall environmental preservation of diverse ecosystems, habitats, communities, populations, species and genes in Gauteng.

These Guidelines are intended to provide a decision-making support tool to any person or organization that is responsible for managing, or whose actions affect, areas in Gauteng where populations of Red List Plant Species grow, whether such person or organization be an organ of state or private entity or individual; thereby enabling the conservation of the Red List Plant Species that occur in Gauteng.

Implication for the development:

The proposed area to be developed has no Orange-Listed plant species habitat according to the map (Figure 11). The Degraded drainage line however could be suitable for some of these species, this area will however be zoned as private open space in the proposed development. No Red

Listed Plant species have been encountered during the specialist's assessments and none are expected to occur due to the high level of disturbance. The Orange-Listed plant species, *Hypoxis hemerocallidea*, was found on the proposed development area and it was recommended that the species be relocated to an area where it can be preserved.

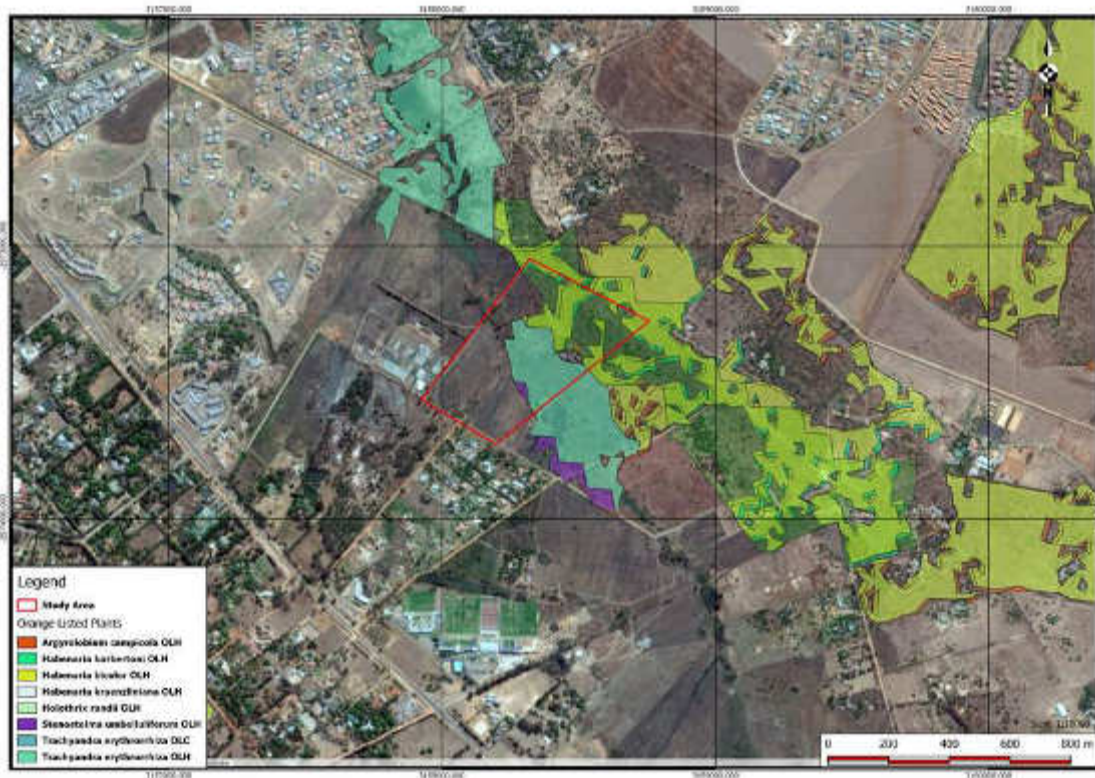


Figure 11 – Orange Listed Plants

Gauteng Noise Control Regulations	Provincial	1999
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The regulation controls noise pollution. According to the acceptable noise levels in a residential area situated within an urban area is 55dBA and the maximum acceptable noise levels in a rural area is 45dBA.

Implication for the development:

Within the construction phase of the proposed development, the impact of noise could be problematic, but such impacts are generally short term. One should note that practical mitigation measures for noise pollution are low, but certain measures can be implemented to mitigate the severity. During the operational phase, there will be no noise impacts. **(Please Refer to Appendix H (EMP) for a list of suitable guidelines and mitigation measures)**

The Gauteng Transport Infrastructure Act	Provincial	2001
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The Act was created to consolidate the laws relating to roads and other types of transport infrastructure in Gauteng; and to provide for the planning, design, development, construction, financing, management, control, maintenance, protection and rehabilitation of provincial roads, railway lines and other transport infrastructure in Gauteng; and to provide for matter connected therewith.



Figure 12 – Roads and Railways

Implication for the development:

All developments in Gauteng must take the Gauteng Road network as published into consideration and no development may be planned across any provincial or K-route.

3. ALTERNATIVES

Describe the proposal and alternatives that are considered in this application. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity could be accomplished. The determination of whether the site or activity (including different processes etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

The no-go option must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed. **Do not** include the no go option into the alternative table below.

Note: After receipt of this report the competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

Provide a description of the alternatives considered

No.	Alternative type, either alternative: site on property, properties, activity, design, technology, operational or other(provide details of "other")	Description
1	Proposal	Residential 1 with "Special" and "Private Open Spaces"
2	Alternative 2	None

NOTE: The numbering in the above table must be consistently applied throughout the application report and process

Please note!! There is no alternative for the proposed development as the proposed layout has already received a Record of Decision (RoD) in 2006 which lapsed due to no commencement of construction. This application is in essence a re-submission of the proposed development that received a RoD in 2006.

4. PHYSICAL SIZE OF THE ACTIVITY

Indicate the total physical size (footprint) of the proposal as well as alternatives. Footprints are to include all new infrastructure (roads, services etc), impermeable surfaces and landscaped areas:

Alternative:

Alternative 1(Proposed activity)

Alternative 2 (if any)

Alternative 3 (if any)

Size of the activity:

± 14 ha

Ha

or, for linear activities:

Alternative:

Alternative 1(Proposed activity)

Alternative 2 (if any)

Alternative 3 (if any)

Length of the activity:

m/km

Indicate the size of the site(s) or servitudes (within which the above footprints will occur):

Alternative:

Alternative 1(Proposed activity)

Alternative 2 (if any)

Alternative 3 (if any)

Size of the site/servitude:

± 14 ha

Ha/m²

5. SITE ACCESS

Alternative 1 (Proposal)

Does ready access to the site exist, or is access directly from an existing road?

YES	NO
------------	-----------

X	
	m

If NO, what is the distance over which a new access road will be built
Describe the type of access road planned:

The proposed residential development will gain access from Alexander Road (currently a gravel road) via Graham Road (M6).

Please note!! SEF Environmental Consultants is in the process of obtaining environmental authorization for a road (Hazeldean Road) that will traverse a section of the subject area. Should the proposed road receive a positive decision on environmental authorization, amendments at such time will be applied for to accommodate the road.

Include the position of the access road on the site plan.

PLEASE NOTE: Points 6 to 8 of Section A must be duplicated where relevant for alternatives

Section A 6-8 has been duplicated
(only complete when applicable)

0

Number of times

6. SITE OR ROUTE PLAN

A detailed site or route (for linear activities) plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document. The site or route plans must indicate the following:

- the scale of the plan, which must be at least a scale of 1:2000 (scale cannot be larger than 1:2000 i.e. scale can not be 1:2500 but could where applicable be 1:1500)
- the property boundaries and numbers of all the properties within 50m of the site;
- the current land use as well as the land use zoning of each of the properties adjoining the site or sites;
- the exact position of each element of the application as well as any other structures on the site;
- the position of services, including electricity supply cables (indicate above or underground), water supply pipelines, boreholes, street lights, sewage pipelines, septic tanks, storm water infrastructure and telecommunication infrastructure;
- walls and fencing including details of the height and construction material;
- servitudes indicating the purpose of the servitude;
- sensitive environmental elements on and within 100m of the site or sites including (but not limited thereto):
 - Rivers and wetlands;
 - the 1:100 and 1:50 year flood line;
 - ridges;
 - cultural and historical features;
 - areas with indigenous vegetation (even if it is degraded or infested with alien species);
- for gentle slopes the 1m contour intervals must be indicated on the plan and whenever the slope of the site exceeds 1:10, the 500mm contours must be indicated on the plan; and
- the positions from where photographs of the site were taken.
- Where a watercourse is located on the site at least one cross section of the water course must be included (to allow the 32m position from the bank to be clearly indicated)

7. SITE PHOTOGRAPHS

Colour photographs from the center of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under the appropriate Appendix. It should be supplemented with additional photographs of relevant features on the site, where applicable.

8. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of 1:200 for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity. To be attached in the appropriate Appendix.

SECTION B: DESCRIPTION OF RECEIVING ENVIRONMENT

Note: Complete Section B for the proposal

Further:

Instructions for completion of Section B for linear activities

- 1) For linear activities (pipelines etc) it may be necessary to complete Section B for each section of the site that has a significantly different environment.
- 2) Indicate on a plan(s) the different environments identified
- 3) Complete Section B for each of the above areas identified
- 4) Attach to this form in a chronological order
- 5) Each copy of Section B must clearly indicate the corresponding sections of the route at the top of the next page.

Section B has been duplicated for sections of the route times

Instructions for completion of Section B for location/route alternatives

- 1) For each location/route alternative identified the entire Section B needs to be completed
- 2) Each alternative location/route needs to be clearly indicated at the top of the next page
- 3) Attach the above documents in a chronological order

Section B has been duplicated for location/route alternatives times

(complete only when appropriate)

Instructions for completion of Section B when both location/route alternatives and linear activities are applicable for the application

Section B is to be completed and attachments order in the following way

- All significantly different environments identified for Alternative 2 is to be completed and attached in a chronological order; then
- all significantly different environments identified for Alternative 3 is to be completed and attached chronological order
- etc

Section B - Section of Route (complete only when appropriate for above)

Section B – Location/route Alternative No. (complete only when appropriate for above)

1. PROPERTY DESCRIPTION

Property description:

Part of Portion 5 of the Farm Tyger Valley 334 JR

(Farm name, portion etc.)

2. ACTIVITY POSITION

Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in decimal degrees. The degrees should have at least six decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

Alternative:

Latitude (S):

Longitude (E):

S25.793674°

E28.370159°

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

In the case of linear activities:

Alternative:

- Starting point of the activity
- Middle point of the activity
- End point of the activity

Latitude (S):

Longitude (E):

For route alternatives that are longer than 500m, please provide co-ordinates taken every 250 meters along the route and attached in the appropriate Appendix

Addendum of route alternatives attached

3. GRADIENT OF THE SITE

Indicate the general gradient of the site.

Flat	1:50 – 1:20	1:20 – 1:15	1:15 – 1:10	1:10 – 1:7,5	1:7,5 – 1:5	Steeper than 1:5
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4. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site.

Ridgeline	Plateau	Side slope of hill/ridge	Valley	Plain	Undulating plain/low hills	River front
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5. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

REFER TO APPENDIX I: FIGURE 13 – SOILS MAP AND FIGURE 14 – DOLOMITE MAP

a) Is the site located on any of the following?
Shallow water table (less than 1.5m deep)

Dolomite, sinkhole or doline areas

Seasonally wet soils (often close to water bodies)

Unstable rocky slopes or steep slopes with loose soil

Dispersive soils (soils that dissolve in water)

Soils with high clay content (clay fraction more than 40%)

YES	NO maybe
YES	NO X
YES maybe	NO
YES	NO X
YES	NO X
YES Maybe, Adjacent to an area with high clay content	NO

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

Any other unstable soil or geological feature

YES	NO X
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An area sensitive to erosion

YES The banks of the drainage line	NO
--	----

(Information in respect of the above will often be available at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by Geological Survey may also be used).

Please note for clarity purposes all figures within the Basic Assessment for this proposed development is in a larger format at the back of the Report as Appendix I.

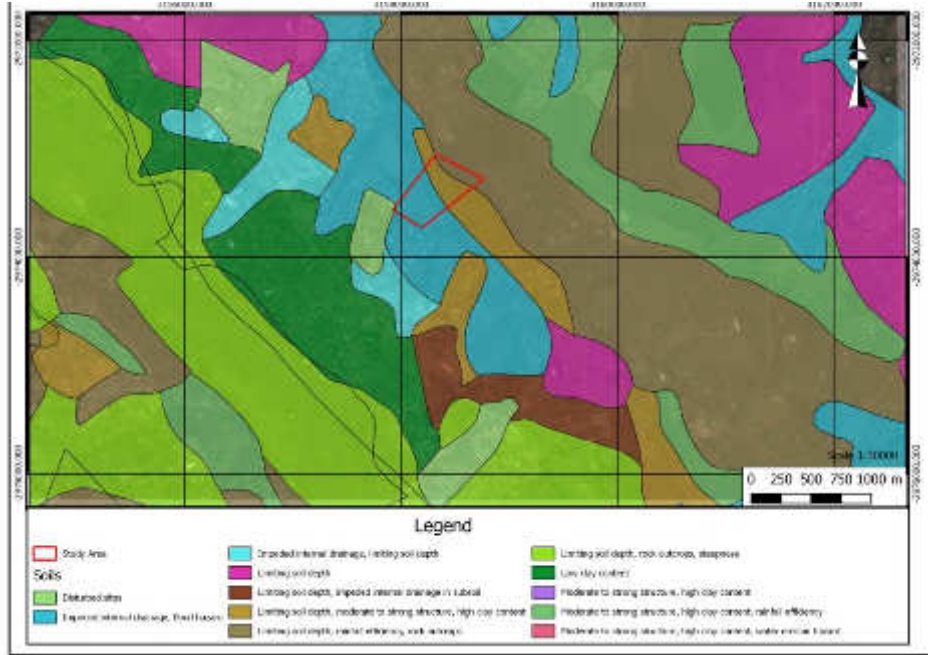


Figure 13 – Soils



Figure 14 – Dolomite

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

b) are any caves located on the site(s)

YES	NO X
-----	---------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	Longitude (E):

c) are any caves located within a 300m radius of the site(s)

YES	NO X
-----	---------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	Longitude (E):

d) are any sinkholes located within a 300m radius of the site(s)

YES	NO X
-----	---------

If yes to above provide location details in terms of latitude and longitude and indicate location on site or route map(s)

Latitude (S):	Longitude (E):

If any of the answers to the above are "YES" or "unsure", specialist input may be requested by the Department

The proposed residential development is not situated on dolomite. The drainage line do has some erosion potential and possible high content on the development area.

The site is underlain by alluvial and colluvial clayey soils overlying residual soils and shale bedrock. These belong to the Silverton Shale Formation, Pretoria Group, Transvaal Supergroup. It is not anticipated that there would be any problems with excavations on the alluvial clayey soils. The water table was not encountered during the investigation; however, seasonal perched water conditions and marshy conditions might occur. Some unstable sidewall conditions can be expected.

The area proposed for development consists of the Sepane soil form. Around the drainage line area there is dark fine structured clayey top soils. The soils on the site suggest low to moderate agricultural potential.

6. AGRICULTURE

REFER TO APPENDIX I: FIGURE 8 – AGRICULTURAL POTENTIAL MAP

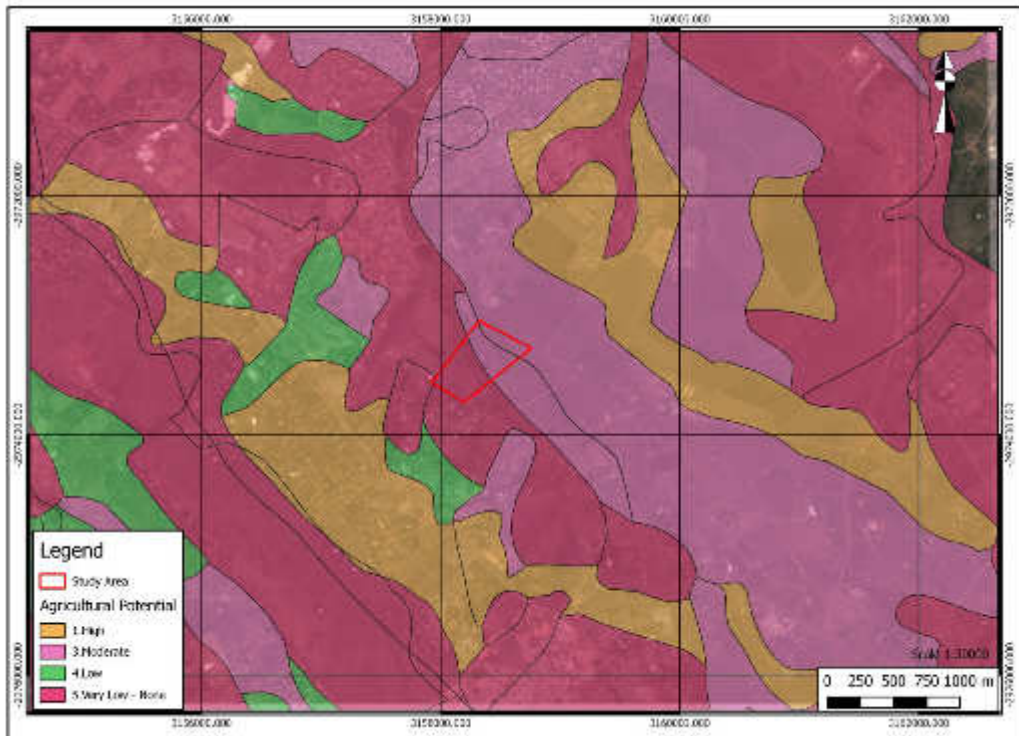


Figure 8 – Agricultural Potential

Does the site have high potential agricultural soils as contemplated in the Gauteng Agricultural Potential Atlas (GAPA)?

YES	NO X
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Please note: The Department may request specialist input/studies depending on the nature of the soil type and location of the site

Implications for the development

No Agricultural Potential Study was conducted for the proposed development due to the following:

- The proposed development site under application is situated in close proximity to residential areas and education facilities with limited agricultural activities in the surrounding area;
- The proposed application is small (not larger than 14 hectares) and thus too small for economic viable agricultural activities;
- The Agricultural Potential of the proposed application site according to GAPA version 3 indicates a Very Low Agricultural Potential;
- The proposed development site is not located within any of the seven Agriculture Hubs identified for the Gauteng Province. (Please refer to figure 10 – Urban Edge Map)

7. GROUNDCOVER

To be noted that the location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

Indicate the types of groundcover present on the site and include the estimated percentage found on site

Natural veld - good condition % =	Natural veld with scattered aliens % =	Natural veld with heavy alien infestation % =	Veld dominated by alien species % = 20	Landscaped (vegetation) % =
Sport field % =	Cultivated land % = 80	Paved surface (hard landscaping) % =	Building or other structure % =	Bare soil % =

Please note: The Department may request specialist input/studies depending on the nature of the groundcover and potential impact(s) of the proposed activity/ies.

Are there any rare or endangered flora or fauna species (including red list species) present on the site

YES	NO X
-----	-----------------

If YES, specify and explain:

A Flora and Fauna Habitat Assessment was conducted by Galago Environmental on Portion 5 of the farm Tyger Valley 334 JR, the proposed residential development will only be on a part of Portion 5 of the farm Tyger Valley 334 JR.

Flora

The proposed study area falls within the Marikana Thornveld which forms part of the Savannah biome. Six plant communities were identified on the larger study area and these include:

- *Acacia karroo* – *Rhus lancea* bushveld
- Plateau savannah
- Moist *Acacia karroo* savannah
- Disturbed moist secondary grassland
- Degraded drainage line
- Disturbed alien and indigenous vegetation

However, the proposed development will only be established on the Disturbed moist secondary grassland and the Degraded drainage line. The Orange-Listed plant species, *Hypoxis hemerocallidea*, which was identified on site, was found within the Disturbed moist secondary grassland. It is recommended by the specialist that this plant species be relocated to an area where it can be preserved. No Red-Listed plant species were found on site.

The *Acacia karroo* – *Rhus lancea* bushveld vegetation and Plateau savannah (which is not included in the proposed development) is considered sensitive and recommended to be excluded from development. These communities

are amongst those which are excluded from the proposed development. The Disturbed moist secondary grassland and the Degraded drainage line are deemed not sensitive. The Degraded drainage line will not be developed apart from the road crossing but it will be zoned as private open space adjacent to the proposed residential township.

Please refer to **Appendix G1** for the Flora and Fauna Habitat Assessment.

Fauna

Mammals:

The study area was surveyed for mammal species. The following mammals were identified during the fauna survey:

- Scrub hare (*Lepus saxatilis*)
- Jameson's red rock rabbit (*Pronolagus randensis*)
- Cape porcupine (*Hystrix africaeaustralis*)

These mammal species which were identified on the study area are common and widespread and have a high ability to co-exist in close proximity of humans and their associated activities.

Birds:

Twenty-three bird species were recorded during the site visit by the specialist. The habitat south-west of the drainage line is considered less sensitive in terms of avifaunal habitat. The ridge slope and plateau is considered sensitive for bird species. This is the only area where possible red listed bird species are likely to occur. The drainage line is also sensitive bird habitat however, this drainage line does not retain water for a long time and is only likely to attract more common bird species.

Reptiles and Amphibians:

The study area was assessed for reptile and amphibian species. On the area to be developed no termitaria was found and the substrate is regarded as hard clayey, there is also dense accumulation of dry grass. There is some indication that this area was ploughed in the past. It was concluded that this area might have less specialised terrestrial reptile species that utilise the area and no amphibians are expected to occur here. The Degraded drainage line might be suitable for the reproduction of some toads and sandfrogs.

Please refer to **Appendix G1** for the Flora and Fauna Habitat Assessment.

The sensitive and species-rich areas are towards the north-east of the larger study area and do not form part of the proposed development. It is our opinion that the area proposed for development is regarded as the less

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

sensitive area on the site, in terms of flora or fauna. The drainage line is degraded and utilised by some fauna species but it is important to note that the drainage line will not be developed but be zoned as private open space.

Are there any rare or endangered flora or fauna species (including red list species) present within a 200m (if within urban edge, May 2002) or within 600m (if outside the urban edge, May 2002) radius of the site	YES	NO X
---	------------	-----------------

If YES, specify and explain:

Are there any special or sensitive habitats or other natural features present on the site?	YES	NO X
--	------------	-----------------

If YES, specify and explain:

Was a specialist consulted to assist with completing this section	YES X	NO
---	------------------	-----------

If yes complete specialist details:

Name of the specialist:	Dr I.L. Rautenbach		
Qualification(s) of the specialist: Professional Registration	Pri.Sci.Nat: Ph.D. T.H.E.D.		
Postal address:	-		
Postal code:	-		
Telephone:	012 345 4891	Cell:	-
E-mail:	vanessam@lantic.net	Fax:	086 675 6136
Are any further specialist studies recommended by the specialist?	YES	NO X	
If YES, specify:			
If YES, is such a report(s) attached?	YES	NO	
If YES list the specialist reports attached below			
Signature of specialist:		Date:	November 2006

If yes complete specialist details:

Name of the specialist:	Mr. W.D. Haacke		
Qualification(s) of the specialist: Professional Registration	Pri.Sci.Nat: M.Sc		
Postal address:	-		
Postal code:	-		
Telephone:	012 345 4891	Cell:	-
E-mail:	vanessam@lantic.net	Fax:	086 675 6136
Are any further specialist studies recommended by the specialist?	YES	NO X	
If YES, specify:			
If YES, is such a report(s) attached?	YES	NO	
If YES list the specialist reports attached below			
Signature of specialist:		Date:	November 2006

If yes complete specialist details:

Name of the specialist:	Mr. R.F. Geysler		
Qualification(s) of the specialist: Professional Registration	-		
Postal address:	-		
Postal code:	-		

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Telephone:	012 345 4891	Cell:	-
E-mail:	vanessam@lantic.net	Fax:	086 675 6136
Are any further specialist studies recommended by the specialist?		YES	NO X
If YES, specify:			
If YES, is such a report(s) attached?		YES	NO
If YES list the specialist reports attached below			
Signature of specialist:		Date:	November 2006

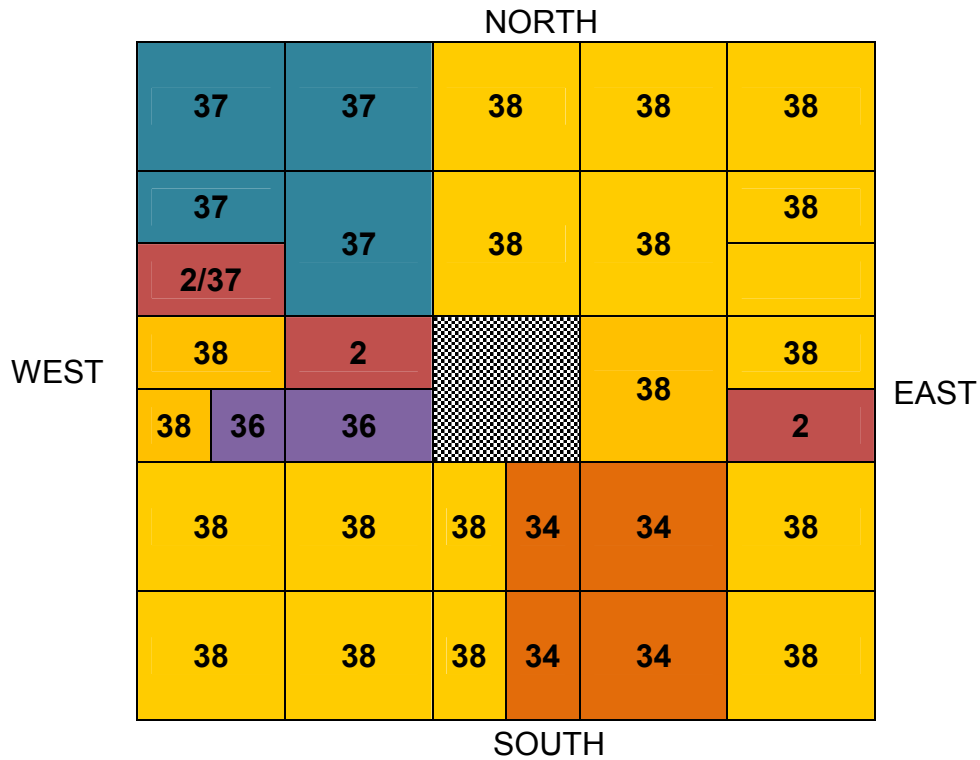
If yes complete specialist details:			
Name of the specialist:	Mrs. P. Lemmer		
Qualification(s) of the specialist: Professional Registration	Cert.Sci.Nat: B.Sc		
Postal address:	-		
Postal code:	-		
Telephone:	012 345 4891	Cell:	-
E-mail:	vanessam@lantic.net	Fax:	086 675 6136
Are any further specialist studies recommended by the specialist?		YES	NO X
If YES, specify:			
If YES, is such a report(s) attached?		YES	NO
If YES list the specialist reports attached below			
Signature of specialist:		Date:	November 2006

Please note; If more than one specialist was consulted to assist with the filling in of this section then this table must be appropriately duplicated

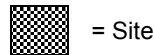
8. LAND USE CHARACTER OF SURROUNDING AREA

Using the associated number of the relevant current land use or prominent feature from the table below, fill in the position of these land-uses in the vacant blocks below which represent a 500m radius around the site

1. Vacant land	2. River, stream, wetland	3. Nature conservation area	4. Public open space	5. Koppie or ridge
6. Dam or reservoir	7. Agriculture	8. Low density residential	9. Medium to high density residential	10. Informal residential
11. Old age home	12. Retail	13. Offices	14. Commercial & warehousing	15. Light industrial
16. Heavy industrial ^{AN}	17. Hospitality facility	18. Church	19. Education facilities	20. Sport facilities
21. Golf course/polo fields	22. Airport ^N	23. Train station or shunting yard ^N	24. Railway line ^N	25. Major road (4 lanes or more) ^N
26. Sewage treatment plant ^A	27. Landfill or waste treatment site ^A	28. Historical building	29. Graveyard	30. Archeological site
31. Open cast mine	32. Underground mine	33. Spoil heap or slimes dam ^A	34. Agricultural Holdings	35. Substation
Other land uses (describe):	36. Rose farm	37. Game Lodge	38. Natural veld / agricultural area	



NOTE: Each block represents an area of 250m X250m



Note: More than one (1) Land-use may be indicated in a block

Please note: The Department may request specialist input/studies depending on the nature of the land use character of the area and potential impact(s) of the proposed activity/ies. Specialist reports that look at health & air quality and noise impacts may be required for any feature above and in particular those features marked with an "A" and with an "N" respectively.

Have specialist reports been attached

YES	NO X
-----	-----------------------

If yes indicate the type of reports below

N/A

9. SOCIO-ECONOMIC CONTEXT

Describe the existing social and economic characteristics of the area and the community condition as baseline information to assess the potential social, economic and community impacts.

The growth in the residential market has been considerable in recent years. This is evident from the popularity of newly proclaimed townships in the study area's vicinity. This proposed township is considered necessary as it will provide in this demand for economical, medium density, secure housing, which is currently popular under home buyers. The sales figures of similar

residential estates in the area are evidence of this.

The following design principles were adhered to in order to ensure desirability:

- Single controlled entrance;
- Provision of a site for a clubhouse;
- Traffic distribution;
- Provision of Open Space System;
- Road safety;
- Densities;
- Storm water drainage;
- Existing right-of-way servitude;
- Natural character;
- Total number of dwelling units;
- Installation of cost effective services;
- Dominance of space.

This development can be of economic importance to the surrounding community and the area as a whole thereby increasing the economic base of the Municipality. The proposed development will contribute by means of job opportunities during construction phase for construction related workers (skilled, semi-skilled and un-skilled individuals) and the operational phase for cleaning and gardening services.

10. CULTURAL/HISTORICAL FEATURES

Please be advised that if section 38 of the National Heritage Resources Act 25 of 1999 is applicable to your proposal or alternatives, then you are requested to furnish this Department with written comment from the South African Heritage Resource Agency (SAHRA) – Attach comment in appropriate annexure

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

- (a) the construction of a road, wall, powerline, pipeline, canal or other similar form of linear development or barrier exceeding 300m in length;*
- (b) the construction of a bridge or similar structure exceeding 50m in length;*
- (c) any development or other activity which will change the character of a site-*
 - (i) exceeding 5 000 m2 in extent; or*
 - (ii) involving three or more existing erven or subdivisions thereof; or*
 - (iii) involving three or more erven or divisions thereof which have been consolidated within the past five years; or*
 - (iv) the costs of which will exceed a sum set in terms of regulations by SAHRA or a provincial heritage resources authority;*
- (d) the re-zoning of a site exceeding 10 000 m2 in extent; or*
- (e) any other category of development provided for in regulations by SAHRA or a provincial heritage resources authority, must at the very earliest stages of initiating such a development, notify the responsible heritage resources authority and furnish it with details regarding the location, nature and extent of the proposed development.*

Are there any signs of culturally (aesthetic, social, spiritual, environmental) or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including archaeological or palaeontological sites, on or close (within 20m) to the site?

If YES, explain:

YES	NO X
-----	-----------------------

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

If uncertain, the Department may request that specialist input be provided to establish whether there is such a feature(s) present on or close to the site.

Briefly explain the findings of the specialist if one was already appointed:

A heritage impact assessment was conducted for the proposed development on the larger study area. One site of heritage importance was found on this larger study area. This site consisted of a number of smaller stone circles. There is a possibility that these relate to the Late Iron Age habitation that was found east of the site. This important site centres around the coordinates S-25.79229; E28.37379. The specialist recommended that a 25m buffer zone be established around the site. However, the heritage site and the recommended buffer zone are not overlapping the development area. The north-eastern boundary of the study area is the drainage line which is incorporated into a private open space area and the site with heritage importance is north of the planned private open space.

Will any building or structure older than 60 years be affected in any way?

YES	NO X
YES	NO X

Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?

If yes, please attached the comments from SAHRA in the appropriate Appendix

SECTION C: PUBLIC PARTICIPATION

1. ADVERTISEMENT

The Environmental Assessment Practitioner must follow any relevant guidelines adopted by the competent authority in respect of public participation and must at least –

- 1(a) Fix a notice in a conspicuous place, on the property where it is intended to undertake the activity which states that an application will be submitted to the competent authority in terms of these regulations and which provides information on the proposed nature and location of the activity, where further information on the proposed activity can be obtained and the manner in which representations on the application may be made.
- 1(b) inform landowners and occupiers of adjacent land of the applicant's intention to submit an application to the competent authority
- 1(c) inform landowners and occupiers of land within 100 metres of the boundary of the property where it is proposed to undertake the activity and whom may be directly affected by the proposed activity of the applicant's intention to submit an application to the competent authority;
- 1(d) inform the ward councillor and any organisation that represents the community in the area of the applicant's intention to submit an application to the competent authority;
- 1(e) inform the municipality which has jurisdiction over the area in which the proposed activity will be undertaken of the applicant's intention to submit an application to the competent authority; and
- 1(f) inform any organ of state that may have jurisdiction over any aspect of the activity of the applicant's intention to submit an application to the competent authority; and
- 1(g) place a notice in one local newspaper and any *Gazette* that is published specifically for the purpose of providing notice to the public of applications made in terms of these regulations.

2. LOCAL AUTHORITY PARTICIPATION

Local authorities are key interested and affected parties in each application and no decision on any application will be made before the relevant local authority is provided with the opportunity to give input. The planning and the environmental sections of the local authority must be informed of the application at least 30 (thirty) calendar days before the submission of the application.

Has any comment been received from the local authority?

YES	NO x
-----	-----------------------

If "YES", briefly describe the comment below (also attach any correspondence to and from the local authority to this application):

If "NO" briefly explain why no comments have been received

Comments will be received from the local authority once the Basic Assessment Report is available for public review. The comments will be attached in the final document.

3. CONSULTATION WITH OTHER STAKEHOLDERS

Any stakeholder that has a direct interest in the site or property, such as servitude holders and service providers, should be informed of the application at least 30 (thirty) calendar days before the submission of the application and be provided with the opportunity to comment.

Has any comment been received from stakeholders?

YES	NO x
-----	-----------------------

If "YES", briefly describe the feedback below (also attach copies of any correspondence to and from the stakeholders to this application):

If "NO" briefly explain why no comments have been received

Comments will be received from the stakeholders once the Basic Assessment Report is available for public review. The comments will be attached in the final document.

4. GENERAL PUBLIC PARTICIPATION REQUIREMENTS

The Environmental Assessment Practitioner must ensure that the public participation is adequate and must determine whether a public meeting or any other additional measure is appropriate or not based on the particular nature of each case. Special attention should be given to the involvement of local community structures such as Ward Committees and ratepayers associations. Please note that public concerns that emerge at a later stage that should have been addressed may cause the competent authority to withdraw any authorisation it may have issued if it becomes apparent that the public participation process was inadequate.

The practitioner must record all comments and respond to each comment of the public / interested and affected party before the application is submitted. The comments and responses must be captured in a Comments and Responses Report as prescribed in the regulations and be attached to this application.

5. APPENDICES FOR PUBLIC PARTICIPATION

All public participation information is to be attached in the appropriate Appendix. The information in this Appendix is to be ordered as detailed below

Appendix 1 – Proof of site notice

Appendix 2 – written notices issued to those persons detailed in 1(b) to 1(f) above

Appendix 3 – Proof of newspaper advertisements

Appendix 4 – Communications to and from persons detailed in Point 2 and 3 above

Appendix 5 – minutes of any public and or stakeholder meetings

Appendix 6 - Comments and Responses Report

Appendix 7 –Comments from I&APs on Basic Assessment (BA) Report

Appendix 8 –Comments from I&APs on amendments to the BA report

Appendix 9 – Copy of the register of I&APs

Appendix 10 – Comments from I&APs on the application

Appendix 11 - Other

SECTION D: RESOURCE USE AND PROCESS DETAILS

Note: Section D is to be completed for the proposal

Instructions for completion of Section D for alternatives

- 1) For each alternative under investigation, where such alternatives will have different resource and process details (e.g. technology alternative), the entire Section D needs to be completed
- 4) Each alternative needs to be clearly indicated in the box below
- 5) Attach the above documents in a chronological order

Section D has been duplicated for alternatives times
(complete only when appropriate)

Section D Alternative No. (complete only when appropriate for above)

1. WASTE, EFFLUENT, AND EMISSION MANAGEMENT

Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?

YES X	NO
------------------------	----

If yes, what estimated quantity will be produced per month?

Not Available

How will the construction solid waste be disposed of (describe)?

During the construction phase the disposal of solid waste will be the responsibility of the developer. An area on the application site will be earmarked for dumping of solid waste to be disposed of during construction. This area must be situated carefully not to be visual from the surrounding residents. The demarcated area must be easily accessible for dumping trucks to collect waste. The waste will be carted to registered landfill site.

Where will the construction solid waste be disposed of (describe)?

All construction solid waste will be disposed of at the nearest registered dumping site. No solid waste will be dumped on surrounding open areas or adjacent properties.

Will the activity produce solid waste during its operational phase?

YES X	NO
------------------------	----

If yes, what estimated quantity will be produced per month?

± 210 m ³

How will the solid waste be disposed of (describe)?

The local municipality will be responsible for solid waste disposal.

Has the municipality or relevant service provider confirmed that sufficient air space exists for treating/disposing of the solid waste to be generated by this activity? **UNKNOWN**

YES	NO
-----	----

Where will the solid waste be disposed if it does not feed into a municipal waste stream (describe)?

Not applicable

Note: If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Can any part of the solid waste be classified as hazardous in terms of the relevant legislation?

YES	NO X
-----	-----------------------

If yes, inform the competent authority and request a change to an application for scoping and EIA.

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Is the activity that is being applied for a solid waste handling or treatment facility?

YES	NO X
-----	-----------------------

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

Describe the measures, if any, that will be taken to ensure the optimal reuse or recycling of materials:

It is recommended that all construction waste materials be sorted into recyclable materials and non-recyclable materials and the recyclable materials should be re-used or disposed of by a recycling company.

Liquid effluent (other than domestic sewage)

Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system?

YES	NO X
-----	-----------------------

If yes, what estimated quantity will be produced per month?

Not Applicable

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the liquid effluent to be generated by this activity(ies)?

Not Applicable

Will the activity produce any effluent that will be treated and/or disposed of on site?

Yes	NO X
-----	-----------------------

If yes, what estimated quantity will be produced per month?

Not Applicable

If yes describe the nature of the effluent and how it will be disposed.

Not Applicable

Note that if effluent is to be treated or disposed on site the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA

Will the activity produce effluent that will be treated and/or disposed of at another facility?

YES	NO X
-----	-----------------------

If yes, provide the particulars of the facility:

Facility name:			
Contact person:			
Postal address:			
Postal code:			
Telephone:		Cell:	
E-mail:		Fax:	

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

Not Applicable

Liquid effluent (domestic sewage)

Will the activity produce domestic effluent that will be disposed of in a municipal sewage system?

YES X	NO
------------------------	----

If yes, what estimated quantity will be produced per month?

± 4410 kℓ (147 kℓ/day)

If yes, has the municipality confirmed that sufficient capacity exist for treating / disposing of the domestic effluent to be generated by this activity(ies)?

YES X	NO
------------------------	----

Will the activity produce any effluent that will be treated and/or disposed of on site?

YES	NO X
-----	-----------------------

If yes describe how it will be treated and disposed off.

Not Applicable

Emissions into the atmosphere

Will the activity release emissions into the atmosphere?

YES	NO X
-----	-----------------------

If yes, is it controlled by any legislation of any sphere of government?

Not Applicable

If yes, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If no, describe the emissions in terms of type and concentration:

The proposed development will not generate any emissions. Some additional

vehicle/truck traffic during the construction phase may have an influence but this can be regarded as insignificant.

2. WATER USE

Indicate the source(s) of water that will be used for the activity

Municipal	Directly from water board	groundwater	river, stream, dam or lake	other	
-----------	---------------------------	-------------	----------------------------	-------	--

If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month:

Not
Applicable

If Yes, please attach proof of assurance of water supply, e.g. yield of borehole, in the appropriate Appendix

Does the activity require a water use permit from the Department of Water Affairs and Forestry?

YES maybe	NO
---------------------	----

If yes, list the permits required

In terms of the Section 21 of the National Water Act, the developer might need a water use license for activities (c) and (i) for the proposed development as the proposed development is within 500m from a watercourse.

If yes, have you applied for the water use permit(s)?

NO

If yes, have you received approval(s)? (attached in appropriate appendix)

Not
Applicable

3. POWER SUPPLY

Please indicate the source of power supply eg. Municipality / Eskom / Renewable energy source

The relevant authority will ensure the connection and installation of electricity.

If power supply is not available, where will power be sourced from?

Not Applicable

4. ENERGY EFFICIENCY

Describe the design measures, if any, that have been taken to ensure that the activity is energy efficient:

The following could be considered:

- Residential units could be orientated in a northern direction.
- Where possible energy saving light bulbs must be used in all the units as well as outside.
- Time switches must be used for outdoor lighting.
- Geysers must be fitted with insulation blankets.
- Solar panels can be used to heat the water and geysers and for outdoor lighting.

The developer is committed to search and investigate more solutions and

opportunities to increase the sustainability of this development making it a project that will be a landmark on many levels.

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The following alternative energy sources can be considered:

Hydro Power

This option was rejected because the hydrological conditions required for hydro generation in this area could not be met i.e. water quantity, etc.

Wind turbines

This option was rejected because the wind conditions required cannot be met in this region.

Biomass

This option was rejected because the fuel required for producing electricity is not locally available, the distance between the source of biomass and the power plant must be short for economic viability.

Gas

This option was rejected because natural gas is not available and the Egoli Gas pipeline is remote and the energy spent in processing the gas and transporting it affects the viability of this process.

Coal fired generation

This option was rejected because of the distance from the coal fields and because pollution is not allowed in this area.

Nuclear

This option could not be considered due to South Africa's nuclear policy.

Solar

Solar power generation will be encouraged with each individual development however cannot be considered as the prime generation system due to the 24 hour power requirements of the industrial, residential, office/business park etc. projects.

SECTION E: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2006, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

1. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

Summarise the issues raised by interested and affected parties.

The public participation for the Tijger Valley Extension 14 & 34 was done in order to ensure that all Interested and Affected Parties register.

The proposed project was advertised in the Beeld newspaper on Wednesday, 3 September 2014 (**Refer to Appendix Ei – Proof of Newspaper advertisement**). Site notices were also erected at prominent points adjacent to the application site on 3 September 2014. (**Refer to Appendix Eii – Proof of Site Notice**). Furthermore Flyers were also distributed to residents, land owners, tenants and stakeholders in the surrounding area (**Refer to Appendix Eiii – Written Notices**).

It is the opinion of Bokamoso that the Public participation was extensive and transparent enough to ensure any comments or issues in regards to the proposed development to be addressed and to suggest possible mitigation measures.

Please note!! SEF Environmental Consultants is in the process of obtaining environmental authorization for a road that will traverse a section of the subject area. Should the proposed road receive a positive decision on environmental authorization, amendments at such time will be applied for to accommodate the road.

Summary of response from the practitioner to the issues raised by the interested and affected parties
(A full response must be provided in the Comments and Response Report that must be attached to this report):

Please refer to Appendix E (iv) for the Comments and Issues Register.

2. IMPACTS THAT MAY RESULT FROM THE CONSTRUCTION AND OPERATIONAL PHASE

Briefly describe the methodology utilised in the rating of significance of impacts

The beneficial and adverse impacts of the proposed development have been discussed below.

The impacts are rated based on consideration of the following:

A). Significance:

- | | | | |
|--------------------------|------------|---|---|
| <input type="checkbox"/> | Improbable | - | Low possibility of impact to occur either because of design or historic experience. |
| <input type="checkbox"/> | Probable | - | Distinct possibility that impact will occur. |

<input type="checkbox"/>	Highly probability	-	Most likely that impact will occur.
<input type="checkbox"/>	Definite	-	Impact will occur, in the case of adverse impacts regardless of any prevention measures.
B).Intensity factor:			
<input type="checkbox"/>	Low intensity	-	natural and man made functions not affected
<input type="checkbox"/>	Medium intensity	-	environment affected but natural and man made functions and processes continue
<input type="checkbox"/>	High intensity	-	environment affected to the extent that natural or man made functions are altered to the extent that it will temporarily or permanently cease
C). Duration:			
<input type="checkbox"/>	Short term	-	<1 to 5 years - Factor 2
<input type="checkbox"/>	Medium term	-	5 to 15 years - Factor 3
<input type="checkbox"/>	Long term	-	impact will only cease after the operational life of the activity, either because of natural process or by human intervention
<input type="checkbox"/>	Permanent	-	mitigation, either by natural process or by human intervention, will not occur in such a way or in such a time span that the impact can be considered transient.

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the construction phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Alternative 1 (Proposal)

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
CONSTRUCTION PHASE			
Beneficial Impacts			

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Institutional Environment			
The proposed development will be in line with the current and proposed developments in the vicinity.	High	Not applicable	High
Fauna & Flora			
Eradication of invasive species.	High	Eradication of invasive species during the construction phase would benefit the biophysical environment. Not necessary to mitigate.	High
Social & Economic Environment			
Creation of Job opportunities.	Medium	The proposed development would create job opportunities during the construction phase. Should the local community not benefit from these opportunities, it could lead to an influx of people from other areas. Only employing people from the local community could mitigate the potential adverse impact.	Medium
Reduction of areas that have potential for informal settlements and illegal dumping.	High	The proposed township development will prevent informal settlements and illegal dumping on the proposed development areas.	High
Increase in the rates and taxes payable to the City of Tshwane Metropolitan Municipality.	Medium	More rates and taxes will be paid to the City of Tshwane Metropolitan Municipality.	Medium
Services			
Upgrading of existing services and the construction of new services.	High	The upgrading of existing services and the establishment of new services will be essential to support the proposed development. The developer will also maintain the existing and established services during the operational phase of the development.	High
Optimum utilization of services.	High	The proposed development will utilize the existing services which supports development optimally. The developer/ facility manager will also manage and provide for the routine maintenance of such services.	High
Adverse Impacts			
Flora & Fauna			
<p>Construction works will cause the eradication of existing vegetation –</p> <p>Site clearance forms part of any project of this scale. Large areas of exposed soil will cause erosion and dust pollution. Due to the already extensive disturbance within the study area by human activity, large bare soil areas are visible and can create opportunity for extensive erosion on site.</p>	Low	<ul style="list-style-type: none"> • The project should be planned to ensure that only specific areas are cleared as the project progress to ensure that large areas are not exposed over long periods. • Before the removal of vegetation takes place, the area to be cleared must be clearly marked. • Strip topsoil at start of works and store in stockpiles no more than 1.5 m high in designated storage areas. The topsoil should contain the natural grass component as the seeds may help with the re-vegetation of the site during rehabilitation. 	None

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		<ul style="list-style-type: none"> As many of the large indigenous tree specimens must be retained on the application site during construction. The trees to be retained must be marked and may not be disturbed during the construction activities. 	
Uncontrolled fires may cause damage and loss to vegetation and fauna in the area.	Low	<ul style="list-style-type: none"> If fires are required for cooking and heating purposes, these fires will only be permitted in designated areas on site. 	None
Possible spreading of invaders into the natural surrounding areas.	Low	<ul style="list-style-type: none"> No plants, not indigenous to the area, or exotic plant species should be introduced into the landscaping of the proposed development. 	None
The Orange-Listed plant species, <i>Hypoxis hemerocallidea</i> , was identified on site, within the Disturbed moist secondary grassland.	Medium	<ul style="list-style-type: none"> It is recommended by the specialist that this plant species be relocated to an area where it can be preserved. 	Low
Geology & Soils			
<p>Soil erosion due to drainage systems –</p> <p>During the construction phase temporary measures should be implemented to manage storm water and water flow on the application site. If the storm water and water flow is not regulated and managed on site it could cause significant erosion of soil, as well as the pollution and siltation of water bodies.</p>	Medium	<ul style="list-style-type: none"> Only the identified areas should be cleared of vegetation. This should be done in stages as construction works progress; Implement temporary storm water management measures that will help to reduce the speed of the water. This measures must also assist with the prevention of water pollution, erosion and siltation; If excavations or foundations fill up with storm water, these areas should immediately be drained and measures to prevent further water from entering the excavations should be implemented; Biodegradable matting, geotextiles and other means of erosion control should be implemented during the construction phase on large exposed areas and where storm water are temporarily channeled; Any storm water outfalls should be designed and measures should be implemented to prevent erosion and water pollution at these points. Areas around buildings, where gutters and outlets are implemented should be paved; The services which will be installed in the area, should be designed to run in the same direction as the existing services to make installation and maintenance easy; Trees may not be planted any closer to services than 1.5 times their mature height. 	None

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

<p>If not planned and managed correctly topsoil will be lost.</p>	<p align="center">Medium</p>	<ul style="list-style-type: none"> • A shake down area at the exits of the construction site should be established where the excessive soil on the tires of the construction vehicles can be brushed off and kept aside for later use during rehabilitation works; • The layout of the construction site should be planned before any construction site should be planned before any construction activities take place. The areas where soil will be compacted by construction activities, heavy vehicle movement, site camp, material storage areas and stockpiling areas should be marked out and the topsoil should be removed; • The areas where topsoil will not be removed and which will be conserved during the construction phase should be marked with barrier tape to ensure that vehicles do not move across these areas, and construction activities does not damage the in-situ topsoil; • The removed topsoil should be stored separately from all stockpiled materials and subsoil, according to the stockpiling methods as described below. The stockpiled topsoil should be used for rehabilitation and landscaping purposes after construction has been completed; • The installation of services could leave soils exposed and susceptible to erosion. Soils should be stored adjacent to the excavated trenches that are excavated to install services, and this should be filled up with the in-situ material as the services are installed. All stones and rocks bigger than 80 mm should be removed from the top layer of soil and these disturbed areas should be re-vegetated immediately after works in a specific area are completed to prevent erosion; • Excavations on site must be kept to minimum and done only one section at a time. Excavated soils must be stockpiled directly on the demarcated area on site. 	<p align="center">Low</p>
<p>Excavations are not kept dry.</p>	<p align="center">Medium</p>	<ul style="list-style-type: none"> • Construction works and bulk earth works which involve the construction of excavations must be proposed for the drier season. 	<p align="center">Low</p>
<p>Climate</p>			

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

Construction during the rainy season can cause delays and damage to the environment.	Low	<ul style="list-style-type: none"> • It is recommended that the construction phase be scheduled for the winter months especially activities such as the installation of services, foundations, excavations and road construction; • It is also recommended that the precautionary measures be taken in order to prevent the extensive loss of soil during rainstorms. Large exposed areas should adequately be protected against erosion by matting or cladding; • Measures should be implemented during the rainy season to channel storm water away from open excavations and foundations. 	None
Construction during the dry and windy season could cause excessive dust pollution during construction works.	Low	<ul style="list-style-type: none"> • Regular and effective damping down working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. When necessary, these working areas should be damped down at least twice a day. 	None
Hydrology & groundwater			
The use of insufficient drainage systems.	Medium	<ul style="list-style-type: none"> • A storm water management plan should be designed by an engineer to ensure sufficient drainage on site. 	None
Excavated materials that are stockpiled in wrong areas can interfere with the natural drainage.	Medium	<ul style="list-style-type: none"> • An area must be allocated for stockpiling of topsoil before any construction takes place on the application site. The stockpiles must be situated away from any water source or drainage channel. A sediment fence or barrier must be constructed around the stockpile, to prevent soil from washing away by rain or any water. 	Low
Cultural and Archaeology			
Occurrence of cultural historical assets on the proposed development site.	Medium	<ul style="list-style-type: none"> • If archeological sites are exposed during construction work, it should immediately be reported to a museum, preferably on at which an archaeologist are available so that an investigation and evaluation of the site can be made. 	None
Localized Vibration			
The noise created by earthmoving machinery will result in the greatest increase in ambient levels. This will be short term, being generated only during the day.	Medium	<ul style="list-style-type: none"> • All construction activities must be restricted during normal working hours from 8:00 in the morning to no later than 18:00 in the afternoons. No construction may take place on Sundays and public holidays. 	Low
Air pollution			

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

Nuisance to neighbours in terms of dust generation due to construction during the dry and windy season.	Medium	<ul style="list-style-type: none"> The application site must be damped at a regular basis with water (more or less 3 to 4 times on a dry day). A water tanker should be used if possible. 	Low
Roads and Traffic			
Heavy vehicle traffic increase could disrupt the surrounding landowners' daily routines.	Medium	Heavy vehicles must be instructed to only use the main roads during off-peak hours.	Low
Restrictions of access to surrounding properties and the study area during construction phases.	Medium	<ul style="list-style-type: none"> To minimize the impacts or risks, heavy construction vehicles should avoid using the local road network during peak traffic times; These vehicles should use only specific roads and strictly keep within the speed limits and abide to all traffic laws. No speeding or reckless driving should be allowed. Access to the site for construction vehicles should be planned to minimize the impact on the surrounding network; and Warning signs should be erected on the roads that these vehicles will use, at big crossings/ access roads and on the site if needed. 	Low
Damage to roads.	Medium	<ul style="list-style-type: none"> Specific roads must be allocated for the use by construction vehicles. 	Low
Safety and Security			
During the construction phase safety and security problems (especially for the surrounding residents) are likely to occur.	Medium	<ul style="list-style-type: none"> Construction must be completed in as short time as possible. No construction worker or relative may reside on the application site during the construction phase. All construction workers must leave the site at the end of a day's work. A security guard should be appointed on site to prevent any security problems. 	Low
Any proposed development offers the potential for unplanned informal settlement (squatting) before construction commences or after construction.	Medium	<ul style="list-style-type: none"> No construction worker, friend or relative may settle/ reside on site. Only security may be present on site after construction hours. 	Low
Construction activities could cause danger to children and animals of the surrounding residents.	Low	<ul style="list-style-type: none"> Although regarded as a normal practice, it is important to erect proper signs indicating the operation of heavy vehicles in the vicinity of dangerous crossings and access roads or erven with in the development site, if necessary; It is also important to indicate all areas where excavations took place/ are taking place and warning signs that clearly indicate areas with excavations must be placed immediately adjacent to excavations; A barrier should be established around dangerous excavation 	None

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

		<p>areas;</p> <ul style="list-style-type: none"> • With the exception of appointed security personnel, no other worker, friend or relatives will be allowed to sleep on the construction site (weekends included), in the public open space or on adjacent properties; and • No worker should be allowed to enter adjacent private properties without written consent of the legal owners to the contractor. 	
Visual Impact			
Dumping of builder's rubble on neighbouring properties.	Medium	<ul style="list-style-type: none"> • A specific location for building rubble must be allocated on site, to concentrate and collect the building rubble and cart it to a certified landfill site. The allocated area must be out of sight of neighbouring properties to have a less visual impact. 	Low
Stockpile areas for construction materials.	Medium	<ul style="list-style-type: none"> • An area on the site must be allocated for the stockpile of construction materials. The area must be situated on the application site, and must be situated to have a minimal visual impact on the neighbouring area. 	Low
Veld fires may cause damage to infrastructure, vegetation and neighbouring properties.	Low	<ul style="list-style-type: none"> • A specific area on site must be allocated, which will have the least impact on the environment and surrounding landowners, for fires of construction workers. This allocated area must be far from any structures and no fires may be lit except in the designated location. 	Low
The construction vehicles, the site camp and other construction related facilities will have a negative visual impact during the construction phase.	Medium	<ul style="list-style-type: none"> • Before any construction commence on site, an area on site must be demarcated for a site camp. 	Low
Waste Management			
Site office, camp and associated waste (visual, air and soil pollution)	Medium	<ul style="list-style-type: none"> • Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks; • These points should not be located in areas highly visible from the properties of the surrounding landowners/ tenants/ in areas where the wind direction will carry bad odours across the properties of adjacent tenants or landowners; • The site camp and the rest of the study area should appear neat at all times; • Waste materials should be removed from the site on a regular basis, to a registered 	Low

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

		<p>dumping site; and</p> <ul style="list-style-type: none"> The site camp should not be located in a highly visual area on the study area, or a screen or barrier should be erected as not have a negative impact on the sense of place. 	
Disposal of building waste & liquids	Medium	<ul style="list-style-type: none"> All the waste generated by the proposed developments must be dumped at a preselected area on site to be carted to a register landfill site; THESE AREAS SHALL BE PREDETERMINED AND LOCATED IN AREAS THAT ARE ALREADY DISTURBED; Small lightweight waste items should be contained in skips with lids to prevent wind littering; All waste must be removed to a recognized waste disposal site/ landfill site on a weekly basis. No waste materials may be disposed of on or adjacent to the site; The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the local authority; and Keep records of waste reuse, recycling and disposal for future reference. 	Low
OPERATIONAL PHASE			
Beneficial Impacts			
Social & Economic Environment			
Creation of temporary and permanent jobs.	Medium	During the operational phase numerous permanent jobs will be created on various levels (house, garden, maintenance, etc.).	Medium
Increasing security in the area.	High	In the long term the proposed development will improve the security of the area. The monitored access points will improve the security of the proposed site and surrounding areas.	High
Higher quality of livelihoods.	High	The community's quality of life will increase and more people will be economically active.	High
Reduction of areas that have potential for informal settlements and illegal dumping.	High	The proposed township development will prevent informal settlements and illegal dumping on the proposed development area.	High
Increase in rates and taxes payable to the City of Tshwane Metropolitan Municipality.	Medium	More rates and taxes will be paid to the CTMM.	Medium
Increase in surrounding property values.	High	If planned and managed correctly, the proposed development could have a positive impact on property values. Due to the proposed theme, the development will generally be in line with the surrounding land uses.	High
Visibility and accessibility of study	High	The visibility and accessibility of the	High

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area.		study area contributes to the study area's ideal suitability for the proposed land use.	
Adverse Impacts			
Hydrology			
An increase in surface water runoff to storm water management systems (because of an increase of hard-surfaces such as roofs and paved areas), may have an impact on surface quality and quantities.	Low	<ul style="list-style-type: none"> • Storm water through the site should be managed to accommodate the higher quantities of runoff; • Sheet flow should be encouraged as far as possible, and channels should be designed sufficiently to address the problem or erosion; and • Bio-swale system could be implemented to filter water from paved areas and especially from roads and parking areas to sufficiently clean water of heavy metals and other hazardous materials contained in storm water in a natural manner. This will further provide an opportunity for water to infiltrate the soil, break the energy of storm water and keep the water on site for longer. 	Low
Leaking pipes could cause ground water pollution risks.	Low	<ul style="list-style-type: none"> • Pipes should be inspected on a regular basis. 	None
Light pollution			
The proposed development could cause a significant level of light pollution as the light industrial development will need some security lighting.	Low	<ul style="list-style-type: none"> • Lighting within the proposed development, including security lighting, could easily glare into surrounding residences if not designed appropriately. It is recommended that all the lighting on site be designed to point downwards and designed in such a way to not cause glare dispersal or unnecessary flickering. 	None
Pollution			
The generation of Air pollution.	Low	The proposed development is located within an area that is characterized by residential developments. It is therefore that one can consider the fact that the study area is surrounded by activities that will contribute to the same level air pollution as the proposed development. One however, has to note that on a local scale, the proposed development does not include noxious industries, and therefore specifically would not contribute to any air pollution. As mentioned previously the exhaust fumes of additional vehicles may have an influence, but in this particular instance it is deemed as insignificant, and therefore on a local scale would not have any affect.	Low
The generation of noise pollution	Low	As mentioned previously, one has to	Low

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

<p>–</p> <p>Additional traffic generated by the proposed development will have some impact on the ambient noise levels within the area.</p>		<p>note that the study area is wedged between many Provincial and National Roads which already generate ambient noise levels that exceed the acceptable levels for urban and residential areas. It is therefore, when one consider the above mentioned, that ambient noise levels generated by this particular development would not be that significant, as the proposed development, is located within an area that already exceed the acceptable noise levels.</p>	
Roads & Traffic			
<p>Additional vehicle traffic could have a detrimental impact on the existing roads with in the vicinity of proposed development.</p>	Medium	<p>If required, the road network which surrounds the proposed development will have to be correctly maintained/ upgraded in order to support additional traffic generated.</p>	Low
Visual Impact			
<p>The proposed development will have some visual impact on the surrounding areas.</p>	Medium	<ul style="list-style-type: none"> • Due to the development control measures and the fact that residential uses will be developed, it is anticipated that the proposed development will have a great visual impact on the surrounding environment, • It is important that the roofs of all the buildings within the proposed development should not reflect any sunlight; • The colour scheme for the buildings should be taken from the palette of colours in the natural surroundings; • Existing trees, if any should be retained as far possible on the site, in order to soften the visual impact of the buildings associated with the development, and to bring the scale of the large buildings in scale with the surrounding environment; • It is also proposed that as many additional indigenous trees be planted in areas that were previously disturbed, in order to soften the harsh visual impact of the proposed development. The planting of additional trees will help to develop a certain character for the site which will fit in with the surrounding environment. 	Low
<p>Impact on the sense of place.</p>	Low	<p>If not managed correctly, the proposed development will have a negative impact on the sense of place of the surrounding environment, due to the height of the buildings that will form part of</p>	None

		<p>the proposed development;</p> <p>In order to “Promote the Sense of Place” of the surrounding area, the colour scheme of the buildings which will form part of the proposed development, should be taken from a palette of colours in the natural surroundings.</p> <p>It is also important that a landscape development plan should be developed and implemented for the study area, prior to the operational phase. Landscaped areas which will form part of the proposed development will in essence soften the harsh architectural lines and elements which are associated with the proposed development. Landscaped areas within the proposed development will also bring the scale of the buildings in relation to the surrounding environment.</p>	
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List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

Ecological Red Listed Species Assessment (Appendix G1)
Wetland Delineation Assessment (Appendix G2)

3. IMPACTS THAT MAY RESULT FROM THE DECOMMISSIONING AND CLOSURE PHASE

Briefly describe and compare the potential impacts (as appropriate), significance rating of impacts, proposed mitigation and significance rating of impacts after mitigation that are likely to occur as a result of the decommissioning and closure phase for the various alternatives of the proposed development. This must include an assessment of the significance of all impacts.

Alternative 1 (Proposal)

Potential impacts:	Significance rating of impacts:	Proposed mitigation:	Significance rating of impacts after mitigation:
Geology & Soils			
Soil erosion, siltation and gully formation.	Low	Demolition works must be kept to a minimum on site and only be done one section at a time to prevent excessive open soil areas that could lead to soil erosion, siltation and excessive compaction.	Low
If not planned and managed correctly, topsoil will be lost.	Low	<ul style="list-style-type: none"> ▪ A shake down area at the exit of the site should be established where the excessive soil on the tires of vehicles can be brushed off 	Low

		<p>and kept aside for later use during rehabilitation works;</p> <ul style="list-style-type: none"> ▪ The site should be planned before any decommissioning activities take place on site. The areas where soil will be compacted, heavy vehicle movement (on site construction routes), site camp, material storage areas and stockpiling areas should be marked out and the topsoil should be removed; ▪ The areas where topsoil will not be removed and that will be conserved should be marked with barrier tape to ensure vehicles do not move across these areas and decommissioning activities do not damage the in situ topsoil; ▪ The removed topsoil should be stored separately from all stockpiled materials and subsoil, according to the stockpiling methods as described below. The stockpiled topsoil should be used for rehabilitation purposes after decommissioning has been completed; and ▪ Rehabilitation works must be done immediately after the involved works in an area is completed to prevent erosion. 	
<p>Water seepage at shallow depth could cause instability of soil or water pollution.</p>	Medium	<p>Geotechnical and civil engineers must supply mitigation measures and guidelines to prevent problems.</p>	Low
Hydrology & Groundwater			
<p>Vehicle maintenance.</p>	Medium	<p>Vehicle maintenance may not be done on the application site. Whenever a vehicle needs maintenance it must be taken to a certified workshop for the maintenance.</p>	None
<p>Excavated materials that are stockpiled in the wrong areas can interfere with the natural drainage.</p>	Medium	<p>An area must be allocated for stockpiling of topsoil before any demolishing of buildings take place on the site and must be situated from any water source or drainage channels. A sediment fence or barrier must be constructed around the stockpile to prevent soil from washing away by rain or any water.</p>	Low

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Surface water flows will be altered during the decommissioning phase.	Low	Due to the demolishing that will take place (there will be trenches, topsoil and subsoil mounds in and around the area), the topography of the site will temporarily be altered.	Low
Climate			
Demolition works during the rainy season can cause unnecessary delays and damage to the environment, especially damage to existing roads in the area.	Low	Should decommissioning take place in the wetter months, frequent rain could cause very wet conditions, which makes it extremely difficult to do the necessary rehabilitation works of disturbed areas. Wet soils are vulnerable to compaction. Wet conditions often causes delays and the draining of water away from the works (in the case of high water tables) into the water bodies of the adjacent properties, could (if not planned and managed correctly) have an impact on the water quality of these water bodies.	Low
Demolition works during the dry and windy season.	Low	Regular and effective damping down of working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. When necessary, these working areas should be damped down at least twice daily.	None
Fauna & Flora			
Uncontrolled fires may cause damage or loss to vegetation and fauna in the area.	Medium	If fires are required for cooking and heating purposes, these fires will only be permitted in designated areas on the site. The fire area should be an exposed area (no natural veld grass should be in close proximity of the fire area). Workers should only be allowed to smoke in the fire area and fires should preferably be prevented while strong winds are blowing.	None
Uncontrolled activities and access to sensitive areas in the vicinity.	Medium	<ul style="list-style-type: none"> ▪ Dumping of building rubble and other waste on these areas is strictly prohibited; and ▪ No vehicles must be allowed to move in or across the sensitive areas. This leaves visible scars and destroys habitat. 	Low
Visual Impact			
Dumping of builder's rubble on neighbouring properties.	Medium	A specific location for building rubble must be allocated on	None

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		site, to concentrate and collect the building rubble and cart it to a certified landfill site. The allocated area must be out of sight of neighbouring properties to have a less visual impact.	
Localised Vibrations			
Noise pollution.	Medium	The activities related with the decommissioning phase will generate noise. Therefore, it must be restricted during working hours.	Low
Roads & Traffic			
Heavy vehicle traffic increase could disrupt the surrounding landowners' daily routines.	Medium	Heavy vehicles must be instructed to only use the main roads during off-peak hours.	Low
Restrictions of access to surrounding properties.	Low	<ul style="list-style-type: none"> ▪ To minimize this impacts or risks, heavy vehicles (trucks, bull dowers, etc.) should avoid using the local road network during peak traffic times; ▪ These vehicles should use only specific roads and strictly keep within the speed limits and abide to all traffic laws. No speeding or reckless driving should be allowed. Access to the site for heavy vehicles should be planned to minimize the impact on the surrounding network; and ▪ Warning signs should be erected on the roads that these vehicles will use, at big crossings/access roads and on the site if needed. 	None
Damage to roads.	Medium	Specific roads must be allocated for the use by heavy vehicles and photos must be taken prior to decommissioning in order to determine if any damage has been done.	None
Safety & Security			
During the decommissioning phase safety and security problems (especially for the surrounding residents) are likely to occur.	Low	Demolition works must be completed in as short time as possible. No worker or relative may reside on the site. All workers must leave the site at the end of a day's work. A security guard should be appointed on site to prevent any security problems.	Low
Decommissioning activities could cause danger to children and animals of the surrounding residents.	Medium	<ul style="list-style-type: none"> ▪ Although regarded as a normal practice, it is important to erect proper signs indicating the operations of heavy vehicles in the vicinity of dangerous crossings and access roads or even on the site if 	Low

BASIC ASSESSMENT REPORT [REGULATION 22(1)]

		<p>necessary;</p> <ul style="list-style-type: none"> ▪ It is also important to indicate all areas where excavations took place/are taking place and warning signs that clearly indicate areas with excavations must be placed immediately adjacent to excavations; ▪ A barrier should be established around dangerous excavation areas; ▪ With the exception of the appointed security personnel, no other workers, friend or relatives will be allowed to sleep on the site (weekends included), in the public open space or on adjacent properties; and ▪ No workers should be allowed to enter adjacent private properties without written consent of the legal owners to the contractor. 	
Waste Management			
<p>Site office, camp and associated waste (visual, air and soil pollution)</p>	Medium	<ul style="list-style-type: none"> ▪ Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks; ▪ These points should not be located in areas highly visible from the properties of the surrounding land-owners/tenants/in areas where the wind direction will carry bad odours across the properties of adjacent tenants or landowners; ▪ The site camp and the rest of the area should appear neat at all times; ▪ Waste materials should be removed from the site on a regular basis, to a registered dumping site; and ▪ The site camp should not be located in a highly visual area on the site, or a screen or barrier should be erected as not have a negative impact on the sense of place. 	Low
<p>Disposal of building waste & liquids.</p>	Medium	<ul style="list-style-type: none"> ▪ All waste generated must be dumped at a pre-selected area on site to be carted to a registered landfill site. THESE AREAS SHALL BE PREDETERMINED; ▪ Small lightweight waste 	Low

		<p>items should be contained in skips with lids to prevent wind littering;</p> <ul style="list-style-type: none"> ▪ All waste must be removed to a recognized waste disposal site on a weekly basis. No waste materials may be disposed of on or adjacent to the site; ▪ The storage of solid waste on site, until such time that it may be disposed of, must be in the manner acceptable to the Local Authority; and ▪ Keep records of waste reuse, recycling and disposal for future reference. 	
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List any specialist reports that were used to fill in the above tables. Such reports are to be attached in the appropriate Appendix.

N/A

4. CUMULATIVE IMPACTS

Describe potential impacts that, on their own may not be significant, but is significant when added to the impact of other activities or existing impacts in the environment. Substantiate response:

Should the proposed development be approved, the majority of cumulative impacts will be related to the construction phase.

- Noise pollution may upset residents in the area – to prevent this, construction activities may only take place during the daytime;
- Surface water flows will be altered during the construction phase of the proposed residential development;
- The construction vehicles and facilities will have a negative impact on the study area and surrounding views – this impact may be minimized by locating the site camp in an area with low visibility from surrounding developments and road networks;
- Dust pollution could cause nuisance to surrounding residents – dust can be effectively controlled through the wetting of exposed surfaces, especially in the winter months;
- During the construction phase some safety problems (especially for the surrounding residents) are likely to occur – in order to minimise this, site workers are not to be allowed to sleep on the construction site at night and provision for adequate security/ site supervision must be made during the day;
- Loss of flora and fauna and potential invasion of exotic plant species.

Subsequently, the above mentioned cumulative impacts can be mitigated if activities are correctly planned and measures are implemented to manage activities which could cause any negative cumulative impacts.

5. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that sums up the impact that the proposal and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

Alternative 1 (Proposal)

The major impacts that is likely to occur during the construction and operational phase:

- **Biodiversity**

The environment will be temporarily affected by the moving of large construction vehicles and the excavations for the installation of services and infrastructure and construction of residential units. The river system might be impacted upon through erosion and sedimentation and the spreading of alien and invasive plant species. A drainage line traverses the site but would be kept as private open space for the proposed development.

- **Geology and Soils**

The proposed residential development is not situated on dolomite. The drainage line has some erosion potential and possible high content on the development area.

The site is underlain by alluvial and colluvial clayey soils overlying residual soils and shale bedrock. It is not anticipated that there would be any problems with excavations on the alluvial clayey soils. The water table was not encountered during the investigation; however, seasonal perched water conditions and marshy conditions might occur.

Valuable topsoil may also be lost during the construction process. The loss of topsoil can however be minimised through the storage of topsoil in designated stockpiles on site and the re-use thereof within the landscape component of the development.

- **The Social Environment**

The public participation were done by means of a newspaper notice, site notices placed on prominent points on the application site, hand delivered notices to surrounding tenants and landowners and the distributing of notices to stakeholders such as the Local Authorities, Councillors by means of faxes and e-mails.

Dangerous excavations can cause injury/ even death to people if proper precautions are not taken. Crime can also impact the surrounding community from the temporary workers. Social importance, new human activity in the area.

Construction vehicles and equipment can be temporarily visually unpleasant for residents.

The proposed residential development will contribute to storm water management, road safety, traffic distribution etc.

- **Economic Environment**

Installation of services for the proposed development as well as construction of dwelling units will create a significant number of employment opportunities for skilled and un-skilled workers. During the operational phase of the residential development the job opportunities in the surrounding environment will be increased.

- **Noise**

The construction phase will cause noise pollution and disturb the receiving community, but can be mitigated with the limitation construction hours from 8:00 to 18:00 to cause minimal disturbance to the community.

- **Visual**

Construction vehicles and equipment can be visually unpleasant for residents.

Alternative 2

N/A

No-go (compulsory)

The no-go option entails that the development area stay in the current state and no new services is installed and no residential units will developed.

The proposed development will not have a significant impact on the Bio-physical environment, as the majority of the site is already disturbed and degraded.

The locality of the site in an area filled with new developments and with water resources available makes it rather susceptible for informal settlements for

individuals with no formal residence in particular those working in the vicinity. Informal settlements also bring about petty crime that could possibly escalate to major crimes. Informal settlements on the site will increase the level of littering on the site and water pollution of the drainage line.

6. IMPACT SUMMARY OF PREFERRED PROPOSAL

Identify preferred proposal

Alternative 1 (Proposal)

Having assessed the significance of impacts of the proposal and various alternatives, please provide an overall summary and reasons for selecting the preferred project proposal.

It is evident that based on the biophysical and sociological characteristics, the site is suitable for the proposed development of a residential township (only if the project is planned and managed in accordance with an approved Environmental Management Plan). The development will fit in with the surrounding area and create job opportunities during the constructional phase.

As already indicated, most of the construction related activities could be mitigated to an acceptable level. The proposed development on the site will contribute to the biodiversity as alien and invasive plant species will be eradicated and monitored.

The proposed development will create several job opportunities during the construction and operational phase.

If managed correctly, the proposed project could have a significant positive impact on the social and economical environments. The proposed development could also have a positive impact on the ecological environment (especially through the upgrade and protection of the drainage line area and the removal of exotic invaders and weeds from the site).

In the long term the impact of the proposed development will be more positive than negative for the Bio-physical, Social and Economic environments:

Biophysical

- The exotic invaders and weeds will be removed from the site on a continuous basis;
- No construction is planned within the drainage line area except for the road crossing.

Social

- Noise and dust problems during the construction phase;

- Dangerous excavations can cause injury to people in the surrounding environment.

Economic

- Creation of job opportunities during the construction and operational phase;
- Increased rates and taxes to the local municipality.

The mitigations and adaptive monitoring outlined in this Basic Assessment and the EMP with respect to potential adverse impacts should result in limited adverse impacts on local and regional, natural and socio-economic resources. No "fatal flaws" or adverse impacts that cannot be mitigated are anticipated to be associated with the proposed residential development.

As a result of the above mentioned information, Bokamoso is of the opinion that the proposed development (only if planned, implemented and managed correctly) will in the long term have a significant positive impact on the larger regional system to which it is linked.

It is therefore requested that the proposed township development be allowed to proceed, so long as the mitigation measures contained in this report and in the Environmental Management Plan (Appendix H) are implemented, so as to achieve maximum advantage from beneficial impacts, and sufficient mitigation of adverse impacts.

7. RECOMMENDATION OF PRACTITIONER

Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the Environmental Assessment Practitioner).

YES X	NO
------------------------	----

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment):

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application:

As a result of the above mentioned information, Bokamoso request that the above development be approved as long as the following are followed:

- All recommendations as part of the attached Fauna and Flora Habitat Assessment as well as the Wetland Delineation (Refer to Appendix G) must be adhered to;
- Recommendations in the Geotechnical Report needs to be incorporated in the planning and designing phase of this

development;

- The EMP attached must be adhered to at all times and the appointed ECO must ensure the developer comply with the EMP.

8. ENVIRONMENTAL MANAGEMENT PLAN (EMP)

If the EAP answers yes to Point 7 above then an EMP is to be attached to this report as an Appendix

EMP attached

YES
X

SECTION F: APPENDIXES

The following appendixes must be attached as appropriate:

It is required that if more than one item is enclosed that a table of contents is included in the appendix

Appendix A: Site plan(s)

Appendix B: Photographs

Appendix C: Facility illustration(s)

Appendix D: Route position information

Appendix E: Public participation information

Appendix F: Water use license(s), SAHRA information, service letters from municipalities,
water supply information

Appendix G: Specialist reports

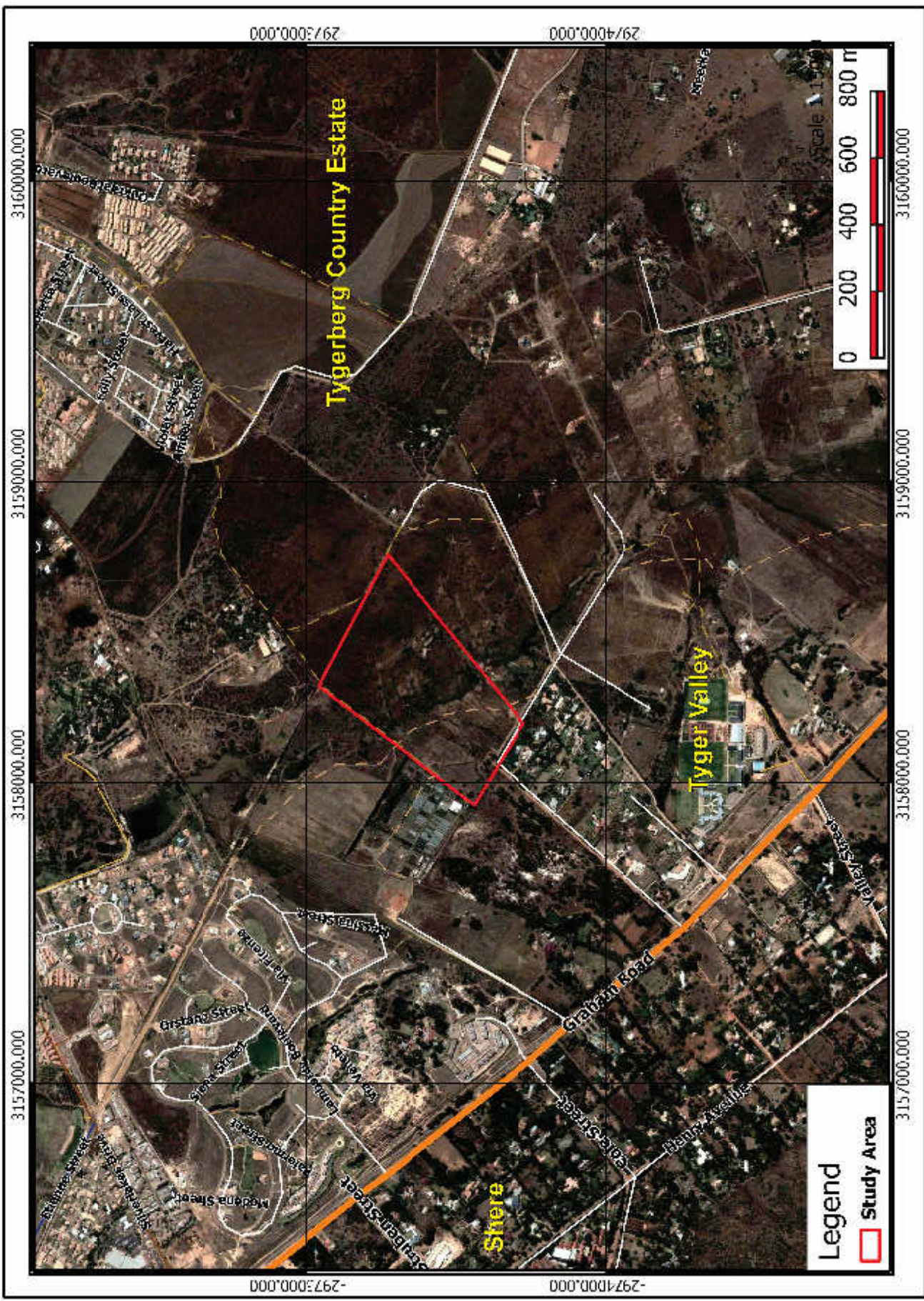
Appendix H: EMP

Appendix I: Other information

Site plan(s)



Appendix A



2973000.000 2974000.000

3157000.000 3158000.000 3159000.000 3160000.000

Tygerberg Country Estate

Tyger Valley

Shere



Legend

 Study Area

Photographs

Not available

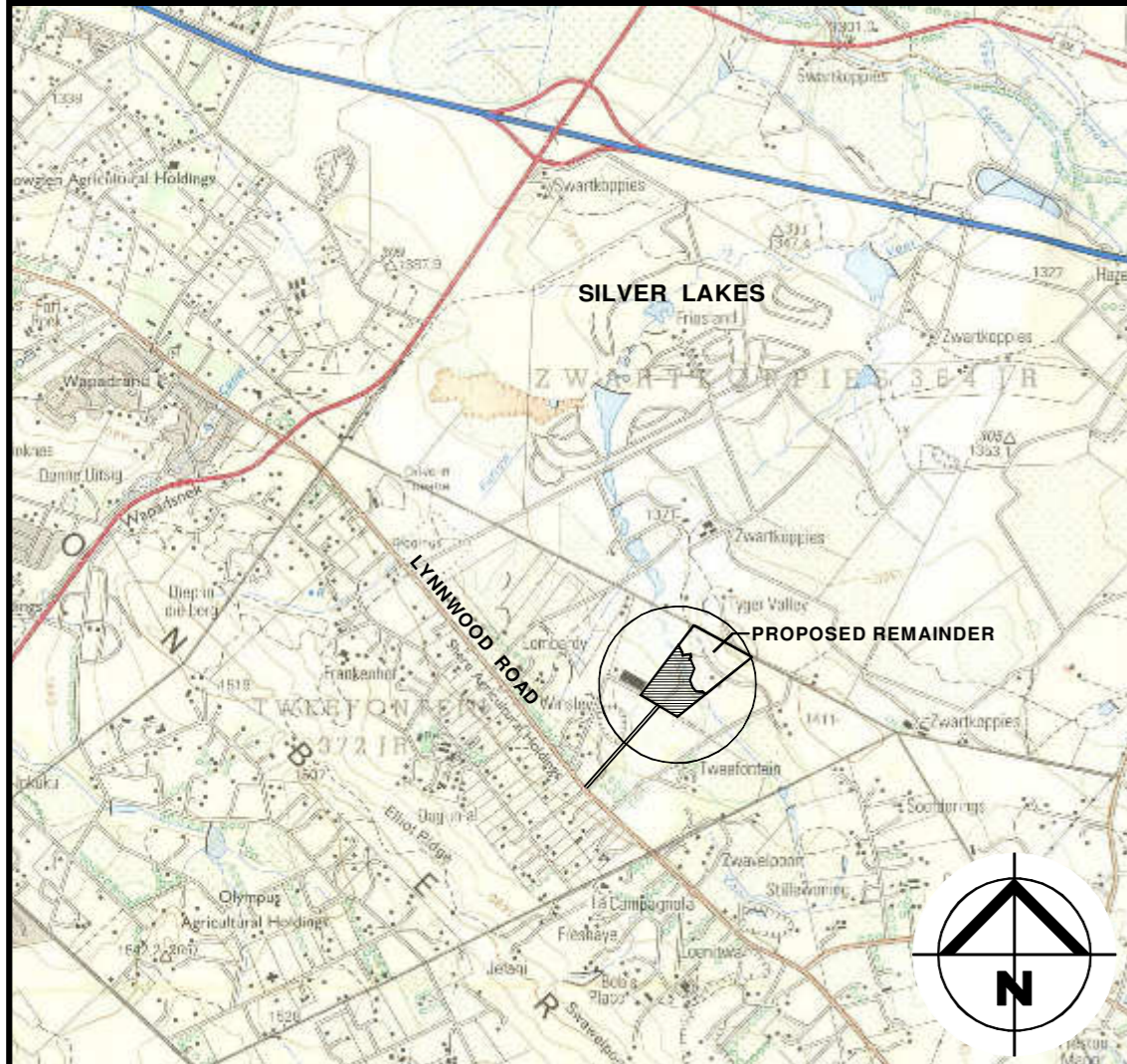


Facility Illustration(s)



Appendix C

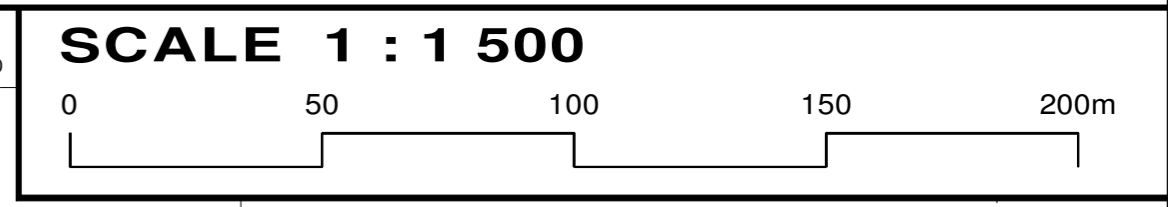
PROPOSED TOWNSHIP TIJGER VALLEY X14



LOCALITY PLAN 1 : 50 000

LOCALITY
SITUATED ON PART OF PORTION 5 OF THE FARM TYGER VALLEY 334-JR REPRESENTED BY THE FIGURE A-B-C-D-E-F-G-H-J-K-L-M-N-P-Q-R-A

LOCAL AUTHORITY
KUNGWINI LOCAL MUNICIPALITY



VLIETSTRA
TOWN AND REGIONAL PLANNING

PO Box 72097
LYNWOOD RIDGE
0040

Sagewood House
Eastwood Office Park
Lynnwood Road
Lynnwood Ridge
PRETORIA

Tel (012) 348-5720
Fax (012) 348-5726
e-Mail: vliet@lantic.net

VLIETSTRA TOWN AND REGIONAL PLANNING INC REG NO 1985/011261/21

- SERVITUDE NOTES**
- 1) A SEWER SERVITUDE 2M WIDE IN FAVOUR OF THE LOCAL AUTHORITY IS PROPOSED OVER ERF 31.
 - 2) A GENERAL SERVITUDE FOR MUNICIPAL PURPOSES IN FAVOUR OF THE LOCAL AUTHORITY IS PROPOSED OVER ERVEN 1 AND 53-60.
 - 3) THE PROPOSED TOWNSHIP IS AFFECTED BY A RIGHT-OF-WAY SERVITUDE 9,45M WIDE IN FAVOUR OF THE GENERAL PUBLIC, INCORPORATED AS STREETS, (S.G. NO. A 923/60).
 - 4) A GENERAL R.O.W. SERVITUDE IN FAVOUR OF THE PROPOSED REMAINDER IS PROPOSED OVER ERF 1.

- GENERAL NOTES**
- 1) ALL DIMENSIONS AND AREAS APPROXIMATE
 - 2) THE CONTOURS ARE IN ACCORDANCE WITH REGULATION 18(1) OF THE TOWN-PLANNING AND TOWNSHIPS ORDINANCE, ORDINANCE 15 OF 1986
CO-ORDINANCE SYSTEM: WGS 29°
CONTOUR DATUM: SEA LEVEL
1m CONTOUR INTERVALS
 - 3) CONTOURS SUPPLIED BY ISAZI SURVEYS

DENSITY NOTE
NETT DENSITY = 25,41 DWELLING UNITS PER HECTARE

FLOOD LINE CERTIFICATE

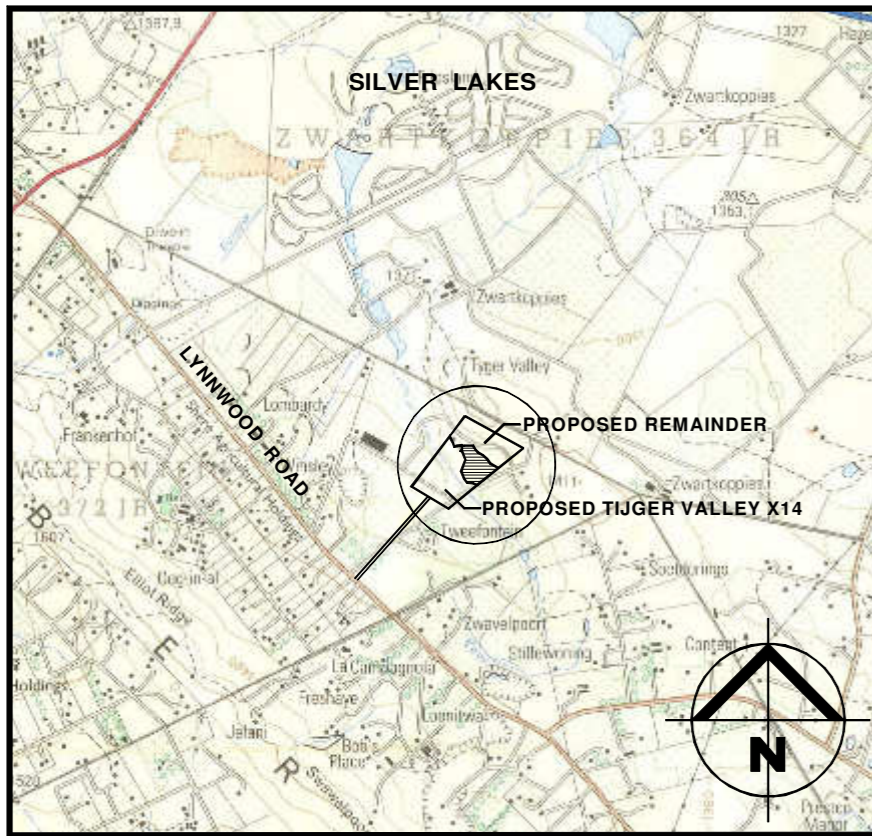
IN TERMS OF SECTION 144 OF THE NATIONAL WATER ACT (ACT NO. 36 OF 1998), IT IS HEREBY CERTIFIED THAT THE LINES INDICATED ON THIS PLAN, REPRESENT THE MAXIMUM LEVELS THAT FLOODS WILL REACH WITH AVERAGE RECURRENCE INTERVALS OF 100 YEARS AND 50 YEARS.

F.W.J. KOEN (Pr.Eng.) (Reg. No. 760534)

LAND USE	ZONING	ERF NUMBERS	No OF ERVEN	No OF D/UNITS	AREA (Ha)	%	MAY 2006
	RESIDENTIAL 1	2-12, 21-29, 33-38, 42-52	37	37	2,1460	21,56	
	"SPECIAL" FOR DWELLING UNITS (25 u/Ha)	13, 18-20, 30, 32, 41	7	21	0,8502	8,54	
	"SPECIAL" FOR DWELLING UNITS (30 u/Ha)	17	1	7	0,2334	2,34	
	"SPECIAL" FOR DWELLING UNITS (40 u/Ha)	14-16, 39,40	5	47	1,1773	11,83	
	"SPECIAL" FOR ACCESS AND ACCESS CONTROL	1	1	N/A	1,8637	18,73	
	"SPECIAL" FOR CLUBHOUSE ETC.	31	1	N/A	0,3878	3,90	
	PRIVATE OPEN SPACE	53-60	8	N/A	2,4941	25,06	
	STREETS (9,45 & 14,72m)		N/A	N/A	0,8000	8,04	
	TOTAL		60	112	9,9525	100,00	

PROPOSED TIJGER VALLEY X34 TOWNSHIP

PLAN No: 15/4/290/3/1
JUNE 2007



LOCALITY PLAN 1 : 50 000

SERVITUDE NOTES

1) A GENERAL SERVITUDE FOR MUNICIPAL PURPOSES IN FAVOUR OF THE LOCAL AUTHORITY IS PROPOSED OVER ERVEN 1 AND 43-47.

GENERAL NOTES

- 1) ALL DIMENSIONS AND AREAS APPROXIMATE
- 2) THE CONTOURS ARE IN ACCORDANCE WITH REGULATION 18(1) OF THE TOWN-PLANNING AND TOWNSHIPS ORDINANCE, ORDINANCE 15 OF 1986 CO-ORDINANCE SYSTEM: WGS 29th CONTOUR DATUM: SEA LEVEL 1m CONTOUR INTERVALS
- 3) CONTOURS SUPPLIED BY ISAZI SURVEYS

DENSITY NOTE

NETT DENSITY = 14,73 DWELLING UNITS PER HECTARE

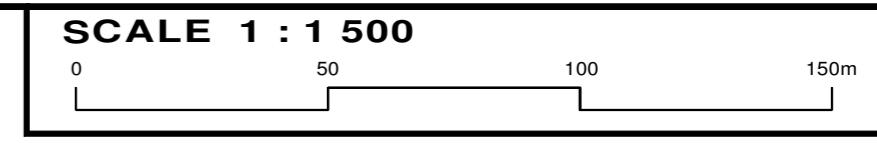
FLOOD LINE CERTIFICATE

IN TERMS OF SECTION 144 OF THE NATIONAL WATER ACT (ACT NO. 36 OF 1998), IT IS HEREBY CERTIFIED THAT THE LINES INDICATED ON THIS PLAN, REPRESENT THE MAXIMUM LEVELS THAT FLOODS WILL REACH WITH AVERAGE RECURRENCE INTERVALS OF 100 YEARS AND 50 YEARS.

F.W.J. KOEN (Pr.Eng.) (Reg. No. 760534)

LOCALITY
SITUATED ON PART OF PORTION 5 OF THE FARM TYGER VALLEY 334-JR REPRESENTED BY THE FIGURE A-B-C-D-E-F-G-H-J-K-L-M-N-P-Q-R-S-A

LOCAL AUTHORITY
KUNGWINI LOCAL MUNICIPALITY



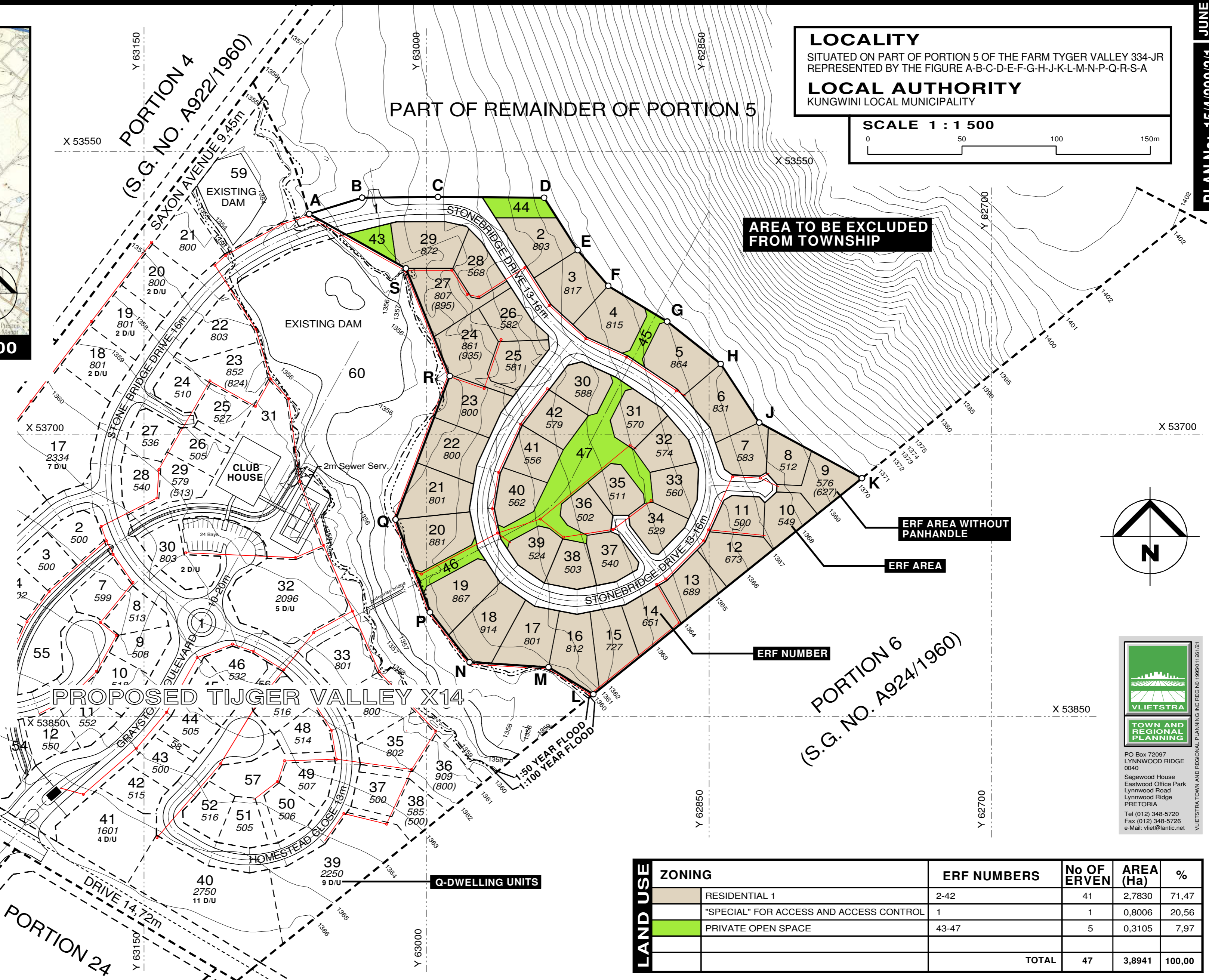
AREA TO BE EXCLUDED FROM TOWNSHIP

ERF AREA WITHOUT PANHANDLE

ERF AREA

ERF NUMBER

PART OF REMAINDER OF PORTION 5



PROPOSED TIJGER VALLEY X14

PORTION 6
(S.G. NO. A924/1960)

PORTION 3
(S.G. NO. A921/1960)

PORTION 24

LAND USE	ZONING	ERF NUMBERS	No OF ERVEN	AREA (Ha)	%
		RESIDENTIAL 1	2-42	41	2,7830
	"SPECIAL" FOR ACCESS AND ACCESS CONTROL	1	1	0,8006	20,56
	PRIVATE OPEN SPACE	43-47	5	0,3105	7,97
	TOTAL		47	3,8941	100,00



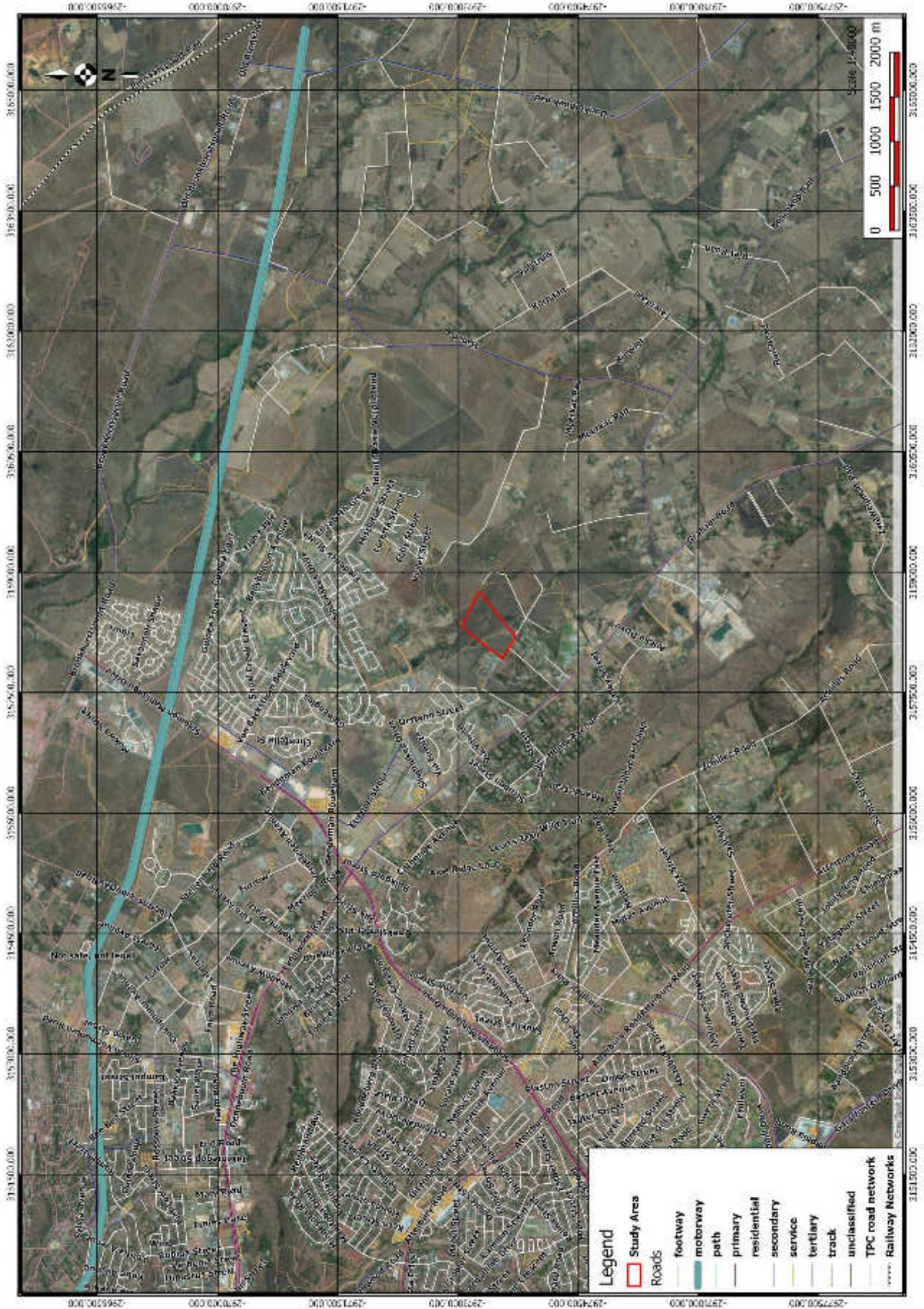
PO Box 72097
LYNNWOOD RIDGE
0040
Sagewood House
Eastwood Office Park
Lynnwood Road
Lynnwood Ridge
PRETORIA
Tel (012) 348-5720
Fax (012) 348-5726
e-Mail: vliet@tanic.net

VLIETSTRA TOWN AND REGIONAL PLANNING INC REG NO: 19950118/21

Route Position Information



Appendix D



Public Participation Information



Appendix E

Proof of Site Notice



Appendix E1

NOTICE OF BASIC ASSESSMENT PROCESS

Notice is given of an application for a **Basic Assessment Process** that was submitted to the Gauteng Department of Agriculture and Rural Development, in terms of Regulation No. R543 published in the Government Notice No. 33306 of 18 June 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) governing **Basic Assessment Procedures (Listing Notice: 1 and 3 – Government Notice R544 & R546)** for the following activity:

Reference No: Gaut 002/14-15/0091

Project Name: Tijger Valley Extension 14 & 34

Project & Property Description: The proposed development is a Residential Township that is situated on Part of Portion 5 of the Farm Tygervalley 334 JR

Listing Activities Applied for:

GNR 544 (Listing Notice 1), 18 June 2010	Activity 9
GNR 544 (Listing Notice 1), 18 June 2010	Activity 10
GNR 544 (Listing Notice 1), 18 June 2010	Activity 11
GNR 544 (Listing Notice 1), 18 June 2010	Activity 18
GNR 544 (Listing Notice 1), 18 June 2010	Activity 22
GNR 544 (Listing Notice 1), 18 June 2010	Activity 23
GNR 544 (Listing Notice 1), 18 June 2010	Activity 26
GNR 546 (Listing Notice 3), 18 June 2010	Activity 13
GNR 546 (Listing Notice 3), 18 June 2010	Activity 16

Proponent Name: André Wright

Location: The proposed study area is located approximately 1km North-East of Graham Road (Lynnwood Rd) and approximately 1km East of Lombardy Estate.

Date of Notice: 3 September 2014 – 13 October 2014

Queries regarding this matter should be referred to:

Bokamoso Landscape Architects and Environmental Consultants CC

Public Participation registration and inquiries: **Juanita De Beer**

Project Inquiries: **Anè Agenbacht**

P.O. Box 11375

Maroelana 0161

www.bokamoso.biz

Tel: (012) 346 3810

Fax: (086) 570 5659

E-mail: lizelleg@mweb.co.za

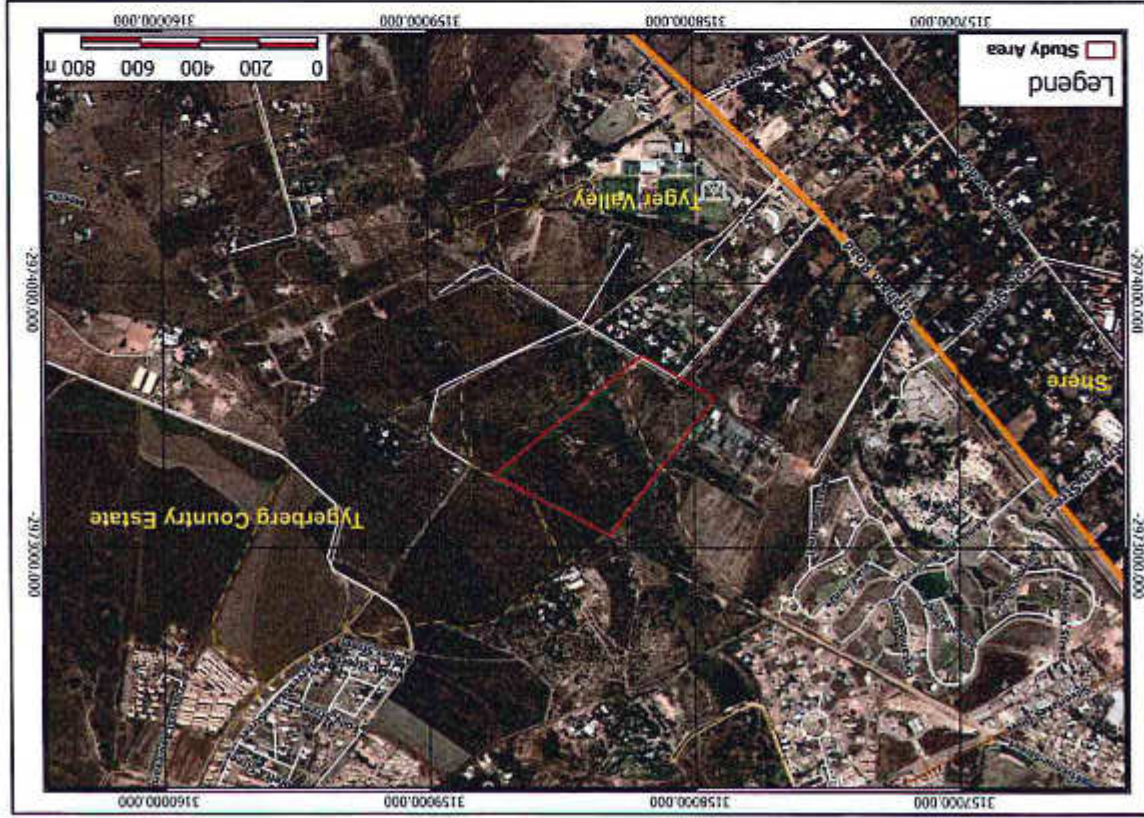
In order to ensure that you are identified as an Interested and/or Affected Party (I&AP) please submit your name, contact information and interest in the matter, in writing, to the contact person given above **within 40 days of this Notice**.

**Written Notices Issued to Those Persons
Detailed in 1(b) to 1(f) above**



Appendix E2

Tijger Valley X14 & X34



Locality Map

NOTICE OF BASIC ASSESSMENT PROCESS

Notice is given of an application for a **Basic Assessment Process** that was submitted to the Gauteng Department of Agriculture and Rural Development, in terms of Regulation No. R543 published in the Government Notice No. 33306 of 18 June 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) governing **Basic Assessment Procedures (Notice 1 and 3 – Government Notice R544 & R546)** for the following activity:

Reference No: Gaut 002/14-15/0091

Project Name: Tijger Valley Extension 14 & 34

Project & Property Description: The proposed development is a Residential Township that is situated on Part of Portion 5 of the Farm Tygervalley 334 JR

Proponent Name: André Wright

Listing Activities Applied: GNR 544 (Listing Notice 1), 18 June 2010 – Activity 9, 10, 11, 18, 22, 23 & 26 and GNR 546 (Listing Notice 3), 18 June 2010 – Activity 13 & 16

Location: The proposed study area is located approximately 1km North-East of Graham Road (Lynnwood Rd) and approximately 1km East of Lombardy Estate.

Date of Notice: 3 September 2014 – 13 October 2014

Queries regarding this matter should be referred to:

Bokamoso Landscape Architects and Environmental Consultants CC

Public Participation registration and inquiries: **Juanita De Beer**

Project inquiries: **Anè Agenbacht**

P.O. Box 11375

Maroelana 0161

www.bokamoso.biz

Tel: (012) 346 3810

Fax: (086) 570 5659

E-mail: lizelleg@mweb.co.za

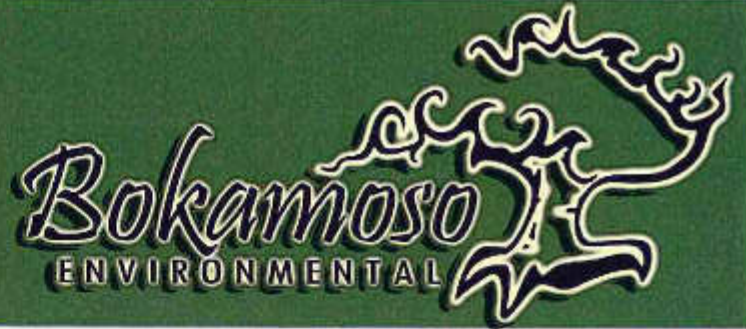


In order to ensure that you are identified as an interested and/or Affected Party (I&AP) please submit your name, contact information and interest in the matter, in writing, to the contact person given above **within 40 days of this Notice.**

LEBOMBO GARDEN BUILDING
38 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizelleg@mweb.co.za
Website: www.bokamoso.biz



Dear Landowner/Tenant

3 September 2014

You are hereby informed that Bokamoso Environmental Consultants were appointed (as EAP) by André Wright to conduct the Basic Assessment Process in terms of the amended 2010 NEMA EIA Regulations for the proposed Tijger Valley Extension 14 & 34 on Part of Portion 5 of the Farm Tygervally 334 JR

The proposed Land-uses for the study area are as follows:

Residential Township

In terms of Regulation No. R543 published in the Government Notice No. 33306 of 18 June 2010 of the National Environment Management Act, 1998 (Act No. 107 of 1998) governing Basic Assessment Procedures (Notice 1 and 3 – Governing Notice R544 & R546) of the 2010 amended NEMA Regulations, the EAP must inform all landowners and tenants within 100m from the study area of the proposed development.

Bokamoso already supplied you (landowner/tenant) of the property within 100m with notification letter and request that you supply the contact details of any tenants or other interested and affected parties that reside or work on the property to Bokamoso. Bokamoso will then also supply these parties with the necessary notification letters.

Alternatively, you are also welcome to distribute copies of your notification to these parties. We will however require proof that you supplied the notices to the tenants, landowners, workers etc. Another option is to act as representative on behalf of these parties.

Please confirm (via email/fax) that you received the landowners/tenant notification and this letter. Also indicate in this confirmation letter whether you have tenants on your property and you're preferred method of tenant/worker notification.

Regards

.....
Lizelle Gregory/Juanita De Beer

LEBOMBO GARDEN BUILDING
38 LEBOMBO ROAD
ASHLEA GARDENS
0081

P.O. BOX 11375
MAROELANA
0161

Tel: (012) 346 3810
Fax: 086 570 5659
E-mail: lizelleg@mweb.co.za
Website: www.bokamoso.biz



Dear Landowner

30 June 2014

Basic Assessment Process in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2010 (Version 1) for the proposed Residential Township Development on Part of Portion 5 of the Farm Tygervalley 334 JR

We hereby confirm that André Wright, appointed Bokamoso Landscape Architects and Environmental Consultants cc, to undertake a Basic Assessment Process in terms of the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment (EIA) Regulations, 2010 (Version 1) for the proposed Residential Township Development on Part of Portion 5 of the Farm Tygervalley 334 JR as listed above.

In terms of the 2010 amended NEMA EIA Regulations, the applicant, if not the land-owner, must notify the land-owner and tenants of a proposed development planned on a property occupied by the land-owner/tenant. In the case of this application the property occupied by you (as the land-owner/ tenant) forms part of the land-parcel earmarked for the above-mentioned project.

This notification therefore represents the formal notification of land-owners and/or tenants of the proposed project on Part of Portion 5 of the Farm Tygervalley 334 JR. This notification letter will be submitted as part of the formal application to be submitted to the Gauteng Department of Agriculture and Rural Development (GDARD).

This notification also affords you the opportunity to register (at an early stage) as an Interested and Affected Party (I&AP) in the Basic Assessment Process. In order to register you are requested to fill in your full details on the form supplied below and to fax or e-mail your details to Juanita de Beer (public participation co-ordinator of Bokamoso) for the inclusion of your details onto our public participation database.

Once you are registered as an interested and affected party, we will keep you informed of the progress with the application and we will make all correspondence, documents and other information regarding the application available to you throughout the application process.

Registration as Interested and Affected Party	
Farm Name:	
Erf /Portion Number:	
Street Address:	
Landowner:	Name & Surname: Email address: Telephone: Cell phone: Fax Number: Postal Address:
Tenant Details: (if applicable)	Name & Surname: Email address: Telephone: Cell phone: Fax Number: Postal Address:

Sincerely,

Lizelle Gregory
Bokamoso Landscape Architects and Environmental Consultants cc

Contact Information



VAN DER MERWE, NESTOR

GENERAL INFORMATION

Date Requested 2014/08/26 11:05
Reference -

PERSON INFORMATION

Surname VAN DER MERWE
Forename(s) NESTOR
Date of Birth 1947/08/12
ID Number(s) 4708125043087

CONTACT INFORMATION

Phone (home) 0128090070
(Last updated: 2009/04/13)

Phone (work) 0123221170
(Last updated: 2008/08/02)

Mobile Number NOT AVAILABLE

Residential Address 512 MEDFORUM, 412 SCHOEMAN STREET, PRETORIA, 0002
(Last updated: 2009/01/01)

Postal Address NOT AVAILABLE

DISCLAIMER

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Contact Information



MICHALETOS, ROSEMARY

GENERAL INFORMATION

Date Requested 2014/08/26 10:44
Reference -

PERSON INFORMATION

Surname MICHALETOS
Forename(s) ROSEMARY
Date of Birth 1960/10/16
ID Number(s) 6010160212083

CONTACT INFORMATION

Phone (home) 0128090266
(Last updated: 2007/02/11)

Phone (work) 0128090266
(Last updated: 2007/02/11)

Mobile Number NOT AVAILABLE

Residential Address THE FARM INN HOTEL, LYNNWOOD ROAD, PRETORIA, 0002
(Last updated: 2007/02/11)

Postal Address P O BOX 71702, THE WILLOWS, 0041
(Last updated: 2007/01/26)

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Contact Information



BASSON, RACHEL CATRINA

GENERAL INFORMATION

Date Requested 2014/08/26 10:48
Reference -

PERSON INFORMATION

Surname BASSON
Forename(s) RACHEL CATRINA
Date of Birth 1949/05/28
ID Number(s) 4905280015088

CONTACT INFORMATION

Phone (home) 0128090190
(Last updated: 2006/06/23)

Phone (work) 0128090190
(Last updated: 2007/01/31)

Mobile Number NOT AVAILABLE

Residential Address 25 ADELAIDE ROAD, GLENASHLEY, DURBAN NORTH, 4051
(Last updated: 2006/08/13)

Postal Address P O BOX 100, CROWN MINES, 2025
(Last updated: 2007/01/26)

DISCLAIMER

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CIPC Company Report

SEARCH DETAILS

Date requested 2014/08/26 11:01
Reference -

COMPANY SUMMARY

Name ERF 24 TIGERVALLEY
Status IN BUSINESS
Registration number 1994/034049/23
Registration date 1994/10/18

MEMBER AND OTHER SUMMARY

ACTIVE

Name	ID Number	Type	Status
BUYSKES, MICHAEL DIGBY	5201085122009	MEMBER	ACTIVE

ACCOUNTING OFFICER SUMMARY

G G J VAN DER MERWE

COMPANY INFORMATION

Enterprise name	ERF 24 TIGERVALLEY	Status	IN BUSINESS
Registration number	1994/034049/23	Enterprise type	CLOSE CORPORATION
Tax number	9251126646	Business start date	1994/10/18
Short name	-	Registration date	1994/10/18
Translated name	-	Financial year end	2
Old reg. number	943404923	Fin effective date	1994/10/18
Conv. company No	-	CK date received	-
Region	GAUTENG	CK date	-
Country	-	Date of type	1994/10/18
Country of origin	-		
Issued shares	-		
Issued capital	-		
Authorized shares	-		
Authorized capital	-		
SIC code	8		
Industry	FINANCIAL INTERMEDIATION, INSURANCE, REAL ESTATE AND BUSINESS SERVICES		
Registered address	WAPADRAND OFFICE PARK, BLOCK 12 SUITE 122, 90 KINGBOLT CRESCENT, WAPADRAND, 0050		
Postal address	P O BOX 74772, LYNNWOOD RIDGE, 0040		

MEMBER(S) AND OTHER (1)

BUYSKES, MICHAEL DIGBY

Initials	MD	Status	ACTIVE
ID/Passport number	5201085122009	Type	MEMBER

Date of birth	1952/01/08	Appointment date	1994/10/18
Profession	-	Resignation date	-
Country of residence	-	Member size (%)	100
Residential address	PLOT NUMBER 195, GARSFONTEIN, 0042	Member contribution (R)	100.00
Postal address	P O BOX 20086, ALKANTRANT, 0005		

REPRESENTATIVE TRUSTEE(S) (NONE)

INTER VIVOS TRUST(S) (NONE)

TESTAMENTARY TRUST(S) (NONE)

OTHER TRUSTEE(S) (NONE)

ACCOUNTING OFFICER(S) (1)

G G J VAN DER MERWE

Profession code	CHARTERED ACCOUNTS	Status	CURRENT
Profession number	929336A	Type	ACC
Reg. entry date	-	Start date	-
Expiry date	-	End date	-
Reference number	-	CM31 completed	-
Fine letter	-	CM31 received	-
Physical address	-		
Postal address	P O BOX 74772, LYNNWOOD RIDGE, 0040		

CAPITAL INFORMATION

No capital information to display.

HISTORY

Effective Date	Change Type
2003/07/29	REGISTERED ADDRESS CHANGE (PLOT 195GARSFONTEIN0042)
2003/07/29	AUDITOR/ACC OFFICER CHANGE (ADD RECORDNAME : = G G J VAN DER MERWESTATUS : = CURRENT)
2003/07/29	POSTAL ADDRESS CHANGE (P O BOX 20086ALKANTRANT0005)
2013/10/28	CO/CC ANNUAL RETURN (COMPANY / CLOSE CORPORATION AR FILING - WEB SERVICES : REF NO. : 59309000)

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Contact Information



TAMMA, PASQUA

GENERAL INFORMATION

Date Requested 2014/06/30 08:53
Reference -

PERSON INFORMATION

Surname TAMMA
Forename(s) PASQUA
Date of Birth 1935/02/26
ID Number(s) 3502260037082

CONTACT INFORMATION

Phone (home) NOT SPECIFIED
Phone (work) NOT AVAILABLE
Mobile Number NOT AVAILABLE
Residential Address 650 SIBELIUS STREET, LUKASRAND, 0181
(Last updated: 2009/01/01)
Postal Address NOT AVAILABLE

DISCLAIMER

This report contains information gathered from our suppliers and we do not make any representations about the accuracy of the data displayed nor do we accept responsibility for inaccurate data. WinDeed will not be liable for any damage caused by reliance on this report. This report is subject to the terms and conditions of the [WinDeed End User Licence Agreement \(EULA\)](#).

List of REGISTERED LETTERS
Lys van GEREГИSTREERDE BRIEWE
(With an insurance option/met 'n versekeringsopsie)



Full tracking and tracing/Volledige volg en spoor

Name and address of sender
 Naam en adres van afsender Bobamase PO Box 11375,
Marcelona 0161,
Graystone

Enquiries/Toll-free number
 Toll-free number
 Tolvry nommer
0800 111 502

No	Name and address of addressee Naam en adres van geadresseerde	Insured amount Versekerde bedrag	Insurance fee Versekeringsgeld	Postage Posgeld	Service fee Diensgeld	Affix Track and Trace customer copy Plak Volg-en-Spoor-kliëntafskrif
1	Pasqua Tammd 650 Sibelius street, Lukarand, 0181					<small>(with a domestic insurance option) ShareCall 0800 111 502 www.saps.co.za</small> RD 885 058 677 ZA CUSTOMER COPY 301028R
2						
3						
4						
5						
6						
7						
8						
9						
10						

Number of letters posted
 Getal briewe gepos 1

Total Totaal

R	R	R	R
---	---	---	---

Signature of client
 Handtekening van kliënt [Signature]

Signature of accepting officer
 Handtekening van aanneembeampte [Signature]



The value of the contents of these letters is as indicated and compensation is not payable for a letter received unconditionally. Compensation is limited to R100,00. No compensation is payable without documentary proof. Optional insurance of up to R2 000,00 is available and applies to domestic registered letters only.

Die waarde van die inhoud van hierdie briewe is soos aangedui en vergoeding sal nie betaal word vir 'n brief wat sonder voorbehoud ontvang word nie. Vergoeding is beperk tot R100,00. Geen vergoeding is sonder dokumentêre bewys betaalbaar nie. Opsionele versekering van tot R2 000,00 is beskikbaar en is slegs op binnelandse geregistreerde briewe van toepassing.



Tijger Valley X14 & X34 Land owner Notification

Acknowledgement of Receipt of land owner notification concerning the proposed Tijger Valley X14 & X34 project.

	Name	Address	Contact Details	Signature
1	Nancy	Salt Creek Roses	Email: Fax: Tel: 012 817 2099	
2	Blaire Deverneuil	Farm Ilm	Email: Fax: Tel: 012 809 0266	
3			Email: Fax: Tel:	
4			Email: Fax: Tel:	
5			Email: Fax: Tel:	
6			Email: Fax: Tel:	
7			Email: Fax: Tel:	
8			Email: Fax: Tel:	
9			Email: Fax: Tel:	
10			Email: Fax: Tel:	
11			Email: Fax: Tel:	
12			Email: Fax: Tel:	
13			Email: Fax: Tel:	
14			Email: Fax: Tel:	
15			Email: Fax: Tel:	

Proof of Newspaper Advertisement



Appendix E3

VOERTUIG

VOERTUIG GESOEK OM TE KOOP

000001



Ek koop seige... Onmiddellik... Ploet 078 100 7754... 012 543 3286

Bakkers... Bol of S&S... 674-39-7300

HUIJRKOP... 084 794 3204

Regskeni Isgewings

Kansellaries... voor publikasie om R.00

REGSKENISGEWINGS & TENDERS

SAKELISENSIERS

MINERAL CALONS

Mineral... 011 324 0000

MINERAL GALDOR

Mineral... 011 324 0000

ARTICLE OF ASSOCIATION... VOERTUIG... 012 543 3286

ONS OMGEWINGSIMPAKSTUDIE

ONS OMGEWINGSIMPAKSTUDIE... 012 543 3286

TINGER VALLEY K&M

TINGER VALLEY K&M... 012 543 3286

HERREGISTRASIES

HERREGISTRASIES... 012 543 3286

DORPSVESTIGING/STIGTING

MOONLICH UTREK

MOONLICH UTREK... 012 543 3286

BYLAE

BYLAE... 012 543 3286

MOONLICH UTREK... 012 543 3286

MOONLICH UTREK

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MOONLICH UTREK... 012 543 3286

MOONLICH UTREK

MOONLICH UTREK... 012 543 3286

HUISE TE HUUR

KAREN PARK, AKASIA... 5600 sqm, Skool en... 087232548 / 082564 1876 / 012 549 1145

STUIERA... R5 900 per... 082 322 8724 / 0872321662

KAMERS TE HUUR... QUEENSWOOD... 072 636 3332

STUDENTE-... AKKOMMODASIE... 082 322 8724 / 0872321662

MEENTHUIS... TE HUUR... 082 322 8724 / 0872321662

OLY HIER

MACPROP... 082 322 8724 / 0872321662

VOERTUIG

VOERTUIG... 082 322 8724 / 0872321662

000001

082 322 8724 / 0872321662

082 322 8724 / 0872321662

Regskennisgewings

082 322 8724 / 0872321662

REKENINGEMINGS & TENDERS

SAKELIENSIES

082 322 8724 / 0872321662

082 322 8724 / 0872321662

HOPPEVELE/... LINDWAGSIES

082 322 8724 / 0872321662

STUDENTE-... AKKOMMODASIE

082 322 8724 / 0872321662

MEENTHUIS... TE HUUR

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REKENINGEMINGS & TENDERS

082 322 8724 / 0872321662

SAKELIENSIES

082 322 8724 / 0872321662

**Communications to and from Persons
Detailed in Point 2 and 3 above**



Appendix E4

Juanita

From: Juanita <user3@bokamoso.net>
Sent: 03 September 2014 01:55 PM
To: 'jgrobler@geoscience.org.za'; asalomon@sahra.org.za;
'maphata.ramphele@gauteng.gov.za'; justicem@dwaf.gov.za; keetm@dwaf.gov.za;
siwelanel@dwa.gov.za; tshifaror@dwa.gov.za; MathebeT@dwa.gov.za;
'central@eskom.co.za'; 'paia@eskom.co.za'; 'schmidk@nra.co.za';
'kumen.govender@gauteng.gov.za'; mmpshe@randwater.co.za;
'nkoneigh@randwater.co.za'; RudzaniM@TSHWANE.GOV.za;
loveous.tampane@transnet.net; 'casperm@tshwane.gov.za'; 'andre@ward101.co.za'
Subject: Graystone - Tjiger Valley X14 & X34 - Public Participation
Attachments: Public Notice BA.pdf

Dear Interested and/or Affected Party Member,

Please refer to the attached Public Notice regarding the proposed Tjiger Valley X14 & X34 Project.

Hope this finds you well.

Kind Regards

Juanita De Beer

Public Participation Consultant



**Landscape Architects &
Environmental Consultants**

T: (+27)12 346 3810 | F: (+27) 86 570 5659 | E: lizalleg@mweb.co.za | www.bokamoso.net
36 Lebombo Street, Ashlea Gardens, Pretoria | P.O. Box 11375 Maroelana 0161

Juanita

From: Juanita <user3@bokamoso.net>
Sent: 04 September 2014 11:59 AM
To: 'carl@soleil.ludwigsroses.co.za'
Subject: RE: ASSESMENT PROCESS REF GAUT 002/14-15/0091 DEVELOPMENT OF TIJGER VALLEY EXTENSION 14 & 34

Dear Carl Coetzee,

Thank you for your response, I have registered you as Interested and/or Affected Party Member for the proposed *Tijger Valley X14 & X34* Project.

We will keep you updated regarding the process in the future.

Hope this finds you well.

Kind Regards

Juanita De Beer

Public Participation Consultant



**Landscape Architects &
Environmental Consultants**

T: (+27)12 346 3810 | F: (+27) 86 570 5859 | E: lizelleq@mweb.co.za | www.bokamoso.net
36 Lebombo Street, Ashlea Gardens, Pretoria | P.O. Box 11375 Maroelana 0161

From: Carl Coetzee [<mailto:carl@soleil.ludwigsroses.co.za>]
Sent: 04 September 2014 11:47 AM
To: lizelleq@mweb.co.za
Cc: 'Ludwig Taschner'; halmar@ludwigsroses.co.za; 'Bernd Mewald'
Subject: ASSESMENT PROCESS REF GAUT 002/14-15/0091 DEVELOPMENT OF TIJGER VALLEY EXTENSION 14 & 34

Dear Sirs,

We would like to register as an affected party in the above process.

Physical Address;
Plot 4 Tygervalley
Tyger St
SHERE

Pretoria.

Postal Address;
PO Box 72183.
Lynnwood Ridge
0040

We are situated on portion 12 of Tygervalley, which is adjacent to the proposed development. Our contact details are as below.

Please confirm receipt of this email.

Carl Coetzee

general manager

tel: +27 (0) 12 817 2099 | 2101

fax: 086 524 3973

cell: 083 247 4688

email: carl@sales.ludwigroses.co.za

web: www.ludwigroses.co.za

[Catalogue](#) | [Maps](#) | [Events](#) | [Rose Barn Venue](#) | [Restaurant](#) | [Thorns 'n Things](#)

Juanita

From: Bokamoso <lizelle@mweb.co.za>
Sent: 04 December 2014 03:38 PM
To: Drikus.Swanepoel@aurecongroup.com
Subject: RE: Enquiry Tijger Valley Extension 14 & 34
Attachments: Public Notice BA.pdf

Flag Status: Flagged

Good day Drikus,

Please find attached the public notice for this project.

The entire property is approximately 21 hectares but the development will be less than 20 hectares. The layout is not yet finalised but will be included in the Draft Basic Assessment Report.

You will be notified when this Draft Basic Assessment Report is available for review.

Trust you find the above in order.

Kind Regards,

Mary-Lee van Zyl

Senior Environmental Assessment Practitioner



**Landscape Architects &
Environmental Consultants cc**

T: (+27)12 346 3810 | F: (+27) 86 570 5659 | E: lizelle@mweb.co.za | www.bokamoso.biz
36 Lebombo Street, Ashlea Gardens, Pretoria | P.O. Box 11375 Maroelana 0161

Please consider the environment before printing this email

From: Drikus Swanepoel
Sent: Wednesday, December 03, 2014 2:35 PM
To: 'lizelle@mweb.co.za'
Subject: RE: Enquiry Tijger Valley Extension 14 & 34

Hi Lizelle, Ane

Would you kindly provide feedback on my earlier request (see e-mail below dated 18 November).

Regards

Drikus Swanepoel PMP, PrEng, MEng (Project Management)
Project Manager, Aurecon
T +27 12 427 2356 F +27 86 267 8210 C +27 79 490 7844

E Drikus.Swanepoel@aurecongroup.com

Aurecon Centre Lynnwood Bridge Office Park 4 Daventry St Lynnwood Manor 0081 Tshwane South Africa
aurecongroup.com



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DISCLAIMER

From: Drikus Swanepoel
Sent: Tuesday, November 18, 2014 12:10 PM
To: 'lizelleg@mweb.co.za'
Subject: Enquiry Tijger Valley Extension 14 & 34

Hi Lizelle, Ane

Would you kindly provide me with additional information regarding the proposed development / project (particulars below).

Reference No: Gaut 002/14-15/0091
Project Name: Tijger Valley Extension 14 & 34

A general layout of the proposed development indicating the stand locations, sizes etc. would be appreciated.

Much appreciated.

Kind regards

Drikus Swanepoel PMP, PrEng, MEng (Project Management)
Project Manager, Aurecon
T +27 12 427 2356 F +27 86 267 8210 C +27 79 490 7844

E Drikus.Swanepoel@aurecongroup.com

Aurecon Centre Lynnwood Bridge Office Park 4 Daventry St Lynnwood Manor 0081 Tshwane South Africa
aurecongroup.com



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DISCLAIMER



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This email is free from viruses and malware because [avast! Antivirus](#) protection is active.

Juanita

From: Juanita <user3@bokamoso.net>
Sent: 04 December 2014 02:24 PM
To: 'Drikus.Swanepoel@aurecongroup.com'
Subject: RE: Enquiry Tijger Valley Extension 14 & 34

Hi Drikus Swanepoel,

Baie dankie vir jou terugvoering, jy is geregistreer as belanghebbende persoon vir die voorgestelde Tijger Valley X14 & X34 Projek.

Ons sal jou ophoogte hou in verband met die verdere proses in die toekoms.

Kind Regards/Vriendelike Groete

Juanita De Beer

Public Participation Consultant



**Landscape Architects &
Environmental Consultants**

T: (+27)12 346 3810 | F: (+27) 86 570 5659 | E: lizelleq@mweb.co.za | www.bokamoso.net
36 Labombo Street, Ashlea Gardens, Pretoria | P.O. Box 11375 Marbelana 0161

From: Drikus Swanepoel [<mailto:Drikus.Swanepoel@aurecongroup.com>]
Sent: 03 December 2014 03:32 PM
To: lizelleq@mweb.co.za
Subject: RE: Enquiry Tijger Valley Extension 14 & 34

Hi Lizelle, Ane

Vervolgens ons telefoniese gesprek, kan julle my asb registreer as n belanghebbende party.

Dankie

Drikus Swanepoel PMP, PrEng, MEng (Project Management)
Project Manager, Aurecon
T +27 12 427 2356 F +27 86 267 8210 C +27 79 490 7844
E Drikus.Swanepoel@aurecongroup.com
Aurecon Centre Lynnwood Bridge Office Park 4 Daventry St Lynnwood Manor 0081 Tshwane South Africa
aurecongroup.com

DISCLAIMER

From: Drikus Swanepoel
Sent: Wednesday, December 03, 2014 2:35 PM
To: 'lizelle@mweb.co.za'
Subject: RE: Enquiry Tijger Valley Extension 14 & 34

Hi Lizelle, Ane

Would you kindly provide feedback on my earlier request (see e-mail below dated 18 November).

Regards

Drikus Swanepoel PMP, PrEng, MEng (Project Management)
Project Manager, Aurecon
T +27 12 427 2356 F +27 86 267 8210 C +27 79 490 7844
E Drikus.Swanepoel@aurecongroup.com
Aurecon Centre Lynnwood Bridge Office Park 4 Daventry St Lynnwood Manor 0081 Tshwane South Africa
aurecongroup.com

DISCLAIMER

From: Drikus Swanepoel
Sent: Tuesday, November 18, 2014 12:10 PM
To: 'lizelle@mweb.co.za'
Subject: Enquiry Tijger Valley Extension 14 & 34

Hi Lizelle, Ane

Would you kindly provide me with additional information regarding the proposed development / project (particulars below).

Reference No: Gaut 002/14-15/0091
Project Name: Tijger Valley Extension 14 & 34

A general layout of the proposed development indicating the stand locations, sizes etc. would be appreciated.

Much appreciated.

Kind regards

Drikus Swanepoel PMP, PrEng, MEng (Project Management)
Project Manager, Aurecon
T +27 12 427 2356 F +27 86 267 8210 C +27 79 490 7844
E Drikus.Swanepoel@aurecongroup.com
Aurecon Centre Lynnwood Bridge Office Park 4 Daventry St Lynnwood Manor 0081 Tshwane South Africa
aurecongroup.com

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DISCLAIMER

Juanita

From: Juanita <user3@bokamoso.net>
Sent: 02 October 2014 11:02 AM
To: 'elana.orsmond@propcobrokers.co.za'
Subject: RE: Grey Stone Development

Dear Elana Orsmond,

Thank you for your response, I have registered you as Interested and/or Affected Party Member for the proposed Graystone Project.

We will keep you updated regarding the process in the future.

Hope this finds you well.

Kind Regards

Juanita De Beer

Public Participation Consultant



**Landscape Architects &
Environmental Consultants**

T: (+27)12 346 3810 | F: (+27) 86 570 5659 | E: lizelleg@mweb.co.za | www.bokamoso.net
36 Lebombo Street, Ashlea Gardens, Pretoria | P.O. Box 11375 Margelana 0161

From: Elana Orsmond [<mailto:elana.orsmond@propcobrokers.co.za>]
Sent: 02 October 2014 10:23 AM
To: lizelleg@mweb.co.za
Subject: Grey Stone Development

Good morning Liselle

I spoke to you about a week ago regarding the proposed development, Grey Stone, next to Ludwich Roses in the Area of Lombardy estate

Kindly register me as an interested party and place me on your mailing list

My details: Elana Orsmond
Elana.orsmond@propcobrokers.co.za
Cell 0825696190

Regards

Elana Orsmond

Elana Orsmond
cell 082 56 96 190 fax 086 510 3517
PropCo Brokers
INDUSTRIAL & RETAIL PROPERTY CONSULTANTS

**Minutes of Any Public and/or
Stakeholders Meetings**

(Not available)



Appendix E5

Comments and Responses Report



Appendix E6

**COMMENT AND RESPONSE REPORT-
FOR THE PROPOSED TIJGER VALLEY X14 & X34
Gaut: 002/14-15/0091**

Issue	Commentator	Response
<p>We would like to register as an affected party in the above process.</p> <p>Physical Address: Plot 4 Tygervalley Tyger St Shere Pretoria</p> <p>Postal Address: PO Box 72183 Lynnwood Ridge 0040</p> <p>We are situated on portion 12 of Tygervalley, which is adjacent to the proposed development. Our contact details are as below.</p> <p>Please confirm receipt of this email.</p>	<p>Carl Coetzee carl@soleil.ludwigsroses.co.za</p>	<p>Thank you for your response, I have registered you as Interested and/or Affected Party Member for the proposed Tijger Valley X14 & X34 Project.</p> <p>We will keep you updated regarding the process in the future.</p> <p>Hope this finds you well.</p>
<p>I spoke to you about a week ago regarding the proposed development, Grey Stone, next to Ludwich Roses in the Area of Lombardy estate.</p> <p>Kindly register me as an interested party and place me on your mailing list.</p> <p>My details: Elana Orsmond; Elana.orsmond@propcobrokers.co.za; Cell 082 569 6190</p>	<p>Elana Orsmond Elana.orsmond@propcobrokers.co.za</p>	<p>Thank you for your response, I have registered you as Interested and/or Affected Party Member for the proposed Graystone Project.</p> <p>We will keep you updated regarding the process in the future.</p> <p>Hope this finds you well.</p>

Comments from I&Ap's on Basic Assessment (BA) Report



Appendix E7

Not Available

Comments from I&Ap's on Amendments to the BA Report

(not available)



Copy of the Register of I&AP's



Appendix E9

Nr	Registered Parties	Contact details	Address
Stakeholders			
1	Council Geo-Science	jgrobler@geoscience.org.za	
2	SAHRA Gauteng	asalomon@sahra.org.za nndobochani@sahra.org.za	
3	PHRAG	maphata.ramphele@gauteng.gov.za	
4	DWA	justicem@dwaf.gov.za keetm@dwaf.gov.za siwelanel@dwa.gov.za tshifaror@dwa.gov.za mathebet@dwa.gov.za	
5	Eskom	central@eskom.co.za paia@eskom.co.za	
6	SANRAL	schmidk@nra.co.za	
7	Gautrans	kumen.govender@gauteng.gov.za	
8	Randwater	mmpshe@randwater.co.za nkoneigh@randwater.co.za	
9	City Of Tshwane	RudzaniM@tshwane.gov.za	
10	Spoornet	daniel.ramokone@transnet.net loveous.tampane@transnet.net	
11	DA Roads	casperm@tshwane.gov.za	
12	Ward Councillor Andre van der Walt	andre@ward101.co.za Cell: 083 462 5928 Tel: 011 242 8800	
Interested and Affected Parties			
1	Carl Coetzee Ludwigs roses	carl@soleil.ludwigsroses.co.za Cell: 083 247 4688 Tel: 012 817 2099/2101	

Comments from I&AP's on the Application

(Not available)



Appendix E10

**Water Use Lisence(s), SAHRA Information,
Service Letters from Municipalities &
Water Supply Information**



Appendix F

Not Available

Specialist Reports



Appendix G

Civil Services



Appendix G1



**DEKKER &
GELDERBLOM**

137 Muckleneuk Street
c/o Melk & Muckleneuk Street
Nieuw Muckleneuk
0181

P O Box 36817
Mentlo Park
0102

Tel (012) 460-0801
Fax (012) 460-0803
e-mail: mail@dgeng.co.za
www.dgeng.co.za

Reg No 2000/021627/07

13 June 2005

RefNo 012f/498

Synergistics Environmental Services
P O Box 13419
Vorna Valley
1686

For attention: Mr D Kathawaroo

CIVIL SERVICES EIA INPUT REPORT: GREYSTON ESTATE

1. INTRODUCTION

The applicant has appointed Dekker & Gelderblom, Consulting Engineers (Pty) Ltd for the civil engineering services (roads, water, sewer). A full services report for council will be compiled at a later stage.

The purpose of this report is to confirm the availability and capacity of the existing civil engineering services.

2. DESCRIPTION OF THE SITE

The site is approximately 21 ha in extend, and is situated north of Lynnwood Road.. The site is situated inside the Kungwini Municipal Boundaries.

The site drains towards the western boundary in a northern direction..

3. GEOLOGY

A geotechnical investigation has been compiled by Johan van der Merwe. A copy of the report is attached as Annexure A.

It is noted that a portion of the soil zone D extends into the proposed erven and an appropriate engineering solution for the foundations must be designed by the individual owners based on a more detailed investigation of each site.

NW Dekker

PrEng, BSc(Eng)/Civ(Pret)
B(Eng) (Hons) (Struct) (Pret)
M(Eng) (Struct) (Pret), PhD(Wits)

JH Gelderblom

PrEng, B(Eng) (Pret)
B(Eng) (Hons) (Struct) (Pret)
M(Eng) (Struct) (Pret)

4. THE PROPOSED DEVELOPMENT

The proposed township will consist of the following:

- Residential I stands 57 No off
- Residential II 28 No off (99 dwelling units)
- Clubhouse 1 No off

5. PROVISION OF SEWAGE RETICULATION

5.1 Existing external sewer reticulation

According to the report from CES (Attached as Annexure A), Kungwini insisted that the developer immediately west of this development will install a new 525 mm dia outfall sewer to the eastern boundary of their property.

5.2 Proposed link sewer

A new link sewer will be installed from the eastern boundary of Paradise Township to the western boundary of this township. This main outfall sewer will also extend through the township to allow for development upstream of this township.

Kungwini will be responsible for the cost of the enlargement which will be subtracted from bulk service contributions.

5.3 Indicative sewage flow calculations for the full development

Average daily flow = 147 kl/day

5.4 Proposed internal sewer reticulation

A network of 160 mm dia uPVC pipe will be installed on the low side of each stand to drain towards the new approved external connection points.

The internal sewer pipes will be designed in accordance with the "General principles for the design and installation of sewage reticulation in the Pretoria Municipal area as well as Guidelines for the provisional Engineering Services and Amennities in Residential Township Development (Amended 1995)." The more important design criteria are:

- Peak flow rate: 1 l/s for 30 dwelling units
- Minimum pipe diameter = 160 mm (nominal)
- Minimum slope = 1:100 in the first length
- Capacities calculated at 95 % of full flow

- Maximum distance between manholes is 110m.
- Minimum depth within the road reserve 1,0 m
- Minimum depth in midblock sewers 0,6 m
- Cleaning eyes permitted if the last length of sewer is less than 55 m
- Extraneous flow = 1,7 l/s per kilometer of total sewer pipe (internal & external the first, ignoring 15 m of pipe from each block).

5.5 Conclusion

The entire site can be serviced with a gravity sewerage reticulation to the satisfaction of the local authority and the existing bulk sewer has sufficient capacity to cater for these flows.

6. PROVISION OF WATER RETICULATION

6.1 Existing external water reticulation

The developer for Paradiso Estate will install a new bulk water pipe from the existing Rand Water pipe.

6.2 Proposed link water between the site and the existing external reticulation

The internal reticulation will be linked to the new bulk supply pipe in Paradiso Estate.

6.3 Water demand

Water demand figures are based on the average water consumption figures for a "Residential II" development as per the "Guidelines for the provision of Engineering services and amenities in residential township development".

- Annual average daily water demand 147 kl/day

6.4 Proposed water reticulation inside the township

The individual dwelling units will be supplied with water via an uPVC main distribution network, which will also provide water to the fire hydrants. Isolation valves will be positioned along the water pipes to facilitate easy maintenance.

The estimated minimum static pressure inside the development will be 35 m.

6.5 Conclusion

The entire development can be serviced by connecting to the existing water reticulation.

7. **ROADS**

7.1 Existing external road network

Access to the existing road network will be obtained via Lynnwood Road.

7.2 External Road upgrades as part of this development

A new link road will be constructed from the southern boundary of the property up to Lynnwood Road on the current road servitude. Refer to the attached drawing from ITS indicating the future master plan in terms of the proposed road upgrades.

7.3 Proposed internal roads

The internal roads will consist of roads with a width varying between 6 and 7,4 m depending on local authority requirements.

7.4 Conclusion

Access to the site can be obtained via Lynnwood Road.

8. **SOLID WASTE AND GAS EMISSIONS**

This development will generate approximately 51 m³ of solid waste per week. The local authority will be responsible for solid waste removal.

No gas emissions will be generated by the development.

9. **CONSTRUCTION PERIOD**

The estimated construction period will be 6 months for the external services.

10. SUMMARY

This report deals with the provision of civil engineering services for a township, which consist of a combination residential 1 and residential 2 erven. The proposed development will be approximately 156 dwelling units on approximately 21 ha.

The site can be serviced with a gravity sewerage reticulation. The new bulk sewer to be installed by the developer of Paradiso Estate will have sufficient capacity to cater for the sewerage flow.

The entire site can be serviced with a domestic and fire water reticulation by means of a new connection to the existing reticulation. The new bulk water supply to be installed by the developer of Paradiso Estate, will have enough capacity and pressure to service this development.

Access to the site may be obtained via the new link road installed from Lynnwood Road as per the roads masterplan done by ITS.

Based on the above scenario in terms of the existing civil engineering services, we can therefore conclude that this property can be developed and link to the existing local authority services without difficulty or abnormal cost implications. The existing local authority services have enough capacities to cater for the proposed development.

8 December 2004

CES

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COMMUNITY
ENGINEERING
SERVICES

Director : Corporate Services
Kungwini Local Municipality
P O Box 40
BRONKHORSTSPRUIT
1020

Attention: Mr Governor Seleka

Dear Sir

DEVELOPMENT OF PARADISO ESTATE

The attached request by DLV Engineers (Pty) Ltd dated 23 November 2004, with regards to accommodation of the proposed development in the Metsweding (Kungwini) water distribution system and sewer network, refers.

1. WATER DISTRIBUTION SYSTEM

1.1. Distribution zone

The proposed development area should be accommodated in the Bronberg direct zone as shown on Figure 1. The Bronberg direct zone has an 830 mm Rand Water pipe, supplying northward from the Bronberg reservoir. There is also a Kungwini 500 mm/400 mm/300 mm pipe supplying Silver Lakes. It is not certain whether this pipe is linked to the Bronberg reservoir, or to a PRV on the Rand Water pipes upstream of the Bronberg reservoir.

1.2 Water demand

The bulk distribution pipes in the Bronberg direct zone was analysed and planned as part of the Tshwane water master plan. The Tshwane planning was done with a total Annual Average Daily Demand (AADD) for the proposed development of 2 299 kl/d.

For this re-analysis, the AADD for the proposed development was calculated as follows:

• 283 Residential erven @ 1,8 kl/erf/d	= 509 kl/d
• 64 Group housing units @ 1,8 kl/unit/d	= 115 kl/d
• 6,95 ha Town houses @ FSR of 0,4 @ 0,6 kl/100 m ² /d	= 167 kl/d
• 0,53 ha High rise flats @ FSR of 2,0 @ 0,6 kl/100 m ² /d	= 64 kl/d
• 1,02 ha Workshop area @ FSR of 0,6 @ 0,6 kl/100 m ² /d	= 37 kl/d
• 2,72 ha Offices @ FSR of 0,4 @ 0,4 kl/100 m ² /d	= 44 kl/d
• 0,82 ha Shopping centre @ FSR of 0,4 @ 0,4 kl/100 m ² /d	= 13 kl/d
• 5,60 ha Guest House & Hotel @ FSR of 0,4 @ 0,6 kl/100 m ² /d	= 134 kl/d
• 25,93 ha Parks @ FSR of 0,6 @ 30 kl/ha/d	= 467 kl/d
	<u>1 550 kl/d</u>

Directors:
L C Geustyn
F J Haupt
J E Kock
L H Matlala
S S Dube

The logo of the Engineering Council of South Africa (ECSA) is located in the bottom right corner of the page. It consists of a circular emblem with the letters 'ECSA' inside, surrounded by the text 'Engineering Council of South Africa'.

1.3 Present situation

Upgrading of the existing system will not be required to accommodate the peak hour demand of the development. The proposed development can connect to the existing Kungwini 400 mm \emptyset supply pipeline. It must be checked however, whether this pipe is linked to the Rand Water Bronberg reservoir, or to a PRV upstream of the reservoir. If the latter, then it is suggested that the pipe be switched to a feed directly from the reservoir.

1.4 Future situation

In future this area will still form part of the future Bronberg Direct zone.

2. SEWER NETWORK

2.1 Drainage area

The proposed development falls within the Baviaanspoort WCW drainage area of Tshwane as indicated on Figure 2, showing the master plan items required for the Metsweding (Kungwini) part of the drainage area.

2.2 Sewer flow

The outfall sewers in Tshwane were recently analysed and planned as part of a master planning study. The master planning took cognizance of the present and potential sewer flows from Kungwini.

For the Tshwane planning the Peak Day Dry Weather Flow (PDDWF) for the proposed development was calculated at 1 629 kl/d @ 20 units/ha.

For this re-analysis, the PDDWF for the proposed development was calculated at 766 kl/d with a Instantaneous Peak Dry Weather Flow (IPDWF) of 13,0 l/s.

2.3 Present situation

To link the proposed development to the existing system will require the following (schematic) master plan item. Its future pro rata load on the pipe is also given:

<u>Item</u>	<u>New outfall sewer</u>	<u>IPDWF</u>	<u>Cost</u>	<u>Pro rata load</u>
• S1	970 m x 525 mm \emptyset	264 l/s	R681 000 *	5,0%

The following items are required to accommodate the flow from the proposed development in the existing Metsweding (Kungwini) system, allowing for all potential future upstream flow:

<u>Item</u>	<u>New outfall sewer</u>	<u>IPDWF</u>	<u>Cost</u>	<u>Pro rata load</u>
• S2	430 m x 600 mm \emptyset	295 l/s	R 486 000 *	4,5%
• S3	730 m x 675 mm \emptyset	305 l/s	R1 006 000 *	4,5%
• S4	450 m x 750 mm \emptyset	310 l/s	R 713 000 *	4,3%

(* Excluding P & G, Contingencies, Fees and VAT).

An alternative route for items S2 to S6 is also indicated on the figure.

The pipes sizes inside and through the proposed development should be designed such that the 8,9 l/s (Point A) and 9,0 l/s (Point B) IPDWF from the potential future areas draining towards the development can also be accommodated in the pipelines whilst flowing 70% or less full. (The remaining 30% of the flow area is reserved for accommodation of stormwater ingress).

2.4 Future situation

The development will have a pro rata effect on the following longer term master plan items downstream of its connection. These are not required to accommodate the proposed development in the present situation, but will only be required in future when substantial developments have taken place in the drainage area:

Item	New outfall sewer	IPDWF	Cost	Pro rata load
• S5	300 m x 750 mm Ø	312 l/s	R 484 000 *	4,3%
• S6	400 m x 750 mm Ø	317 l/s	R 636 000 *	4,2%
• S7	1 810 m x 750 mm Ø	504 l/s	R2 769 000 *	3,4%
• S8	530 m x 1 500 mm Ø	3 625 l/s	R1 927 000 *	0,4%
• S9	260 m x 2 100 mm Ø	3 625 l/s	R2 122 000 *	0,4%
• S10	1 110 m x 2 100 mm Ø	3 675 l/s	R8 987 000 *	0,4%

(* Excluding P & G, Contingencies, Fees and VAT).

If required, the effect of the proposed development on the relevant master plan items in the Tshwane system, can be addressed.

Yours sincerely
 COMMUNITY ENGINEERING SERVICES
 REG. NO.: 96/13328/07



Per: DR BF LOUBSER

ANNEXURE A
GEOTECHNICAL REPORT

JOHANN VD MERWE (Pty) Ltd
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PROJECT No: M05/2568

5 June 2005

SYNERGISTICS ENVIRONMENTAL SERVICES
P.O. Box 13419
VORNA VALLEY 1686

Attention: Ms. D. Kathararoo

Dear Sir,

REPORT ON GEOTECHNICAL INVESTIGATION CARRIED OUT FOR THE PROPOSED: TYGER VALLEY HOUSING DEVELOPMENT TO BE ESTABLISHED ON: PORTION 5 OF THE FARM TYGERVALLEI 334-JR, PRETORIA DISTRICT, TSHWANE METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE

1. INTRODUCTION

At the request of Ms. Deshika Kathararoo of Synergistics Environmental Services, who is acting on behalf of a client, a detailed geotechnical investigation was carried out during May 2005 on the above property. The purpose of the investigation was to determine foundation conditions for the establishment of the proposed new Tygervalley Housing Development. The investigation consisted of a detailed geotechnical investigation during which time a number of test pits were inspected across the site, combined with soil sampling and testing in order to produce this report.

2. TERMS OF REFERENCE

The objectives of the desk study were to: -

- Determine the engineering properties of the site soils and bedrock including potentially expansive material, low bearing capacity soils and areas difficult to excavate.
- Present appropriate recommendations for residential township design and precautionary measures in accordance with the requirements of the National Home Builders Registration Council's guidelines.

The investigation was carried out in terms of written instructions received from Ms. Deshika Kathararoo in her letter referenced S0015 dated 15 April 2005.

3. INFORMATION CONSULTED

The following information was available and was consulted: -

- A site layout plan prepared to a scale of 1: 1 500 by Vlietstra Town and Regional Planners showing existing roads, the proposed layout of the new township, the boundaries of the site and surface contours at 1,0m intervals.

- The 1: 50 000 scale Geological and Topographical Series Maps Sheet Number 2528CD Rietvleidam.
- The publication "National Home Builders Registration Council's Home Building Manual, Part 1 & 2, February 1999.

4. SITE DESCRIPTION

The site for the proposed development is situated in the eastern part of Pretoria as shown on the attached 1: 50 000 scale Locality Map at the back of the report. The property is trapezoidal in shape and covers a surface area of some 20,65 hectares of which 16 hectares was investigated in detail. The site is bounded to the south by Lynnwood Road, to the north by a prominent rocky ridge and on the remaining sides by adjacent agricultural holdings.

The property is a partly developed agricultural holding containing a derelict house and outbuildings located in the north-eastern part of the site. The surface cover consists of Highveld sourgrass containing dense growths of indigenous trees in the central and northern portions of the site, the most common species observed were *Acacia*, *Rhus*, *Olea* and *Ziziphus spp.* The property is bisected by a westerly flowing, non-perennial drainage feature (a tributary of the Pienaars River) and surface drainage takes place via sheetwash towards this feature from the south at an average gradient of some 2% and from the north at some 30% initially, flattening to some 6%. Two small earth dams are located in the lower reaches of the drainage feature, close to the western boundary of the site.

5. SITE INVESTIGATION

Thirty-one test pits were excavated across the site using a John Deere 310 backactor supplied by SNA Labr, were entered and inspected by the undersigned, a registered professional engineering geologist. The soil and bedrock formations were described in terms of the methods advocated by Jennings *et al* (1973) namely, moisture condition, colour, soil consistency, soil structure, soil type and origin (MCCSSO). Due to the steepness of the northern part of the site, no test pits could be excavated here due to access problems.

During the test pit profiling, disturbed and undisturbed representative soil samples were recovered from the test pits and submitted to SNA's and Soillab's commercial soil laboratories in Pretoria for testing and identification. Detailed descriptions of the test pit profiles are provided on the Soil Profile Sheets in Appendix 1 of the report whilst the laboratory test results appear in Appendix 2. The location of the test pits is shown on the "Geotechnical Map", Drawing Number M05/2568 at the back of the report.

6. OBSERVATIONS

The site is underlain by prominent horizons of alluvial and colluvial clayey soils overlying residual soils and shale bedrock belonging to the Silverton Shale Formation, Pretoria Group, Transvaal Supergroup. A diabase sill of Post Transvaal age is intruded into the sediments in portions of the site. The property has been apportioned into four prominent soil zones, Zones "A" to "D" as shown on the "Geotechnical Map".

Soil Zone "A" covers the *higher-lying northern portion* of the site and a very generalized description of the typical soil profile that may be encountered here, is as follows: -

- 0,0 - 0,3: Abundant coarse, flaky and angular SHALE GRAVELS, clast supported in a matrix of dry, dark brown, sandy CLAY; pebble marker. Overall consistency is loose.
- 0,3 - 0,6: Moist, dark khaki becoming light grey, very stiff, shattered, silty CLAY; residual shale.
- 0,6 - 1,3: Light grey becoming dark yellow stained orange and yellow on joints, highly weathered, very closely bedded and jointed, very soft rock SHALE becoming soft rock with increasing depth. Bedding planes dip towards the north at about 15° and contains thin infill of clay and silt on discontinuity surfaces. Abundant open, randomly oriented and vertically and sub-vertically inclined joints present. Scattered large and medium-sized DIABASE BOULDERS occur at surface across this soils zone, these are derived from a weathered diabase sill upslope of Zone "A".

Soil Zone "B" covers the area immediately to the south of the rocky ridge and a very generalized description of the typical soil profile that may be encountered here, is as follows: -

- 0,0 - 1,0: Moist, dark grey, very stiff, shattered, sandy CLAY; colluvium.
- 1,0 - 1,1: As above and containing abundant coarse GRAVELS and COBBLES; pebble marker.
- 1,1 - 1,3: Abundant coarse, medium and fine angular and flaky SHALE FRAGMENTS, clast supported in a matrix of moist, dark yellow, clayey SILT; reworked residual shale. Overall consistency is dense becoming very dense.
- 1,3 - 1,5: Light grey becoming dark yellow stained orange and yellow on joints, highly weathered, very closely bedded and jointed, very soft rock SHALE becoming soft rock with increasing depth. Bedding planes dip towards the north at about 15° and contains thin infill of clay and silt on discontinuity surfaces. Abundant open, randomly oriented and vertically and sub-vertically inclined joints present.

Soil Zone "C" covers the major portion of the site and a very generalized description of the typical soil profile that may be encountered here, is as follows: -

- 0,0 - 0,5: Moist, dark grey, medium dense, clayey fine SAND containing roots; colluvium. This sandy colluvium occurs in the south-eastern part of the site only.
- 0,5 - 2,0: Moist, dark grey becoming dark yellowish brown blotched light grey towards the base, very stiff, slickensided, silty CLAY containing scattered, well-rounded gravels and occasional boulders; alluvium.
- 2,0+: Moist, dark yellow, stiff, relict jointed, clayey sandy SILT; residual diabase (extreme northern portion of the site) and elsewhere, very soft rock SHALE.

Soil Zone "D" covers the central, lower-lying portion of the site where the major drainage feature is located as well as a number of subtle, subdued drainage features that occur elsewhere across the site.

Slow excavation to gradual refusal of the backactor was experienced in the shale bedrock from below a depth of 0,8m to 1,5m in Zones "A" and "B", elsewhere, no refusal (although very slow excavation in the very stiff clay) was experienced down to a depth of at least 2,0m below surface. The water table, whether perched or permanent, was not encountered during the investigation, which was carried out during the beginning of the dry season. Seasonal perched water table conditions can be expected to occur in the south-eastern portion of the site at the interface between the highly permeable colluvial sand and the underlying impermeable alluvial clay.

7. GEOTECHNICAL CONSIDERATIONS

7.1 Expansive Soils

Soil Zone "A" is underlain by a thin horizon of khaki brown, silty and clayey residual soils. The residuum is potentially "low/medium" in the degree of expansiveness, the potentially expansive horizon is comparatively thin and a maximum heave value of less than 15mm is predicted at the ground surface in this soil zone.

Soil Zone "B" is underlain by a moderate horizon of colluvial and residual sandy clay that extend down to a depth of some 1,0m below surface. These materials are potentially "medium/high" in the degree of expansiveness and a total surface heave value of some 7,5mm to 20mm is predicted in this area.

The alluvial clay horizon that blankets Zone "C" the site down to a depth in excess of 2,0m below surface is potentially highly expansive based on the results of the laboratory free swell test carried out by Soillab with a maximum swell pressure of some 780 kPa being predicted for the material. The Van der Merwe (1964) method indicates that the clay is potentially "medium" in the degree of expansiveness but this value should be ignored in view of the free swell test results and a more conservative approach should be adopted, it should therefore be assumed that the clay is potentially "high" to "very high" in degree of expansiveness. A total surface heave value in excess of 30mm, possibly as much as 80mm is predicted across this portion of the site, should the moisture condition of the soils change from a dry to a saturated state

7.2 Excavation Characteristics

No problems should be experienced in excavating the alluvial clayey soils across the site, using conventional earthmoving equipment down to a depth of at least 2,0m below surface. The alluvial clay will be difficult to work during the wet season when machines will tend to become bogged down in the upper clay horizons that tend to soften up when becoming saturated.

The shale bedrock that underlie the clay will require very hard excavation from below a depth of 0,8m in places, using a more powerful machine than the one used during the investigation and the use of jackhammers and possibly "pop" blasting will be required to remove the shale bedrock, especially across Zones "A" and "B".

Unstable sidewall conditions can be expected in deep excavations in the clay horizon, caused by slickensided joints and shoring will be required in deep excavations in order to safeguard construction personnel. Likewise, unstable sidewall conditions can be expected along the southern, eastern and western sidewalls in deep excavations in the shale bedrock, caused by unfavorably dipping joint- and bedding planes.

7.3 Foundations

Soil Zone "A"

This soil zone tentatively classifies as a Site Class "H1" according to the guidelines of the National Home Builders Registration Council's Standards and Guidelines of 1999 and in view of the potentially moderately expansive nature of the upper soils, one of the following foundation systems may be considered for proposed rigid, single-storey, residential structures: -

Modified Normal Construction

- Lightly reinforced strip footings
- Articulation joints at all internal/external doors and openings
- Light reinforcement in masonry
- Site drainage and plumbing precautions to be taken

Soil Raft

- Remove all or part of the expansive horizon to 1m beyond the perimeter of the structure and replace with inert backfill compacted to 93% Mod AASHTO density at -1% to +2% of optimum moisture content.
- Normal construction with lightly reinforced strip footings and light reinforcement in masonry if residual movements are <7,5mm or construction type appropriate to residual movement.
- Site drainage and plumbing/service precautions to be taken.

Soil Zone "B"

This portion of the site tentatively classifies as a Site Class "H1-H2" according to the guidelines of the National Home Builders Registration Council's Standards and Guidelines of 1999 and in view of the potentially expansive nature of the upper soils which blanket this soil zone, one of the following foundation systems may be considered for proposed structures: -

Soil Raft

- Remove all or part of the expansive horizon to 1m beyond the perimeter of the structure and replace with inert backfill compacted to 93% Mod AASHTO density at -1% to +2% of optimum moisture content.
- Normal construction with lightly reinforced strip footings and light reinforcement in masonry if residual movements are <7,5mm or construction type appropriate to residual movement.
- Site drainage and plumbing/service precautions to be taken.

Split construction

- Combination of reinforced brickwork/ blockwork and full movement joints;
- Suspended floors or fabric reinforced ground slabs acting independently from the structure;
- Site drainage and plumbing/service precautions to be taken.

Piled construction

- Piled foundations with suspended floor slabs with or without ground beams.
- Site drainage and plumbing/service precautions to be taken.

Stiffened or cellular raft

- Stiffened or cellular raft of articulated lightly reinforced masonry.
- Site drainage and plumbing/service precautions to be taken.

Soil Zone "C"

The major portion of the site is underlain by potentially highly expansive alluvial and colluvial clay and classifies as being Site Class "H3" according to the guidelines of the NHBRC Standards and Guidelines of 1999. One of the following foundation solutions (excluding areas affected by a flood line) may be adopted for the construction of single-storey, masonry, residential structures: -

Stiffened or cellular raft

- Stiffened or cellular raft with articulation joints or solid lightly reinforced masonry.
- Site drainage and plumbing/service precautions to be taken.

Soil Raft

- Remove all or necessary parts of expansive horizon to 1,0m beyond the perimeter of the structure and replace with inert backfill material compacted to 93% Mod AASHTO density at -1% to +2% of optimum moisture content.
- Normal construction with lightly reinforced strip footings and light reinforcement in masonry if residual movements are <7,5mm or construction type appropriate to residual movements.
- Light reinforcement in masonry.
- Site drainage and plumbing/service precautions to be taken.

Piled construction

- Piled foundations with suspended floor slabs with or without ground beams.
- Site drainage and plumbing/service precautions to be taken.

Soil Zone "D"

This soil zone classifies as a Site Class "H3" and "P" (flooding) according to the National Home Builders Registration Council's (NHBRC) Standards and Guidelines of 1999 and it is recommended that this soil zone be excluded from the development. Alternatively, the portions of this zone that are not affected by flooding and seasonal wet and standing water conditions, may be developed, adopting similar precautionary measures as for Zone "C".

The design and construction of raft foundations (whether soil or concrete) should be done in accordance and under supervision of a civil or structural engineer. It is recommended that the excavations for foundations be carefully examined during construction in order to determine the presence of disturbed ground conditions that may have been caused by previous activities.

The design of heavier structures such as double- or multi-storey structures, should take cognisance of the potentially highly expansive site soils. The design of lightly loaded structures such as garden walls, boundary walls etc. should also take cognisance of the potentially expansive nature of the foundation soils. Flood lines should be determined accurately and areas that may be affected by seasonal flooding and standing water conditions, should be excluded from the development.

7.4 Earthworks

The site soils which blankets the property are generally fine-grained with a high plasticity index, a low grading modulus and will probably possess a very low compacted strength and a high swell after compaction. Material for use as backfill underneath surface beds and for the construction of roads and parking areas will have to be imported to the site.

The design and construction of roads should take cognisance of the potentially expansive nature of the alluvial clay as well as the potentially compressible nature of the colluvial sand that blankets the south-eastern part of the site.

7.5 Ground Water and Soil Chemistry

Although the water table was not encountered in any of the test pits during the investigation, seasonal perched water conditions and marshy conditions may occur, especially during the rainy season. The necessary damp proofing precautions should be taken underneath structures and the design of subsurface structures such as basements should take cognizance of this phenomenon.

The foundation soils are expected to be potentially neutral to slightly chemically aggressiveness with regards to buried ferrous pipes (pH values ranging from 7,78 to 9,17 and electrical conductivity values ranging from 0,01 to 0,09 S/m) based on the results of the chemical tests carried on the soils. Non-ferrous metal pipes or plastic pipes should therefore be used for wet services and the foundation soils should be treated with an environment friendly insecticide to combat termites.

8. GENERAL


While every effort has been made to ensure that representative test pitting and sampling has been undertaken to probe the soils on-site, guaranteeing that isolated zones of either poor foundation material or hard rock excavation have not been identified, is impossible under the constraints of an investigation of this nature. The investigation has sought to highlight general areas of potential foundation and excavation problems, and to provide early warning to the design engineers and town planners. In view of the variability inherent in soils, a competent person must inspect all foundation excavations.

The placement of the engineered fills must be controlled with suitable field tests to ensure that the required densities are achieved during compaction, and that the quality of fill material is within specification.

This investigation serves as a Phase 1 geotechnical investigation in terms of the National Department of Housing's Generic Specification GFSH-2 that specifies that a Phase 2 investigation should also be carried out. The Phase 2 investigation comprises the appointment of a competent person by the developer during the installation of township services. Such an investigation comprises observations and in some instances, additional investigations after the township has been pegged, to confirm the site class designation of individual erven in accordance with the NHBRC requirements for enrolment of top structures in the Warranty Scheme under the provisions of the Housing Consumer Protection Measures Act, 1998 (Act No 95 of 1998) and the Joint Structural Division of the South African Institution of Civil Engineering and Institution of Structural Engineers' code of practice for foundations and superstructures for single storey residential buildings of masonry construction.

We trust that the above information will meet with your immediate requirements, please do not hesitate to call for any further information.

Yours faithfully,



JOHANN VAN DER MERWE (Pr. Sci. Nat.)
Engineering Geologist

9. APPENDICES

Test Pit Profiles

Laboratory Test Results

Locality Map

Geotechnical Map

ANNEXURE B

LAYOUT OF THE PROPOSED DEVELOPMENT

ANNEXURE C

ROADS, WATER AND SEWER MASTERPLAN

ANNEXURE C

ROADS, WATER AND SEWER MASTERPLAN

PORTION 5 TYGERVALLEI 334-JR

ZWARTKOPPIES No. 364-JR
PORTION 21

POTN 18

PORTION 4

PORTION 6

PORTION 12



NETT DENSITY SOUTH OF RIVER
= 23,15 DWELLING UNITS PER Ha

PORTION 3

0: \491\tigdx\3 site layout.drw

TONSHIP CONSISTS OF 57 HOUSES
AND 106 DWELLING UNITS

PORTION 24
PORTION 25

LAND USE	ERF NUMBERS	NO OF ERVEN	AREA (Ha)	%
RESIDENTIAL 1	1-15, 24-27, 37-38, 41-47	57	X	X
RESIDENTIAL 2	2-16, 28, 21, 23, 29-36, 48	28	X	X
SPECIAL FOR ACCESS AND ACCESS CONTROL	1	1	X	X
SPECIAL FOR CLUBHOUSE	22	1	0,3384	1,93
PRIVATE OPEN SPACE	68-69	11	X	X
PUBLIC FRONTS	N/A	N/A	X	X
TOTAL		98	21,4127	100,00

SCALE 1:1000

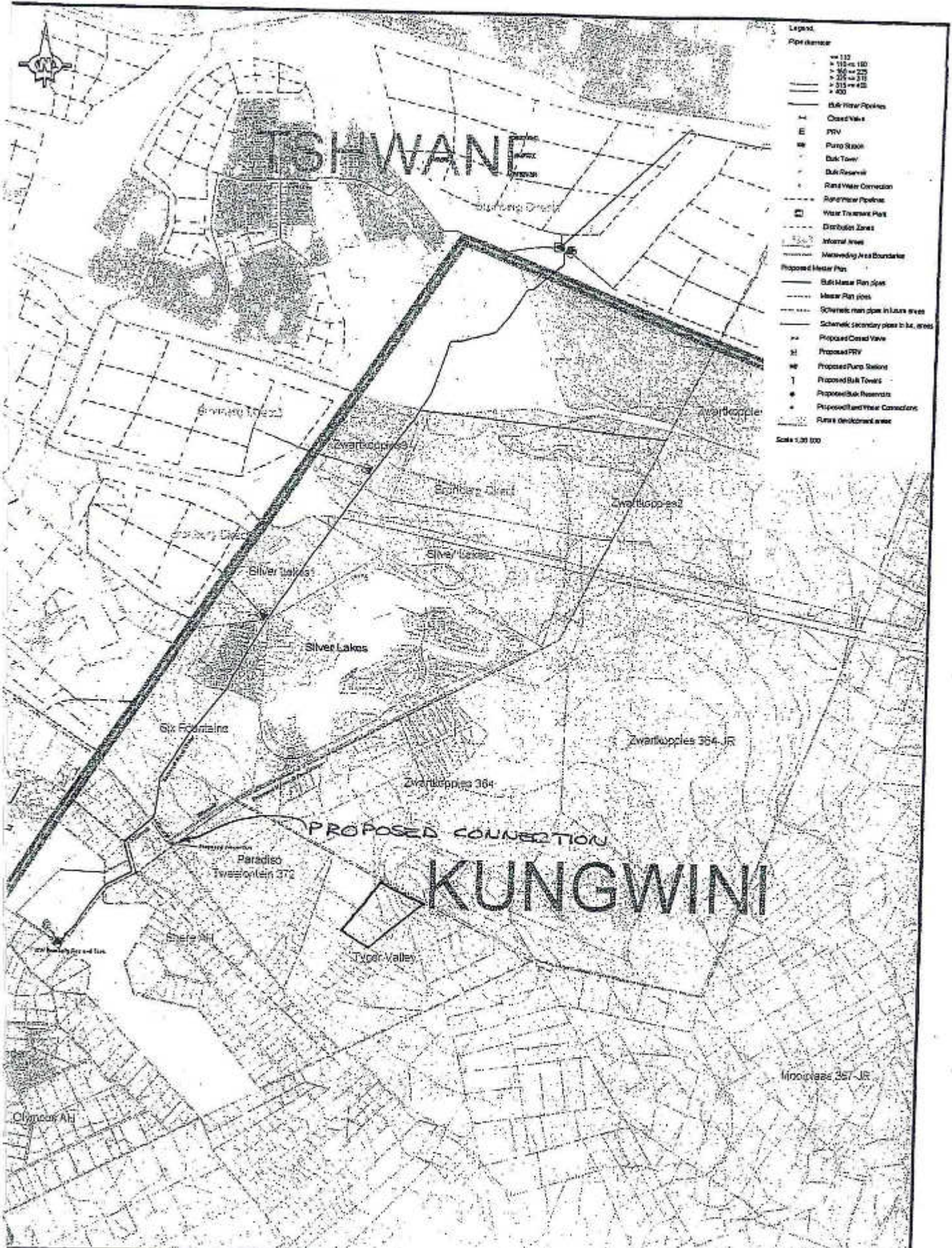


FIGURE 1
Required Works - Future System:
Bronberg Direct Zone

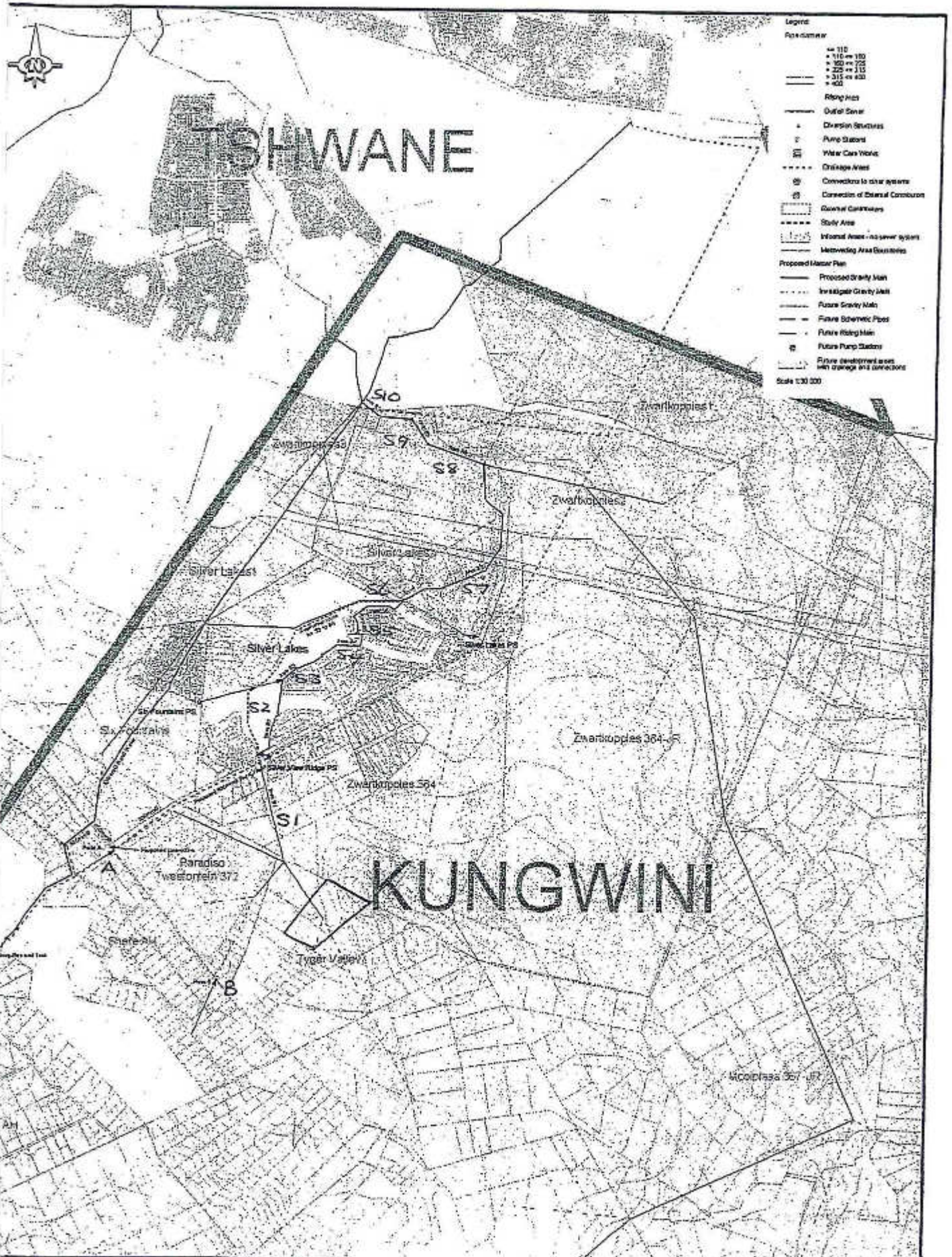


FIGURE 2
Required Works - Future System:
Baviaanspoort Drainage Area

Geotechnical Report



Appendix G2

JOHANN V.D. MERWE (Pty) Ltd
CONSULTING APPLIED EARTH AND ENVIRONMENTAL SCIENTISTS

289 Polaris Avenue
Waterkloof Ridge 0181
Pretoria, GAUTENG
SOUTH AFRICA

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WATERKLOOF 0145
Pretoria, GAUTENG
SOUTH AFRICA

PROJECT No: M05/2568

5 June 2005

SYNERGISTICS ENVIRONMENTAL SERVICES
P.O. Box 13419
VORNA VALLEY 1686

Attention: Ms. D. Kathawaroo

Dear Sir,

REPORT ON GEOTECHNICAL INVESTIGATION CARRIED OUT FOR THE PROPOSED: TYGER VALLEY HOUSING DEVELOPMENT TO BE ESTABLISHED ON: PORTION 5 OF THE FARM TYGERVALLEI 334-JR, PRETORIA DISTRICT, TSHWANE METROPOLITAN MUNICIPALITY, GAUTENG PROVINCE

1. INTRODUCTION

At the request of Ms. Deshika Kathawaroo of Synergistics Environmental Services, who is acting on behalf of a client, a detailed geotechnical investigation was carried out during May 2005 on the above property. The purpose of the investigation was to determine foundation conditions for the establishment of the proposed new Tygervalley Housing Development. The investigation consisted of a detailed geotechnical investigation during which time a number of test pits were inspected across the site, combined with soil sampling and testing in order to produce this report.

2. TERMS OF REFERENCE

The objectives of the desk study were to: -

- Determine the engineering properties of the site soils and bedrock including potentially expansive material, low bearing capacity soils and areas difficult to excavate.
- Present appropriate recommendations for residential township design and precautionary measures in accordance with the requirements of the National Home Builders Registration Council's guidelines.

The investigation was carried out in terms of written instructions received from Ms. Deshika Kathawaroo in her letter referenced S0015 dated 15 April 2005.

3. INFORMATION CONSULTED

The following information was available and was consulted: -

- A site layout plan prepared to a scale of 1: 1 500 by Vlietstra Town and Regional Planners showing existing roads, the proposed layout of the new township, the boundaries of the site and surface contours at 1,0m intervals.

- The 1: 50 000 scale Geological and Topographical Series Maps Sheet Number 2528CD Rietvleidam.
- The publication "National Home Builders Registration Council's Home Building Manual, Part 1 & 2, February 1999.

4. SITE DESCRIPTION

The site for the proposed development is situated in the eastern part of Pretoria as shown on the attached 1: 50 000 scale Locality Map at the back of the report. The property is trapezoidal in shape and covers a surface area of some 20,65 hectares of which 16 hectares was investigated in detail. The site is bounded to the south by Lynnwood Road, to the north by a prominent rocky ridge and on the remaining sides by adjacent agricultural holdings.

The property is a partly developed agricultural holding containing a derelict house and outbuildings located in the north-eastern part of the site. The surface cover consists of Highveld sourgrass containing dense growths of indigenous trees in the central and northern portions of the site, the most common species observed were *Acacia*, *Rhus*, *Olea* and *Ziziphus spp.* The property is bisected by a westerly flowing, non-perennial drainage feature (a tributary of the Piensaars River) and surface drainage takes place via sheetwash towards this feature from the south at an average gradient of some 2% and from the north at some 30% initially, flattening to some 6%. Two small earth dams are located in the lower reaches of the drainage feature, close to the western boundary of the site.

5. SITE INVESTIGATION

Thirty-one test pits were excavated across the site using a John Deere 310 backactor supplied by SNA Labr, were entered and inspected by the undersigned, a registered professional engineering geologist. The soil and bedrock formations were described in terms of the methods advocated by Jennings *et al* (1973) namely, moisture condition, colour, soil consistency, soil structure, soil type and origin (MCCSSO). Due to the steepness of the northern part of the site, no test pits could be excavated here due to access problems.

During the test pit profiling, disturbed and undisturbed representative soil samples were recovered from the test pits and submitted to SNA's and Soillab's commercial soil laboratories in Pretoria for testing and identification. Detailed descriptions of the test pit profiles are provided on the Soil Profile Sheets in Appendix 1 of the report whilst the laboratory test results appear in Appendix 2. The location of the test pits is shown on the "Geotechnical Map", Drawing Number M05/2568 at the back of the report.

6. OBSERVATIONS

The site is underlain by prominent horizons of alluvial and colluvial clayey soils overlying residual soils and shale bedrock belonging to the Silverton Shale Formation, Pretoria Group, Transvaal Supergroup. A diabase sill of Post Transvaal age is intruded into the sediments in portions of the site. The property has been apportioned into four prominent soil zones, Zones "A" to "D" as shown on the "Geotechnical Map".

Soil Zone "A" covers the *higher-lying northern portion* of the site and a very generalized description of the typical soil profile that may be encountered here, is as follows: -

- 0,0 - 0,3: *Abundant coarse, flaky and angular SHALE GRAVELS, clast supported in a matrix of dry, dark brown, sandy CLAY; pebble marker. Overall consistency is loose.*
- 0,3 - 0,6: *Moist, dark khaki becoming light grey, very stiff, shattered, silty CLAY; residual shale.*
- 0,6 - 1,3: *Light grey becoming dark yellow stained orange and yellow on joints, highly weathered, very closely bedded and jointed, very soft rock SHALE becoming soft rock with increasing depth. Bedding planes dip towards the north at about 15° and contains thin infill of clay and silt on discontinuity surfaces. Abundant open, randomly oriented and vertically and sub-vertically inclined joints present. Scattered large and medium-sized DIABASE BOULDERS occur at surface across this soils zone, these are derived from a weathered diabase sill upslope of Zone "A".*

Soil Zone "B" covers the area immediately to the south of the rocky ridge and a very generalized description of the typical soil profile that may be encountered here, is as follows: -

- 0,0 - 1,0: *Moist, dark grey, very stiff, shattered, sandy CLAY; colluvium.*
- 1,0 - 1,1: *As above and containing abundant coarse GARVELS and COBBLES; pebble marker.*
- 1,1 - 1,3: *Abundant coarse, medium and fine angular and flaky SHALE FRAGMENTS, clast supported in a matrix of moist, dark yellow, clayey SILT; reworked residual shale. Overall consistency is dense becoming very dense.*
- 1,3 - 1,5: *Light grey becoming dark yellow stained orange and yellow on joints, highly weathered, very closely bedded and jointed, very soft rock SHALE becoming soft rock with increasing depth. Bedding planes dip towards the north at about 15° and contains thin infill of clay and silt on discontinuity surfaces. Abundant open, randomly oriented and vertically and sub-vertically inclined joints present.*

Soil Zone "C" covers the major portion of the site and a very generalized description of the typical soil profile that may be encountered here, is as follows: -

- 0,0 - 0,5: *Moist, dark grey, medium dense, clayey fine SAND containing roots; colluvium. This sandy colluvium occurs in the south-eastern part of the site only.*
- 0,5 - 2,0: *Moist, dark grey becoming dark yellowish brown blotched light grey towards the base, very stiff, slickensided, silty CLAY containing scattered, well-rounded gravels and occasional boulders; alluvium.*
- 2,0+: *Moist, dark yellow, stiff, relict jointed, clayey sandy SILT; residual diabase (extreme northern portion of the site) and elsewhere, very soft rock SHALE.*

Soil Zone "D" covers the central, lower-lying portion of the site where the major drainage feature is located as well as a number of subtle, subdued drainage features that occur elsewhere across the site.

Slow excavation to gradual refusal of the backactor was experienced in the shale bedrock from below a depth of 0,8m to 1,5m in Zones "A" and "B", elsewhere, no refusal (although very slow excavation in the very stiff clay) was experienced down to a depth of at least 2,0m below surface. The water table, whether perched or permanent, was not encountered during the investigation, which was carried out at during the beginning of the dry season. Seasonal perched water table conditions can be expected to occur in the south-eastern portion of the site at the interface between the highly permeable colluvial sand and the underlying impermeable alluvial clay.

7. GEOTECHNICAL CONSIDERATIONS

7.1 Expansive Soils

Soil Zone "A" is underlain by a thin horizon of khaki brown, silty and clayey residual soils. The residuum is potentially "low/medium" in the degree of expansiveness, the potentially expansive horizon is comparatively thin and a maximum heave value of less than 15mm is predicted at the ground surface in this soil zone.

Soil Zone "B" is underlain by a moderate horizon of colluvial and residual sandy clay that extend down to a depth of some 1,0m below surface. These materials are potentially "medium/high" in the degree of expansiveness and a total surface heave value of some 7,5mm to 20mm is predicted in this area.

The alluvial clay horizon that blankets Zone "C" the site down to a depth in excess of 2,0m below surface is potentially highly expansive based on the results of the laboratory free swell test carried out by Soilab with a maximum swell pressure of some 780 kPa being predicted for the material. The Van der Merwe (1964) method indicates that the clay is potentially "medium" in the degree of expansiveness but this value should be ignored in view of the free swell test results and a more conservative approach should be adopted, it should therefore be assumed that the clay is potentially "high" to "very high" in degree of expansiveness. A total surface heave value in excess of 30mm, possibly as much as 80mm is predicted across this portion of the site, should the moisture condition of the soils change from a dry to a saturated state

7.2 Excavation Characteristics

No problems should be experienced in excavating the alluvial clayey soils across the site, using conventional earthmoving equipment down to a depth of at least 2,0m below surface. The alluvial clay will be difficult to work during the wet season when machines will tend to become bogged down in the upper clay horizons that tend to soften up when becoming saturated.

The shale bedrock that underlie the clay will require very hard excavation from below a depth of 0,8m in places, using a more powerful machine than the one used during the investigation and the use of jackhammers and possibly "pop" blasting will be required to remove the shale bedrock, especially across Zones "A" and "B".

Unstable sidewall conditions can be expected in deep excavations in the clay horizon, caused by slickensided joints and shoring will be required in deep excavations in order to safeguard construction personnel. Likewise, unstable sidewall conditions can be expected along the southern, eastern and western sidewalls in deep excavations in the shale bedrock, caused by unfavorably dipping joint- and bedding planes.

7.3 Foundations

Soil Zone "A"

This soil zone tentatively classifies as a Site Class "H1" according to the guidelines of the National Home Builders Registration Council's Standards and Guidelines of 1999 and in view of the potentially moderately expansive nature of the upper soils, one of the following foundation systems may be considered for proposed rigid, single-storey, residential structures: -

Modified Normal Construction

- Lightly reinforced strip footings
- Articulation joints at all internal/external doors and openings
- Light reinforcement in masonry
- Site drainage and plumbing precautions to be taken

Soil Raft

- Remove all or part of the expansive horizon to 1m beyond the perimeter of the structure and replace with inert backfill compacted to 93% Mod AASHTO density at -1% to +2% of optimum moisture content.
- Normal construction with lightly reinforced strip footings and light reinforcement in masonry if residual movements are <7,5mm or construction type appropriate to residual movement.
- Site drainage and plumbing/service precautions to be taken.

Soil Zone "B"

This portion of the site tentatively classifies as a Site Class "H1-H2" according to the guidelines of the National Home Builders Registration Council's Standards and Guidelines of 1999 and in view of the potentially expansive nature of the upper soils which blanket this soil zone, one of the following foundation systems may be considered for proposed structures: -

Soil Raft

- Remove all or part of the expansive horizon to 1m beyond the perimeter of the structure and replace with inert backfill compacted to 93% Mod AASHTO density at -1% to +2% of optimum moisture content.
- Normal construction with lightly reinforced strip footings and light reinforcement in masonry if residual movements are <7,5mm or construction type appropriate to residual movement.
- Site drainage and plumbing/service precautions to be taken.

Split construction

- Combination of reinforced brickwork/ blockwork and full movement joints;
- Suspended floors or fabric reinforced ground slabs acting independently from the structure;
- Site drainage and plumbing/service precautions to be taken.

Piled construction

- Piled foundations with suspended floor slabs with or without ground beams.
- Site drainage and plumbing/service precautions to be taken.

Stiffened or cellular raft

- Stiffened or cellular raft of articulated lightly reinforced masonry.
- Site drainage and plumbing/service precautions to be taken.

Soil Zone "C"

The major portion of the site is underlain by potentially highly expansive alluvial and colluvial clay and classifies as being Site Class "H3" according to the guidelines of the NHBRC Standards and Guidelines of 1999. One of the following foundation solutions (excluding areas affected by a flood line) may be adopted for the construction of single-storey, masonry, residential structures: -

Stiffened or cellular raft

- Stiffened or cellular raft with articulation joints or solid lightly reinforced masonry.
- Site drainage and plumbing/service precautions to be taken.

Soil Raft

- Remove all or necessary parts of expansive horizon to 1,0m beyond the perimeter of the structure and replace with inert backfill material compacted to 93% Mod AASHTO density at -1% to +2% of optimum moisture content.
- Normal construction with lightly reinforced strip footings and light reinforcement in masonry if residual movements are <7,5mm or construction type appropriate to residual movements.
- Light reinforcement in masonry.
- Site drainage and plumbing/service precautions to be taken.

Piled construction

- Piled foundations with suspended floor slabs with or without ground beams.
- Site drainage and plumbing/service precautions to be taken.

Soil Zone "D"

This soil zone classifies as a Site Class "H3" and "P" (flooding) according to the National Home Builders Registration Council's (NHBRC) Standards and Guidelines of 1999 and it is recommended that this soil zone be excluded from the development. Alternatively, the portions of this zone that are not affected by flooding and seasonal wet and standing water conditions, may be developed, adopting similar precautionary measures as for Zone "C".

The design and construction of raft foundations (whether soil or concrete) should be done in accordance and under supervision of a civil or structural engineer. It is recommended that the excavations for foundations be carefully examined during construction in order to determine the presence of disturbed ground conditions that may have been caused by previous activities.

The design of heavier structures such as double- or multi-storey structures, should take cognisance of the potentially highly expansive site soils. The design of lightly loaded structures such as garden walls, boundary walls etc. should also take cognisance of the potentially expansive nature of the foundation soils. Flood lines should be determined accurately and areas that may be affected by seasonal flooding and standing water conditions, should be excluded from the development.

7.4 Earthworks

The site soils which blankets the property are generally fine-grained with a high plasticity index, a low grading modulus and will probably possess a very low compacted strength and a high swell after compaction. Material for use as backfill underneath surface beds and for the construction of roads and parking areas will have to be imported to the site.

The design and construction of roads should take cognizance of the potentially expansive nature of the alluvial clay as well as the potentially compressible nature of the colluvial sand that blankets the south-eastern part of the site.

7.5 Ground Water and Soil Chemistry

Although the water table was not encountered in any of the test pits during the investigation, seasonal perched water conditions and marshy conditions may occur, especially during the rainy season. The necessary damp proofing precautions should be taken underneath structures and the design of subsurface structures such as basements should take cognizance of this phenomenon.

The foundation soils are expected to be potentially neutral to slightly chemically aggressiveness with regards to buried ferrous pipes (pH values ranging from 7,78 to 9,17 and electrical conductivity values ranging from 0,01 to 0,09 S/m) based on the results of the chemical tests carried on the soils. Non-ferrous metal pipes or plastic pipes should therefore be used for wet services and the foundation soils should be treated with an environment friendly insecticide to combat termites.

8. GENERAL


While every effort has been made to ensure that representative test pitting and sampling has been undertaken to probe the soils on-site, guaranteeing that isolated zones of either poor foundation material or hard rock excavation have not been identified, is impossible under the constraints of an investigation of this nature. The investigation has sought to highlight general areas of potential foundation and excavation problems, and to provide early warning to the design engineers and town planners. In view of the variability inherent in soils, a competent person must inspect all foundation excavations.

The placement of the engineered fills must be controlled with suitable field tests to ensure that the required densities are achieved during compaction, and that the quality of fill material is within specification.

This investigation serves as a Phase 1 geotechnical investigation in terms of the National Department of Housing's Generic Specification GFSH-2 that specifies that a Phase 2 investigation should also be carried out. The Phase 2 investigation comprises the appointment of a competent person by the developer during the installation of township services. Such an investigation comprises observations and in some instances, additional investigations after the township has been pegged, to confirm the site class designation of individual erven in accordance with the NHBC requirements for enrolment of top structures in the Warranty Scheme under the provisions of the Housing Consumer Protection Measures Act, 1998 (Act No 95 of 1998) and the Joint Structural Division of the South African Institution of Civil Engineering and Institution of Structural Engineers' code of practice for foundations and superstructures for single storey residential buildings of masonry construction.

We trust that the above information will meet with your immediate requirements, please do not hesitate to call for any further information.

Yours faithfully,



JOHANN VAN DER MERWE (D. Sc. Nat.)
Engineering Geologist

9. APPENDICES

Test Pit Profiles

Laboratory Test Results

Locality Map

Geotechnical Map

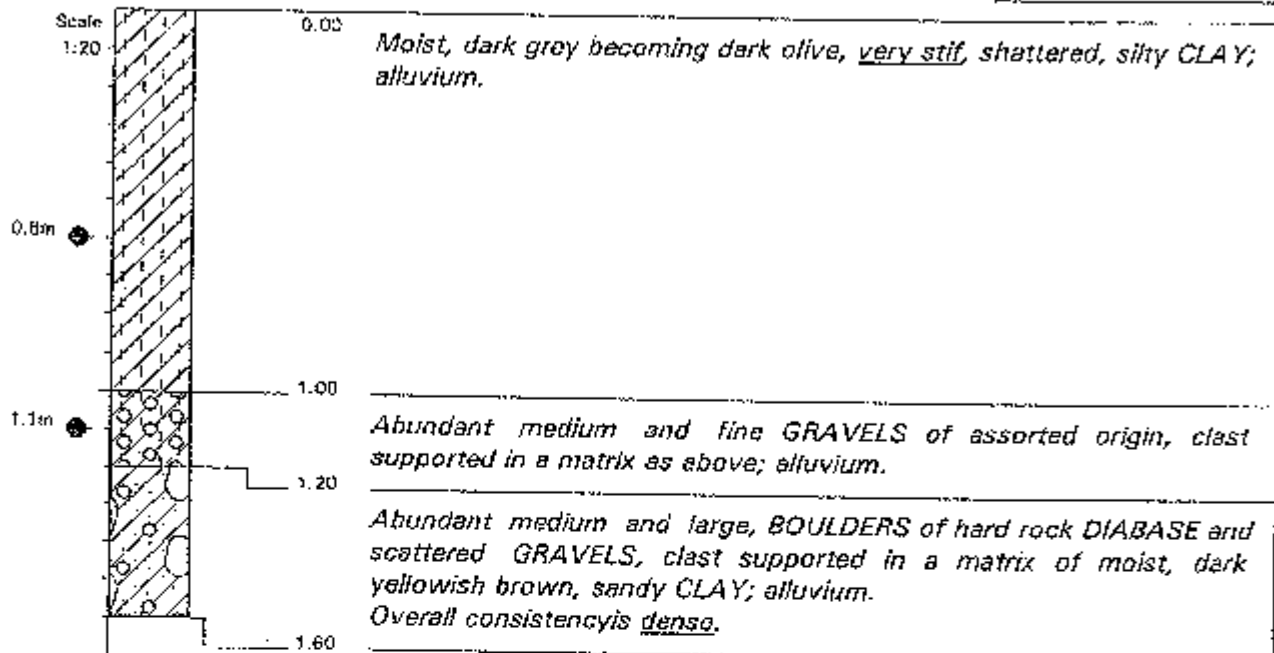
APPENDIX 1 : TEST PIT PROFILES

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/1

Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) Refusal of backactor at 1,6m in boulder horizon.
- 2) No water seepage encountered.
- 3) Disturbed indicator samples taken at 0,6m and at 1,1m.

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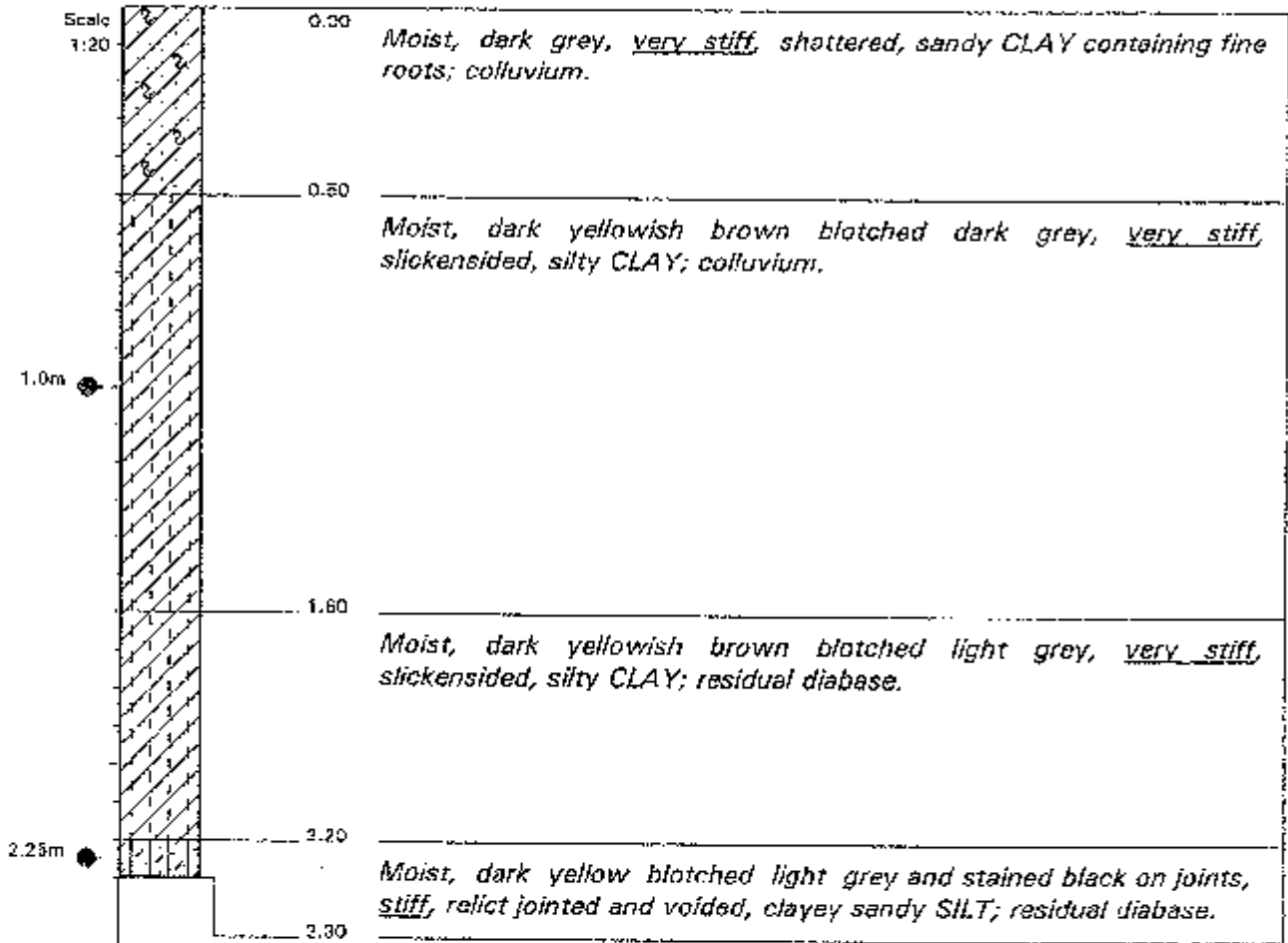
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 Y COORD :

HOLE No: TV/1

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/2
 Sheet 1 of 1
 JOB NUMBER: M05/2568



NOTES

- 1) No refusal of backactor at 2,3m.
- 2) No water seepage encountered.
- 3) Disturbed indicator samples taken at 1,0m and at 2,25m.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
 TYPE SET BY : jvdm

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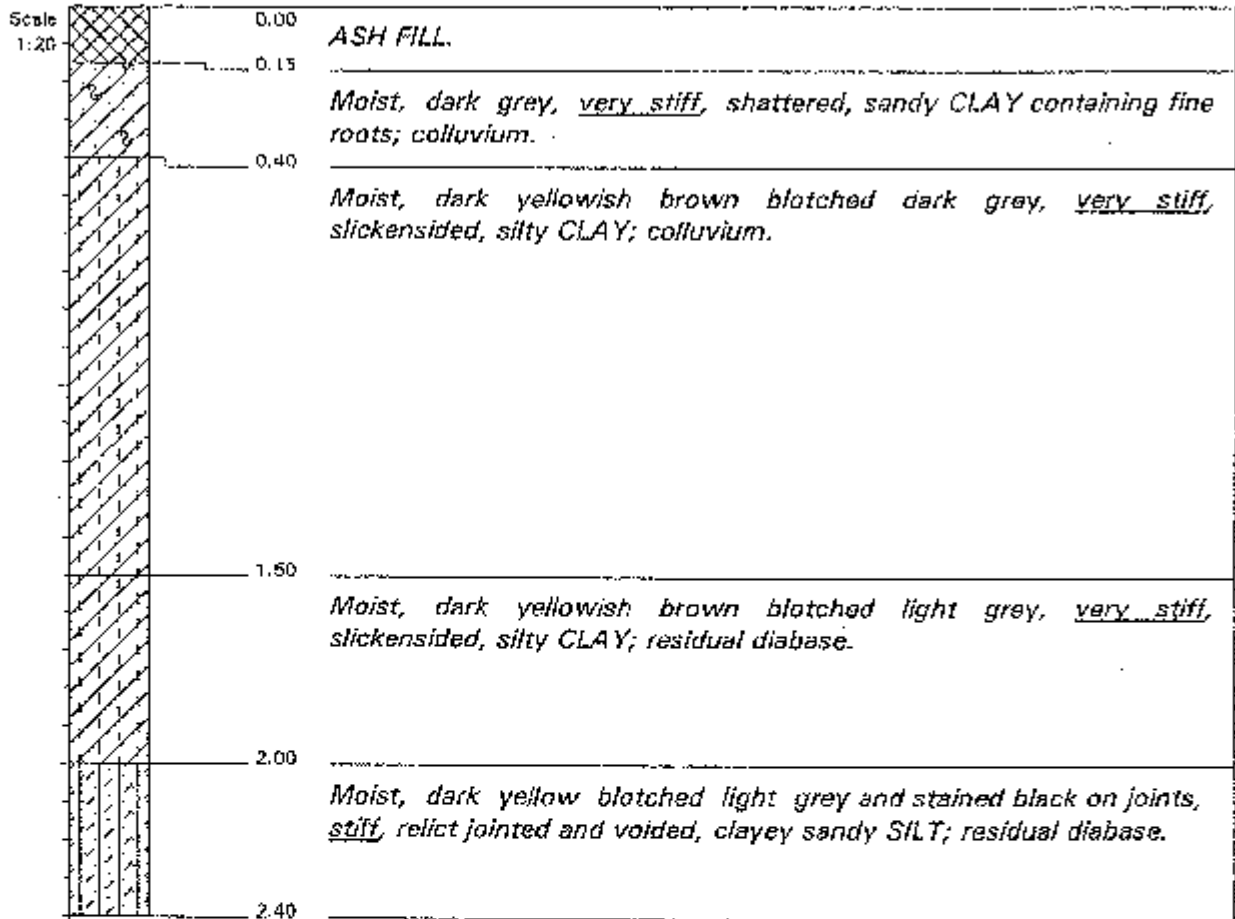
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HOLE No: TV/2

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/3
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) No refusal of backactor at 2,4m.
- 2) No water seepage encountered.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
 TYPE SET BY : jvdm

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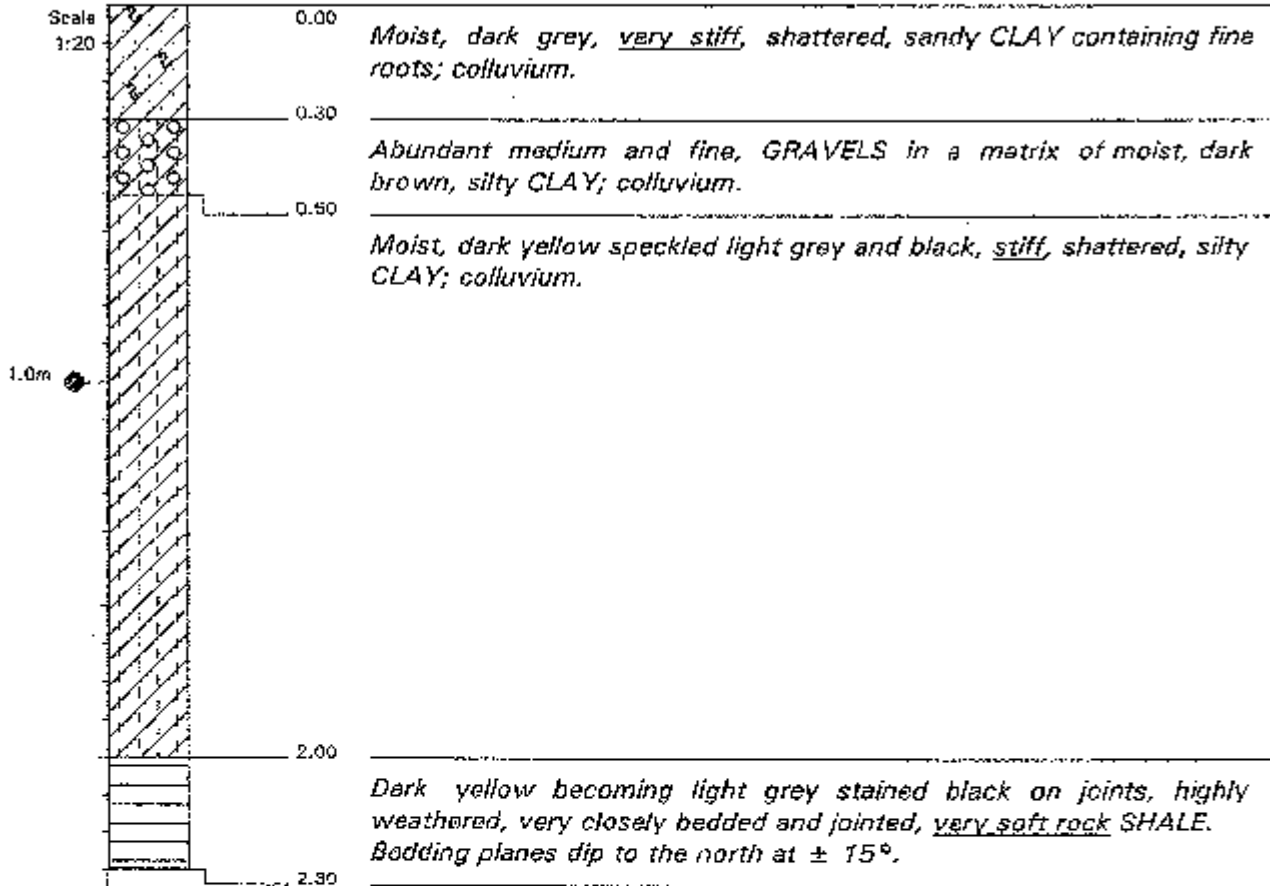
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HOLE No: TV/3

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/4
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) No refusal of backactor at 2,3m.
- 2) No water seepage encountered.
- 3) Disturbed indicator sample taken at 1,0m.

CONTRACTOR : SNA Lab
 MACHINE : John Doere 310
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 PROFILED BY : jvdm
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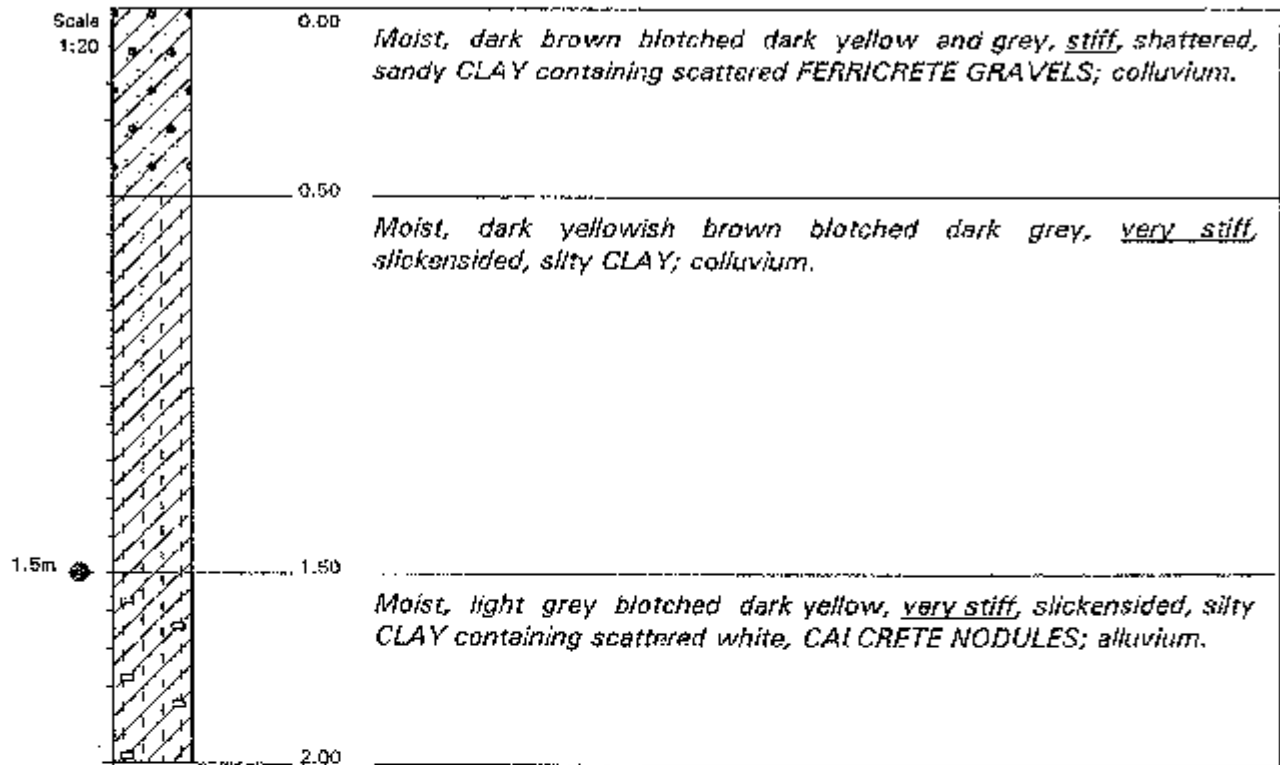
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HOLE No: TV/4

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: *TV/5*
 Sheet 1 of 1

JOB NUMBER: *M05/2568*



NOTES

- 1) No refusal of backactor at 2,0m.
- 2) No water seepage encountered.
- 3) Disturbed indicator sample taken at 1,5m.

CONTRACTOR : *SNA Lab*
 MACHINE : *John Deere 310*
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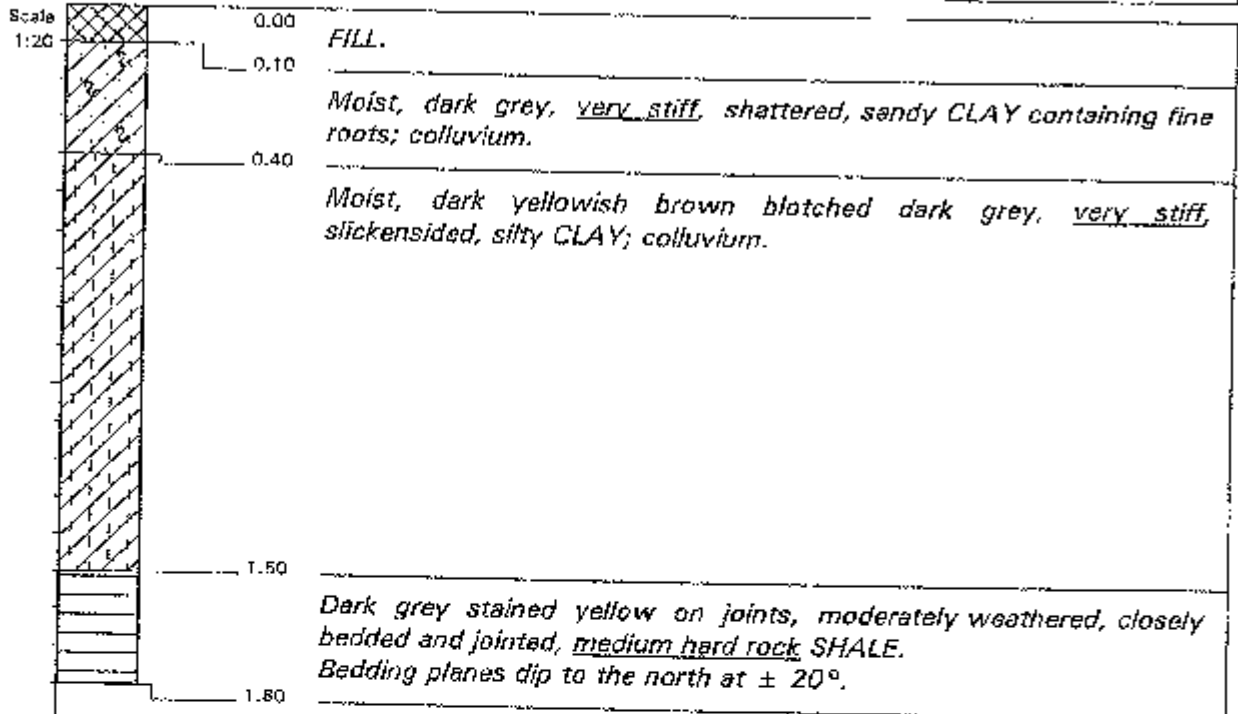
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 Y-COORD :

HOLE No: *TV/5*

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
 PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/6
 Sheet 1 of 1
 JOB NUMBER: M05/2568



NOTES

- 1) Refusal of backactor at 1,8m n shale bedrock.
- 2) No water seepage encountered.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
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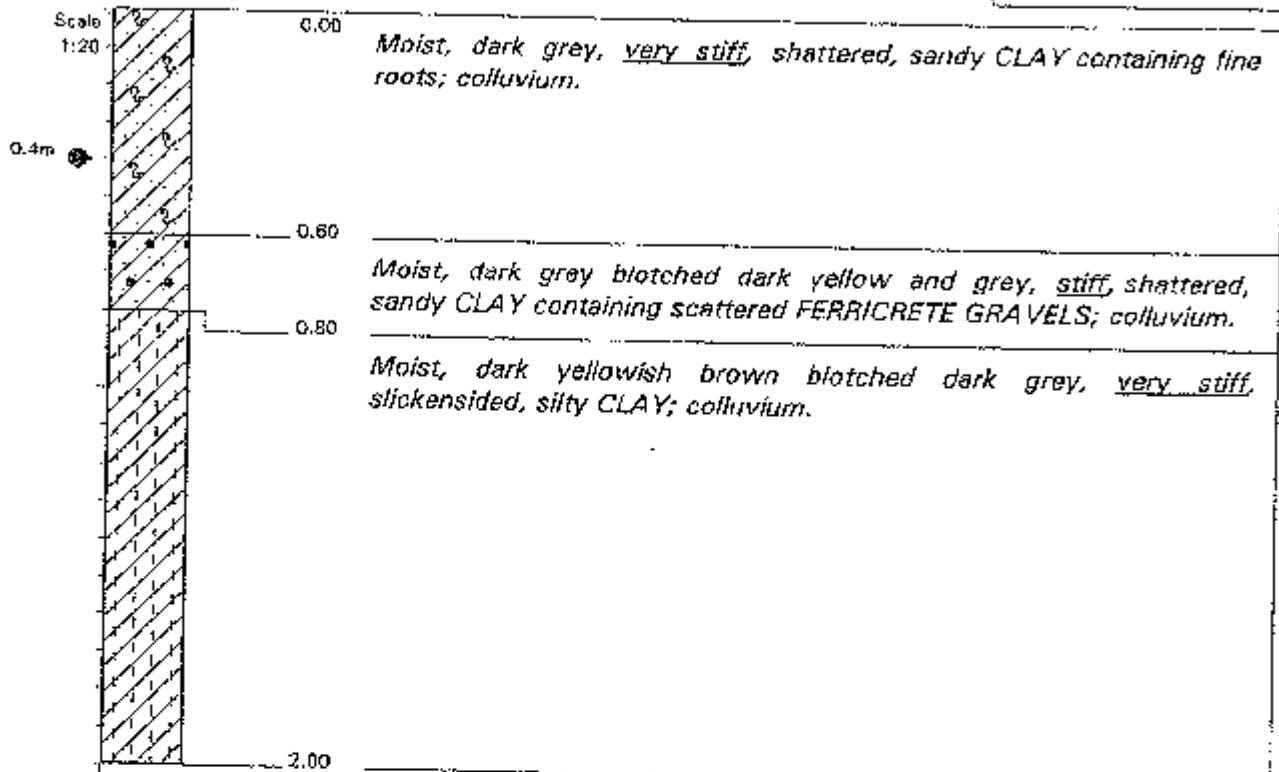
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HOLE No: TV/6

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/7
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) No refusal of backactor at 2,0m.
- 2) No water seepage encountered.
- 3) Disturbed Indicator sample taken at 0,4m.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
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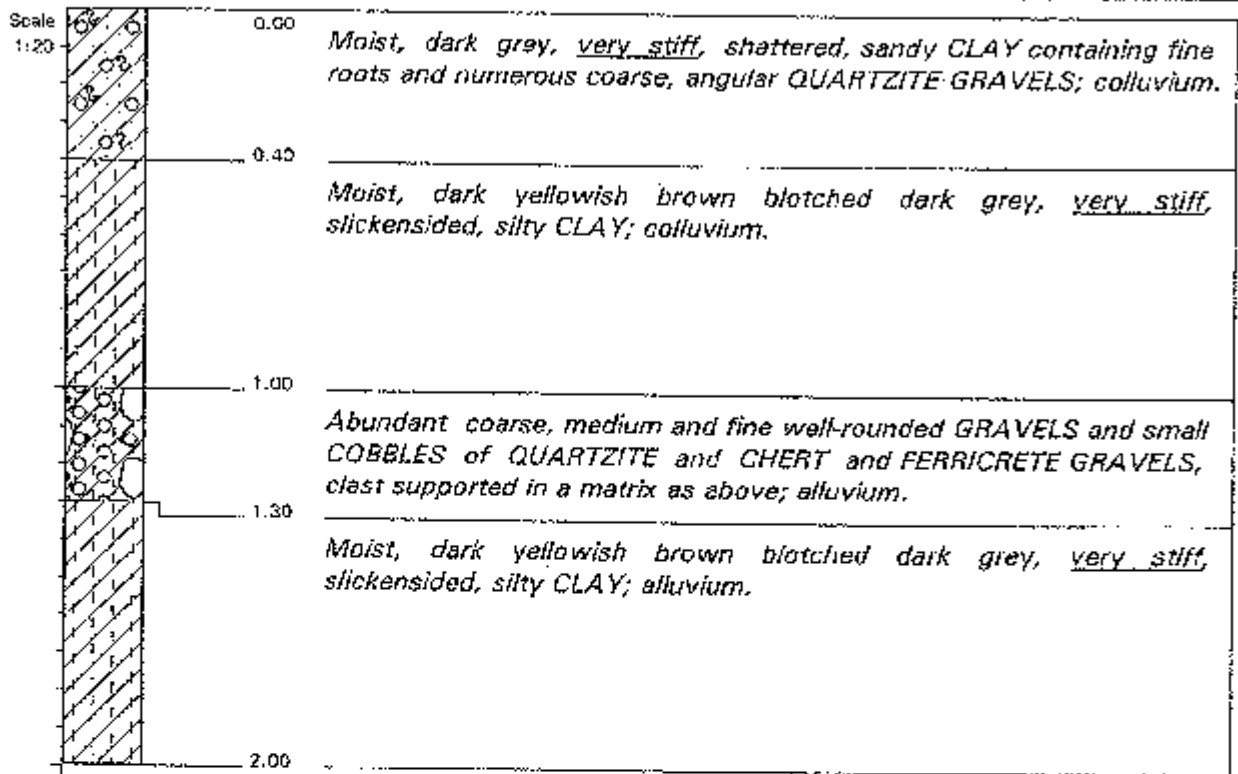
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HOLE No: TV/7

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/8
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) No refusal of backactor at 2,0m.
- 2) No water seepage encountered.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
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 TYPE SET BY : jvdm
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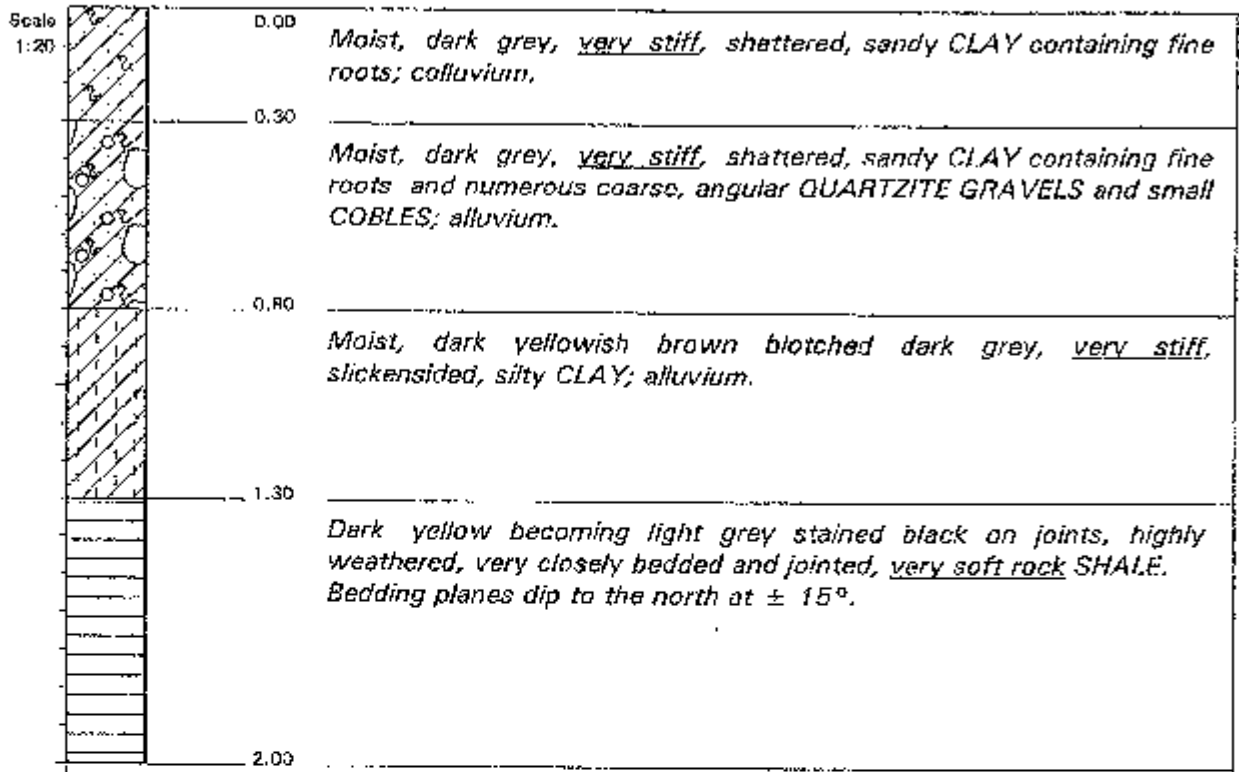
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HOLE No: TV/8

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: **TV/9**
 Sheet 1 of 1

JOB NUMBER: **M05/2568**



NOTES

- 1) No refusal of backactor at 2,0m.
- 2) No water seepage encountered.

CONTRACTOR : **SNA Lab**
 MACHINE : **John Deere 310**
 DRILLED BY :
 PROFILED BY : **jvdm**
 TYPE SET BY : **jvdm**
 SET FILE : STAMINADH.SET

INCLINATION :
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 DATE : **09/05/2005**
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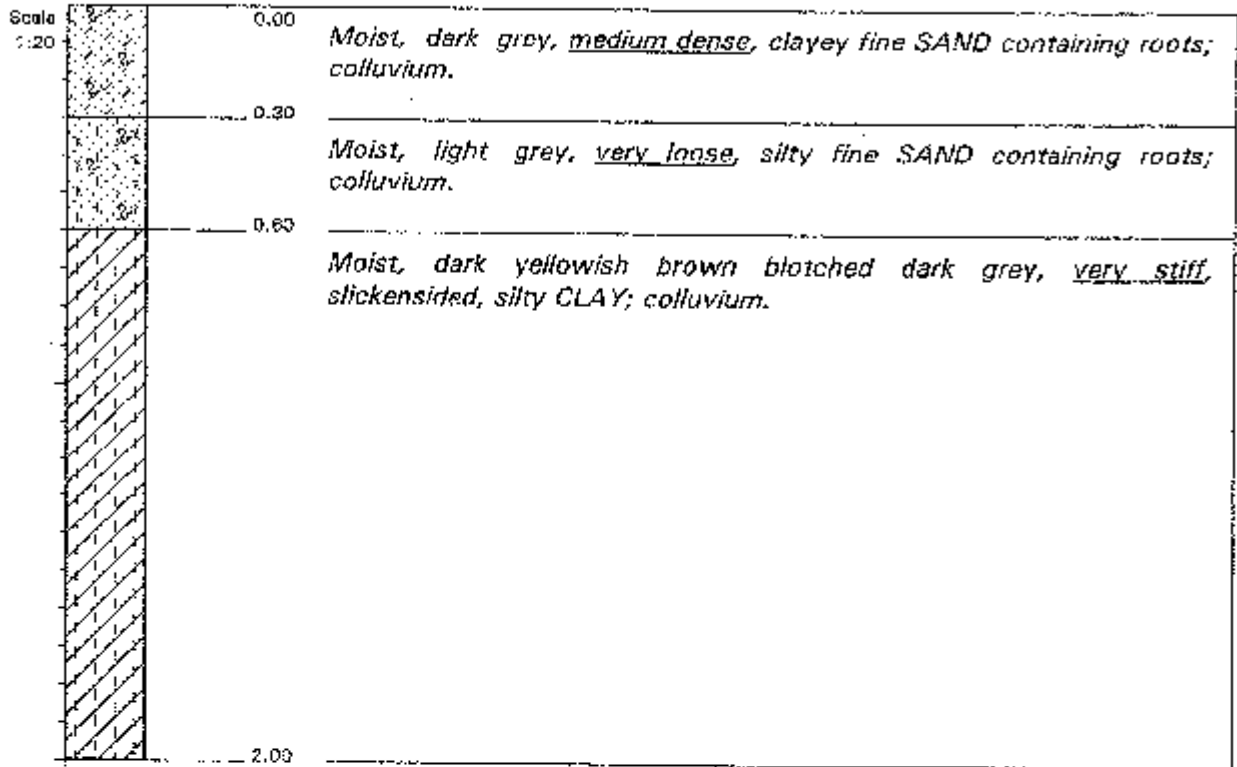
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 X-COORD :
 Y-COORD :

HOLE No: **TV/9**

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
**GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
 PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT**

HOLE No: *TV/10*
 Sheet 1 of 1

JOB NUMBER: *M05/2568*



NOTES

- 1) No refusal of backactor at 2,0m.
- 2) No water seepage encountered.

CONTRACTOR : *SNA Lab*
 MACHINE : *John Deere 310*
 DRILLED BY :
 PROFILED BY : *jvdm*
 TYPE SET BY : *jvdm*

INCLINATION :
 D'AM : *Trench*
 DATE : *09/05/2005*
 DATE : *09/05/2005*
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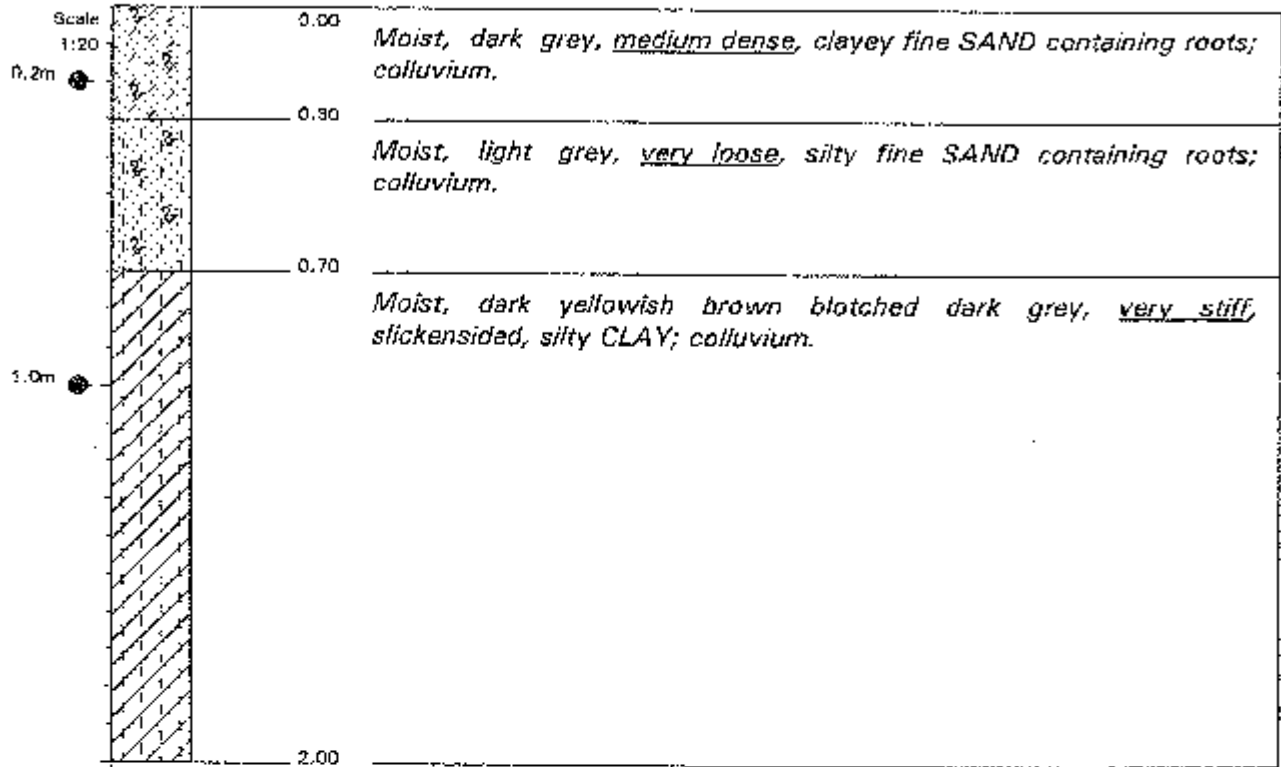
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 X-COORD :
 Y-COORD :

HOLE No: *TV/10*

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
 PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/11
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) No refusal of backactor at 2,0m.
- 2) No water seepage encountered.
- 3) Disturbed indicator samples taken at 0,2m and at 1,0m.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
 TYPE SET BY : jvdm

INCLINATION :
 DIAM : Trench
 DATE : 09/05/2005
 DATE : 09/05/2005
 DATE : 19/05/05 12:37

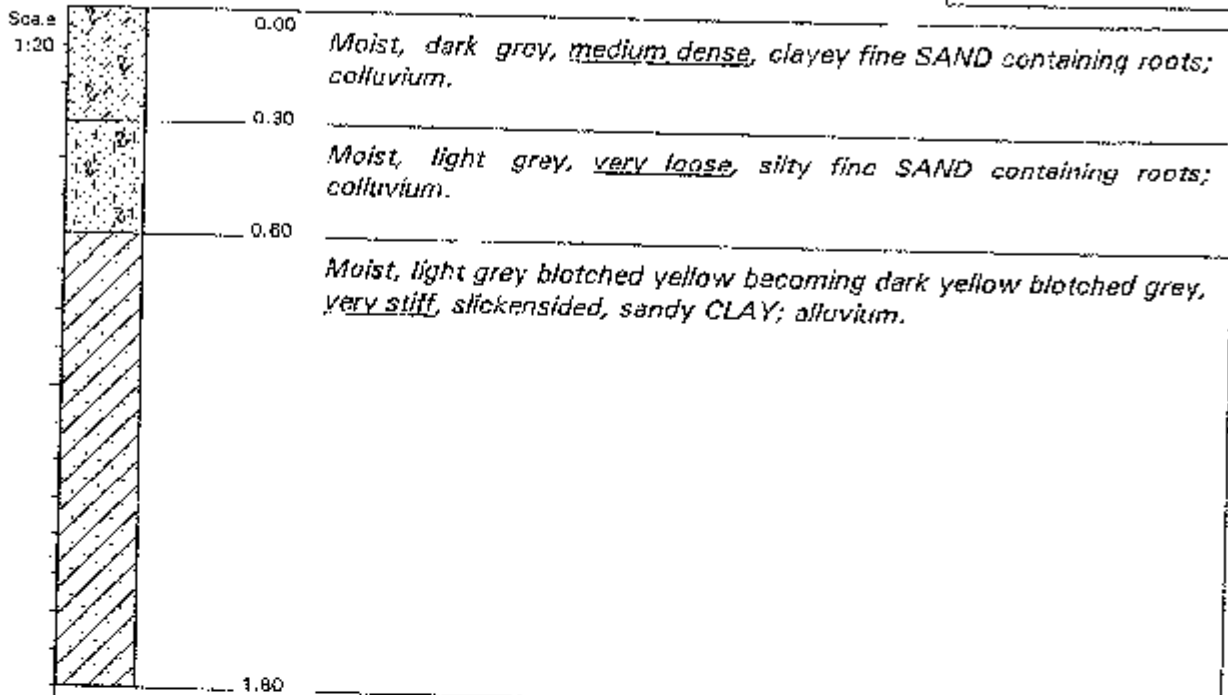
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 X-COORD :
 Y-COORD :

HOLE No: TV/11

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/12
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) No refusal of backactor at 1.8m.
- 2) No water seepage encountered.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
 TYPE SET BY : jvdm
 SET UP BY : STAMBAARD, GY

INCLINATION :
 DIAM : Trench
 DATE : 09/05/2005
 DATE : 09/05/2005
 DATE : 18/05/05 12:37

ELEVATION :
 X-COORD :
 Y-COORD :

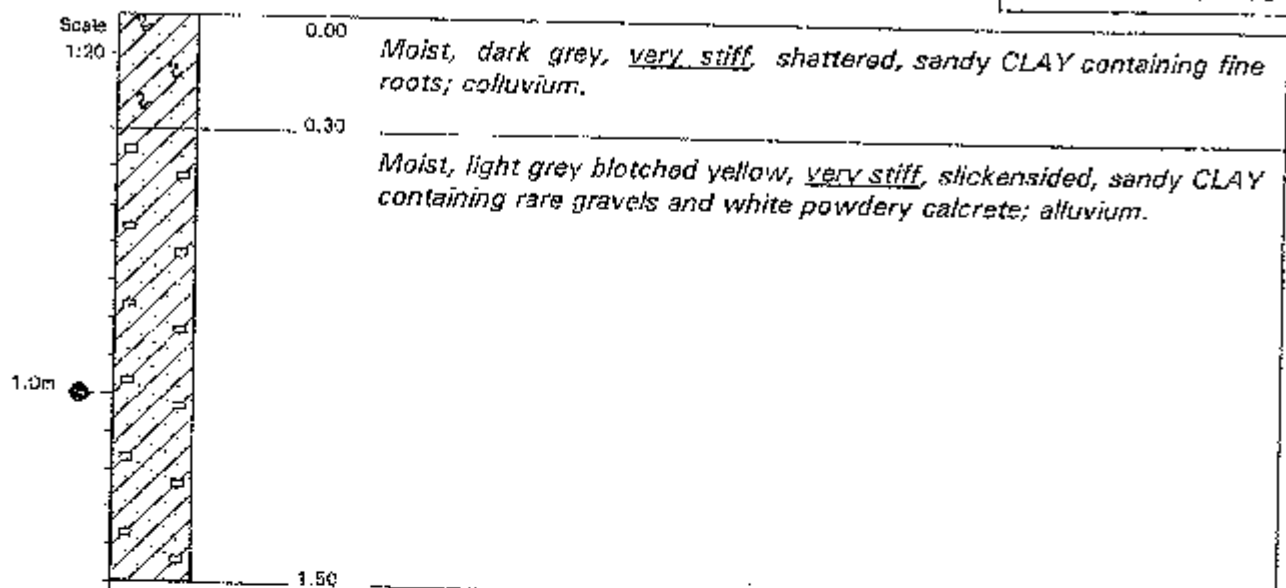
HOLE No: TV/12

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: **TV/13**

Sheet 1 of 1

JOB NUMBER: **M05/2568**



NOTES

- 1) Extremely slow excavation to near refusal of backactor at 1,5m.
- 2) No water seepage encountered.
- 3) Disturbed indicator sample taken at 1,0m.

CONTRACTOR : **SNA Lab**
 MACHINE : **John Deere 310**
 DRILLED BY :
 PROFILED BY : **jvdm**
 TYPE SET BY : **jvdm**
 SETUP FILE : STANDARD.SET

INCLINATION :
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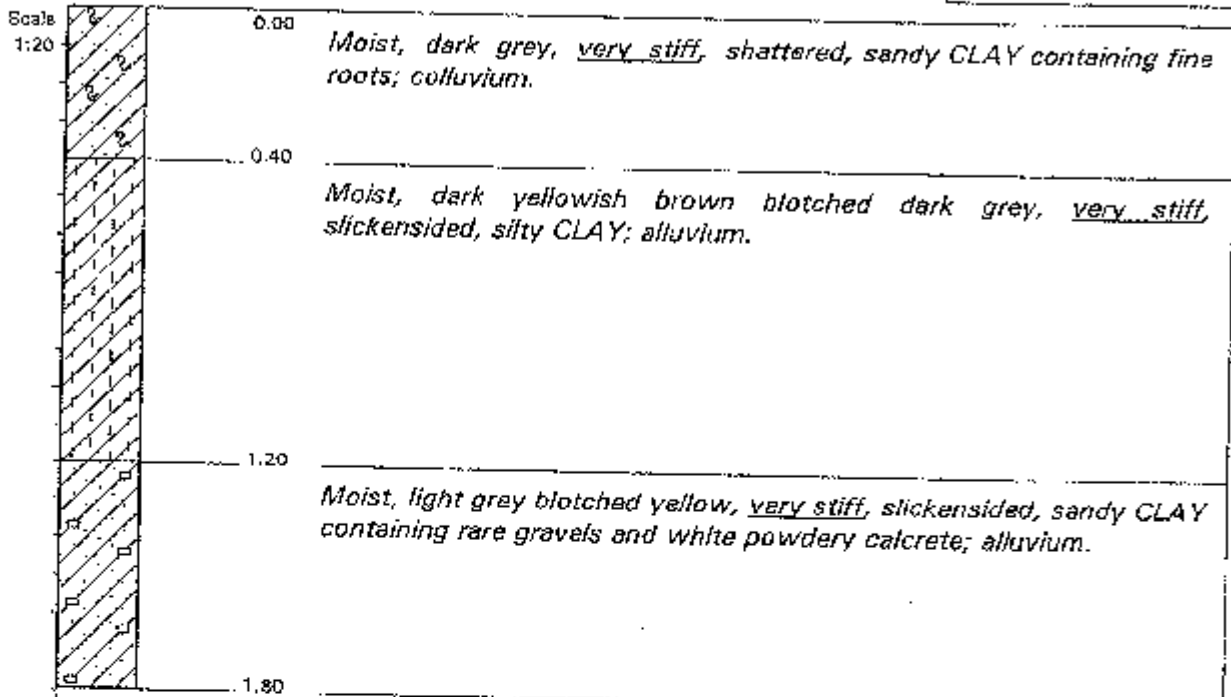
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 X-COORD :
 Y-COORD :

HOLE No: **TV/13**

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: *TV/14*
 Sheet 1 of 1

JOB NUMBER: *M05/2568*



NOTES

- 1) Extremely slow excavation to near refusal of backactor at 1,8m.
- 2) No water seepage encountered.

CONTRACTOR : *SNA Lab*
 MACHINE : *John Deere 310*
 DRILLED BY :
 PROFILED BY : *jvdm*
 TYPE SET BY : *jvdm*
 SETUP FILE : STANDARD SET

INCLINATION :
 DIAM : *Trench*
 DATE : *09/05/2005*
 DATE : *09/05/2005*
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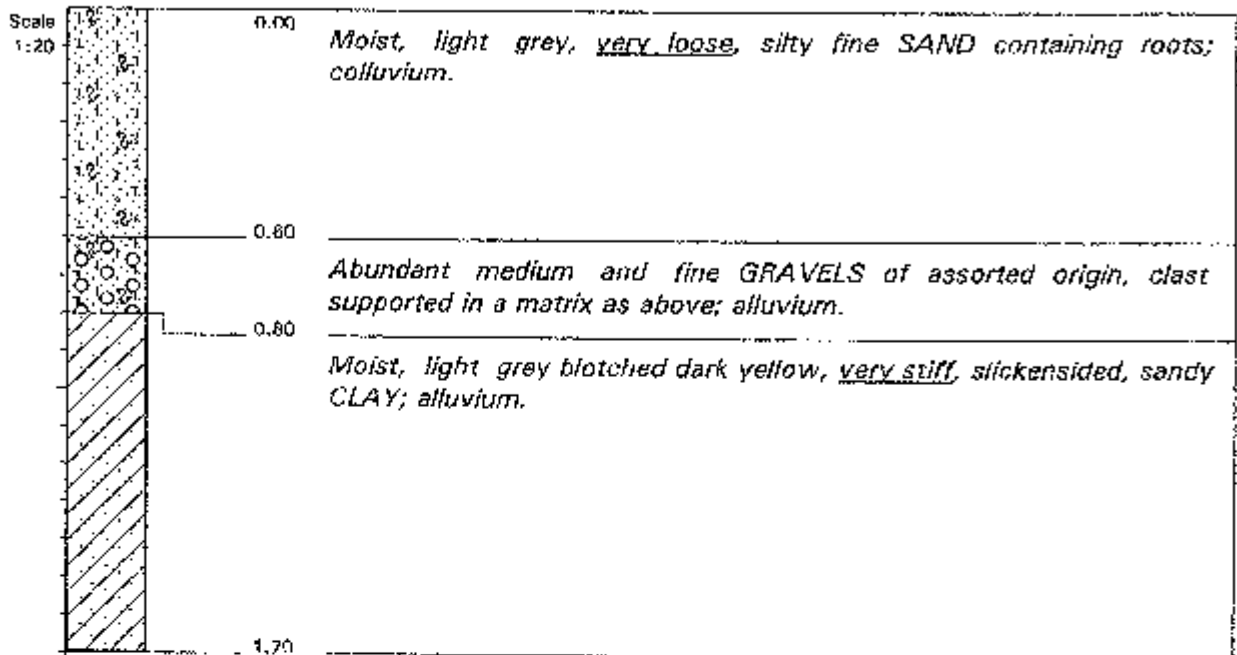
ELEVATION :
 X-COORD :
 Y-COORD :

HOLE No: *TV/14*

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
 PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: **TV/15**
 Sheet 1 of 1

JOB NUMBER: **M05/2568**



NOTES

- 1) Extremely slow excavation but no refusal of backactor at 1,7m.
- 2) No water seepage encountered.

CONTRACTOR : *SNA Lab*
 MACHINE : *John Deere 310*
 DRILLED BY :
 PROFILED BY : *jvdm*
 TYPE SET BY : *jvdm*

INCLINATION :
 D'AM : *Trench*
 DATE : *09/05/2005*
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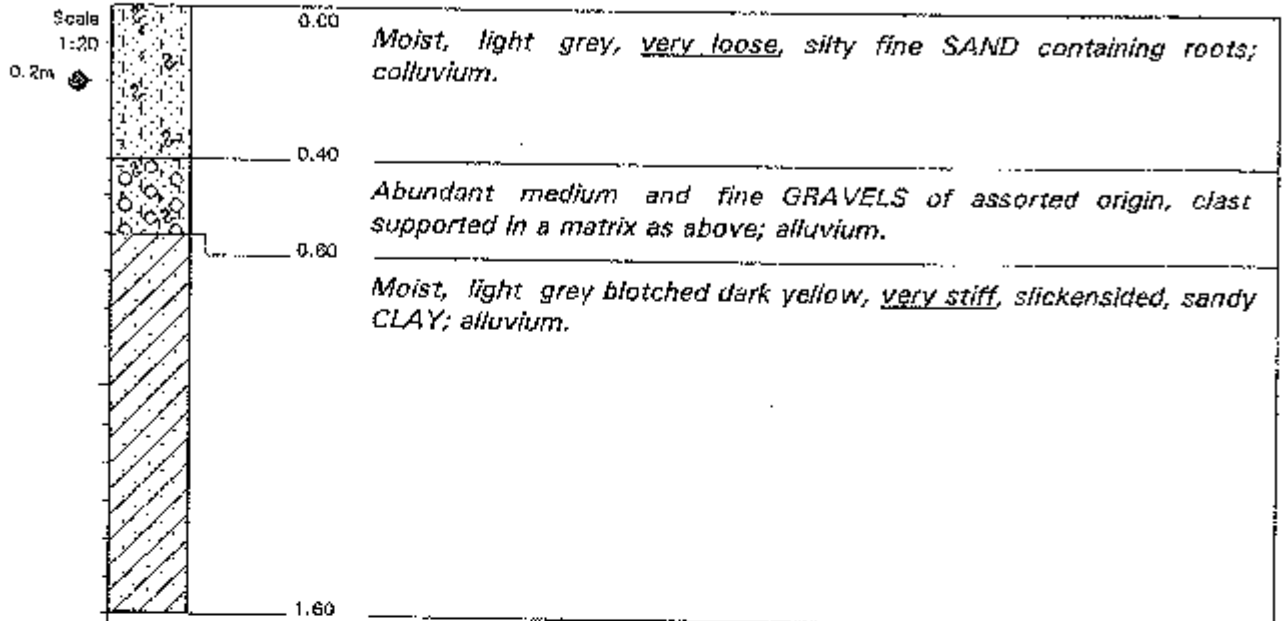
ELEVATION :
 X-COORD :
 Y-COORD :

HOLE No: **TV/15**

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: **TV/16**
 Sheet 1 of 1

JOB NUMBER: **M05/2568**



NOTES

- 1) Extremely slow excavation but no refusal of backactor at 1,6m.
- 2) No water seepage encountered.
- 3) Disturbed soil sample taken at 0,2m.

CONTRACTOR : **SNA Lab**
 MACHINE : **John Deere 310**
 DRILLED BY :
 PROFILED BY : **jvdm**
 TYPE SET BY : **jvdm**

INCLINATION :
 DIAM : **Trench**
 DATE : **09/05/2005**
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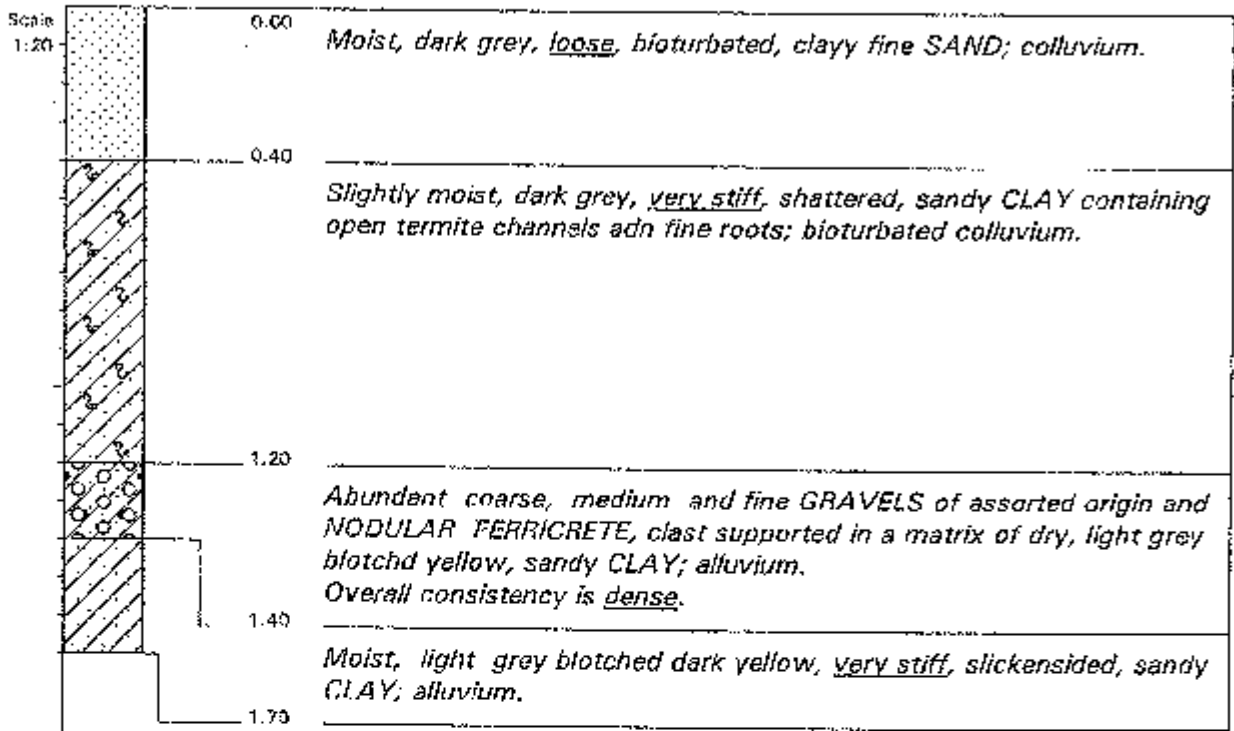
ELEVATION :
 X-COORD :
 Y-COORD :

HOLE No: **TV/16**

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
 PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/17
 Sheet 1 of 1

JOB NUMBER: M05/2558



NOTES

- 1) Extremely slow excavation but no refusal of backactor at 1,7m.
- 2) No water seepage encountered.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
 TYPE SET BY : jvdm

INCLINATION :
 DIAM : French
 DATE : 09/05/2005
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 DATE : 19/05/05 12:37

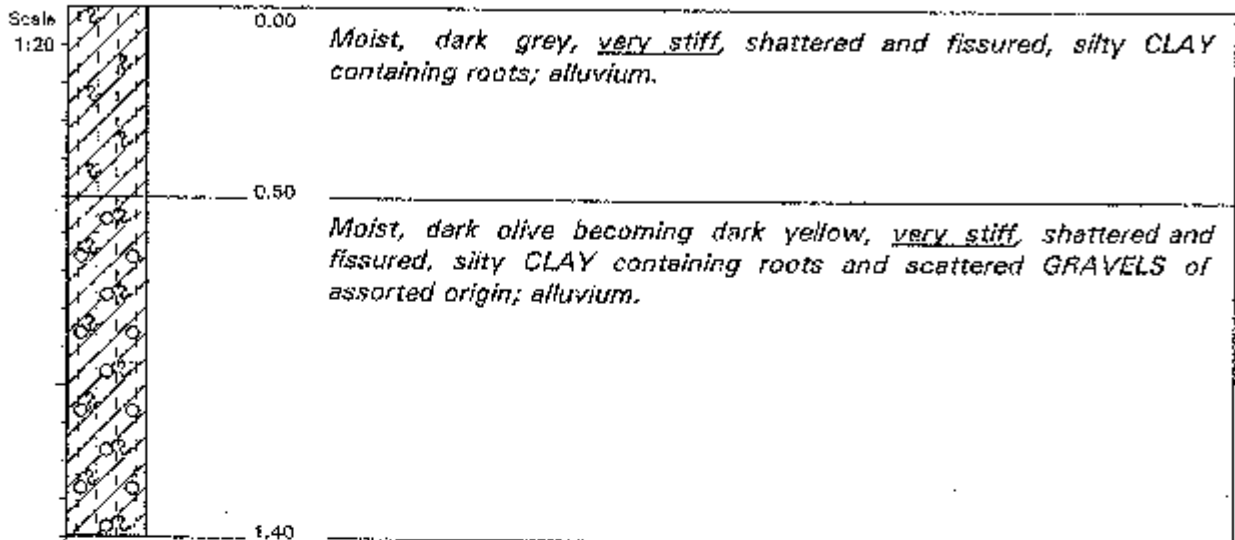
ELEVATION :
 X-COORD :
 Y-COORD :

HOLE No: TV/17

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: **TV/18**
 Sheet 1 of 1

JOB NUMBER: **M05/2568**



NOTES

- 1) Gradual refusal of backactor at 1,4m in very stiff clay.
- 2) No water seepage encountered.

CONTRACTOR : **SNA Lab**
 MACHINE : **John Deere 310**
 DRILLED BY :
 PROFILED BY : **jvdm**
 TYPE SET BY : **jvdm**

INCLINATION :
 DIAM : **Trench**
 DATE : **09/05/2005**
 DATE : **09/05/2005**
 DATE : **19/05/05 12:37**

ELEVATION :
 X-COORD :
 Y-COORD :

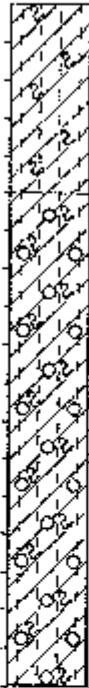
HOLE No: **TV/18**

SYNERGISTICS, Environmental Services
Portion 5 of Tygervallei 334-JR, Pretoria
GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/19
Sheet 1 of 1

JOB NUMBER: M05/2568

Scale
1:20



0.00

Moist, dark grey, very stiff, shattered and fissured, silty CLAY containing roots; alluvium.

0.50

Moist, dark olive becoming dark yellow, very stiff, shattered and fissured, silty CLAY containing roots and scattered GRAVELS of assorted origin; alluvium.

1.80

NOTES

- 1) Slow excavation but no refusal of backactor at 1.8m.
- 2) No water seepage encountered.

CONTRACTOR : SNA Lab
MACHINE : John Deere 310
DRILLED BY :
PROFILED BY : jvdm
TYPE SET BY : jvdm
SETUP FILE - STANDARD.CAT

INCLINATION :
DIAM : Trench
DATE : 09/05/2005
DATE : 09/05/2005
DATE : 19/05/05 12:37

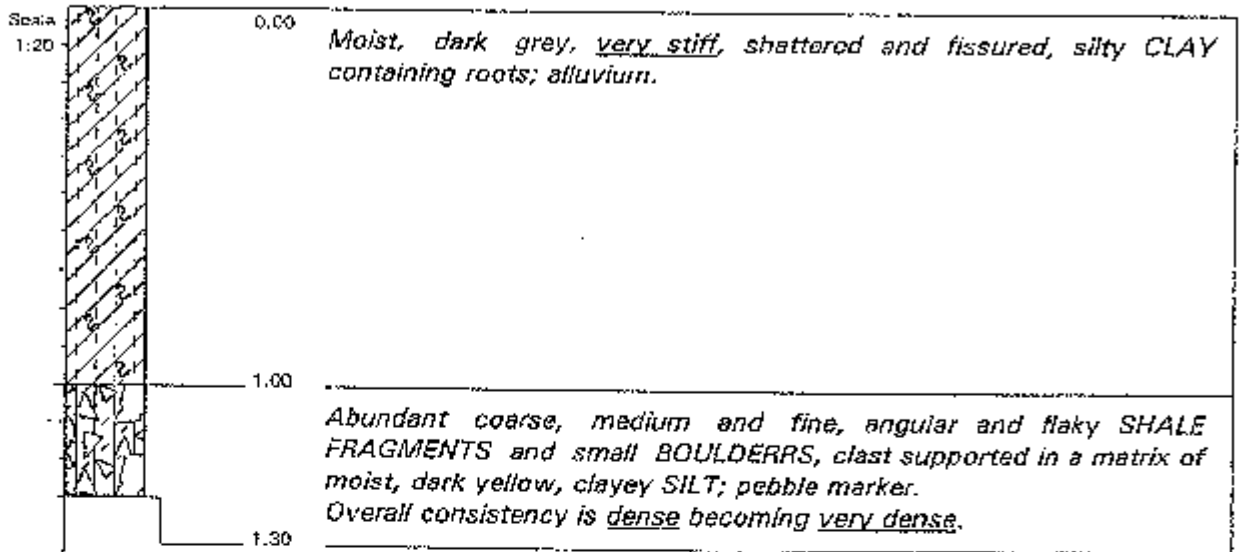
ELEVATION :
X-COORD :
Y-COORD :

HOLE No: TV/19

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: **TV/20**
 Sheet 1 of 1

JOB NUMBER: **M05/2568**



NOTES

- 1) Slow excavation but no refusal of backactor at 1,3m in very dense pebble marker horizon.
- 2) No water seepage encountered.

CONTRACTOR : **SNA Lab**
 MACHINE : **John Deere 310**
 DRILLED BY :
 PROFILED BY : **jvdm**
 TYPE SET BY : **jvdm**
 SET UP FILE : STANDARD.CSY

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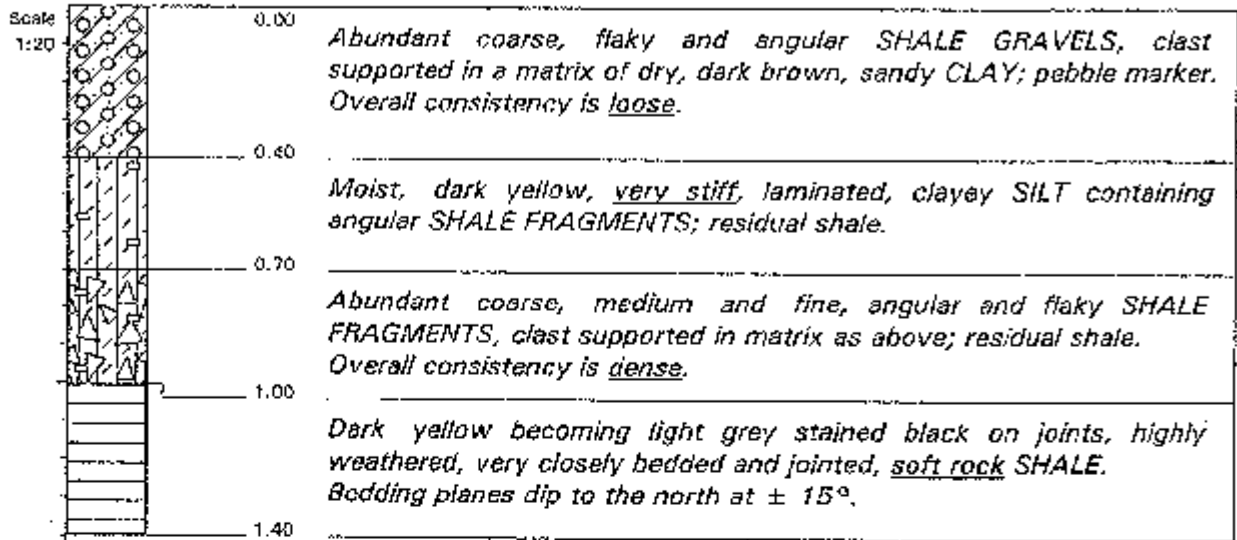
ELEVATION :
 X-COORD :
 Y-COORD :

HOLE No: **TV/20**

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: **TV/21**
 Sheet 1 of 1

JOB NUMBER: **M05/2568**



NOTES

- 1) Gradual refusal of backactor at 1,4m in shale bedrock.
- 2) No water seepage encountered.

CONTRACTOR : *SNA Lab*
 MACHINE : *John Deere 310*
 DRILLED BY :
 PROFILED BY : *jvdm*
 TYPE SET BY : *jvdm*

INCLINATION :
 DIAM : *Trench*
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 DATE : *09/05/2005*
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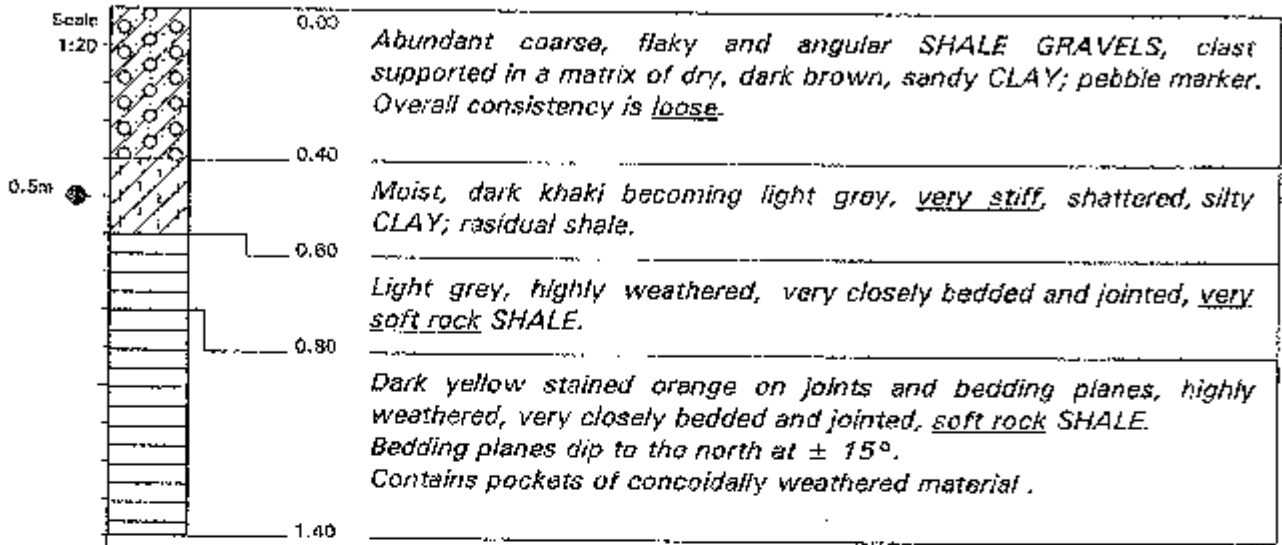
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 X-COORD :
 Y-COORD :

HOLE No: **TV/21**

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/22
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) Gradual refusal of backactor at 1,4m in shale bedrock.
- 2) No water seepage encountered.
- 3) Disturbed soil sample taken at 0,5m.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
 TYPE SET BY : jvdsm

INCLINATION :
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 DATE : 09/05/2005
 DATE : 19/05/05 12:37

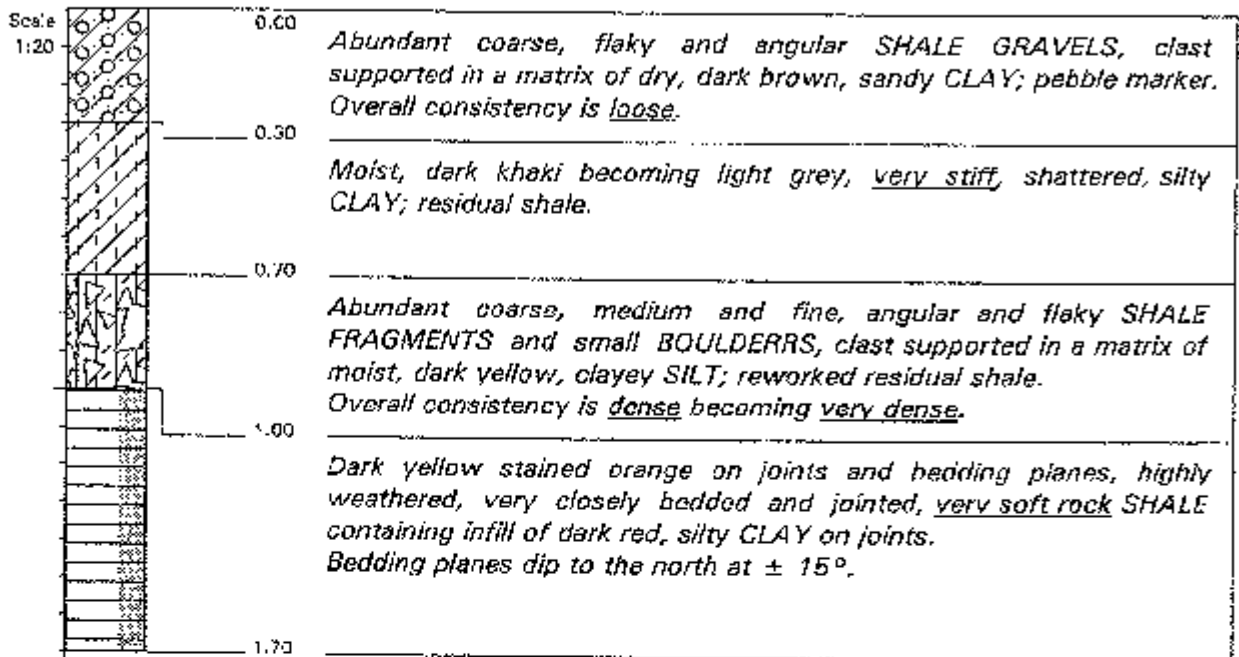
ELEVATION :
 X-COORD :
 Y-COORD :

HOLE No: TV/22

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/23
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) Gradual refusal of backactor at 1,7m in shale bedrock.
- 2) No water seepage encountered.
- 3) Abundant large and medium-sized diabase boulders scattered at surface around test pit.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
 TYPE SET BY : jvdm
 SET UP FILE : STANDARD.CCT

INCLINATION :
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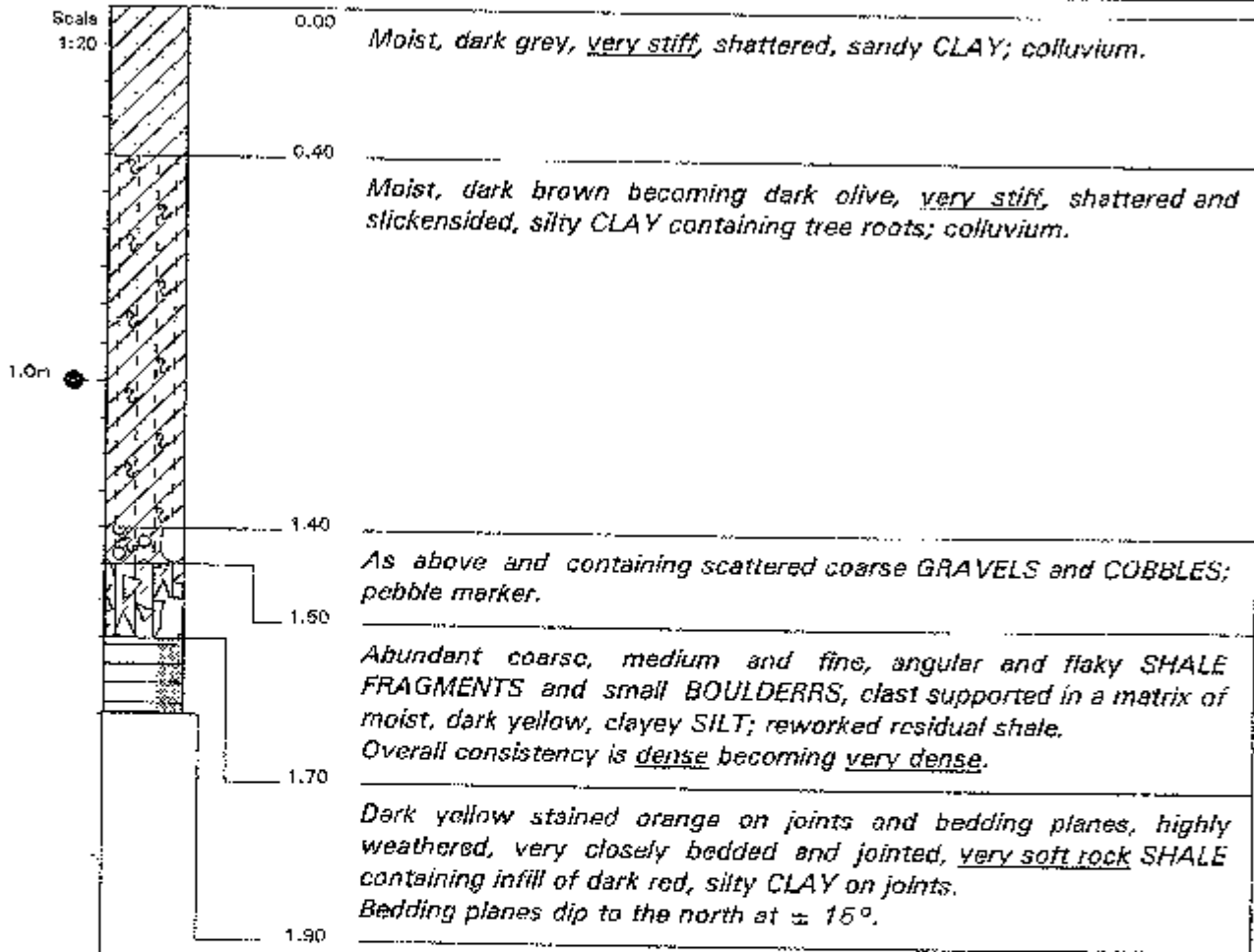
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 Y-COORD :

HOLE No: TV/23

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE NO: TV/25
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) Gradual refusal of backactor at 1,9m in shale bedrock.
- 2) No water seepage encountered.
- 3) Disturbed soil sampletaken at 1,0m.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvd/m
 TYPE SET BY : jvd/m
 SET UP FILE : STANDARD SET

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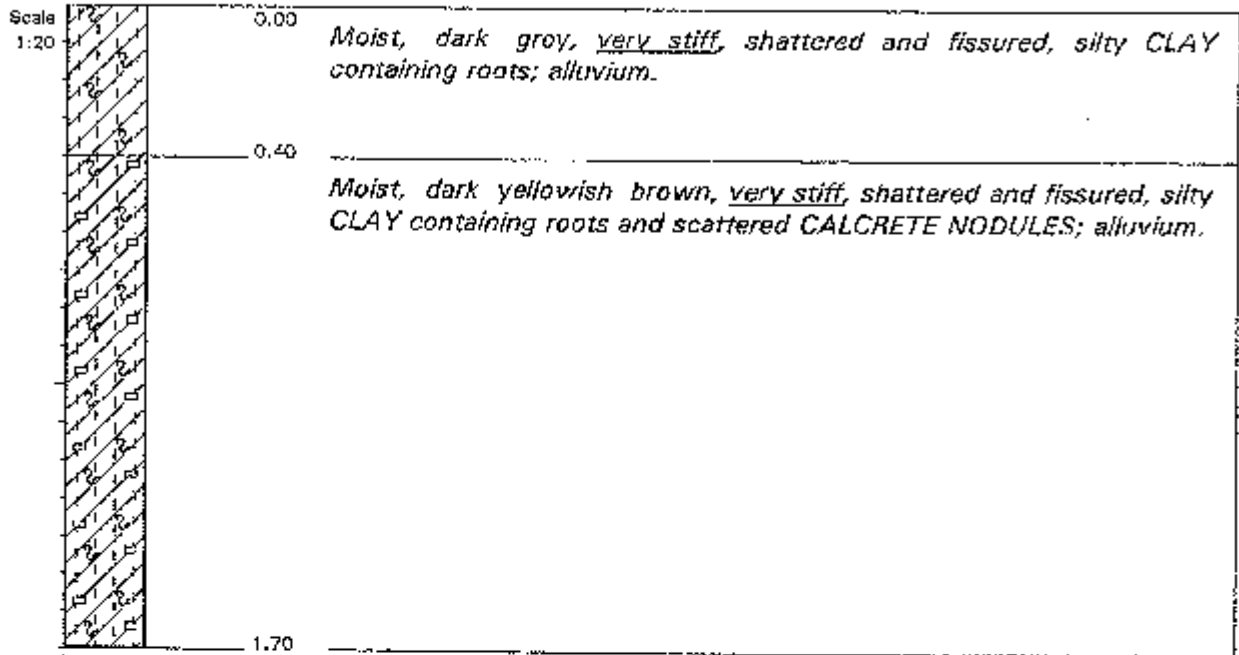
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 Y-COORD :

HOLE No: TV/25

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
**GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
 PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT**

HOLE No: **TV/26**
 Sheet 1 of 1

JOB NUMBER: **M05/2568**



NOTES

- 1) Slow excavation but no refusal of backactor at 1,7m.
- 2) No water seepage encountered.

CONTRACTOR : *SNA Lab*
 MACHINE : *John Deere 310*
 DRILLED BY :
 PROFILED BY : *jvdm*
 TYPE SET BY : *jvdm*

INCLINATION :
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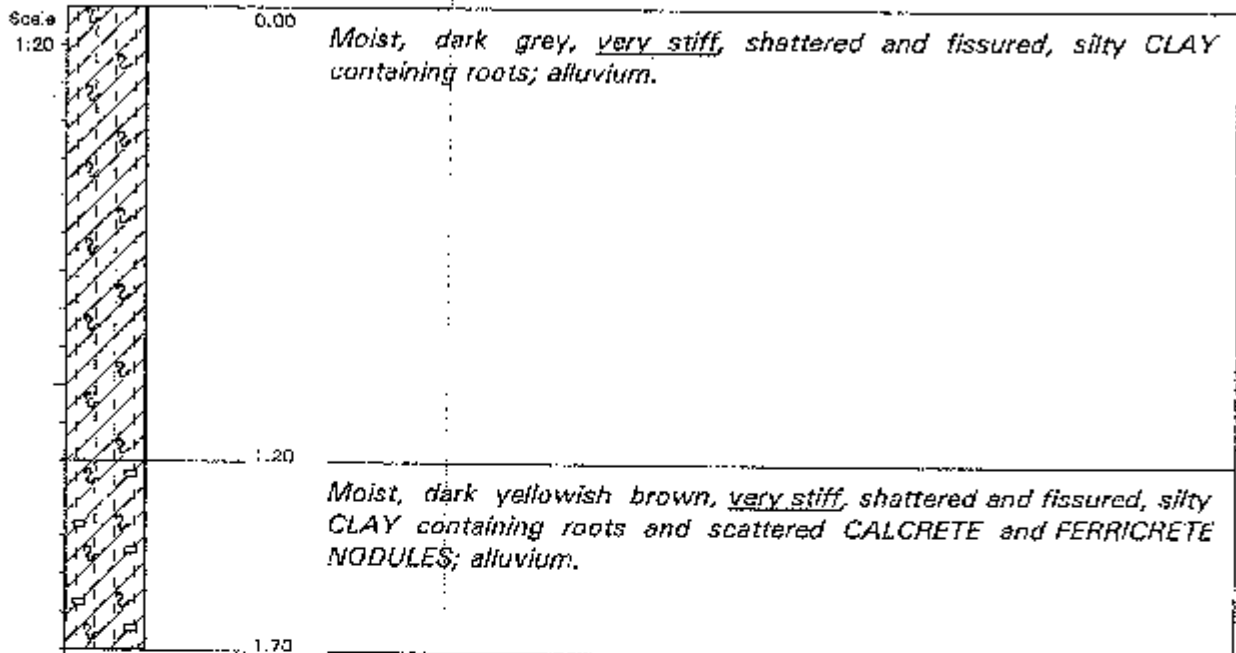
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 X-COORD :
 Y-COORD :

HOLE No: **TV/26**

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: *TV/27*
 Sheet 1 of 1

JOB NUMBER: *M05/2568*



NOTES

- 1) Slow excavation but no refusal of backactor at 1.7m.
- 2) No water seepage encountered.

CONTRACTOR : *SNA Lab*
 MACHINE : *John Deere 310*
 DRILLED BY :
 PROFILED BY : *jvdm*
 TYPE SET BY : *jvdm*
 SOUTH AFRICAN STANDARD

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ELEVATION :
 X-COORD :
 Y-COORD :

HOLE No: *TV/27*

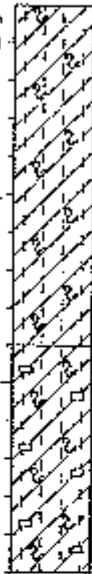
SYNERGISTICS, Environmental Services
Portion 5 of Tygervallei 334-JR, Pretoria
GEO TECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/28

Sheet 1 of 1

JOB NUMBER: M05/2568

Scale
1:20



0.00

Moist, dark grey, very stiff, shattered and fissured, silty CLAY containing roots; alluvium.

0.90

Moist, dark yellowish brown, very stiff, shattered and fissured, silty CLAY containing roots and scattered CALCRETE NODULES; alluvium.

1.50

NOTES

- 1) Slow excavation but no refusal of backactor at 1,5m.
- 2) No water seepage encountered.

CONTRACTOR : SNA Lab
MACHINE : John Deere 310
DRILLED BY :
PROFILED BY : jvdm
TYPE SET BY : jvdm
SETUP FILE : STANDARD.SET

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Y-COORD :

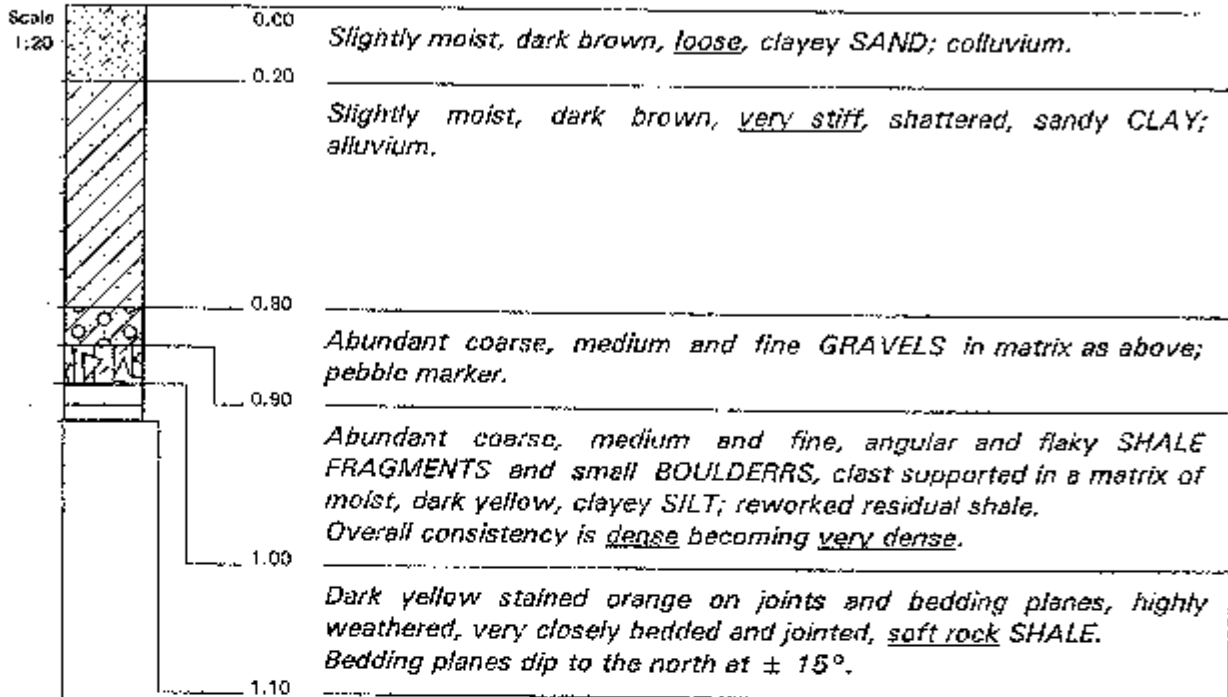
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SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
 PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/29
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) Gradual refusal of backactor at 1,1m in shale bedrock.
- 2) No water seepage encountered.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
 TYPE SET BY : jvdm

INCLINATION :
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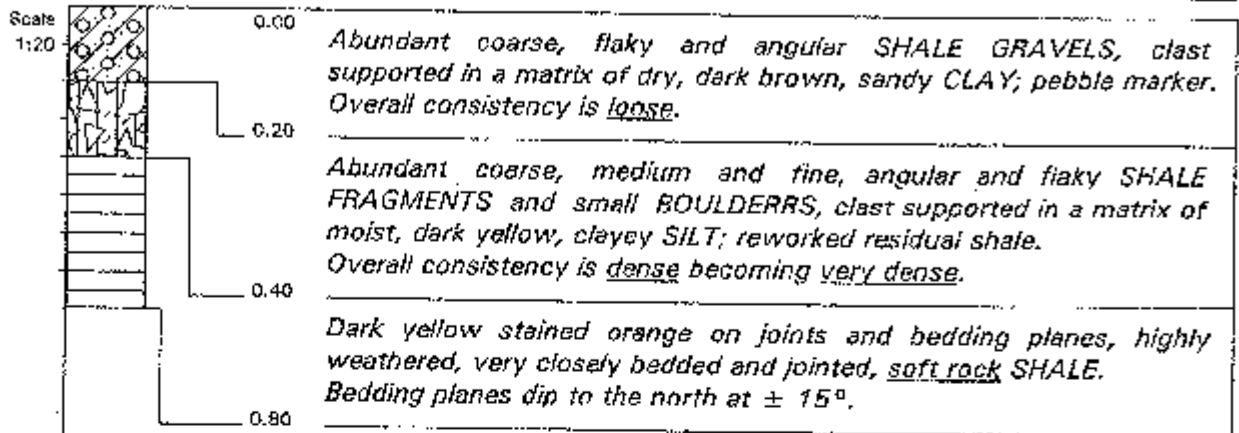
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 Y-COORD :

HOLE No: TV/29

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/30
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) Gradual refusal of backactor at 0,8m in shale bedrock.
- 2) No water seepage encountered.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
 TYPE SET BY : jvdm

INCLINATION :
 DIAM : Trench
 DATE : 09/05/2005
 DATE : 09/05/2005
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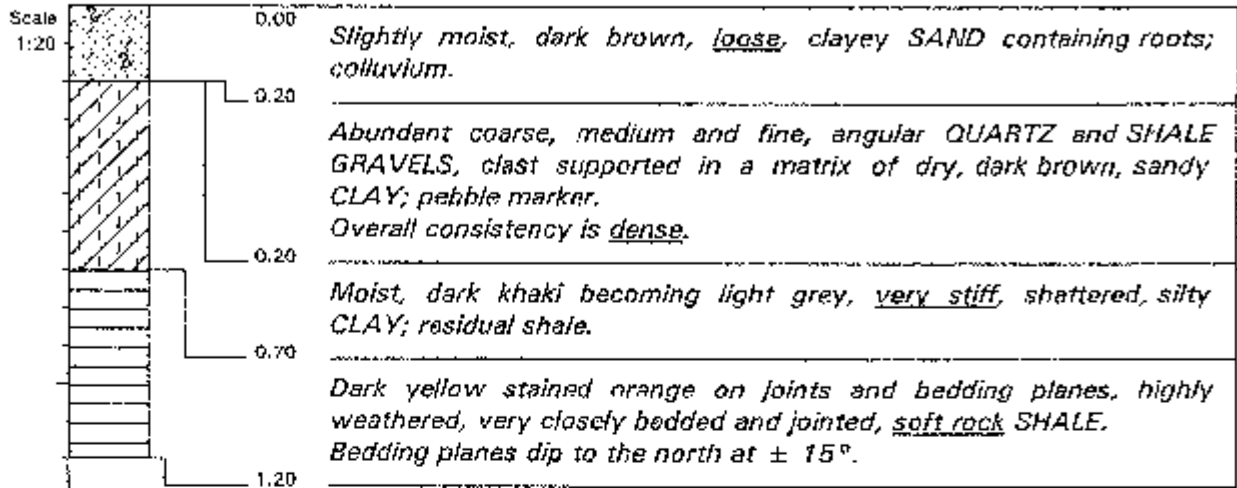
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 X-COORD :
 Y-COORD :

HOLE No: TV/30

SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
**GEO TECHNICAL INVESTIGATION CARRIED OUT FOR:
 PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT**

HOLE No: **TV/31**
 Sheet 1 of 1

JOB NUMBER: **M05/2568**



NOTES

- 1) Gradual refusal of backactor at 1,2m in shale bedrock.
- 2) No water seepage encountered.


CONTRACTOR : **SNA Lab**
 MACHINE : **John Deere 310**
 DRILLED BY :
 PROFILED BY : **jvdm**
 TYPE SET BY : **jvdm**

INCLINATION :
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 DATE : **09/05/2005**
 DATE : **10/05/05 12:37**

ELEVATION :
 X-COORD :
 Y-COORD :

HOLE No: **TV/31**

APPENDIX 2: LABORATORY SOIL TEST RESULTS

 CIVIL & DEVELOPMENT ENGINEERS INC.	Client: Johann vd Merwe	Agent: Joe	Job: (012) 347 9054	Project: 2568: Tyger Valley	Lab #
	CNO: 77	Fac/Tel: 082 570 2222	Rel/Sec/BP: Layer/Holes	Proj #	6256
Order: Joe					704 / 13 / 390
					2005/05/17

INDICATORS

TMH 1: TM, A1(a)&(b), A2 - A4, A5(a)&(b), A20, A21T and ICL Constants; pH; El.Con; ICL and Classification

HOLE & / SAMPLE No.	DEPTH	SIEVE ANALYSIS PASSING # mm (%)										SOIL MORTAR ANAL (% vs # mm)			ATTERBERG LIMITS			I-L-C (%)		RE MARKS			
		75.0	63.0	53.0	26.5	19.0	13.2	4.75	2.0	0.426	0.075	2.0	0.425	0.250	0.150	0.075	GM	LL	LS		PI	I-L-C (%)	ELECTRIC CONDUCT. (S/m)
1/0.6	0.6						100	100	98	94	88	67	7	7	7	67	0.44	47	10.7	23	8.67	0.010	A-7-6 (13)
	B9																						
1/1.1	1.1						100	98	94	88	67	7	7	7	71	0.52	51	8.7	17				A-5 (8)
	K11																						
2/1.0	1.0						100	100	99	95	59	4	11	11	13	59	0.48	46	7.7	16			A-7-6 (10)
	Q10																						
2/2.2-2.3	2.2-2.3						100	100	96	96	64	4	6	12	15	64	0.40	45	7.6	18			A-7-6 (10)
	49																						
4/1.0	1.0						100	98	95	87	59	9	13	11	6	62	0.59	48	7.3	15	9.17	0.084	A-7-6 (13)
	PQ																						
5/1.5	1.5						100	99	87	38	11	23	18	9	39	0.76	30	3.7	8				A-6 (2)
	K33																						
7/0.4	0.4						100	100	89	44	11	18	15	11	44	0.67	23	4.7	10	8.77	0.070		A-4 (2)
	Z14																						
11/0-0.3	0-0.3						100	100	93	45	7	17	19	13	45	0.62	18	2.2	5	8.22	0.028		A-4 (2)
	C18																						
11/1.0	1.0						100	100	87	59	13	12	10	5	59	0.53	38	9.1	20	8.65	0.021		A-6 (9)
	B4																						
13/1.0	1.0						100	100	99	75	45	24	15	11	5	45	0.80	28	3.1	6	8.53	0.046	A-6 (3)
	XC10																						

MARKS: _____

TECH: _____

DATE: 20/5/2005



CIVIL & DEVELOPMENT
ENGINEERS INC.

Client: Johann vd Merwe
C/No: ??
Order: Joe

Agent: FAN/??
Call: 082 570 2222

Project: 2568: Tyger Valley
Ptd/Sec/BP: Layer/Holes

Lab # 6256
Proj # 704/13/390
Date 2005/05/17

INDICATORS


TMH 1: TM, A1(a)&(b), A2 - A4, A5(a)&(b), A20, A21T and ICL Constants; pH; El.Con; ICL and Classification

HOLE & / SAMPLE NO.	DEPTH	SIEVE ANALYSIS PASSING # mm (%)										SOIL MORTAR ANAL (% vs # min)				ATTERBERG LIMITS				I-L-C (%)	REMARKS				
		75.0	63.0	53.0	37.5	26.5	19.0	13.2	4.75	2.0	0.425	0.075	2.0	0.425	0.250	0.150	0.075	GM	LL			LS	PI	pH	ELECTRIC CONDUCT. (S/m)
16/0-0.4	0-0.4																								A-2-4 (0)
	SP22																								
22/0.3-0.8	0.3-0.8																								A-7-5 (8)
	A10																								
24/0.5	0.5																								A-7-6 (10)
	015																								
25/1.0	1.0																								A-7-6 (16)
	F1																								
																									()
																									()
																									()
																									()
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																									()

MARKS:

TECH:

DATE: 20/5/2005

 CIVIL & DEVELOPMENT ENGINEERS INC.	Client	Johann vd Merwe	Project	2548: Tyger Valley	LAB #	6256
	C/No	??	Rd/Sec/BP		PROJ #	704 / 13 / 390
	Order	Joe	Layer/Depth		Date	2005/05/17
	Agent	Joe	Fax/Tel	(012) 347 8064	Cell	082 570 2222

HYDROMETER ANALYSIS

TMH 1: TM 6A (Modified)

(Na₂P₂O₇)

RD / ST / BP / Sample No.						
PEG / HOLE No.		TV 1 / 0.6	TV 1 / 1.1	TV 2 / 1.0	TV 2 / 2.2 - 2.3	TV 4 / 1.0
LAYER / DEPTH (mm)		0.6	1.1	1.0	2.2 - 2.3	1.0
PAN No.		B9	K11	Q10	49.0	PQ

GRADING ANALYSIS. (CUM % PASSING)

SIEVE # (mm)	(01-1)	(01-2)	(02-3)	(02-4)	(03-5)	
63.0						
53.0						
37.5						
26.5						
19.0						
13.2	100	100	100		100	
4.75	100	98	100	100	98	
2.0	99	94	99	100	95	
0.425	90	88	95	96	87	
0.075	67	67	59	64	59	
GRADING MODULUS GM	0.44	0.52	0.48	0.40	0.59	

ATTERBERG CONSTANTS.

LL	47	51	46	45	48
PI	23	17	16	18	15
LS	10.7	8.7	7.7	7.6	7.3

(PI < 20, use 100 g. PI > 20 use 50 g)

HYDROMETER ANALYSIS

USED 50 / 100 g	60	100	100	100	100
SOIL FINES					
STARTING TIME					
FINE SAND 18 sek.	32.0	60.0	58.0	51.0	55.0
SILT 40 sek.	30.0	60.0	50.0	41.0	48.0
CLAY 1 hr.	25.5	48.5	33.0	18.0	25.0
EXPANSIVE CLAY 6 hrs.	22.5	38.0	27.0	16.0	19.0
TEMPERATURE (18 - 22) (°C)	19.5	19.5	19.5	19.5	19.5
CORRECTION	-0.2	-0.2	-0.2	-0.2	-0.2

CORRECTED HYDROMETER READINGS

FINE SAND 18 sek.	63.6	59.8	55.8	50.6	54.8	
SILT 40 sek.	59.6	59.8	49.8	40.8	47.8	
CLAY 1 hrs.	50.6	46.3	32.8	17.8	24.8	
EXPANSIVE CLAY 6 hrs.	44.6	37.8	28.8	15.8	18.8	
SOIL FINES % OF TOTAL SAMPLE	0.075	57.3	52.4	52.8	48.9	47.6
	0.05	53.7	52.4	47.1	39.3	41.5

SOIL MORTAR ANALYSIS

PERCENTAGE OF SOIL MORTAR

C.SAND 2.0 TO 0.425	8.8	6.9	4.2	3.7	8.5
F.SAND 0.425 TO 0.05	38.8	37.4	48.1	57.0	47.8
SILT 0.05 TO 0.005	8.2	12.6	16.3	22.2	21.0
CLAY 0.005 TO 0.002	5.5	7.9	5.7	1.9	5.5
EXP. CLAY (C) < 0.002	40.7	35.2	25.7	15.2	17.2
MORTAR CHECK SUM = 100	100.0	100.0	100.0	100.0	100.0
SILT-CLAY FRACT. < 0.05	54.3	55.7	47.7	39.3	43.7

ACTIVITY INDEX K

SUPPLEMENTARY INFORMATION.

EXP. CLAY FRACT % = 0.4 x C		16.3	14.1	10.3	6.1	6.9
EFFECTIVE PI = % _{0.425} x PI	(P)	20.3	14.9	15.1	17.6	13.0
K = 5((P-0.4C)/(C-10)) ^{0.6}		91	31	67	58	49
ACTIVITY CLASSIFICATION*		MED	LOW	MED	MED	LOW

* ACTIVITY CLASSIFICATION: (P-50), LOW: (50-120), MED: (120-200), HIGH: (200-400), VERY HIGH: (>400) (NOTE: -200, 200, 400)

ELECTRIC CONDUCT. (S/m)	0.01				0.084
pH	8.67				9.17

REMARKS:

TECH:

DATE:


 20/5/02


 CIVIL & DEVELOPMENT
 ENGINEERS INC.

Client	Johann vd Merwe	Project	2568: Tyger Valley	LAB #	6266
C/no	??	Rd/ST/SP		PROJ #	704/13/390
Order	Joe	Layer/Depth		Date	2005/05/17
Agent	Joe	Fax/Tel		Cell	082 570 2222

HYDROMETER ANALYSIS

 TMH 1: TM 6A (Modified) (Na₂P₂O₇)

Rd / ST / BP / Sample No.					
PEG / HOLE No.	TV 5 / 1.5	TV 7 / 0.4	TV 11 / 0 - 0.3	TV 11 / 1.0	TV 13 / 1.0
LAYER / DEPTH (mm)	1.5	0.4	0 - 0.3	1.0	1.0
PAN No.	K33	Z14	C18	B4	XC10

GRADING ANALYSIS. (CUM % PASSING)

	SIEVE # (mm)	(03-6)	(04-7)	(04-8)	(05-9)	(05-10)
	63.0					
	53.0					
	37.5					
	26.5					
	19.0					
	13.2					100
	4.75	100	100	100	100	100
	2.0	99	100	100	100	99
	0.425	87	89	93	87	75
	0.075	38	44	45	59	45
GRADING MODULUS GM		0.76	0.67	0.62	0.53	0.80

ATTERBERG CONSTANTS.

	LL	30	23	18	38	28
	PI	8	10	6	20	6
	LS	3.7	4.7	2.2	9.1	3.1

(PI < 20, use 100 g. PI > 20 use 50 g)

HYDROMETER ANALYSIS

USED 50 / 100 g		100	100	100	100	100
SOIL FINES						
STARTING TIME						
FINE SAND	18 sek.	41.0	Foam	Foam	57.0	39.0
SILT	40 sek.	38.0	Foam	Foam	54.0	35.5
CLAY	1 hr.	29.5	22.0	19.5	41.0	29.0
EXPANSIVE CLAY	6 hrs.	26.0	13.0	13.0	37.0	26.0
TEMPERATURE (18 - 22) (°C)		19.5	19.5	19.5	19.5	19.5
CORRECTION		-0.2	-0.2	-0.2	-0.2	-0.2

CORRECTED HYDROMETER READINGS

FINE SAND	18 sek.	40.8			56.8	38.8
SILT	40 sek.	37.8			53.8	35.3
CLAY	1 hrs.	29.3	21.8	19.3	40.8	27.8
EXPANSIVE CLAY	6 hrs.	25.8	12.8	12.8	36.8	25.8
SOIL FINES % OF	0.075	35.7			49.6	29.2
TOTAL SAMPLE	0.05	33.0			47.0	26.6

SOIL MORTAR ANALYSIS

PERCENTAGE OF SOIL MORTAR

C.SAND	2.0 TO 0.425	11.2	11.0	6.6	12.6	24.4
F.SAND	0.425 TO 0.075	55.2			40.4	48.9
SILT	0.075 TO 0.005	7.5			11.4	5.7
CLAY	0.005 TO 0.002	3.1	8.0	6.1	3.5	1.5
EXP. CLAY (C)	< 0.002	22.9	11.4	12.0	32.1	19.5
MORTAR CHECK SUM	= 100	100.0			100.0	100.0
SILT-CLAY FRACT.	< 0.05	33.6			47.0	26.7

ACTIVITY INDEX K

SUPPLEMENTARY INFORMATION.

EXP. CLAY FRACT % = C ₄ x C		9.2	4.6	4.8	12.9	7.8
EFFECTIVE PI = % _{0.425} x PI	(P)	7.0	9.3	4.3	17.8	4.5
K = 5((P - 0.4C)(C - 10)) ^{0.6}					84	
ACTIVITY CLASSIFICATION*		LOW			MED	LOW

* ACTIVITY CLASSIFICATION (ISO): LOW: (50-100), MED: (120-200), HIGH: (>200), VERY HIGH: 3 (where INUM = 100 val), LOW.

ELECTRIC CONDUCT. (S/m)			0.070	0.028	0.021	0.046
pH			8.77	8.22	8.65	8.63

REMARKS:

TECH:

DATE:

20/5/2005



CIVIL & DEVELOPMENT
ENGINEERS INC.

Client	Johann vd Merwe	Project	2566: Tyger Valley	LAB #	6256
C/No	??	Rd/Sec/BP		PROJ #	704/13/390
Order	Joe	Layer/Depth		Date	2005/05/17
Agent	Joe	Fax/Tel	(012) 347 9064	Cell	082 570 2222

HYDROMETER ANALYSIS

TMH 1: TM 6A (Modified) (Na₄P₂O₇)

RD / ST / BP / Sample No.					
PEG / HOLE No.					
LAYER / DEPTH (mm)	TV 16 / 0 - 0.4	TV 22 / 0.3 - 0.8	TV 24 / 0.8	TV 25 / 1.0	
PAN No.	0 - 0.4	0.3 - 0.8	0.5	1.0	
	3P22	A10	015	F1	

GRADING ANALYSIS (CUM % PASSING)

SIZE # (mm)	(01-1)	(C1-2)	(02-3)	(02-4)	(03-5)
63.0					
53.0					
37.5					
26.5					
19.0					
13.2	100	100	100	100	
4.75	98	93	100	100	
2.0	97	81	99	97	
0.425	86	60	91	91	
0.075	18	49	74	80	
GRADING MODULUS GM	1.19	1.11	0.36	0.32	

ATTERBERG CONSTANTS

LL	20	55	47	52
PI	1	24	20	25
LS	0.5	12.5	10.8	11.7

(Pl < 20, use 100 g. Pl > 20 use 50 g)

HYDROMETER ANALYSIS

USED 50 / 100 g	100	50	50	50
SOIL FINES				
STARTING TIME				
FINE SAND 18 sek.	19.0	29.0	37.5	40.0
SILT 40 sek.	16.0	23.0	33.0	37.5
CLAY 1 hr.	7.0	10.5	20.5	29.0
EXPANSIVE CLAY 6 hrs.	5.0	8.0	11.5	28.0
TEMPERATURE (18 - 22) (°C)	19.5	19.5	19.5	19.5
CORRECTION	-0.2	-0.2	-0.2	-0.2

CORRECTED HYDROMETER READINGS

FINE SAND 18 sek.	18.8	57.6	74.6	79.8
SILT 40 sek.	15.8	45.6	65.8	74.6
CLAY 1 hrs.	6.8	20.6	40.6	57.6
EXPANSIVE CLAY 6 hrs.	4.8	15.8	22.8	51.6
SOIL FINES % OF TOTAL SAMPLE	0.975	12.4	34.4	67.7
	0.05	10.4	27.3	68.0

SOIL MORTAR ANALYSIS

PERCENTAGE OF SOIL MORTAR

C.SAND 2.0 TO 0.425	32.1	25.7	8.1	5.8
F.SAND 0.425 TO 0.05	57.1	40.4	31.6	23.9
SILT 0.05 TO 0.005	6.1	18.6	23.0	16.0
CLAY 0.005 TO 0.002	1.4	3.7	16.5	5.7
EXP. CLAY (C) < 0.002	3.3	11.6	20.8	48.6
MORTAR CHECK SUM = 100	100.0	100.0	100.0	100.0
SILT-CLAY FRACT. < 0.05	10.7	33.9	60.3	70.3

ACTIVITY INDEX K

SUPPLEMENTARY INFORMATION

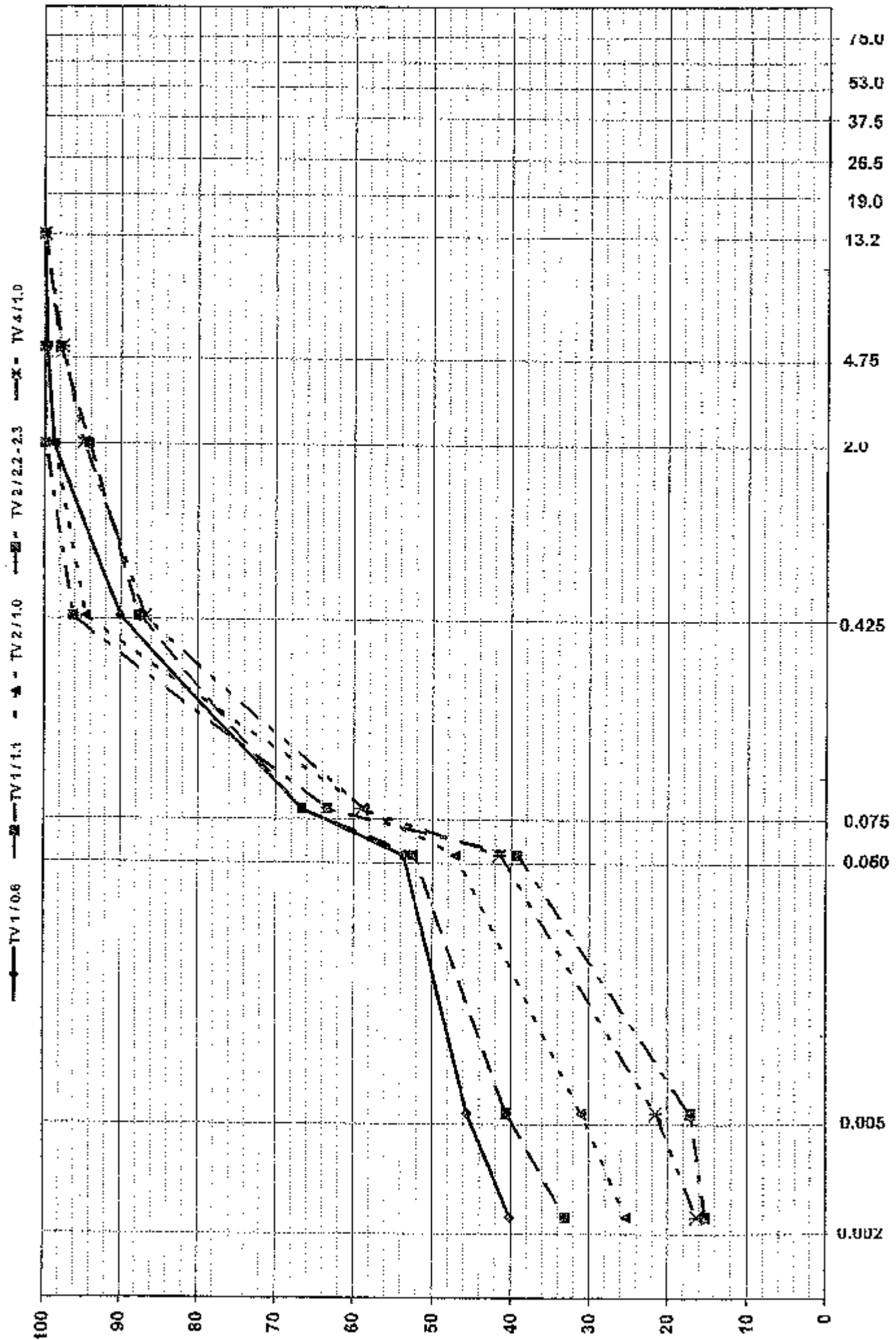
EXP. CLAY FRACT % = 0.4x C		1.3	4.6	8.3	19.4
EFFECTIVE PI = % _{0.425} x PI (P)		0.7	14.4	18.1	22.4
K = 5((P-0.4)(C-10)) ^{0.6}		12	28	82	86
ACTIVITY CLASSIFICATION*		LOW	LOW	MED	MED

* ACTIVITY CLASSIFICATION (1-50) LOW; (52-100) MED; (102-200) HIGH; (202) VERY HIGH; & (above 200) = req. val. LOW.

ELECTRIC CONDUCT. (S/m)	0.01	0.064	0.09	
pH	8.70	8.23	7.78	

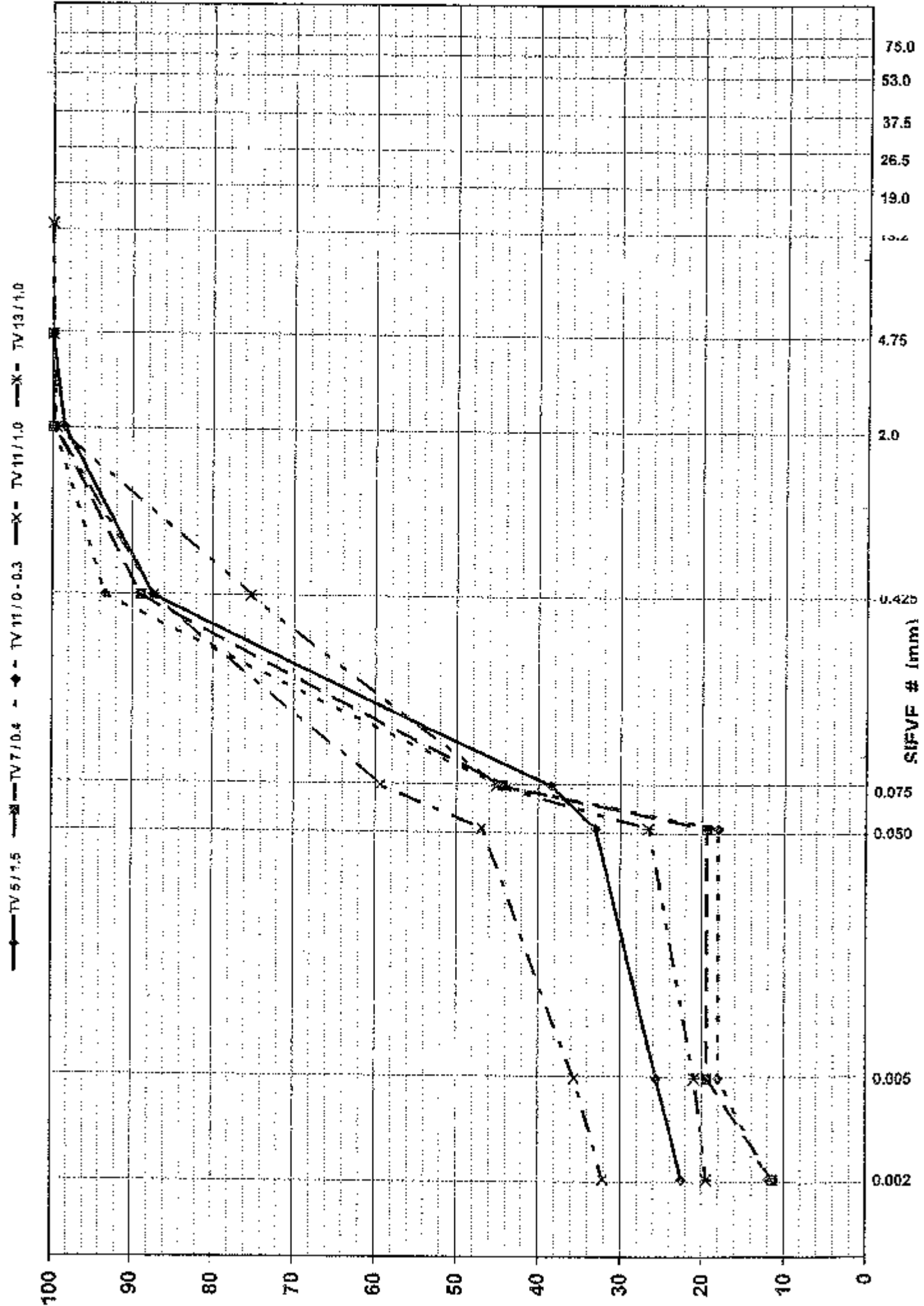
REMARKS:	TV 16 / 0 - 0.4: PI values for Hydrometer Calculation only.	TECH:	
		DATE:	20/5/2005

- MAY 2005



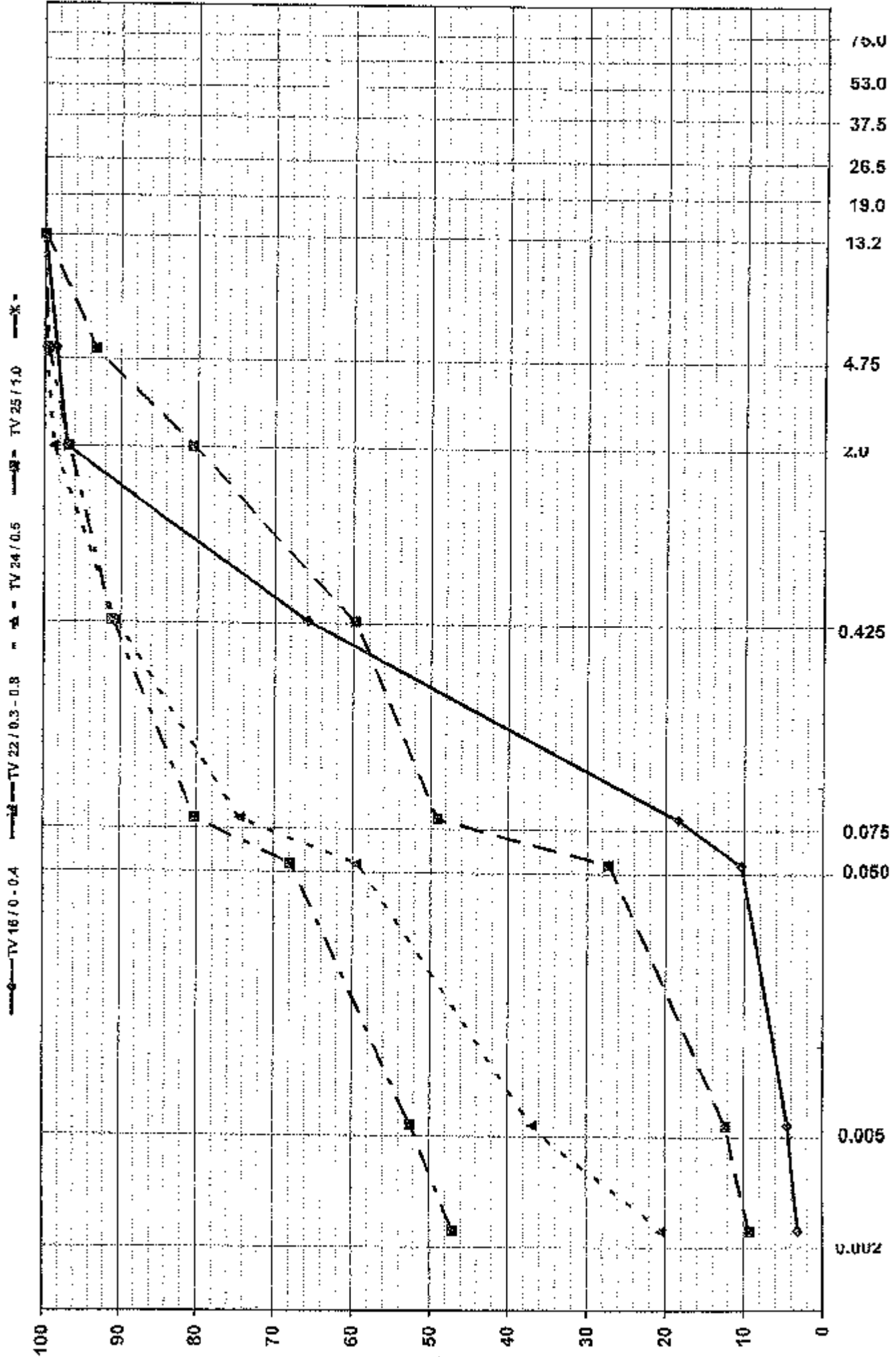
SIEVE # (mm)

- MAY 2005



- MAY 2005

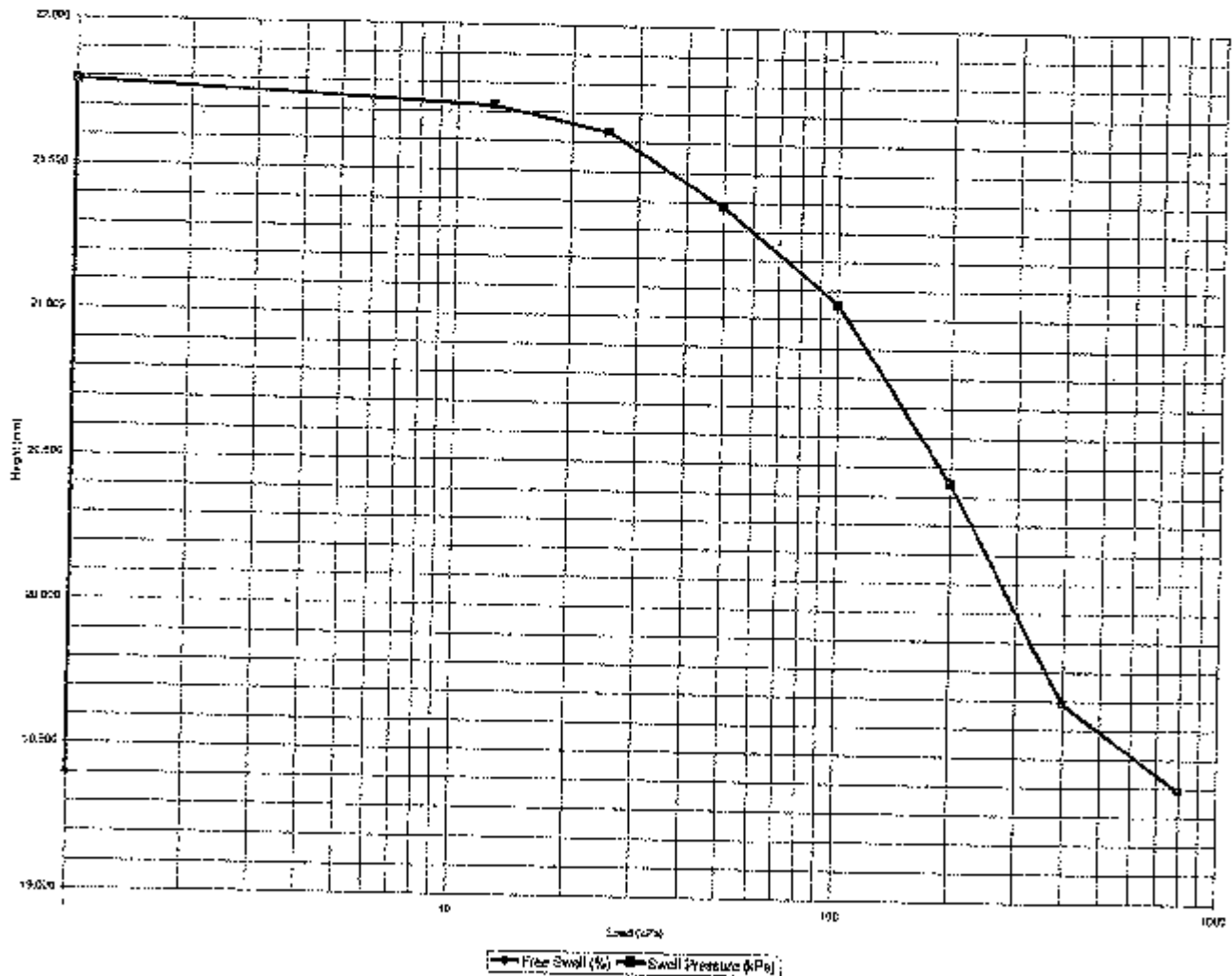
704-12-350-6256/JAN/CHRD-CURF-5-2002/03/11



FREE SWELL & SWELL PRESSURE

PROJECT:	T04/13/890:2565 TIGER VALLEY	INITIAL DRY DENSITY (kg/m ³)	1651
SAMPLE NR.	TV4	INITIAL MOISTURE (%)	22.6
DEPTH (m):	1.0	MOISTURE AFTER TEST (%)	22.3
INITIAL HEIGHT OF SAMPLE (mm)	19.4	RELATIVE DENSITY	2.544
SAMPLE CONDITION	UNDISTURBED	INITIAL VOID RATIO	0.542
SOILLAB SAMPLE No.	S05-446-U2	VOID RATIO AFTER SOAKING	0.732
		% FREE SWELL	12.33
		SWELL PRESSURE (kPa)	780.0

LOAD (kPa)	0	5	10	15	25	50	100	200	400	800
HEIGHT (mm)	18.400	19.388	21.790	21.720	21.638	21.388	21.050	20.442	19.690	19.390
VOID RATIO	0.542	0.542	0.732	0.727	0.720	0.700	0.673	0.628	0.585	0.542

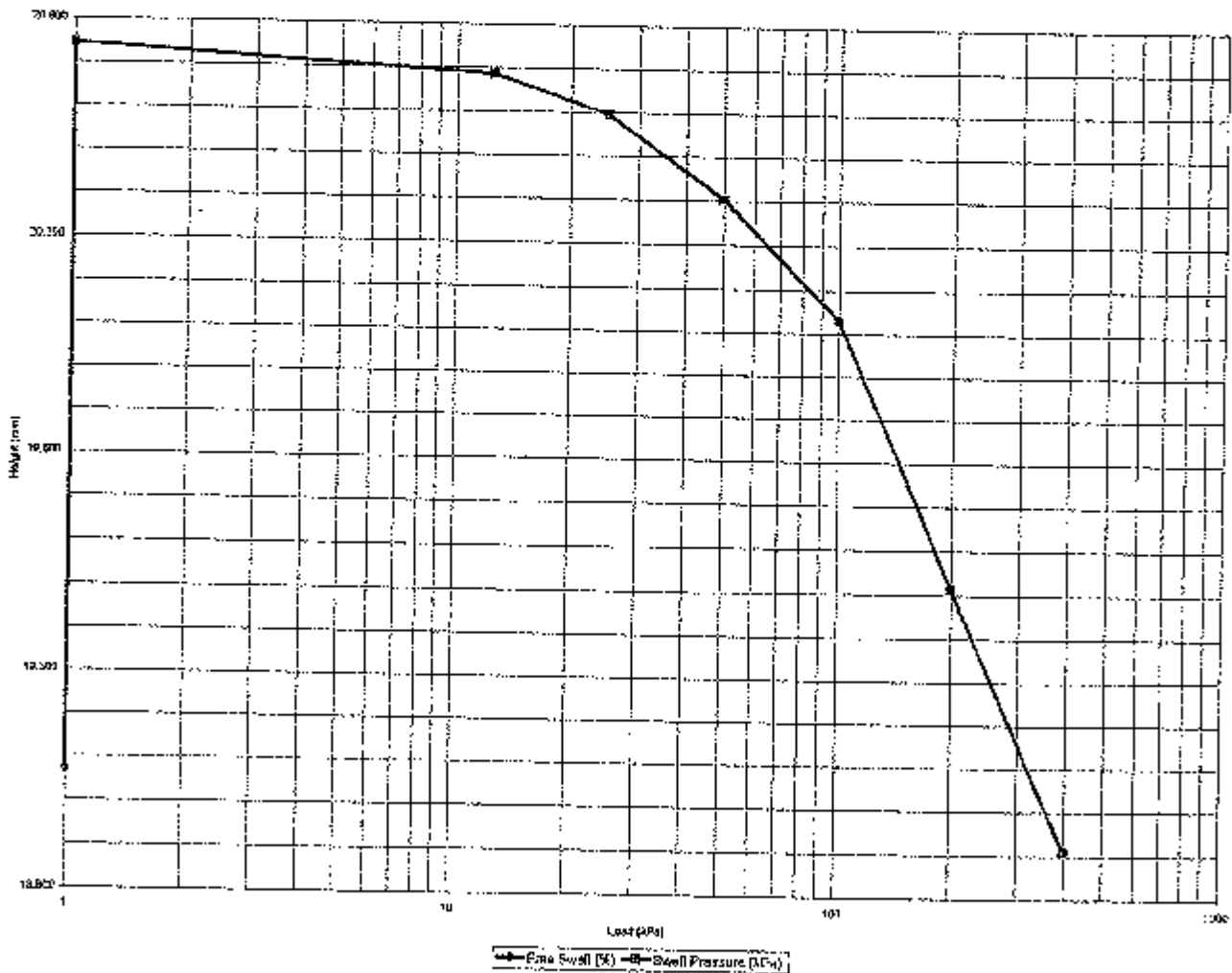


VOID RATIO AFTER SOAKING

FREE SWELL & SWELL PRESSURE

PROJECT:	704/13/330: 2565 TIGER VALLEY	INITIAL DRY DENSITY (kg/m ³)	1508
SAMPLE NR:	EV2	INITIAL MOISTURE (%)	26.4
DEPTH (m):	1.0	MOISTURE AFTER TEST (%)	30.8
INITIAL HEIGHT OF SAMPLE (mm)	19.1	RELATIVE DENSITY	2.553
SAMPLE CONDITION	UNDISTURBED	INITIAL VOID RATIO	0.892
SOILLAB SAMPLE No :	SO5-445-01	VOID RATIO AFTER SOAKING	0.807
		% FREE SWELL	8.75
		SWELL PRESSURE (kPa)	330.0

LOAD (kPa)	0	1	2	5	10	20	50	100	200	400
HEIGHT (mm)	18.100	18.072	20.744	20.858	20.598	20.402	20.128	19.512	18.908	
VOID RATIO	0.692	0.698	0.857	0.832	0.824	0.807	0.793	0.728	0.675	

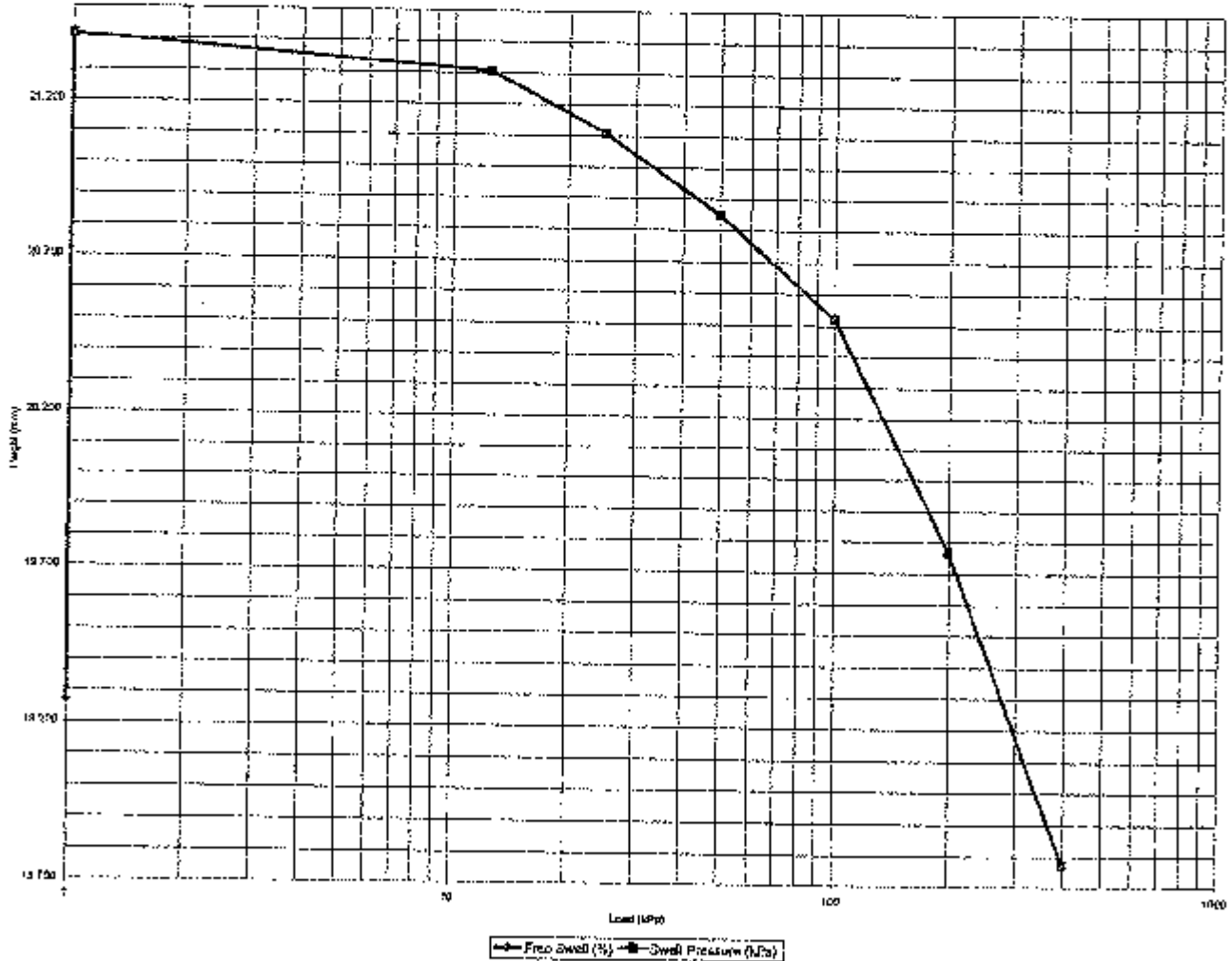


FORM REF 57ALLO/64

FREE SWELL & SWELL PRESSURE

PROJECT:	764/15/380.2565 TIGER VALLEY	INITIAL DRY DENSITY (kg/m ³)	1750
SAMPLE NR.	TV5	INITIAL MOISTURE (%)	19.4
DEPTH (m):	1.5	MOISTURE AFTER TEST (%)	20.3
INITIAL HEIGHT OF SAMPLE (mm)	19.3	RELATIVE DENSITY	2.575
SAMPLE CONDITION	UNDISTURBED	INITIAL VOID RATIO	0.472
SOILLAB SAMPLE No.:	S05-445-03	VOID RATIO AFTER SOAKING	0.685
		% FREE SWELL	11.18
		SWELL PRESSURE (kPa)	283.0

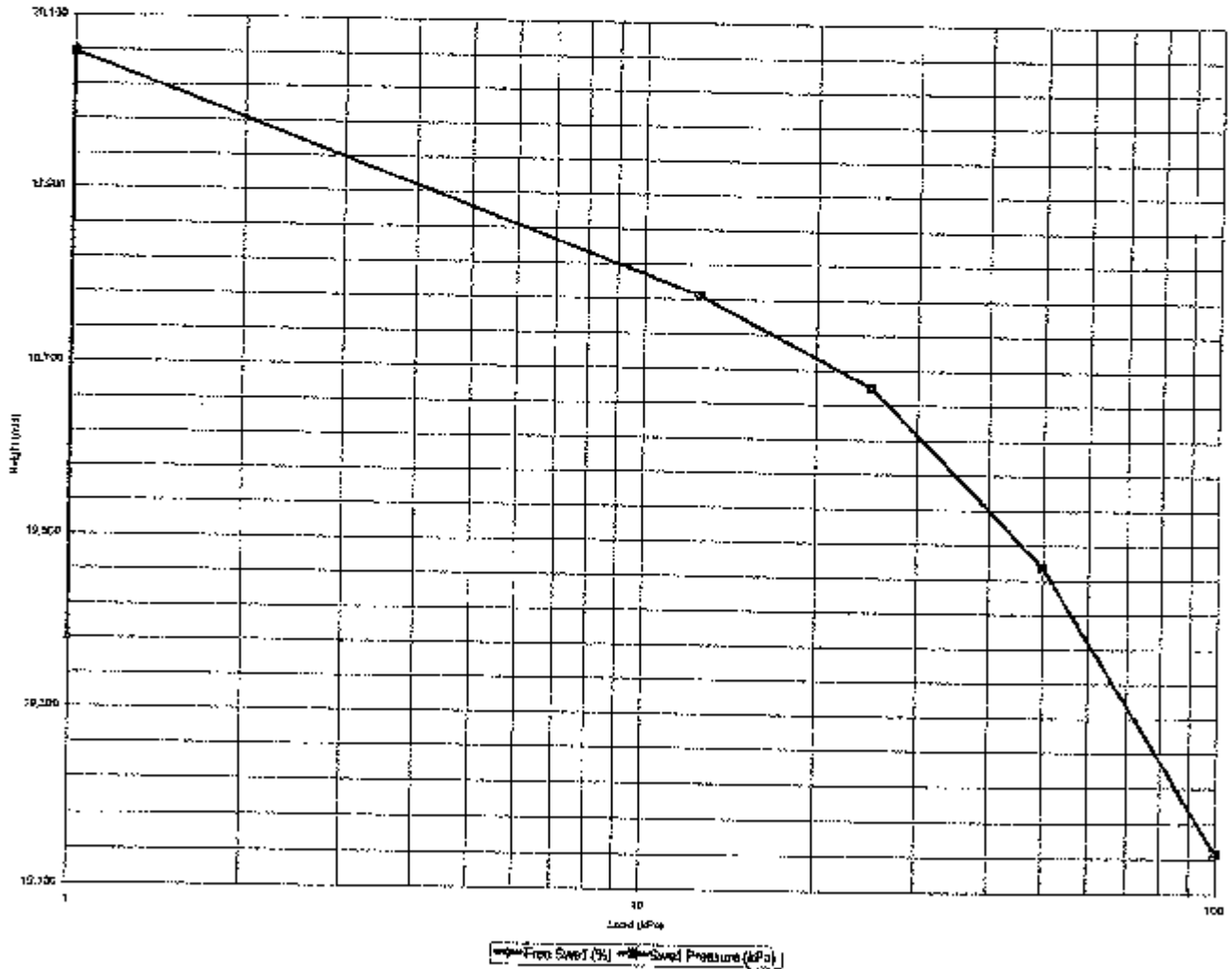
LOAD (kPa)	0	1	2.6	5.0	10	20	50	100	200	400
HEIGHT (mm)	19.300	19.270	21.414	21.305	21.108	20.846	20.518	19.766	18.770	
VOID RATIO	0.472	0.465	0.633	0.624	0.609	0.589	0.564	0.507	0.431	



FREE SWELL & SWELL PRESSURE

PROJECT:	704/13/990/2565 TIGER VALLEY	INITIAL DRY DENSITY (kg/m ³)	1681
SAMPLE NR.	TV11	INITIAL MOISTURE (%)	17.0
DEPTH (m):	1.0	MOISTURE AFTER TEST (%)	21.5
INITIAL HEIGHT OF SAMPLE (mm)	19.4	RELATIVE DENSITY	2.82
SAMPLE CONDITION	UNDISTURBED	INITIAL VOID RATIO	0.577
SCILLAB SAMPLE No.:	S05-446-04	VOID RATIO AFTER SOAKING	0.630
		% FREE SWELL	3.48
		SWELL PRESSURE (kPa)	61.0

LOAD (kPa)	1	2	5	12.5	25	50	100
HEIGHT (mm)	19.400	19.390	19.058	18.784	18.680	18.474	18.146
VOID RATIO	0.577	0.575	0.630	0.608	0.600	0.583	0.558

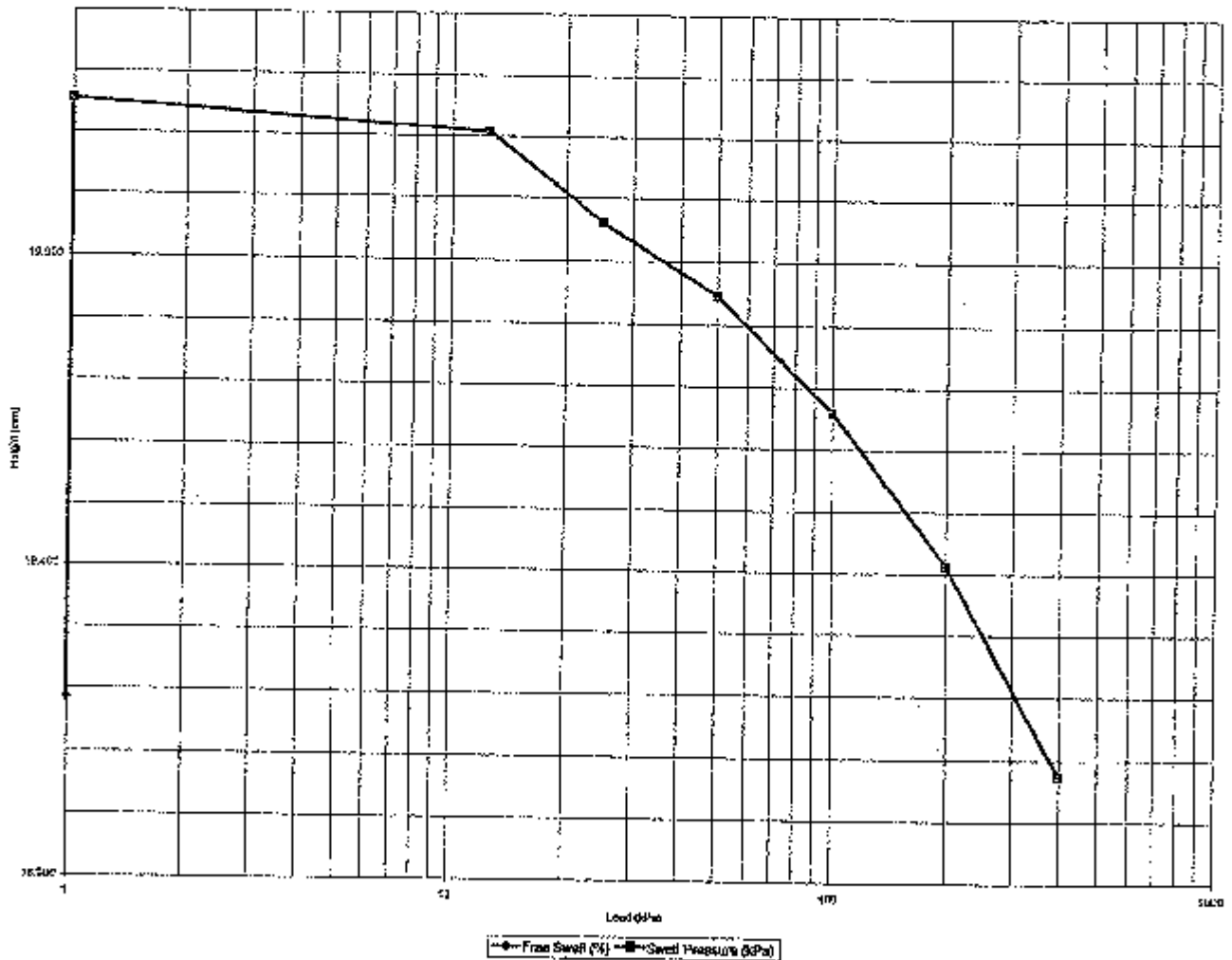


W050702 SW11,0465-04

FREE SWELL & SWELL PRESSURE

PROJECT:	704/11/99/2585 TIGER VALLEY	INITIAL DRY DENSITY (kg/m ³)	2014
SAMPLE NR.	TV13	INITIAL MOISTURE (%)	10.4
DEPTH (m):	1.0	MOISTURE AFTER TEST (%)	13.8
INITIAL HEIGHT OF SAMPLE (mm)	19.2	RELATIVE DENSITY	2.533
SAMPLE CONDITION	UNDISTURBED	INITIAL VOID RATIO	0.259
SOIL LAB SAMPLE No.:	505-448-05	VOID RATIO AFTER SOAKING	0.321
		% FREE SWELL	5.05
		SWELL PRESSURE (kPa)	330.0

LOAD (kPa)	0	10	20	25	30	50	100	200	400
HEIGHT (mm)	19.200	19.188	20.156	20.108	19.960	19.848	19.660	19.412	19.074
VOID RATIO	0.268	0.267	0.331	0.326	0.319	0.311	0.299	0.282	0.280

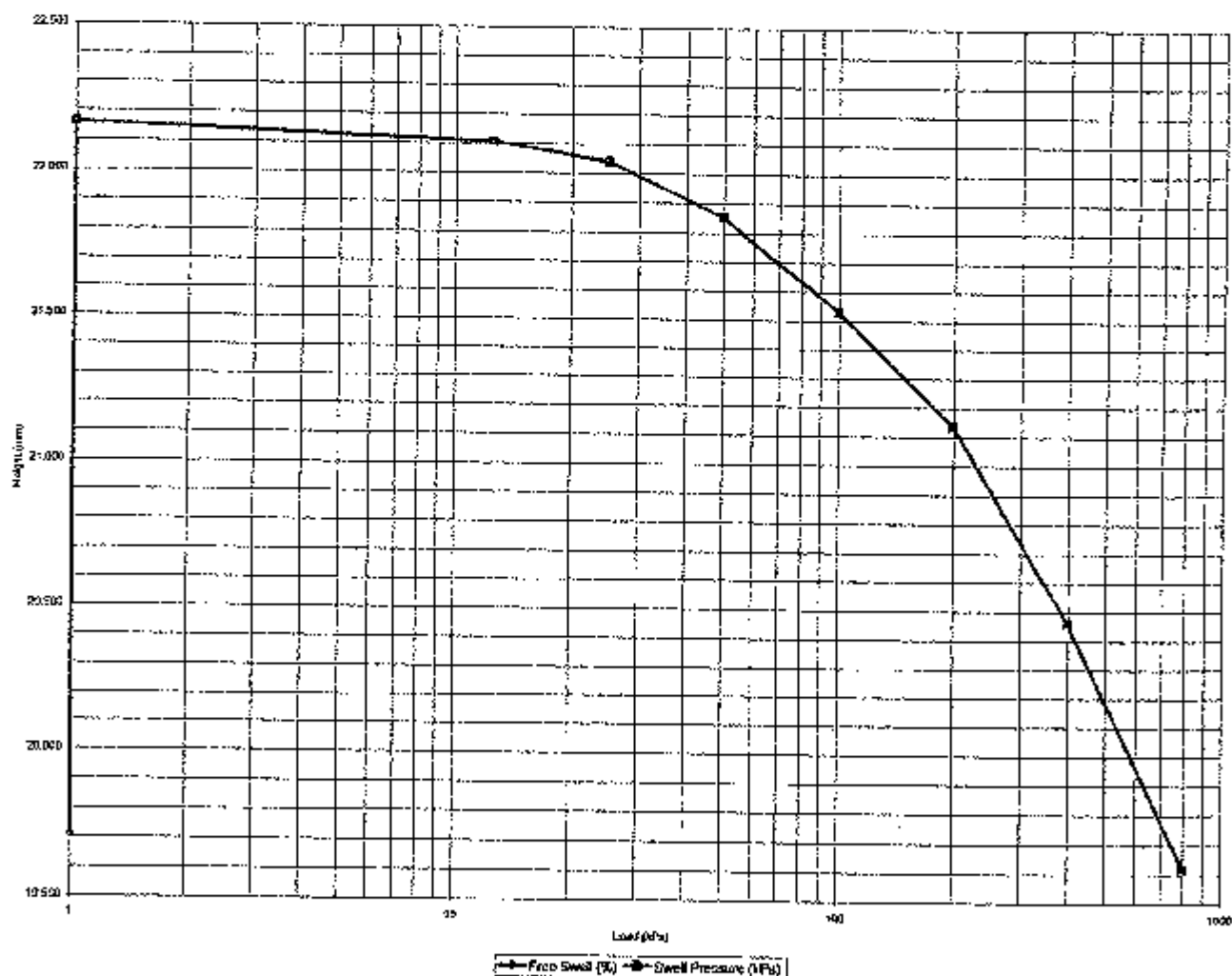


704/11/99/2585 SWELL/448-05

FREE SWELL & SWELL PRESSURE

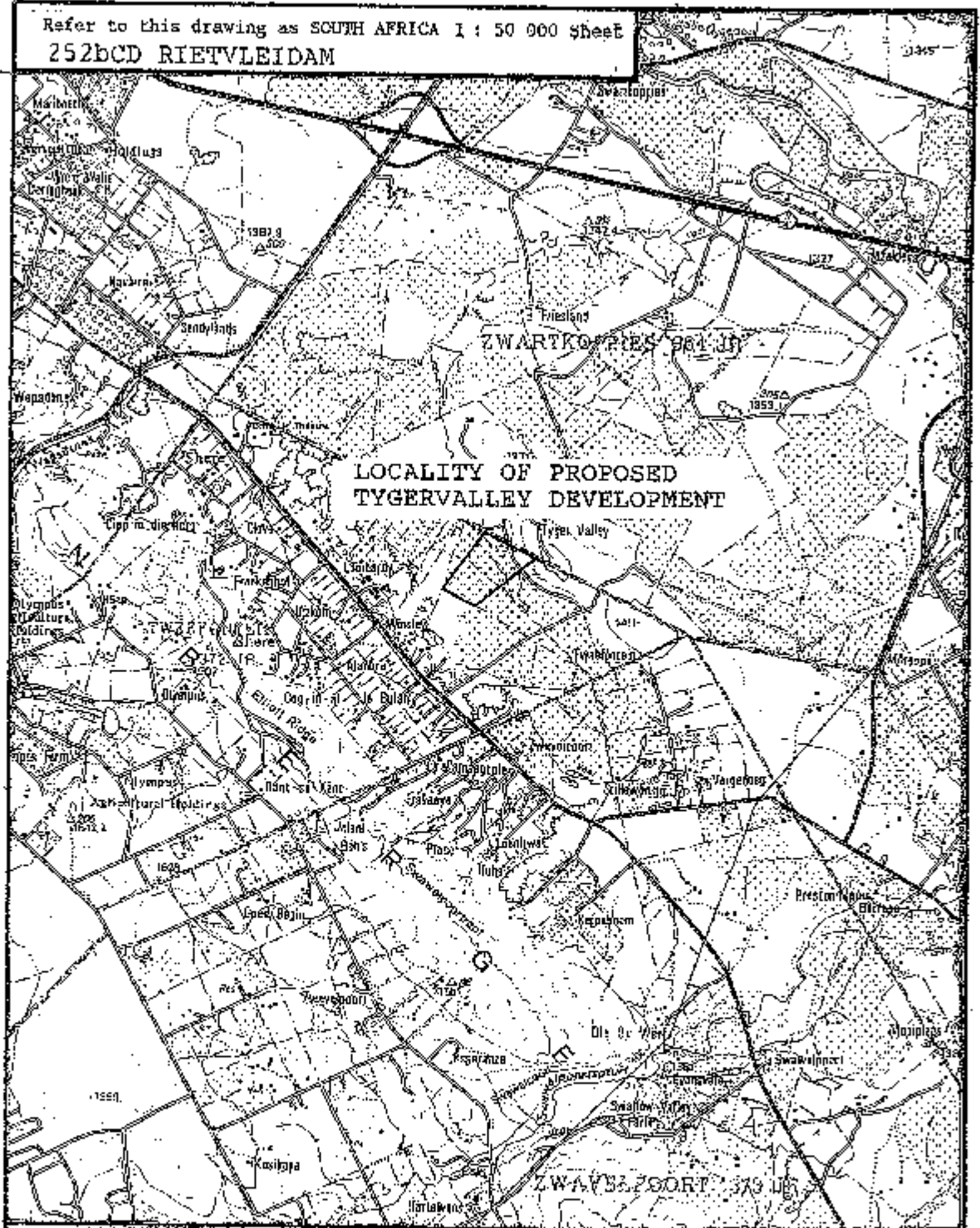
PROJECT:	794/13/390: 2565 TIGER VALLEY	INITIAL DRY DENSITY (kg/m ³)	1940
SAMPLE NR.	TV25	INITIAL MOISTURE (%)	19.9
DEPTH (m):	1.0	MOISTURE AFTER TEST (%)	25.6
INITIAL HEIGHT OF SAMPLE (mm)	19.8	RELATIVE DENSITY	2.63
SAMPLE CONDITION	UNOBTURBED	INITIAL VOID RATIO	0.596
SOIL LAB SAMPLE No.:	503-146-06	VOID RATIO AFTER SOAKING	0.786
		% FREE SWELL	12.37
		SWELL PRESSURE (kPa)	740.0

LOAD (kPa)	1	3	5	12.5	25	50	100	200	400	800
HEIGHT (mm)	19.600	19.712	22.162	22.106	22.040	21.852	21.550	21.134	20.480	19.618
VOID RATIO	0.596	0.565	0.795	0.762	0.778	0.761	0.735	0.703	0.649	0.591



KSCHEPPE SWELL046-05

Refer to this drawing as SOUTH AFRICA 1 : 50 000 Sheet
252bcd RIETVLEIDAM



LOCALITY OF PROPOSED
TYGERVALLEY DEVELOPMENT

LOCALITY PLAN

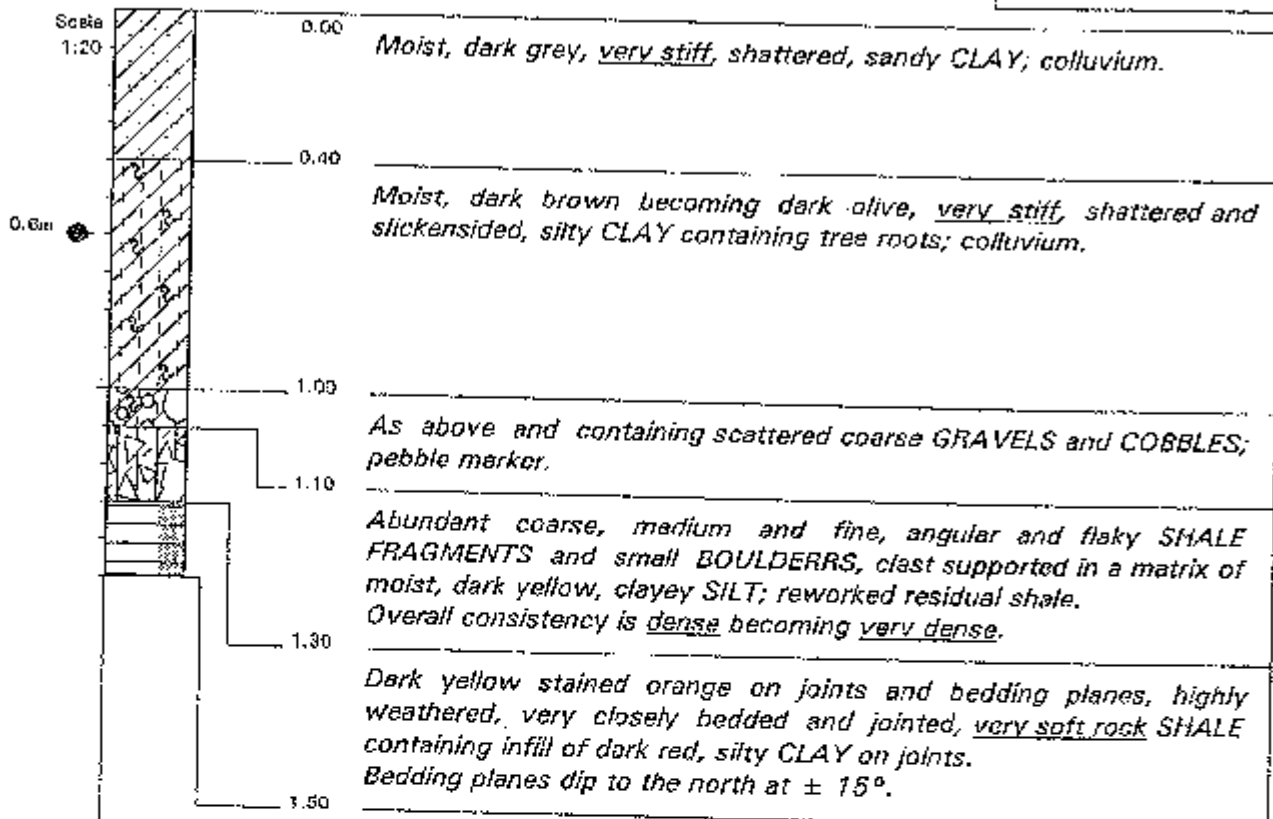
SCALE: 1:50 000



SYNERGISTICS, Environmental Services
 Portion 5 of Tygervallei 334-JR, Pretoria
 GEOTECHNICAL INVESTIGATION CARRIED OUT FOR:
PROPOSED NEW TYGERVALLEY HOUSING DEVELOPMENT

HOLE No: TV/24
 Sheet 1 of 1

JOB NUMBER: M05/2568



NOTES

- 1) Gradual refusal of backactor at 1,5m in shale bedrock.
- 2) No water seepage encountered.
- 3) Disturbed soil sample taken at 0,6m.

CONTRACTOR : SNA Lab
 MACHINE : John Deere 310
 DRILLED BY :
 PROFILED BY : jvdm
 TYPE SET BY : jvdm
 SETUP FILE : STANDARD SET

INCLINATION :
 DIAM : Trench
 DATE : 09/05/2005
 DATE : 09/05/2005
 DATE : 19/05/05 12:37

ELEVATION :
 X-COORD :
 Y-COORD :

HOLE No: TV/24

Soil Investigation



Appendix G3

REPORT

For Synergistics Environmental Services

by

**INSTITUTE FOR SOIL CLIMATE AND WATER
AGRICULTURAL RESEARCH COUNCIL**



Report Number *GW/A/2005/24*

**SOIL INVESTIGATION OF
PORTION 5 OF THE FARM TYGERVALLEY 334~JR**

April 2005

By

E.O. Jacobs

Institute for Soil, Climate and Water, Private Bag X79,
Pretoria 0001, South Africa

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CONTENTS

1. Terms of Reference
2. Study Area
3. Methodology
4. Soils
5. Agricultural Potential
6. Land Use Options

References

Appendix 1: Soil Map

1. TERMS OF REFERENCE

The Institute for Soil, Climate and Water of the Agricultural Research Council (ARC-ISCW) was requested by Synergistics Environmental Services to carry out a soil investigation of portion 5 of the farm Tygervalley 334-JR. The investigation was to describe and map the soils occurring, as well as to assess their broad agricultural potential.

2. STUDY AREA

Site details

The study area comprised 21.41 ha in total, and lies east of Pretoria, south of Silver Lakes. The northern part is located on a steep south facing slope, while the middle and southern parts are virtually flat.

The site is at present bare grassland with partly demolished structures. Remnants of digging activities are still visible next to a dam. To the north and east, grassland of abandoned farms occurs. To the south, new developments (small holdings) have been established. In the west the area partially borders partly a rose nursery.

Geology

The underlying geology consists of shales, carbonaceous in places with hornfels and chert of the Silverton formation (Pretoria Group) and bands of diabase (Geological Survey, 1978).

Climate

The main characteristics (Koch, 1987) are shown in Table 1 below.

The climate of the area can be described as typical of the Highveld, with cool to cold, dry winters and moist, warm to hot summers. Most of the rainfall (85%) falls between October and March, and frost is common.

Table 1. Climate Data

Month	Rainfall (mm)	Min. Temp (°C)	Max. Temp (°C)	Average frost dates
Jan	121.2	15.0	21.0	Start date: 27/05 End date: 16/8
Feb	99.9	14.5	20.9	
Mar	84.7	13.0	19.5	
Apr	40.2	8.9	16.5	
May	19.9	4.2	12.8	
Jun	6.5	0.9	10.0	
Jul	8.0	0.6	9.8	Heat units (hrs > 10°C)
Aug	9.2	3.3	12.6	Summer (Oct-Mar): 2047
Sep	18.0	7.5	16.2	
Oct	60.1	11.6	19.5	
Nov	107.3	13.2	20.1	Winter (Apr-Sept): 539
Dec	107.8	14.4	21.2	
Year	682.0 mm	13.7°C (Average)		

3. METHODOLOGY

The area was originally covered by existing soil maps, at 1:50 000 scale, of the PWV peri-urban soil survey (Yager, 1990). The soil map units from this map were then classified (Soil Classification Working Group, 1991) and grouped into map units.

However, this scale of investigation was deemed insufficient to accurately determine the soils occurring, so a site visit was carried out to map the soils and assess aspects of the site in more detail.

Augering was carried out in the middle and southern part to determine the uniformity of the area and to determine the depth to bedrock or boulders.

4. SOILS

The soils in the northern part of the area are situated on rather steep mid slopes and consist mainly of shallow medium fine structured clay loamy topsoil on weathered rock. Soils are usually not deeper than 300 mm. The most common soil family is Mispah 1100. Rock outcrops may occur.

Lower down on the footslopes the dominant soils consist of a medium fine structured clayey topsoil on strong structured subangular clayey subsoil. The dominant soil family is the Swartland 1111. In places, wet unconsolidated material may underlie the subsoil, with the Sepane 1110 soil form occurring.

The lower half of the survey area consists of the Sepane soil form. Around the dam, dark fine structured clayey top soils may occur giving the topsoil a melanic character. In those cases the Willowbrook soil form occurs.

The main characteristics are given in Table 1 below.

Table 1. Soil Legend

Map Symbol: Soil	Depth (mm)	Soil Characteristics
vsMs1110	200-300	Dark to very dark greyish brown, medium fine structured (30-40% clay), very shallow soils of the Mispah soil form (Ms1100 soil family)
sSw1111	300-500	Dark to very dark greyish brown, medium fine structured (35-45% clay) clay loam on dark greyish brown (40-50%) clay, underlain by saprolite. The Swartland soil form (Sw1111 family) is most common
sSe1110	300-500	Dark to very dark greyish brown, medium fine structured (35-45%) clay loam on dark greyish brown (40-50%) clay, underlain by unconsolidated material with signs of wetness. The Sepane soil form (Sp1110 soil family) is most common. The Willowbrook soil form (Wo 2000) may occur in places

5. AGRICULTURAL POTENTIAL

The soil units as listed above were allocated to a relevant class of agricultural potential. The second part of the symbol (in brackets) refers to the potential class. The limitations are given in Table 2 below.

Table 2. Soil limitations

Potential Class	Map Unit(s)	Soil limitations	Area (ha)
Low (l)	vsMs1110	Shallow soils and excessive steep slopes.	6.91
Low to moderate (l-m)	sSw1111 sSe1110	Heavy clay and structured subsoil restrict root growth and water penetration.	14.5

6. LAND USE OPTIONS

The low to moderate potential soils of the site (sSw1111, sSe1110) are moderately suited for arable agriculture, due to the soil, terrain and climate conditions. Grassland may be a good alternative.

The northern part of the area (vsMs1110) is only suitable for grazing.

REFERENCES

Geological Survey, 1978. 1:250 000 scale geological map 2528 Pretoria. Department of Mineral and Energy Affairs, Pretoria.

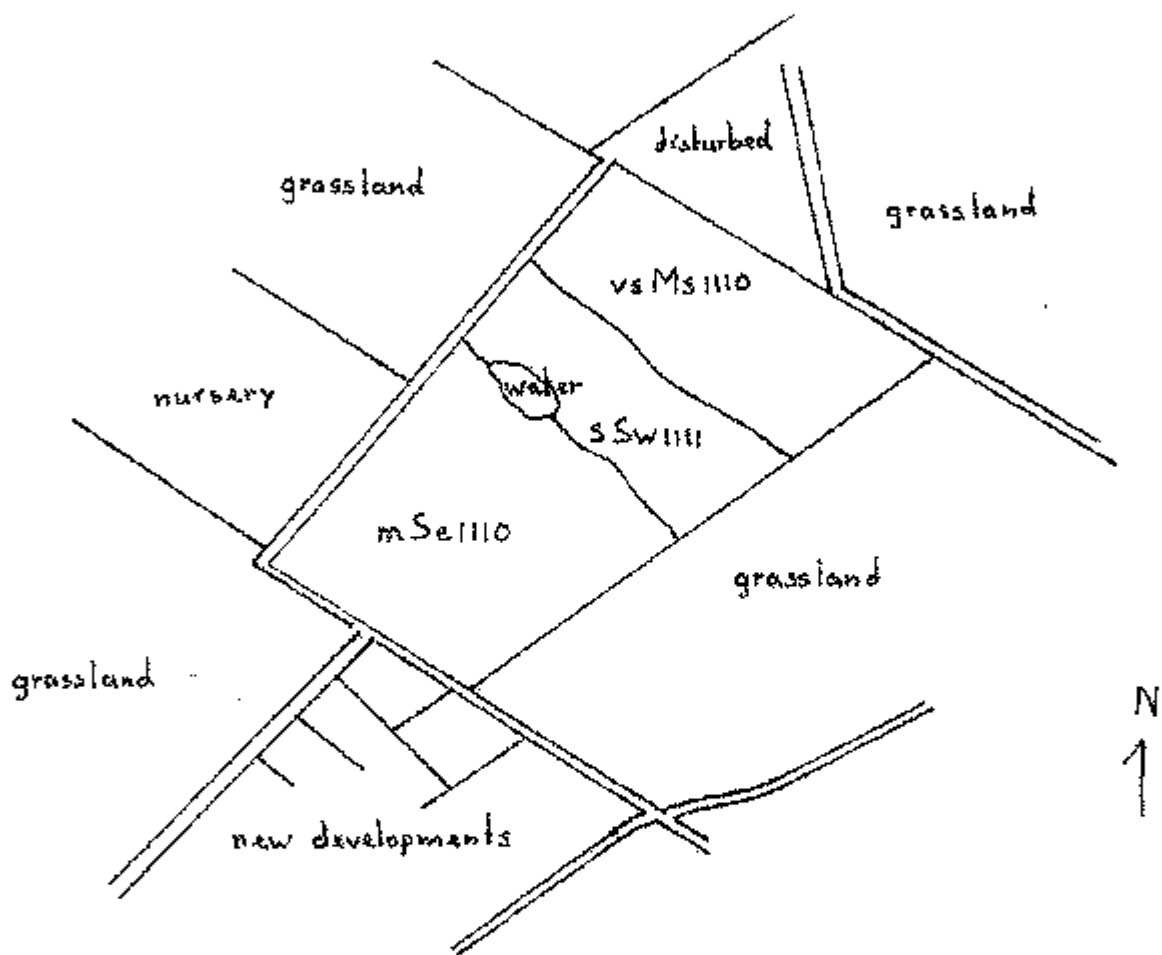
Koch, F.G.L., 1984. Climate data. In: Land types of the maps 2526 Rustenburg and 2528 Pretoria. *Mem. Agric. Nat. res. S. Afr.* No. 8. Dept Agriculture and Water Supply, Pretoria.

Soil Classification Working Group, 1991. Soil classification. A taxonomic system for South Africa.

Yager, T.U., 1990. 1:50 000 scale PWV peri-urban soil survey. ARC-ISCW, Pretoria.

APPENDIX 1:

SOIL MAP



Scale 1:8350

500 m

Heritage Study



Appendix G4



NATIONAL CULTURAL HISTORY MUSEUM
NASIONALE KULTUURHISTORIESE MUSEUM

Building/Gebou: AFRICAN WINDOW
149 Visagie Street,
Pretoria
P O Box 28088,
Sunnyside
0132
RSA
Tel. +27 12 324 6082

Our Ref/Ons Verw	Your Ref/U Verw	Contact/Kontak	Date/Datum
2005KH57			20 April 2005

Ms Deshika Kathawaroo
Synergistic Environmental Services
P O Box 13419
Vorna Valley
1686

Dear Ms Kathawaroo

HERITAGE IMPACT ASSESSMENT: PORTION 5, TYGERVALLEI 334JR

As requested, we have investigated the above portion of the farm Tygervallei 334JR, located in the Pretoria district of Gauteng (Figure 1).

The scope of work consisted of conducting a Phase I archaeological survey of the site in accordance with the requirements of Section 38(3) of the National Heritage Resources Act (Act 25 of 1999). This included:

- Conducting a desk-top investigation of the area
- A visit to the proposed development site

The objectives were to

- Identify possible archaeological, cultural and historic sites within the proposed development areas;
- Evaluate the potential impacts of construction, operation and maintenance of the proposed development on archaeological, cultural and historical resources;
- Recommend mitigation measures to ameliorate any negative impacts on areas of archaeological, cultural or historical importance.

The geology is made up of quartzite and the original vegetation of the area is classified as Rocky Highveld Grassland. A small hill occurs on the north eastern side of the property. The south western section of the survey area, below the hill, has been impacted on by construction activities (houses built within the last 30 years). The rest of the area has been subject to agricultural activities and has been ploughed over annually in the past.

One site has been identified. This consists of a number of smaller stone circles. It is possible that these relate to the very extensive Late Iron Age habitation found east of the site, on the farm Mooiplaats 267JR, and probably served as a cattle outpost. The site centre around the following coordinates: S -25.79229; E 28.37379.

NORTHERN FLAGSHIP INSTITUTION/NOORDELIKE VLAGSKIPINSTELLING
INCORPORATING/GEINKORPOREER
National Cultural History Museum/Nasionale Kultuurhistoriese Museum
Transvaal Museum
National Museum of Military History/Nasionale Museum vir Militêre Geskiedenis
Pioneer/Florier Museum - Kruger Museum - Tswaing Crater/Krater Museum - Samny Marks Museum -
Wiem Prinsloo Agricultural/Landbou Museum

Of course, this was also the area over which the British troops advanced during the Anglo-Boer War, before engaging in battle, on 11 and 12 June 1900, that was later to become known as the "Battle of Diamond Hill" or, the "Slag van Donkerhoek". It was one of the largest battles that took place during the war and the remains of gun placements, trenches and fortifications can still be found, however, mostly to the east of the study area.

We have found one feature of cultural significance that would be impacted on by the proposed development. It is recommended that a buffer zone with a radius of 25 metres from the centre of the site be created around it, and that it is fenced off. However, if this is not feasible, mitigation measures can be implemented, i.e. the mapping and excavation of the site after obtaining a valid permit from SAHRA. As to the rest of the site, we recommend, from a heritage point of view, that the proposed development can continue and requests that if archaeological sites or graves are exposed during construction work, it should immediately be reported to a museum, preferably one at which an archaeologist is available, so that an investigation and evaluation of the finds can be made

Yours sincerely

J van Schaikwyk

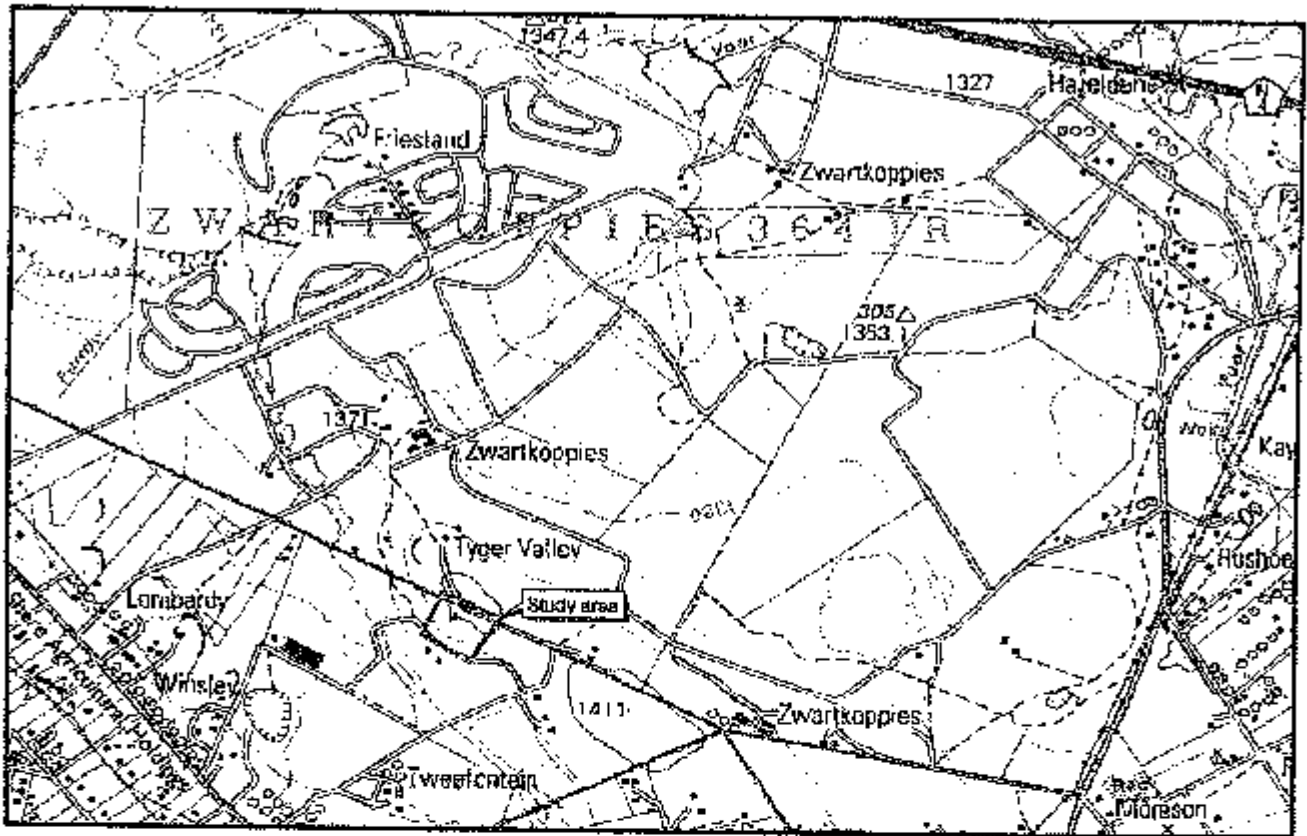


Figure 1. Location of the study area and the identified site (red dot).

Golden Mole Habitat Suitability



Appendix G5

Assessment of golden mole habitat suitability:

Portion 5 of the farm Tygervalley 344 JR

Compiled by Craig Jackson
Mammal Research Institute, University of Pretoria

Introduction

The present survey was undertaken by Craig Jackson following a request by Mrs Deshika Kathawaroo of Synergistics Environmental Services and included a site visit on Monday 7 March 2005. The assessment investigated the habitat suitability of the above-mentioned property for the Juliana's golden mole (*Neamblysomus julianae*), a red data species.

The Juliana's golden mole is endemic to South Africa. It is a range-restricted species that has only been recorded from three localities: Pretoria (Bronberg), Nylsvley area (120km away) and the Pretoriuskop region of the south-western Kruger National Park (400km). We currently cannot categorically say that these three populations are Juliana's golden moles, as they may possibly be three distinct species. Preliminary genetic evidence indicates that each of the three subpopulations may in fact represent separate species, making the conservation of each population even more important.

The golden mole is specialized for a life underground and lacks external ears and the eyes, which are not used, are covered with a layer of skin. It possesses strong forelimbs that are equipped with powerful pick like claws and a leathery hardened nose pad used to push through the sandy soil while burrowing. These animals live completely underground, they are weak diggers and confined to sandy soils through which they "swim" in search of prey.



Figure 1. An adult Juliana's golden mole (*Neamblysomus julianae*)

The burrow systems comprise deep, permanent tunnels that link up to a nest, and a number of superficial foraging tunnels that are characterised by distinctive ridges of soil along the surface. These visible trails are only evident during summer rainfall months when the soil is moist enough for burrowing activity. This should be taken into consideration when conducting surveys, and any surveys done in the dry winter months may be very misleading.



Figure 2. A typical foraging tunnel produced by Juliana's golden moles. The green arrows indicate the trails that are usually inconspicuous to the untrained eye.

Present survey

The Pretoria population of the Juliana's golden mole occurs along the north and north eastern slopes and foot slopes of the Bronberg Ridge. These animals are restricted to this zone due to their dependence on the suitably sandy soil associated with underlying geology. The property in question is situated approximately 2km north east of the Bronberg Ridge but, with regards to soil properties, shares few similarities with the Ridge.

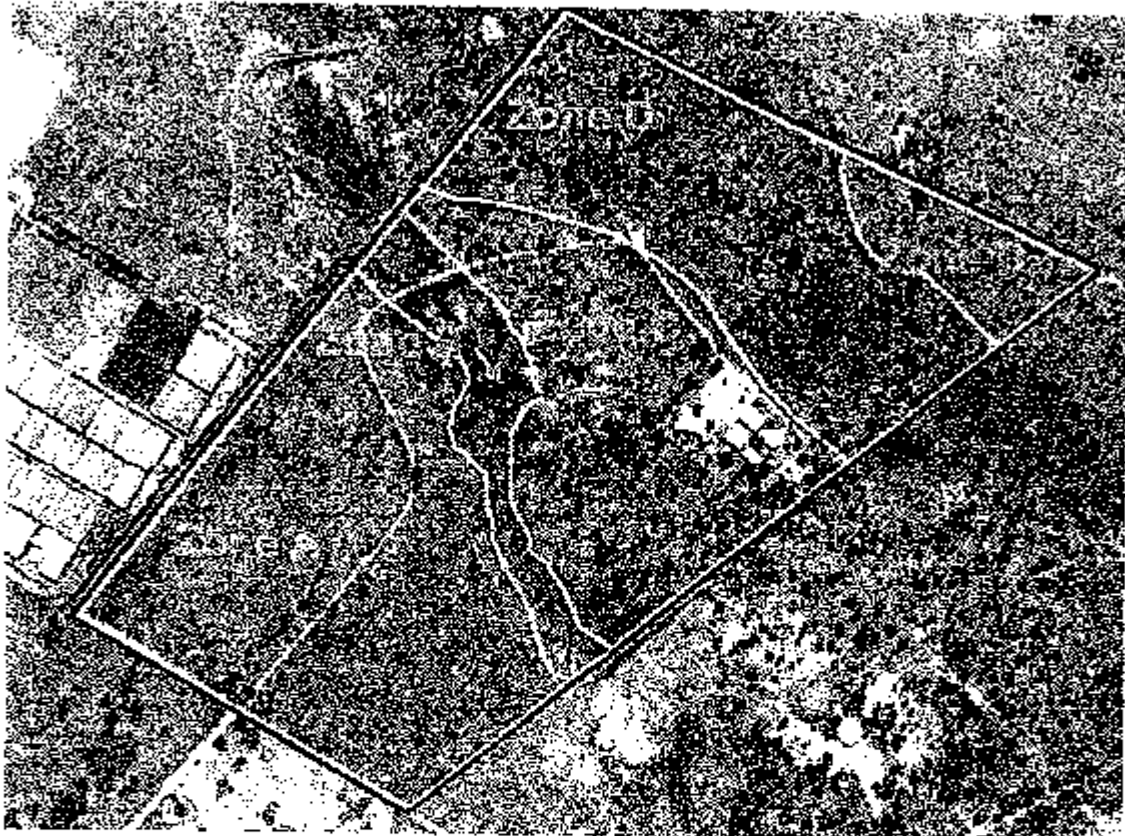


Figure 3. Portion 5 of the farm Tygervally 344 JR with four different ecological zones indicated.

For the purposes of this study, the property can essentially be divided into four ecological zones, as shown in Figure 3. Zone A is a grassland area with relatively high clay content in the soil, resulting in a hard crust with very little loose, sandy soil. The seepage line that runs through the property is designated by Zone B and not suitable for the Juliana's golden mole. Zone C comprises a mixture of *Acacia* trees and grassland on a stonier substrate. A ridge runs through the northeastern portion of the property and forms Zone D. On top of the ridge, in the eastern corner of the property, a plateau is evident (Zone D₂) and differs slightly from the steep slopes of the remainder of the ridge (Zone D₁). The ridge area is extremely stony with relatively little exposed soil on the surface (See Figures 4 and 5). The plateau region has fewer stones and more soil than the greater part of the ridge.



Figure 4. A soil profile in Zone D indicating the prominent stony layer.

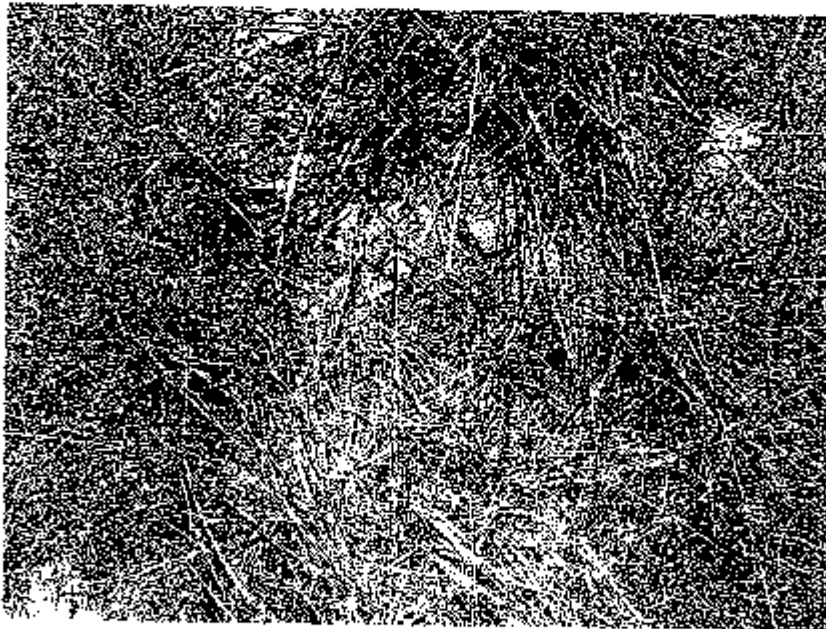


Figure 5. The stony surface as seen from above the soil.

All four Zones lack the characteristic ecological features associated with the Juliana's golden mole and the site can in no way be viewed as suitable habitat for this species. The species requires sandy soils in which the animals can move through easily in search of prey. No such areas were located on the property.

This study was done without prejudice and with no vested interest in any proposed development.

Wetland Delineation



Appendix G6

FINAL DRAFT

PRELIMINARY ASSESSMENT OF THE WETLAND ON PORTION 5 OF THE FARM TYGERVALLEY 334 JR

13 June 2005



Environmental Business Unit

Exigent Engineering Consultants

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Executive Summary

Project and site description

A residential development north of Lynnwood Road is planned for Portion 5 of the farm Tygervalley 334 JR. A ridge occurs on the northern portion of the site, and a tributary of the Pienaars River transects the site from east to west. A dam has been constructed instream.

Methodology

Site visits were conducted on the 26th of February, and 1st and 30th of March 2005. The wetland was delineated, wetland zones identified and wetland functions determined. GPS points were taken of the drainage lines and wetlands, which were plotted on a map (Addendum B). Possible habitat for Red Data species was investigated, and species with a probability of occurring in the wetland areas are included in the document.

As part of the wetland assessment, a desktop study was conducted focussing on the groundwater and Red Data species. The groundwater information was obtained from the 1:500 000 Hydrogeological Map supplied by Department of Water Affairs and Forestry (Barnard, 2000). Red Data species information was obtained from the Gauteng Department of Agriculture, Conservation and Environment. Specialist publications and assessment during the site visits, (see reference list) were used to verify ecological and habitat requirements of Red Data species.

Statutory requirement related to wetlands

The following statutory requirements are applicable to the development:

- Conservation of Agricultural Resources Act, Regulations 7 and 8;
- National Environmental Management Act, Section 4(a);
- Constitution of South Africa, Section 24; and
- Convention on Biological Diversity, Article 8;

Wetland

The wetland is located along the drainage line, with temporary, seasonal and permanent zones occurring as a mosaic throughout the wetland. This mosaic effect was probably caused due to past disturbances in the area, resulting in a patchwork of wetter and drier zones within the wetland. Although the wetland has been impacted on extensively, the wetland is currently in a functional condition.

The damming of the wetland limits water flow on the property and therefore changes the water regime of the wetland. Rubble and soil have been dumped in various portions of the wetland, especially downstream of the dam wall on the property. Some erosion occurs in the drainage channel as well as along the main channel.

The functions of the wetland include flood attenuation, streamflow augmentation, sediment trapping and biodiversity maintenance (ecological integrity).

Wetland delineation

The wetland was delineated using the different criteria as discussed in the DWAF wetland delineation guide (DWAF 2003). Wetlands usually occur in depressions in valley bottoms, however they can occur on steep slopes and hills where they are fed by seeps. This wetland occurs in a valley bottom with a ridge to the north.

The soil wetness and duration of wetness, thereby indicating the different zones of the wetland, are indicated by the colour of the soil. The permanent zone has grey soil, while the seasonal and temporary zones have mottles and concretions. Soil zone D in the geotechnical report (Johan van der Merwe (Pty) Ltd), is the soil zone indicating the wetland and drainage areas on the property.

A variety of wetland and terrestrial plant species occur on the site. The site has been disturbed and many weeds or invasive species occur.

Red Data species

Seven Red Data species has potential of occurring on the site. The Red Data species include four bird species, one reptile species, one insect species and one plant species.

Recommendations

Various recommendations are suggested to limit the impact of the development on the wetland. The recommendations include that the development should remain 10m outside the delineated wetland area and mitigation measures regarding the bulk services, erosion, invasive species and rubble in the wetland. If these mitigation measures are adhered to during the construction and operational phases, it is anticipated that the function of the wetland and its inhabitants will remain.

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Addendums

Addendum A – Site locality plan (1:50 000 topographic map)

Addendum B – Wetland map as delineated using vegetation indicators

Addendum C – Red Data Species potentially occurring on the site

Addendum D – Approximate location of wetland on layout map as delineated using the soil properties (Johan van der Merwe (Pty) Ltd 2005)

Addendum E – Geotechnical soil zones (Johan van der Merwe (Pty) Ltd 2005)

Addendum F – Wetland Rehabilitation Guidelines

1. INTRODUCTION

The Environmental Business Unit of Exigent Engineering Consultants CC was appointed by Synergistics Environmental Consultants to conduct a preliminary wetland assessment of Portion 5 of the farm Tygervally 334 JR.

The following was addressed during the wetland assessment:

- Wetland survey, focussing on the probable occurrences of Red Data species and potential habitat;
- The wetland was delineated according to scientifically recognisable delineation techniques; and
- A sensitivity map was compiled of the wetland, drainage and seepage lines on the property.
- Wetland rehabilitation guidelines have been included.

Due to the limited extent of wetlands and the valuable functions performed by them, wetlands are regarded as sensitive habitats. Wetlands are protected by various parts of legislation and international conventions. The functions performed by a wetland include direct and indirect functions. The direct functions of a wetland are apparent immediately, such as the provisioning of harvestable resources. The indirect functions are not as apparent, such as the cleaning of water resources. The impact of one wetland in a catchment may therefore be small within the overall picture, but the cumulative impact will be vast.

2. PROJECT DESCRIPTION

A residential development is planned for Portion 5 of the farm Tygervally 334 JR. The development will cover an area of 21.41ha. This includes the housing, private open space, access control, internal access, public roads and the clubhouse.

3. SITE DESCRIPTION

The site is located to the north of Lynwood Road just outside the municipal boundaries of Tshwane and to the south-east of Silverlakes. A ridge occurs on the northern portion of the site, and a stream (flowing into the Pienaars River further downstream) transects site from east to west. A small gravel road provides access to the site on the southern portion of the site and crosses the stream over a dam wall that has been constructed in the stream on the property. The development will be located outside the 1:50 year flood line.

4. METHODOLOGY

Site visits were conducted on the 28th of February, and 14th and 30th of March 2005. The wetland was delineated, and wetland zones identified. The functions of the wetland were also determined. GPS points were taken of the drainage lines and wetlands, which were plotted on a map (Addendum B). Possible habitat for Red Data species was investigated, and species with a probability of occurring in the wetland areas are included in the document.

The wetland was delineated according to the Department of Water Affairs and Forestry (DWAF) field guide (2003), "A practical field procedure for identification and delineation of wetlands and riparian areas".

The DWAF field guide makes use of indirect indicators of prolonged saturation by water, namely wetland plants (hydrophytes) and (hydromorphic) soils. The presence of these two indicators is indicative of an area that has sufficient saturation to classify the area as a wetland. The terrain unit is also an effective indicator to determine where wetlands are most likely to occur. Not all parts of a wetland will be saturated for the same duration. Therefore a wetland may be divided into three zones, depending on the changing frequency of the wetland. These zones are; the permanent zone, which is nearly always saturated, the seasonal zone surrounds this zone, these areas are saturated for a significant duration during the rainy season. The temporary zone in turn surrounds the seasonal zone, this zone is only saturated for long enough to encourage the formation of hydromorphic soils and the growth of wetland vegetation. The object of delineation is to determine the outer edge of the temporary zone, which indicates the boundary between the wetland and adjacent terrestrial areas (DWAF 2003).

Four specific indicators must be taken into consideration to determine the outer edge of the temporary zone (DWAF 2003):

- a. The terrain unit indicator;
- b. Soil form indicator;
- c. Soil wetness indicator; and
- d. Vegetation indicator.

Wetland Assess (Kotze *et al*, 2004) is a valuable tool used to assess the various functions of a wetland in a qualitative way. Individual wetlands differ according to their functions and characteristics, and Wetland Assess can be used to give an estimation of the wetland functions for individual wetlands. Wetland Assess is only a baseline study, and should not replace more in depth studies. The system has been developed to assess individual wetlands for comparative purposes, and do not give the cumulative value of a group of wetlands. Wetland Assess can however be used to prioritise wetlands for management and rehabilitation, and can be used to indicate important wetland benefits when managing individual wetlands. It can also be used in catchment planning to determine the importance of a wetland in the catchment context. It is therefore a useful preliminary tool in determining wetland function and prioritisation.

Wetland Assess has two levels of assessment. The level 1 assessment is a desktop study. Based on previous studies certain ecosystem services can be associated with hydro-geomorphic wetland types. The level 2 assessment is a rapid field assessment. Seven benefits can each be assessed according to the specific characteristics that are associated with each particular benefit (Kotze *et al*, 2004).

A desktop study was conducted focussing on the groundwater and the Red Data species. The groundwater information was obtained from the 1:500 000 Hydrogeological Map supplied by DWAF (Barnard, 2000). Red Data species information was obtained from the Gauteng Department of Agriculture, Conservation and Environment (GDACE). Specialist publications (see reference list) were also used to verify ecological information for the Red Data species.

In addition to the Red Data species desktop study the potential habitat for Red Data species on site was investigated during the field visit.

5. STATUTORY REQUIREMENTS RELATED TO WETLANDS

Various pieces of legislation provide statutory requirements when dealing with wetland areas. They have been summarised below.

5.1 CONSERVATION OF AGRICULTURAL RESOURCES ACT

Various regulations promulgated in terms of the **Conservation of Agricultural Resources Act** are relevant in terms of wetlands:

Regulations from Conservation of Agricultural Resources Act (No 43 of 1983)

Regulation 7:

- (1) Subject to the provisions of the Water Act, 1956 (Act 54 of 1956), and subregulation (2) of this regulation, no land user shall utilise the vegetation in a vlei, marsh or water sponge or within the flood area of a water course or within 10 metres horizontally outside such flood area in a manner that causes or may cause the deterioration of or damage to the natural agricultural resources.
- (3) Except on authority of a written permission by the executive officer, no land user shall – (a) drain or cultivate any vlei, marsh or water sponge or a portion thereof on the farm unit

Regulation 8:

- (1) Subject to the provisions of the Water Act, 1956 (Act 54 of 1956), no land user shall in any manner whatsoever divert any run-off water from a watercourse on his farm unit to any other watercourse, except on authority of a written permission by the executive officer.
- (4) No land user shall effect an obstruction that will disrupt the natural flow pattern of run-off water on his farm unit or permit the creation of such obstruction unless the provision for the collection, passing through and flowing away of run-off water through, around or along that obstruction is sufficient to ensure that it will not be a cause for excessive soil loss due to erosion through the action of water or the deterioration of the natural agricultural resources.

5.2 NATIONAL ENVIRONMENTAL MANAGEMENT ACT

The principles underpinning environmental management contained in the National Environmental Management Act, must be taken into account by any organ of state in the exercise of any power that may impact on the environment. Section 4(a) states that sustainable development requires the consideration of all relevant factors including the following:

- That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimised and remedied;
- That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- That the development, use and exploitation of renewable resources and the ecosystems of which they are a part do not exceed the level beyond which their integrity is jeopardised;
- That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

5.3 CONSTITUTION OF SOUTH AFRICA

The Constitution of South Africa also creates a duty on the State to conserve and rehabilitate wetlands.

Section 24 provides that:

**Everyone has the right –*

(b) *to have the environment protected, for the benefit of present and future generations through reasonable legislative and other measures that-*

- i) prevent pollution and ecological degradation;*
- ii) promote conservation; and*
- iii) secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development*.*

5.4 CONVENTION ON BIOLOGICAL DIVERSITY

In terms of the Convention on Biological Diversity, to which South Africa is also a party:

- the State has a duty to conserve wetlands and a duty to rehabilitate them.

Article 8 provides that:

**Each Contracting Party shall, as far as possible and as appropriate:*

(c) *Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use;*

(f) *Rehabilitate and restore degraded ecosystems and promote the recovery of threatened species, inter alia, through the development and implementation of plans or other management strategies.*

(g) *Develop or maintain necessary legislation and/or regulatory provisions for the protection of threatened species or populations*.*

6. BIOPHYSICAL DESCRIPTION OF THE SITE

The site is located in the Rocky Highveld Grassland (Veld type 34) according to Low & Rebelo (1996) and the Bankenveld (Veld type 61) according to Acocks (1988). The lithology of the site is of the Transvaal supergroup, Pretoria group, Silverton formation. This formation consists of layers of shale (Keyser, 1997).

6.1 Wetland

According to the National Water Act (Act no 54 of 1956) a wetland is defined as, "*land which is transitional between terrestrial and aquatic systems where the water table is usually at or near the surface, or the land is periodically covered with shallow water, and which land in normal circumstances supports or would support vegetation typically adapted to life in saturated soil.*"

6.1.1 Origin and characteristics

A wetland occurs along the drainage line transecting the site from east to west. The drainage line has temporary, seasonal and permanent zones occurring as a mosaic throughout the wetland area. This mosaic effect was probably caused due to past disturbance in the area, which resulted in a patchwork of wetter and drier zones within the wetland. The dumping of rubble in the wetland and the damming of the drainage line results in a change in the water regime of the site, as well as a change in the flow patterns, which resulted in a change in the micro topography of the wetland. Due to the mentioned disturbances, the slope of wetland is steep and the valley part undulating.

Wetlands are usually divided into three zones, with various different vegetation structures and species. These factors all contribute to the ability of the wetland to retain its ecological integrity and maintain biodiversity. The wetlands most important function is therefore probably biodiversity maintenance. The wetland should therefore be protected to maintain the current biodiversity or to improve it by removing alien and invasive species.

The large amount of dams in the catchment could have played a role in the formation of the wetland. It is likely that this is a historical wetland.

Although of the wetland has been impacted on extensively, the wetland is in functional condition. The three different zones contribute to the species and habitat diversity the site has to offer. The wetland is therefore an important site to conserve biodiversity in the area. The wetland may have a flood attenuation function, but this is limited by the damming of the water course, both upstream and downstream of the wetland. The zones of this wetland are not clearly defined due to mentioned impacts, thereby creating the mosaic of wetland zones (wetter and drier zones throughout the wetland).

6.1.2 Impacts

The drainage line has been dammed directly east of the site, almost on the border between the site and the adjacent property. The drainage line has also been dammed on the property, close to the western border, and a road was constructed across the drainage line on the dam wall. The damming of the wetland limits water flow on the property and therefore changes the water regime of the wetland.

Rubble and soil have been dumped in various portions of the wetland, especially downstream of the dam wall on the property. The dumped material affects the water flow dynamics and the distribution of the different wetland zones in the wetland. The dumped material will have to be removed if the wetland is rehabilitated, which will result in the enhancement of wetland functions.

Some erosion occurs in the drainage channel as well as next to the channel. This contributes to siltation in the wetland as well as to the canalisation of the drainage line.

According to the layout map of the proposed development some units will be located within the boundaries of the wetland. The construction activities and the structures will have a negative impact on the wetland on the property as this will alter the water regime on the site. Water flow from the rest of the property should not be cut off from the wetland and should not be concentrated into the wetland. Should the water be cut off from the wetland the wetland will dry out. Alternatively, should the water flow into the wetland be concentrated, as through a pipe or concrete channel, erosion will take place in the wetland.

6.1.3 Functions

The functions of the wetland include flood attenuation, streamflow augmentation, sediment trapping and biodiversity maintenance (ecological integrity). The wetland has been dammed on the property and on the property upstream by the dam wall, which impact on the functions that can be performed by the wetland. The functions of flood attenuation and streamflow augmentation of the wetland are probably limited due to the damming at both sides of the property. The dam walls will hold back most of the water during a flood, but the wetland will still perform these functions once the dam's holding capacity has been reached. The dams probably increase the wetland's ability to trap sediment, but the sediment will have to come from the sides of the wetland and not down the stream channel. Erosion is taking place in the areas next to the wetland and this sediment will be trapped by the wetland or the dams occurring in the stream.

6.2 Wetland delineation

The wetland as indicated by the soil properties (Geotechnical report by Johan van der Merwe (Pty) Ltd 2005) is included in Addendum D. The species characteristic of wetlands do not however occur over this entire area, but are limited to the areas as shown on the map attached in Addendum B. Both of these indicate the presence of the wetland, but the soil retains wetland properties longer and at times when the vegetation will not necessarily indicate wetland conditions, such as in a dry year. The soil may therefore indicate the historical presence of the wetland or it may simply be an indication of the extreme limits of the wetland during wet years.

6.2.1 Terrain Unit

The terrain unit can be used as an indicator to determine where a wetland is likely to occur. Wetlands usually occur in depressions in valley bottoms, however they can occur on steep slopes and hills where they are fed by seeps. This wetland occurs in a valley bottom with a ridge to the north. It is clear from the relief of the site that the wetland is located in a low-lying area. The drainage lines can also be distinguished from the small-scale contour lines.

6.2.2 Soil

The soil wetness and duration of wetness are indicated by the colour of the soil. Grey soil is an indication of wetness for prolonged periods of time and mottles indicate fluctuating wetness. The permanent zone of a wetland is therefore characterised by grey soil, the seasonal zone has a high frequency of mottles and the temporary zone has less mottles. Soil in the terrestrial zone surrounding the wetland does not have soil mottles (DWAF 2003).

Due to the physical attributes indicative of wetness in the soil, some soil forms can be classified as wetland soils. Soil forms indicative of the permanent zone of the wetland include Champagne, Katepruit, Willowbrooke and Rensburg, while the following soil forms indicate the seasonal and temporary zones of a wetland: Inhoek, Tsitsikamma, Houwhoek, Molopo, Kimberley, Jonkersberg, Groenkop, Etosha, Addo, Brandvlei, Glenrosa and Dundee (DWAF 2003). It has been stated by ARC (2005) that "*around the dam, dark fine structured clayey top soils may occur giving the topsoil a melanic character. In those cases the Willowbrook soil form occurs*".

The site has been divided into four soil zones (A to D) according to the geotechnical report (Johan van der Merwe (Pty) Ltd, 2005). Soil zone D is the zone that "covers the central, lower-lying portion of the site where the major drainage feature is located as well as a number of subtle, subdued drainage features that occur elsewhere across the site" (Johan van der Merwe (Pty) Ltd, 2005). The geotechnical map indicating the locations of the different soil zones is included in Addendum E. The soil colour and wetness, as well as the vegetation have been regarded as sufficient proof that a wetland occurs on the site.

The permanent zone is located in standing water or in soil with the water just below the surface, the soil has a very high clay content and is dark grey-black in colour. The soil in the seasonal zone has a higher density of mottles, has a very high clay content and is dark brown in colour, with red and yellow mottles and concretions. The soil in the temporary zone of the wetland had some mottles and was yellowish brown in colour, with some metal concretions, and a very high clay content. In another part of the wetland, in one of the drainage areas, the temporary zone had dark red clay soil with mottles. It is therefore assumed that there is more than one soil form representing the temporary zone of the wetland. The soil is infrequently inundated for short periods of time.

It has been suggested by Johan van der Merwe (Pty) Ltd 2005, that "flood lines should be determined accurately and areas that may be affected by seasonal flooding and standing water conditions, should be excluded from the development". The wetland as determined by the soil profile and overlain over the layout plan is attached in Addendum D.

6.2.3 Species composition

6.2.3.1 *Flora*

A variety of wetland and terrestrial species occur on the site. The site has been disturbed and many weeds or invasive species occur. The disturbance contributed to the mosaic affect of the zones in the wetland.

The wetland has been delineated according to the wetland vegetation occurring on site and the map is included in Addendum B.

Permanent zone

The permanent zone of the wetland is distributed in a mosaic pattern along the drainage channel, interspersed with the seasonal and temporary zones. The portion of the wetland occurring downstream of the dam on the property has greater disturbance from rubble dumping than the portion upstream of the dam on the property and has more alien species.

Table 1. List of species occurring in the Permanent Zone

Permanent Zone	Habitat
Grasses & Sedges	
* <i>Arundo donax</i>	Favours moist, not wet, conditions, but can grow in standing water
<i>Leersia hexandra</i>	In or near permanent water sources. Dense stands in shallow water or wet soil.
<i>Paspalum dilatatum</i>	Moist places such as vlei areas and near rivers. Mostly loam and clay soil. Often weeds in gardens, cultivated lands, roadsides and lawns
Forbs	
* <i>Persicaria lapathifolia</i>	Swamps, widespread
<i>Typha capensis</i>	Swampy areas and next to streams

* Indicates exotic species

Seasonal zone

The seasonal zone occurs in a mosaic pattern throughout the wetland in areas that are wetter than the temporary zone, but drier than the permanent zone. The seasonal zone consists of various patches with different dominant species. There are therefore different plant communities within the seasonal zone.

Table 2. List of species occurring in the Seasonal zone

	Habitat
Trees & shrubs	
* <i>Eucalyptus</i> species	Watercourses, roadsides
Grasses & Sedges	
<i>Andropogon eucomus</i>	Wet areas such as vleis, riverbanks, road reserves & seepage areas. Disturbed soil.
<i>Cyperus rotundus</i>	In moist disturbed places
<i>Cyperus textilis</i>	On stream and river banks and in marshy areas
<i>Eragrostis plana</i>	Grows in disturbed places in all types of soil. Mostly damp patches. (sub-climax)
<i>Leersia hexandra</i>	In or near permanent water sources. Dense stands in shallow water or wet soil.
<i>Mariscus</i> species	
<i>Panicum</i> species	
<i>Schoenoplectus corymbosus</i>	Swampy grassland
Forbs	
* <i>Bidens pilosa</i>	Cosmopolitan weed, common in disturbed areas
<i>Chamaecrista mimosoides</i>	Grassland
* <i>Coryza albidia</i>	Common weed of disturbed areas and crops
<i>Coryza podoccephala</i>	In disturbed grassland and road reserves
<i>Denekia capensis</i>	Widespread in moist areas and shallow water
<i>Gomphostigma virgatum</i>	Next to streams, usually in running water between rocks
<i>Lotononis listii</i>	Widespread in grassland, especially moist areas
* <i>Oenothera rosea</i>	Mostly moist disturbed areas. Sometimes in shade
<i>Phyllanthus parvulus</i>	Widespread in grassland
<i>Senecio</i> species	
<i>Sida dregel</i>	Normally in shade under trees

<i>*Tagetes minuta</i>	Common weed of disturbed areas and cultivated fields. Widespread
<i>Teucrium trifidum</i>	Bushy areas, often in colonies under trees
<i>Typha capensis</i>	Swampy areas and next to streams
<i>*Verbena brasiliensis</i>	A general weed in disturbed and moist areas

* Indicates exotic species

Temporary zone

The temporary zone includes the seepage areas entering the wetland as well as the temporary zone on the outside of the wetland. The temporary zone has patches of highly disturbed vegetation dominated almost completely by exotic species, as well as areas retaining most of its ecological integrity. This mosaic quality of disturbance and ecological functions results in the large number of species found in the temporary zone.

Table 3: List of plant species in the temporary zone

Temporary Zones	Habitat
Trees & shrubs	
<i>Acacia karoo</i>	Bushveld, grassland and coastal dune forest
<i>*Acacia mearnsii</i>	Invader of grassland, forest gaps, roadsides and watercourses
<i>Celtis africana</i>	Forest, bushveld and grassland. It often occurs on dolomite
<i>Diospyros lycioides</i>	Occurs in a wide variety of habitats
<i>*Eucalyptus species</i>	
<i>Rhus lancea</i>	Occurs in a wide variety of habitats, often on calcareous substrates
<i>Rhus pyroides</i>	Wide variety of habitats
<i>Rhus zeyheri</i>	Bushveld, often in rocky places or on dolomite
Grasses & Sedges	
<i>Aristida transvaalensis</i>	Bushveld, between rocks (Pioneer)
<i>Digitaria eriantha</i>	Grows along side vleis
<i>Eragrostis chloromelas</i>	Stony slopes in sandy and loam soil. More often in open grassland than bushveld. (sub-climax / climax)
<i>Eragrostis gummiflua</i>	Open grassland and bushveld. Often road reserves and other disturbed places. Also damp areas such as seepage zones. Mostly sandy and gravelly soil. (Sub-climax)
<i>Eragrostis plana</i>	Grows in disturbed places in all types of soil. Mostly damp patches. (sub-climax)
<i>Eragrostis species</i>	
<i>Eragrostis superba</i>	In disturbed places, mostly in sand, loam and gravelly soil. Sometimes in clay soil and on termite mounds. (sub-climax)
<i>Hyparrhenia tamba</i>	In road reserves, especially where water collects and in damp soil next to rivers and vleis. (climax)
<i>Imperata cylindrica</i>	Poorly drained, damp soil such as vleis and riverbanks where it forms dense stands. Also other habitat types in areas with a high rainfall.
<i>Melinis repens</i>	Disturbed places
<i>Panicum species</i>	
<i>Paspalum dilatatum</i>	Vlei areas and near rivers, also in disturbed places
<i>Setaria sphacelata</i>	
<i>Themeda triandra</i>	Abundant in undisturbed open veld. On any type of soil, but mostly clay soil.
<i>Trachypogon spicatus</i>	Mostly open undisturbed grassland. Often near vleis. Mostly in sandy and gravelly soil

Forbs	
<i>Aloe greatheadii</i> var. <i>davyana</i>	Grass and bushveld, often in overgrazed areas
* <i>Amaranthus hybridus</i>	Weed of disturbed places
<i>Asparagus species</i>	
<i>Asparagus suaveolens</i>	Rocky grassland in Bushveld
<i>Berkheya radula</i>	Moist grassland and wetlands
* <i>Bidens pilosa</i>	Cosmopolitan weed, common in disturbed areas
<i>Chamaecrista mimosoides</i>	Grassland
* <i>Coryza albida</i>	Common weed of disturbed areas and crops
<i>Crabbea species</i>	
<i>Gomphocarpus physocarpus</i>	In disturbed areas in grassland
<i>Helichrysum rugulosum</i>	Grassland
* <i>Hibiscus trionum</i>	Grassveld and disturbed places, often a weed of cultivated land
* <i>Ipomoea purpurea</i>	Weed of disturbed places
<i>Lantana rugosa</i>	Common in bushclumps in rocky hills, in shade
<i>Monsonia angustifolia</i>	Grassveld and bushveld, often in disturbed places.
* <i>Oenothera rosea</i>	Mostly moist disturbed areas. Sometimes in shade
<i>Schkuhnia pinnata</i>	Common weed
<i>Senecio affinis</i>	Widespread in grassland
<i>Sida dregei</i>	Normally in shade under trees
* <i>Solanum mauritianum</i>	Weed, mostly in bushclumps, and next to rivers and streams
<i>Solanum panduriforme</i>	Widespread in grassland
<i>Stoebe vulgaris</i>	Widespread in grassland. Increase in overgrazed veld
* <i>Tagetes minuta</i>	Common weed of disturbed areas and cultivated fields. Widespread
* <i>Verbena brasiliensis</i>	A general weed in disturbed and moist areas
<i>Vernonia oligocephala</i>	Common in grassland, widespread
* <i>Zinnia peruviana</i>	Naturalised weed. Often in disturbed places and in the shade of bushclumps

* Indicates exotic species

6.2.3.2 Invasive species

Category 1 plants are plants that will no longer be allowed to occur on any property in South Africa, because their harmful properties outweigh their useful qualities. The plants may not be planted or propagated in any way and existing individuals should be removed. These species may not be transported or allowed to disperse (Landcare South Africa). Category 1 invasive species found on the site is *Arundo donax* and *Solanum mauritianum*.

Category 2 plants are plants proven to have a potential for becoming invasive, but with commercial value. Provision is made in CARA in Regulation 15 and 16 for the species to occur in certain demarcated areas, but the species has to be removed from all areas outside the demarcated areas. An area for the growing of category 2 plants can only be demarcated by the Executive Officer. Since the growing of category 2 plants qualifies as a water use, a water use licence has to be obtained from Department of Water Affairs and Forestry (DWAF) for an area of 1ha and larger. It is also important to ensure that all reasonable steps have been taken to stop the spread of the species to other areas, through seed or vegetative growth. Category 2 plants may never occur within 30m of the 1:50 year floodline of any wetlands or watercourses (Landcare South Africa Date). Category 2 plants occurring on the site are *Acacia mearnsii* and *Eucalyptus* species.

Category 3 plant invaders are plants that are proven to have the potential of becoming invasive. These plants are however popular garden plants (ornamentals or shade trees) and it will take a long time to replace these species. Category 3 plants are not allowed to occur anywhere, unless the plants were already in existence when the regulations came into effect. The conditions for the plants to remain is that all reasonable measures are taken to prevent the spread of the species and that none of the plants occur within 30m of the 1:50 year flood zone of any wetlands or water courses. No propagative material of these plants may be planted, imported or transported in any way. It is however legal to trade the wood of these plants as well as other products that do not have the potential to grow (Landcare South Africa). *Ipomoea purpurea* is a category 3 plant occurring on the site.

6.3 Red Data species

Potential habitat for Red Data plants, mammals, birds, reptiles, amphibians and invertebrates were assessed. Although possible habitat for some Red Data species occurs on site, it should be taken into account that the habitat is disturbed and this may influence the occurrence of the species. The site is however surrounded by agricultural developments and low density developments. According to the GDACE Red Data database no potential Red Data mammal species occurs on site.

Most of the Red Data invertebrate species potentially occurring on the site occur on the ridge areas (M Forsyth, GDACE, *pers com* 12/04/2005). The only invertebrate species potentially occurring on site in the wetland area is the Marsh sylph (*Matisella meninx*). The host plant of this species, *Leersia hexandra* (http://www.lepsoc.org.za/red_data_book.htm, May 2005), has been observed on site. This butterfly species occurs widespread throughout the country. However, the species requires a number of habitat requirements to occur on the site.

Only one Red Data reptile and one Red Data plant species can possibly occur on site. The reptile species is the African Rock Python (*Python natalensis*), found in savanna, especially riverine areas and the plant species is *Galermagrostis epigeios* var. *capensis*, a species occurring in wetland areas and has been recorded in the quarter degree grid. Four Red Data bird species can possibly occur on the site and are listed in Addendum C.

Listed in Addendum C are all the Red Data species, which could potentially utilise the site.

7. BUFFER ZONES

Buffer zones are collars of land around sensitive areas that filters out the negative influences from adjacent activities. These include the effects of invasive plant and animal species, abiotic habitat alterations and pollution. Buffer zones can also provide more space for the functioning of ecological processes (Pfab, 2000).

There is a lot of debate on the width of a buffer zone that is required. These are a few guidelines:

- According to the Gauteng Red Data Plant Policy (Pfab, 2000) if Red Data plant species have been found on the site a buffer zone between 300m and 600m around the population is needed, depending on the species and the area. If suitable habitat occurs for a Red Data species to be present the habitat should be mapped and no structures may occur within the habitat for priority A1 and A2 species (critically endangered and endangered species), and disturbance of the natural environment should be kept to a minimum. In the case of priority B species (vulnerable species), impacts on the suitable habitat should be mitigated.
- According to the GDACE Ridge Policy (Pfab, 2001) a 200m buffer zone should be allowed around a Class 2 ridge.
- According to the Carolinian Canada Draft Guide for the Determination of Setbacks and Buffers (<http://www.carolinian.org>, 23 May 2003) the minimum buffer sizes are:
 - For wildlife habitat – 100 m
 - Woodlands – 10 m beyond drip line of trees
 - Wetlands – 30 m
 - Watercourses – 30 m from high water mark
 - Corridors – 100 m (urban) and 200 m (rural)

A development has different impacts on the surrounding environment and on a wetland. The development changes the infiltration rate, amount of runoff and runoff intensity of the site, and therefore the water regime of the entire site. A hard impervious surface adjacent to the wetland will block normal water flow to the wetland, while increasing stormwater flow during a rainfall event. The combination of these factors will lead to the degradation of the wetland and erosion within the wetland and drainage line. Legislation requires a 10m area around wetlands, where no development or cultivation may take place. It is therefore suggested that a 10m buffer zone be placed around the wetland to limit the impact of the development on the wetland.

8. RECOMMENDATIONS

The following recommendations are made based on the wetland system and its functions:

- **Development buffer zones:** Development should remain outside all the wetland zones. A buffer zone of 10m is recommended around the wetland to limit the impacts of the development on the wetland. A channel can be constructed as indicated on the layout map of the regional townplanners, Vlietsra Town and Regional Planners Layout in Addendum D, to replace the existing drainage line running northwards to the wetland, but the channel has to be planted with suitable indigenous vegetation. The channel should not be lined with concrete. Suitable erosion control measures have to be implemented to prevent erosion in the channel as well as in the wetland.
- **Bulk services supply:** As the natural slope is towards the wetland, it is required that adequate protection be given to the services supply, especially sewerage.
- **Wetland rehabilitation:** Guidelines have been included for wetland rehabilitation (Addendum F).
- **Erosion:** In order to prevent erosion towards the wetland zones during the construction phase, physical protection measures will be required. Revegetation of the disturbed areas should occur as soon as possible after construction.
- **Protection of natural habitat:** Minimal areas should be disturbed for construction purposes.
- **Invasive species:** All invasive species should be removed and the wetland rehabilitated.
- **Rubble in wetland:** The rubble and soil that has been dumped in the wetland should be removed to rehabilitate the wetland. No dumping of rubble into the wetland should be allowed during construction and operation.

9. CONCLUSION

This document provides a status quo of the wetland on the proposed development site on Portion 5 of the farm Tygervalley 334 JR. Visible signs of disturbances occur on the site.

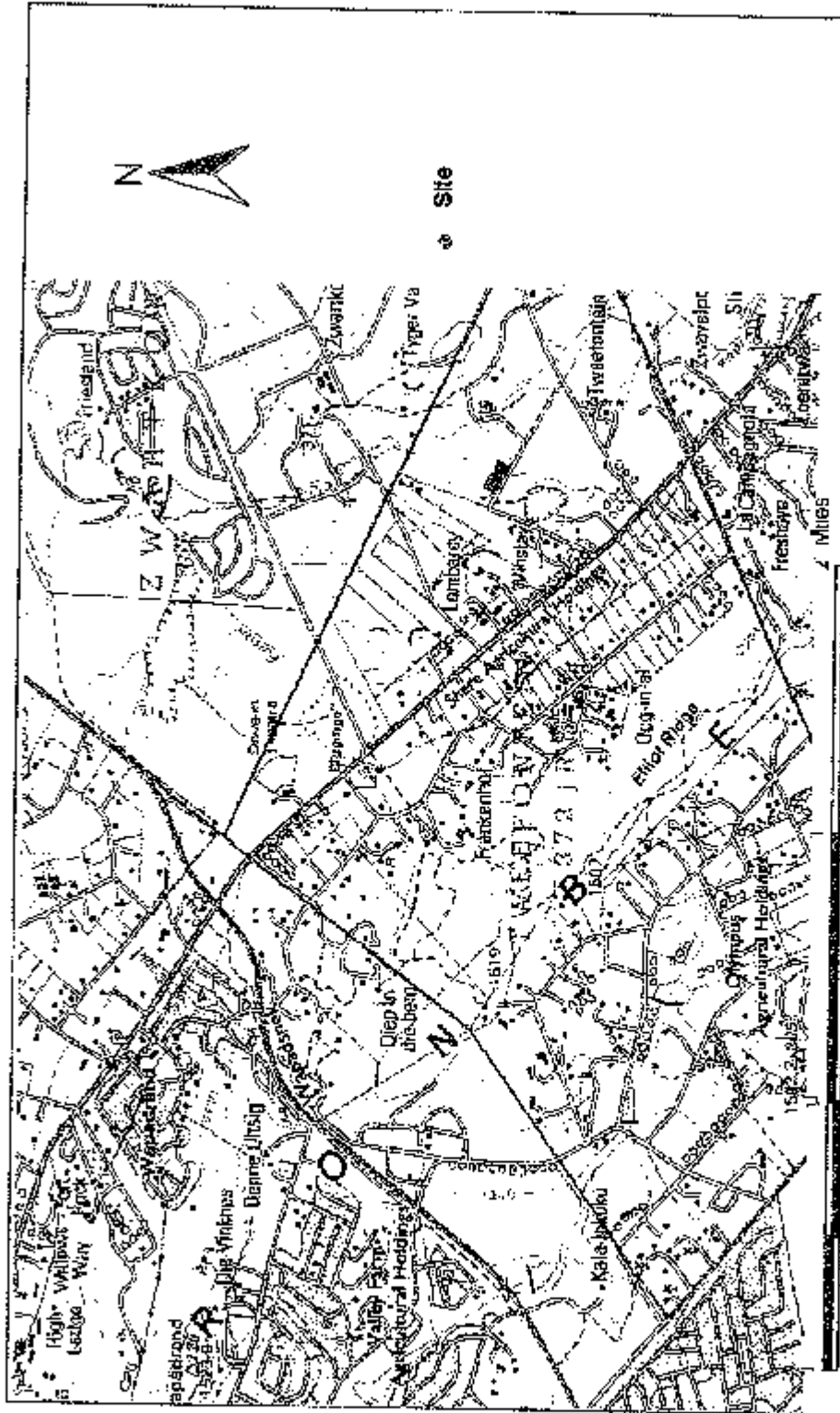
The wetland zones have been identified and the species occurring in each zone identified. The functions performed by the wetland have been identified. The most important of these functions is probably biodiversity maintenance and as habitat for Red Data species. The wetland provides potential habitat for Red Data species, mainly bird species and one invertebrate species. If the wetland habitat is not disturbed, the habitat for these species should remain undisturbed.

The wetland is not in a pristine state, however it does contribute to habitat diversity and flood attenuation. Several recommendations as well as a guideline for rehabilitation of the wetland, have been made with regards to the proposed development. If these mitigation measures are adhered to during the construction and operational phases, it is anticipated that the function of the wetland and its inhabitants will remain.

10. REFERENCES

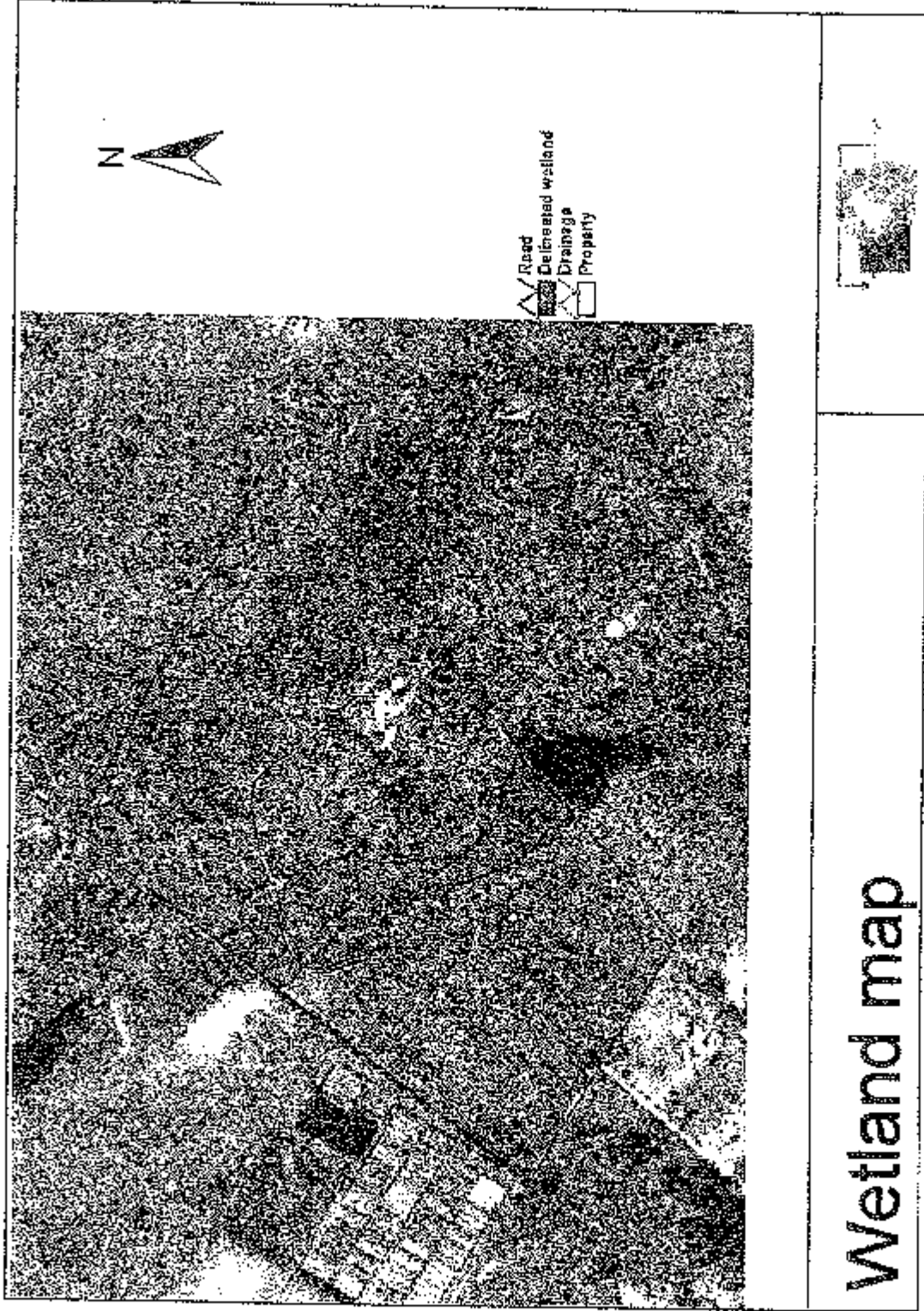
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Addendum A – Site locality plan



Portion of 1:50 000 map 2528CD

Addendum B – Wetland map as delineated using vegetation indicators



Wetland map

Addendum C – Red Data Species potentially occurring on the site

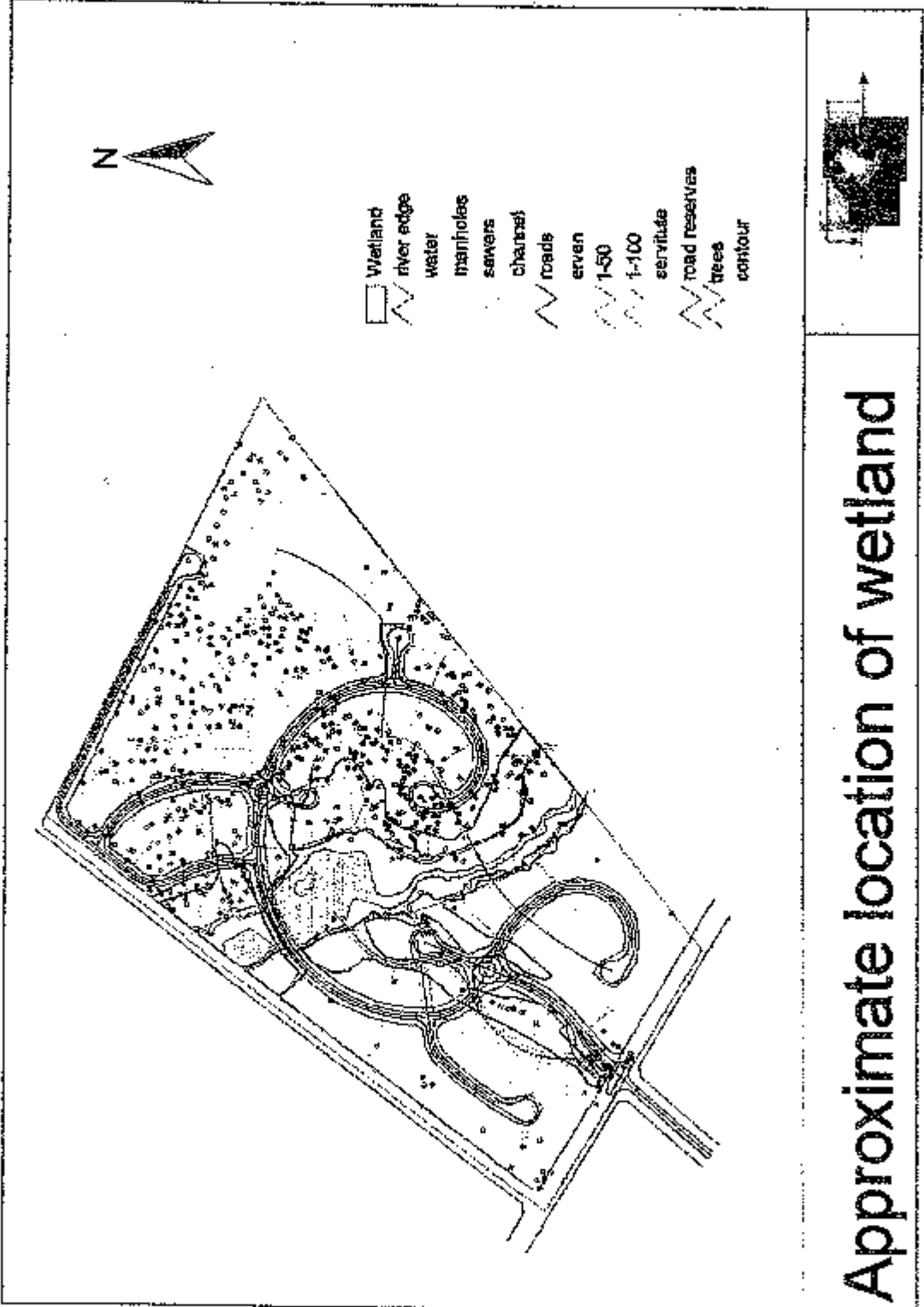
SCIENTIFIC NAMES	COMMON NAMES	STATUS	HABITAT
BIRDS			
<i>Anthropoides parvirostris</i>	Blue Crane	V	Midland and highland grassveld, edge of karoo, cultivated land and edges of vleis (Maclean 1993). Nests in both moist situations in vleis which have short grass cover and in dry sites far from water, usually exposed places such as on hillsides; forages in grassland and cultivated and fallow lands; roosts communally in the shallow water of pans and dams (Tarboton et al. 1987).
<i>Falco naumanni</i>	Lesser Kestrel	V	Forage preferentially in pristine grassland. They roost communally in tall trees, mainly <i>Eucalyptus</i> , in urban areas (in Barnes 2000). Open grassland and intensively cultivated agricultural areas under maize, sorghum, peanuts, wheat, beans and other crops (Tarboton & Ailan 1984). Typical of semi-arid grasslands, avoiding wooded areas.
<i>Tyto capensis</i>	Grass Owl	V	Almost exclusively in rank grass, typically fairly high altitudes. Breeds in permanent and seasonal vleis, which it vacates while hunting or post-breeding. Will breed in any area of long grass and is not necessarily associated with wetlands. Foraging confined to tall grassland (in Barnes 2000). May occur in sparse <i>Acacia</i> woodland where patches of dense grass cover are present (Harrison et al. 1997a).
<i>Myiarcha ibis</i>	Yellowbilled Stork	NT	Utilises diverse habitats, including dams, large marshes, swamps, estuaries, margins of lakes or rivers, seasonal wetlands where there are areas of vegetation free shallow water, and even small pools (Harrison et al. 1997a).
REPTILES			
<i>Python natalensis</i>	Southern African Python		Found in open savanna regions, specifically rocky and riverine shrub areas.
INSECTS			
<i>Metisella meninx</i>	Marsh fly	V	Wetlands Host plant: <i>Leersia hexandra</i>
PLANTS			
<i>Calamagrostis spigeros</i> var. <i>capensis</i>		NT	Vleis.

V = Vulnerable

NT= Near threatened

The categories of threat assigned to the species and the habitat description of the species is as provided by GDACE.

Addendum D – Approximate location of wetland on layout map as delineated using the soil properties (Johan van der Merwe 2005)



Approximate location of wetland

Addendum E – Geotechnical soil zones (Johan van der Merwe (Pty) Ltd, 2005)

Addendum F – Wetland rehabilitation guidelines

WETLAND REHABILITATION GUIDELINES

1 Planning phase

1. Prepare an action plan for eradication of alien invasive species.
2. Prepare an action plan for the removal of dumped material.
3. Species to be used during the rehabilitation should be obtained from commercial sources/ replanted from other areas on site.

2 General rehabilitation

1. Rehabilitation of the disturbed wetland areas has to take place as soon as possible to prevent further deterioration of the wetland functions.
2. Vegetation should be planted in cleared areas in order to limit erosion.
3. All exotics should be removed and controlled, as these species establish in disturbed areas, thereby reducing the potential resources for indigenous vegetation.
4. All rubble and invasive species should be removed from the wetland in such a way as to prevent erosion taking place in the wetland.

3 Eradication of invasive species

Declared weeds/invasive species have to be removed according to Regulations of the Conservation of Agricultural Resources Act. Invasive species observed on the site are included under 6.2.3.2 of the main document. In the table below are the proposed removal methods.

Species	Category	Eradication
<i>Arundo donax</i>	1	Control of reeds are difficult. <i>A. donax</i> can be controlled by physically removing the whole plant, including the rhizomes, as regrowth can occur from pieces left in the soil. <i>A. donax</i> can also be controlled chemically but this is not recommended in a water course, especially one with as many dams downstream. Follow-up treatment is necessary.
<i>Solarium mauritanum</i>	1	The plants can be controlled by cutting and painting the stumps with an herbicide such as chopper. The clouds of fine hairs that are released when the plants are cleared mechanically contain toxins that cause respiratory disease and workers should be protected. A leaf-eating bio-control agent is available for this species. Follow-up control is necessary.
<i>Acacia mearnsii</i>	2	The long-term control of wattle is difficult as they produce seeds that may retain dormancy for up to 50 years, and the plants coppice easily. The plants should be cut down and a herbicide (such as Chopper) painted on the stumps. Coppice should also be controlled and regular follow-up is necessary for several years. A group such as Working for Water can be consulted on the control of wattle, and on the use of wattle products.
Eucalyptus species	2	The trees should be cut down and the stumps painted with herbicide. Working for Water can be consulted on the control of this species and on the uses of the wood.
<i>Iponoxea purpurea</i>	3	This species is best removed by hand. Regular follow-up care is necessary as the seeds from <i>I. purpurea</i> can germinate over an extended period of time and from great depths.

4 Wetland species to use in rehabilitation

Wetland species that may be used include *Typha capensis*, *Leersia hexandra*, *Imperata cylindrica*, *Eragrostis plana*, *Digitaria eriantha* and *Schoenoplectus corymbosus*. The species should be planted along the contour lines to intercept the flow of water. The habitat of these species is listed in the table below.

Species	Zone	Habitat
<i>Typha capensis</i>	Permanent / Seasonal	Swampy areas and next to streams
<i>Leersia hexandra</i>	Permanent / Seasonal	In or near permanent water sources. Dense stands in shallow water or wet soil.
<i>Imperata cylindrica</i>	Temporary	Poorly drained, damp soil such as wetlands and riverbanks where it forms dense stands. Also other habitat types in areas with a high rainfall.
<i>Eragrostis plana</i>	Temporary	Grows in disturbed places in all types of soil. Mostly damp patches.
<i>Digitaria eriantha</i>	Temporary	Grows at edges of wetlands
<i>Schoenoplectus corymbosus</i>	Seasonal	Swampy grassland

5 Monitoring

In order to evaluate the rehabilitation programme, the following monitoring measures can be applied:

- o The rehabilitation program is adhered to
- o Revegetation is successfully taking place
- o No dumping of waste
- o Revegetation is reinforced by planting appropriate plants if necessary
- o Limited erosion, and if it occurs repaired within reasonable timeframe
- o Compliance with all relevant legislation, permits and authorisations regarding soil conservation and rehabilitation of disturbed areas
- o Problems with the rehabilitation programme are addressed
- o Weeds and Invader species are controlled
- o Prevention of degradation of waterways by excessive amounts of soil particles in the water
- o Wetland species diversity remain or improve
- o Wetland habitat improve, especially for bird species

Version 0

**Addendum 14: Report on Geotechnical investigation carried out for the proposed:
Tygervalley Housing Development to be established on: Portion 5 of the
farm Tygervallei 334-JR, Pretoria District, Tshwane Metropolitan
Municipality, Gauteng Province**

Fauna & Flora



Appendix G7

GALAGO ENVIRONMENTAL



***Flora and Fauna
Habitat Assessment***

of

**PORTION 5 OF THE FARM
TYGER VALLEY 334-JR**

November 2006

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1. INTRODUCTION

A mammal, bird, reptile, amphibian and plant survey was requested for the ridge area of Portion 5 of the Farm Tyger Valley 334-JR, scheduled for development. This specialist fauna and flora survey focuses on the current status of vertebrate and plant species occurring or likely to occur on the site of the proposed development. The study also provides an assessment of threatened and potentially threatened species likely to occur on the study area as this pertains to *in situ* habitats including throughout their inclusive distributional range.

2. OBJECTIVES OF THE HABITAT STUDY

- To assess the current status of the habitat component and current general conservation status of the property;
- To list the perceptible flora of the site and to recommend steps to be taken should endangered, vulnerable or rare species be found;
- To provide lists of mammals, birds, reptiles, and amphibians which occur or might occur, and to identify species of conservation importance;
- To highlight potential impacts of the development on the fauna and flora of the proposed site; and
- To provide management recommendations to mitigate negative and enhance positive impacts should the proposed development be approved.

3. SCOPE OF STUDY

This report:

- Lists the more noticeable trees, shrubs, suffrutices, herbs, geophytes and grasses observed during the study and offers recommendations regarding the preservation of the pristine plant communities of the area;
- Provides a mammal, bird, reptile and amphibian survey based on sightings and literature, with comments on their preferred habitats;
- Comments on connectivity with natural vegetation on adjacent sites;
- Comments on ecological sensitive areas;
- Evaluates the conservation importance and significance of the site with special emphasis on the current status of resident threatened species; and
- Offers recommendations to reduce or minimise impacts, should the proposed exploration be approved

4. STUDY AREA

The study site lies in the quarter degree grid square 2528CD (Rietvleidam). According to the latest vegetation map of SANBI, the site falls within Marikana Thornveld (Mucina, Rutherford & Powrie, 2005).

Low and Rebelo (1996) classified the area as Rocky Highveld grassland with shallow rocky soil, which is a transitional type between the high inland plateau grassland and the lower inland plateau bushveld. Of the area covered by this type of grassland, 65% is transformed and 1,38% conserved. The vegetation is in addition highly threatened by urbanization, agriculture and frequent burning. The 21,5458 hectare site comprises two distinct biotopes, namely the grassy flatland towards the south, and the 10.1652 randjie/ridge along the north of the property, which is the focus of this evaluation.

The site is situated north-east of Lynnwood Road and south of Silver lakes and the Farm Inn Hotel. The soil on most of the site consists of light shale soil. A drainage line, that forms the wetland system of Silver Lakes Golf Estate to the north of the site, runs from south-east to north-west through the centre of the site. The north-eastern quadrant of the site comprised a rocky ridge with a plateau in the eastern corner.

The flat land appears to have been tilled in the past, and has since been overgrown with a dense stand of pioneer grass including tall thatch grass, parts of which has not been burnt in recent years. This section is also devoid of any trees of significance, with the exception of a few isolated *Eucalyptus* trees. The soil here is a deep brown sandy soil.

The ridge carries typical indigenous bushveld woodland and dense grass. The slope and ridge is exceptionally rocky. Derelict buildings are located at the foot of the ridge in the south-eastern corner of the main study area.

GPS coordinates;

The main gate to the site 25° 47' 39.8"S; 28° 22' 09.9"E

Dam wall 25° 47' 29.3"S; 28° 22' 14.8"E

Buildings at the foot of the ridge 25° 47' 32.7"S; 28° 22' 23.2"E

5. METHODS

5.1 Vegetation survey

Information about the Red Data species that occur in the area was obtained from GDACE. The Guidelines issued by GDACE to plant specialists were consulted to ascertain the habitat of the Red Data species concerned.

The PRECIS list of plants recorded in the 2528CD quarter degree grid square was obtained from SANBI. This list was consulted to verify the record of occurrence of the plant species seen on the site.

The site was visited on 4 December 2006 and reviewed to determine the various plant communities (see Figure 1). From each plant community one or more plots (depending on the size and composition of the plant community) were selected at random for detailed study. Each plot, which measured about 10m x 10m, was surveyed in a random crisscross fashion and the plants recorded. The vegetation along the ridge was surveyed in a random zigzag manner, searching meticulously for Red-listed species.

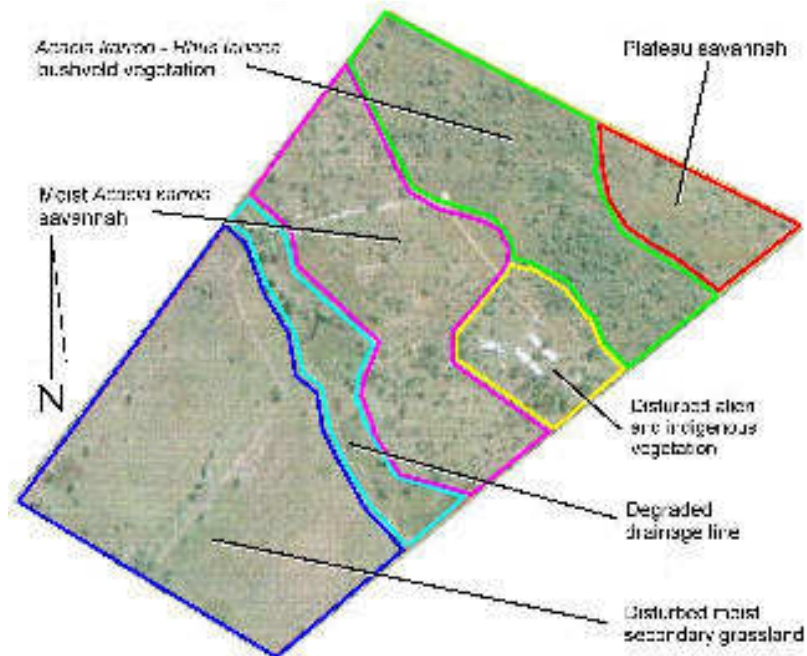


Figure 1. Vegetation communities

5.2 Fauna survey

Site visits were conducted on 18, 19 and 27 November 2006. During these visits the observed and derived presence of species associated with the recognized vegetation units of the study site, were recorded.

4.3.1 Field Survey

During the site visits mammals, birds, reptiles and amphibians were identified by visual sightings through random transect walks. In addition, mammals were also identified by means of spoor, droppings or roosting sites. Possible burrows or reptile habitats (termitaria, stumps or rocks) were inspected for any inhabitants. Amphibians were also identified by their vocalisations.

Birds were identified visually using a 10X42 Bushnell Legend binocular and a 20X-60X Pentax spotting scope and by call and where necessary verified from *Sasol Birds of Southern Africa* (Sinclair *et al.*, 2005) and *Southern African Bird Sounds* (Gibbon, 1991). Calls are in particular important to identify species of the genus *Cistocola*. All sighting of

bird species on site were plotted on a PDA using Cyber Tracker as database, which is connected to an external GPS mouse via blue tooth.

No trapping or mist netting was conducted, as the terms of reference did not require such intensive work.

Three criteria were used to assess the probability of occurrence of birds species as well as Red Data bird species listed for the study that will most probably make use of the site and surrounding area for breeding or feeding purposes: Known distribution range, habitat preference and the presence of suitable habitat on site as well as the presence of food to assess individual species probability of occurrence.

4.3.2 Desktop Survey

As the majority of mammals, reptiles and amphibians are secretive, nocturnal and/or seasonal; distributional ranges and the presence of suitable habitats were used to deduce the presence or absence of these species based on authoritative tomes, scientific literature, field guides, atlases and data bases.

The probability of occurrences of **mammal** species was based on their respective geographical distributional ranges and the suitability of on-site habitat. In other words, *high* probability would be applicable to a species with a distribution range overlying the study site as well as the presence of prime habitat occurring on the study site. Another consideration for inclusion in this category is the inclination of a species to be common, i.e. normally occurring at high population densities.

Medium probability pertains to a mammal species with its distributional range peripherally overlapping the study site, or required habitat on the site being sub-optimal. The size of the site as it relates to its likelihood to sustain a viable breeding population, as well as its geographical isolation is also taken into consideration. Species categorized as *medium* normally do not occur at high population numbers, but cannot be deemed as rare.

A *low* probability of occurrence will mean that the species' distributional range is peripheral to the study site and habitat is sub-optimal. Furthermore, some mammals categorized as *low* are generally deemed to be rare.

The occurrence of some key **bird** species was verified according to the distribution record obtained during the Southern African Bird Atlas period from 1981 tot 1993 (Harrison *et al* 1997) as well as records from 1974 to 1987 according to Tarboton *et al* (1987).

The occurrence and historic distribution of these birds, including all Red Data bird species for the 2528CD quarter-degree grid cell were all verified according to Harrison *et al* (1997) and Tarboton *et al* (1987). The reporting rate was scored between 0 – 100% and is calculated as follows: Total number of cards on which a species was reported during the Southern African Bird Atlas period X 100 ÷ total number of cards for a particular quarter degree grid cell. The colour codes for each species are represented as follow: YELLOW = VERY LOW, LIGHT ORANGE = LOW, DARK ORANGE = MEDIUM AND RED = HIGH.

It is important to note that a quarter-degree grid square covers a large area. The 2528CD quarter-degree square covers an area of $\pm 27 \times 25$ kilometres ($\pm 693 \text{ km}^2$) and it is possible that suitable habitat may exist for a certain red data bird species within this general and surrounding area but that the specific habitat found on site will not suit the particular red data species although it was recorded for the quarter-degree square. For example, the Cape Vulture occurs along the Magaliesberg but will not favour the habitat found within the Pretoria CBD which are both in the same quarter-degree square. Red data bird species were categorised according to Barnes (2000).

4.3.3 Specific Requirements

Particular reference was made to certain species (as required by the GDACE minimum requirements):

During the site visits, the study site was visually surveyed and assessed for the potential occurrence of:

- Juliana's golden mole (*Neamblosomus juliana*)
- Rough haired golden mole (*Chrysospalax villosus*)
- Giant Bullfrogs (*Pyxicephalus adspersus*);
- Red Data avifauna, with particular reference to the African Grass Owl (*Tyto capensis*), the Secretarybird (*Sagittarius serpentarius*) and the African Marsh Harrier (*Circus ranivorus*); and

6. RESULTS

6.1 Vegetation survey:

6.1.1 Plant communities

Six plant communities were identified:

- *Acacia karroo* – *Rhus lancea* bushveld;
- Plateau savannah;
- Moist *Acacia karroo* savannah;
- Disturbed moist secondary grassland;
- Degraded drainage line; and
- Disturbed alien and indigenous vegetation.

Tables 1 to 4 list the trees, shrubs, suffrutices, geophytes, herbs and grasses actually found on each of the surveyed areas of the site.

6.1.2 Medicinal plants

The names of known medicinal plants are marked with numbers to footnotes in Tables 1 to 4 and the footnotes themselves appear at the end of the last table. On the whole site 33 plant species with medicinal properties were recorded, 66% of which were found on the slope of the ridge.

6.1.3 Alien plants

Alien plants are not listed separately, but are included in the lists as they form part of each particular vegetation group. Their names are marked with an asterisk in Tables 1 to 4. Seven alien plant species, of which four species were Category 1 Declared weeds, and one was a Category 2 Declared invader, were recorded on the site. In general, the alien species were found around the old residence and outbuildings. The Eucalyptus trees, a Category 2 Declared invader, were found along the drainage line.

The alien plant names printed in **bold** in the plant tables are those of Category 1 Declared Weeds and the removal of these plants is **compulsory** in terms of the regulations formulated under “The Conservation of Agricultural Resources Act” (Act No. 43 of 1983), as amended. Category 2 Declared invaders should likewise be controlled.

6.1.4 Orange listed species

The habitat was suitable for three Orange-listed plant species known to occur in the quarter degree grid. (See Appendix A for a list of the Red-listed and Orange-listed plants that occur in the quarter degree grid.)

The orange-listed *Hypoxis hemerocallidea* occurred, especially in the Moist *Acacia karoo* savannah.

6.1.5 Red listed species

The habitat was not suitable for any of the red-listed plant species known to occur in the quarter degree grid.

6.1.6 *Acacia karoo* – *Rhus lancea* bushveld vegetation

The species diversity in this vegetation community was high with 88 species recorded, of which 17 were woody species, 12 were grasses and 45 were herbaceous species. Only one alien plant, an inoffensive species, was found. Sixty six percent of the medicinal species were found in this group.

Connectivity with natural vegetation areas existed on all sides. This vegetation community was considered sensitive and should be excluded from development.



Acacia karroo – *Rhus lancea* bushveld vegetation on slope of the ridge

Table 1: Plants recorded in the *Acacia karroo* – *Rhus lancea* bushveld vegetation

SCIENTIFIC NAME	ENGLISH NAME	AFRIKAANS NAME
<i>Acacia caffra</i>	Common hook thorn	Gewone haakdoring
<i>Acacia karroo</i> ^{1,2}	Sweet thorn	Soetdoring
<i>Acalypha villicaulis</i>		
<i>Albuca setosa</i>		Slymbol
<i>Aloe greatheadii</i> var <i>davyana</i> ^{1,2}		Kleinaalwyn
<i>Aloe marlothii</i> subsp <i>marlothii</i> ^{1,2}	Mountain aloe	Bergaalwyn
<i>Alysicarpus rugosus</i> subsp <i>perennirufus</i>	Pioneer fodder plant	
<i>Anthospermum rigidum</i> subsp <i>rigidum</i>		
<i>Aristida congesta</i> subsp <i>barbicollis</i>	Spreading three-awn grass	Witsteekgras
<i>Asparagus flavicaulis</i> subsp <i>flavicaulis</i>		
<i>Asparagus setaceus</i>	Asparagus fern	
<i>Aster harveyanus</i>		Bloublommetjie
<i>Athrixia elata</i>	Wild tea	Bostee
<i>Becium obovatum</i> subsp <i>obovatum</i> var <i>obovatum</i> ^{2,3}	Cat's whiskers	Katsnor
<i>Bonatea speciosa</i> var <i>antennifera</i>	Terrestrial orchid	Grondorgidie
<i>Brachiaria serrata</i>	Velvet grass	Fluweelgras
<i>Canthium gilfillanii</i>	Velvet rock alder	Fluweelklipels
<i>Canthium mundianum</i>	Rock alder	Klipels
<i>Celtis africana</i>	White stinkwood	Witstinkhout
<i>Cephalaria zeyheriana</i>	Mock scabious	
<i>Cheilanthes viridis</i> var <i>viridis</i>	Cliff brake	Kransruigtevaring
<i>Chlorophytum fasciculatum</i>		
<i>Clematis brachiata</i> ²	Traveler's joy	Klimop
<i>Conyza podocephala</i>		
<i>Corchorus asplenifolius</i>		
<i>Crabbaea angustifolia</i> ²		
<i>Cussonia paniculata</i> subsp <i>sinuata</i> ²	Highveld cabbage tree	Hoëveld kiepersol
<i>Digitaria eriantha</i>	Finger grass	Vingergras
<i>Diospyros lycioides</i> subsp <i>guerkei</i>		Bloubos
<i>Elionurus muticus</i>	Wire grass	Draadgras
<i>Eragrostis capensis</i>	Heart-seed love grass	Hartjiesgras

SCIENTIFIC NAME	ENGLISH NAME	AFRIKAANS NAME
<i>Eragrostis chloromelas</i>	Curly leaf	Krulblaar
<i>Eragrostis curvula</i>	Weeping love grass	Oulandsgras
<i>Euclea crispa</i> subsp <i>crispa</i> ⁴	Blue guarri	Blou ghwarrie
<i>Felicia muricata</i> subsp <i>muricata</i> ^{1,2,3}	White felicia	
<i>Gerbera viridifolia</i>		Griekwateebossie
<i>Gladiolus</i> cf <i>dalenii</i> subsp <i>dalenii</i> ³	Wild gladiolus	Wildeswaardlelie
<i>Gymnosporia buxifolia</i> ²	Spikethorn	Pendoring
<i>Helichrysum nudifolium</i> var <i>nudifolium</i> ^{1,2}	Hottentot's tea	Hottentotstee
<i>Helichrysum rugulosum</i> ^{2,3}		
<i>Hermannia depressa</i> ^{2,3}	Creeping red Hermannia	Rooiopslag
<i>Heteromorpha arborescens</i> var <i>abyssinica</i> ^{1,2}	Common parsley tree	Gewone pietersielieboom
<i>Heteropogon contortus</i>	Spear grass	Assegaaigras
<i>Hibiscus aethiopicus</i> var <i>ovatus</i> ^{2,3}	Common dwarf Hibiscus	
<i>Hyparrhenia hirta</i>	Common thatching grass	Dekgras
<i>Hypoxis hemerocallidea</i> ^{1,2,3}	Star flower	Gifbol
<i>Hypoxis rigidula</i> var <i>rigidula</i>	Silver-leaved star flower	Wilde tulp
<i>Indigofera hedyantha</i>		Aambeibossie
<i>Indigofera hiliaris</i> var <i>hiliaris</i>	Red indigo bush	
<i>Ipomoea bathycolpos</i>		Veldsambreeltjies
<i>Ipomoea oblongata</i> ²		
<i>Jamesbrittenia aurantiaca</i>	Cape saffron	Saffraanbossie
<i>Lactuca inermis</i>	Wild lettuce	
<i>Lantana rugosa</i> ^{2,3}	Bird's brandy	Voëlbrandewyn
<i>Ledebouria inquinata</i>		
<i>Ledebouria</i> sp		
<i>Lippia javanica</i> ^{1,2,3}	Fever tea	Koorsbossie
<i>Macleodium zeyheri</i> subsp <i>zeyheri</i> ^{2,3}	Doll's protea	
<i>Melinis nerviglumis</i>	Bristle leaf red top	Steekblaarblinkgras
<i>Nidorella hottentotica</i>		
<i>Ornithogalum tenuifolium</i> subsp <i>tenuifolium</i>		Bosui
<i>Pellaea calomelanos</i> var <i>calomelanos</i> ^{1,2}	Black cliff brake	Swart kransruigtevaring
<i>Pentarrhinum inspidum</i>		Donkieperske
<i>Phyllanthus parvulus</i> var <i>parvulus</i>	Dye bush	Kleurbossie
<i>Polygala rehmannii</i>		
<i>Rhoicissus tridentata</i> subsp <i>cuneifolia</i> ¹	Northern bushman's grape	Noordelike boesmansdruif
<i>Rhus lancea</i>	Karee	Karee
<i>Rhus leptodictya</i>	Mountain karee	Bergkaree
<i>Rhus pyroides</i> var <i>pyroides</i> ⁴	Common wild currant	Taaibos
<i>Rhus zeyheri</i> ²	Blue currant	Blou taaibos
<i>Rhynchosia totta</i> var <i>totta</i>	Yellow carpet bean	Tottabossie
<i>Ruellia</i> cf <i>cordata</i>		
<i>Scabiosa columbaria</i> ^{1,2,3}	Wild scabiosa	Bitterbos
<i>Scolopia zeyheri</i>	Thorn pear	Doringpeer
<i>Senecio inornatus</i>		
<i>Senecio venosus</i>		Besembossie
<i>Seriphium plumosum</i>	Bankrupt bush	Bankrotbos
<i>Sonchus dregeanus</i>		
<i>Sonchus oleraceus</i> *	Sow thistle	Sydissel
<i>Tephrosia capensis</i> var <i>capensis</i>		
<i>Teucrium trifidum</i>	Koorsbossie	

SCIENTIFIC NAME	ENGLISH NAME	AFRIKAANS NAME
<i>Themeda triandra</i>	Red grass	Rooigras
<i>Thesium sp</i>		
<i>Tragia minor</i>		
<i>Tristachya leucothrix</i>	Hairy trident grass	Harige driebloemgras
<i>Vernonia galpinii</i>		Perskwasbossie
<i>Vernonia oligocephala</i> ^{1,2}	Cape vernonia	Blounaaldetee bossie
<i>Withania somnifera</i> ^{1,2}	Winter cherry	Geneesblaarbossie
<i>Zanthoxylum capense</i> ^{1,2}	Small knobwood	Klein perdepram

6.1.7 Plateau savannah

The species diversity of this vegetation community was high with 57 species recorded. Of these only seven were wooded species and ten were grass species. Thirty herbaceous species and six geophytic species were recorded. Of the 33 medicinal species, 18 were recorded here. No alien species were observed. Connectivity with natural vegetation areas existed to the north-east and the south-east. This vegetation community was considered sensitive and should be excluded from development.

Table 2: Plants recorded in the Plateau savannah

SCIENTIFIC NAME	ENGLISH NAME	AFRIKAANS NAME
<i>Acacia caffra</i>	Common hook thorn	Gewone haakdoring
<i>Acacia karroo</i> ^{1,2}	Sweet thorn	Soetdoring
<i>Aloe greatheadii var davyana</i> ^{1,2}		Kleinaalwyn
<i>Aster harveyanus</i>		Bloublommietjie
<i>Brachiaria serrata</i>	Velvet grass	Fluweelgras
<i>Bulbostylis burchellii</i>		Biesie
<i>Cephalaria zeyheriana</i>	Mock scabious	
<i>Chaetacanthus setiger</i>		
<i>Cienfuegosia cf gerrardii</i>		
<i>Elephantorrhiza elephantina</i> ^{1,2,3}	Elephant's root	Olifantwortel
<i>Elionurus muticus</i>	Wire grass	Draadgras
<i>Eragrostis capensis</i>	Heart-seed love grass	Hartjiesgras
<i>Eragrostis racemosa</i>	Narrow heart love grass	Smalhartjiesgras
<i>Euclea crispa subsp crispa</i> ⁴	Blue guarri	Blou ghwarrie
<i>Gerbera viridifolia</i>		Griekwateebossie
<i>Hermannia depressa</i> ^{2,3}	Creeping red Hermannia	Rooiopslag
<i>Heteromorpha arborescens var abyssinica</i> ^{1,2}	Common parsley tree Gewone pietersielieboom	
<i>Heteropogon contortus</i>	Spear grass	Assegaaigras
<i>Hibiscus aethiopicus var ovatus</i> ^{2,3}	Common dwarf Hibiscus	
<i>Hyparrhenia hirta</i>	Common thatching grass	Dekgras
<i>Hypoxis hemerocallidea</i> ^{1,2,3}	Star flower	Gifbol
<i>Hypoxis rigidula var rigidula</i>	Silver-leaved star flower	Wilde tulp
<i>Indigofera hedyantha</i>		Aambeibossie
<i>Indigofera hilaris var hilaris</i>	Red indigo bush	
<i>Ipomoea bathycolpos</i>		Veldsambreetjies
<i>Ipomoea crassipes</i> ^{2,3}	Leafy-flowered Ipomoea	Wildewinde
<i>Justicia anagalloides</i>		
<i>Ledebouria inquinata</i>		
<i>Ledebouria revoluta</i> ³	Common ledebouria	
<i>Ledebouria sp</i>		

SCIENTIFIC NAME	ENGLISH NAME	AFRIKAANS NAME
<i>Lippia javanica</i> ^{1,2,3}	Fever tea	Koorsbossie
<i>Macleodium zeyheri subsp zeyheri</i> ^{2,3}	Doll's protea	
<i>Melinis nerviglumis</i>	Bristle leaf red top	Steekblaarblinkgras
<i>Menodora africana</i>		Balbossie
<i>Nidorella hottentotica</i>		
<i>Pentanisia angustifolia</i>	Wild verbena	Sooibrandbossie
<i>Phyllanthus parvulus var parvulus</i>	Dye bush	Kleurbossie
<i>Polygala rehmannii</i>		
<i>Polygala uncinata</i>		
<i>Raphionacme hirsuta</i> ²	Khadi root	Khadiwortel
<i>Rhus lancea</i>	Karee	Karee
<i>Rhus pyroides var pyroides</i> ⁴	Common wild currant	Taaibos
<i>Rhus zeyheri</i> ²	Blue currant	Blou taaibos
<i>Rhynchosia totta var totta</i>	Yellow carpet bean	Tottabossie
<i>Ruellia cf cordata</i>		
<i>Scabiosa columbaria</i> ^{1,2,3}	Wild scabiosa	Bitterbos
<i>Senecio inornatus</i>		
<i>Senecio venosus</i>		Besembossie
<i>Setaria sphacelata var sphacelata</i>	Small creeping foxtail	Kleinkruipmannagras
<i>Sonchus cf nanus</i>		
<i>Striga bilabiata</i>	Small witch weed	
<i>Tephrosia capensis var capensis</i>		
<i>Themeda triandra</i>	Red grass	Roogras
<i>Thesium sp</i>		
<i>Tristachya leucothrix</i>	Hairy trident grass	Harige drieblomgras
<i>Vernonia oligocephala</i> ^{1,2}	Cape vernonia	Blounaaldetee bossie
<i>Withania somnifera</i> ^{1,2}	Winter cherry	Geneesblaarbossie

6.1.8 Moist *Acacia karroo* savannah

Although the species diversity of this vegetation community was not high, no alien species were recorded. The grass cover in general was rather dense, but only seven grass species could be identified, as most grasses have not yet formed inflorescences. A few patches of sparse vegetation were observed. Connectivity with natural vegetation areas on the north-west and part of the north-eastern sides, as well as the south-eastern side, existed. This vegetation community was not regarded as pristine and therefore not considered sensitive.

Table 3: Plants recorded in the Moist *Acacia karroo* savannah

SCIENTIFIC NAME	ENGLISH NAME	AFRIKAANS NAME
<i>Acacia caffra</i>	Common hook thorn	Gewone haakdoring
<i>Acacia karroo</i> ^{1,2}	Sweet thorn	Soetdoring
<i>Acacia tortilis subsp heteracantha</i>	Umbrella thorn	Haak-en-steek
<i>Acalypha caperonioides</i>		
<i>Aloe greatheadii var davyana</i> ^{1,2}		Kleinaalwyn
<i>Anthospermum rigidum subsp rigidum</i>		
<i>Berkheya radula</i>		Boesmanrietjie
<i>Chlorophytum fasciculatum</i>		
<i>Conyza podocephala</i>		
<i>Crabbaea angustifolia</i> ²		
<i>Dipcadi viride</i>		Gifbolletjie, slymuintjie
<i>Eragrostis capensis</i>	Heart-seed love grass	Hartjiesgras

SCIENTIFIC NAME	ENGLISH NAME	AFRIKAANS NAME
<i>Eragrostis chloromelas</i>	Curly leaf	Krulblaar
<i>Eragrostis curvula</i>	Weeping love grass	Oulandsgras
<i>Eragrostis rigidior</i>	Broad-leaved curly leaf	Breëkrulgras
<i>Helichrysum nudifolium var nudifolium</i> ^{1,2}	Hottentot's tea	Hottentotstee
<i>Helichrysum rugulosum</i> ^{2,3}		
<i>Hermannia depressa</i> ^{2,3}	Creeping red Hermannia	Rooiopslag
<i>Hyparrhenia hirta</i>	Common thatching grass	Dekgras
<i>Hypoxis hemerocallidea</i> ^{1,2,3}	Star flower	Gifbol
<i>Melinis nerviglumis</i>	Bristle leaf red top	Steekblaarblinkgras
<i>Nidorella anomala</i>		
<i>Raphionacme hirsuta</i> ²	Khadi root	Khadiwortel
<i>Rhus lancea</i>	Karee	Karee
<i>Rhus zeyheri</i> ²	Blue currant	Blou taaibos
<i>Rhynchosia totta var totta</i>	Yellow carpet bean	Tottabossie
<i>Scabiosa columbaria</i> ^{1,2,3}	Wild scabiosa	Bitterbos
<i>Senecio affinis</i>		
<i>Senecio inornatus</i>		
<i>Striga bilabiata</i>	Small witch weed	
<i>Themeda triandra</i>	Red grass	Rooigras
<i>Verbena aristigera</i>	Fine-leaved verbena	Fynblaar verbena
<i>Vernonia oligocephala</i> ^{1,2}	Cape vernonia	Blounaaldetee bossie
<i>Ziziphus zeyheriana</i> ²	Dwarf buffalothorn	Dwergblinkblaar wag-'n-bietjie

6.1.9 Disturbed moist secondary grassland

This vegetation community was very disturbed owing to overgrazing. Severe infestation of Bankrupt bush (*Seriphium plumosum*) occurred in places. This part of the site was very moist in places and comprised typical vlei vegetation such as *Nidorella anomala*, *Imperata cylindrica* and *Berkheya radula*. The soil of this part of the site was clay derived from brown shale and not suitable for the Red-listed species that occurs in wetland conditions in the quarter degree grid.

Large numbers of the orange-listed *Hypoxis hemerocallidea* occurred, which should be relocated to an area where they can be preserved.

A survey of the plants that occur in this area was not required. This vegetation community was not considered sensitive.

6.1.10 Degraded drainage line

The drainage line was very degraded with numerous Eucalyptus trees, Spanish reed (*Arundo donax*), Bugweed (*Solanum mauritianum*) and Kukuyu occurring. In places, Bulrush (*Typha capensis*) and various species of the Cyperaceae occurred. The drainage line was not considered sensitive.



The drainage line with Eucalyptus infestation.

6.1.11 Disturbed alien and indigenous vegetation

Along the south-western boundary of the site an old residence with various outbuildings occurred. The species diversity was not high and bare patches of soil occurred. Although only five alien species were found in this part, they grew abundantly and three of them were Category 1 Declared weeds. This vegetation community was not considered sensitive.

Table 4: Plants recorded in the Disturbed alien and indigenous vegetation

SCIENTIFIC NAME	ENGLISH NAME	AFRIKAANS NAME
<i>Acacia caffra</i>	Common hook thorn	Gewone haakdoring
<i>Acalypha caperonioides</i>		
<i>Aloe greatheadii</i> var <i>davyana</i> ^{1,2}		Kleinaalwyn
<i>Aristida congesta</i> subsp <i>barbicollis</i>	Spreading three-awn grass	Witsteekgras
<i>Asparagus suaveolens</i>	Wild asparagus	Katdoring
<i>Campuloclinium macrocephalum</i>	Pom pom weed	Pompombossie
<i>Canthium gilfillanii</i>	Velvet rock alder	Fluweelklipels
<i>Celtis africana</i>	White stinkwood	Witstinkhout
<i>Clematis brachiata</i> ²	Traveler's joy	Klimop
<i>Conyza</i> cf <i>bonariensis</i>	Flax-leaf fleabane	Kleinskraalhans
<i>Conyza podocephala</i>		
<i>Eragrostis capensis</i>	Heart-seed love grass	Hartjiesgras
<i>Eragrostis curvula</i>	Weeping love grass	Oulandsgras
<i>Eragrostis rigidior</i>	Broad-leaved curly leaf	Breëkrulgras
<i>Euclea crispa</i> subsp <i>crispa</i> ⁴	Blue guarri	Blou ghwarrie
<i>Gymnosporia buxifolia</i> ²	Spikethorn	Pendoring
<i>Helichrysum rugulosum</i> ^{2,3}		

SCIENTIFIC NAME	ENGLISH NAME	AFRIKAANS NAME
<i>Heteromorpha arborescens</i> var <i>abyssinica</i> ^{1,2}	Common parsley tree Gewone pietersielieboom	
<i>Heteropogon contortus</i>	Spear grass	Assegaaigras
<i>Hyparrhenia hirta</i>	Common thatching grass	Dekgras
<i>Lantana camara</i>	Lantana	Lantana
<i>Lantana rugosa</i> ^{2,3}	Bird's brandy	Voëlbrandewyn
<i>Melinis nerviglumis</i>	Bristle leaf red top	Steekblaarblinkgras
<i>Rhoicissus tridentata</i> subsp <i>cuneifolia</i> ¹	Northern bushman's grape	Noordelike boesmansdruif
<i>Rhus lancea</i>	Karee	Karee
<i>Rhus pyroides</i> var <i>pyroides</i> ⁴	Common wild currant	Taaibos
<i>Rhus zeyheri</i> ²	Blue currant	Blou taaibos
<i>Scabiosa columbaria</i> ^{1,2,3}	Wild scabiosa	Bitterbos
<i>Setaria sphacelata</i> var <i>sphacelata</i>	Small creeping foxtail	Kleinkruipmannagras
<i>Solanum mauritianum</i>	Bugweed	Luisboom
<i>Solanum panduriforme</i>	Poison apple	Gifappel
<i>Tephrosia capensis</i> var <i>capensis</i>		
<i>Verbena aristigera</i>	Fine-leaved verbena	Fynblaar verbena
<i>Verbena brasiliensis</i>		
<i>Withania somnifera</i> ^{1,2}	Winter cherry	Geneesblaarbossie
<i>Zanthoxylum capense</i> ^{1,2}	Small knobwood	Klein perdepram

¹Van Wyk, B-E., Van Oudtshoorn, B. & Gericke, N. 2002.

²Watt, J.M. & Breyer-Brandwijk, M.G. 1962.

³Pooley, E. 1998.

⁴Van Wyk, B. & Van Wyk P. 1997.

6.2 Vertebrate Faunal survey

6.2.1 Mammals:

Observed and Expected Species Richness

Of the 30 mammal species expected to be present on the two biotopes of the study site (Table 5), only three were confirmed during the site visits (Table 6).

Considering that the brief of this survey is to focus on the randjie/ridge those species expected to occur on this section are printed in Arial Black in Tables 5 and 6.

Table 5 lists the mammals which were observed or deduced to occupy the site, or to be occasional visitors. All feral mammals expected to occur on the study site (e.g. house mice, house rats, dogs and cats) were omitted from the assessment since these species normally associate with human settlements.

Neamblosomus juliana (Juliana's golden mole) occurs on the nearby Bronberg, whereas the site falls within the known range of and has suboptimal habitat for the rough haired golden mole (*Chrysospalax villosus*). However, a thorough search of both the randjies and the drainage lines revealed no evidence that either species occur. The excellent grass cover on the lower plains section of the site is likely to harbour hedgehogs, as well as a plethora of more common small terrestrial mammals normally thriving in lush and humid ground cover.

The listed bats are widespread and common commensals, and are more than likely to hawk for insects over the drainage lines and water surfaces. The listed small carnivores have a high ability to tolerate human presence and activities, and are certain to reside on or visit the site.

Mammal Habitat Assessment

The observed low diversity is due to encroaching civilization and associated activities, low habitat diversity, the size of the site and of adjoining areas, the quality of conservation and past land uses. All the species of the resident assemblage (Table 5) are common and widespread (with the exception of hedgehogs). The regeneration of dense natural grassland (irrespective of its successional stage) provides excellent habitat for the terrestrial small rodents and insectivores listed, as well as their small predators. The scattered patches of semi-aquatic vegetation (viz. reed beds) provide habitat for vlei rats and cane rats (latterly observed in the near vicinity).

Rupicolous habitat generally displays lower mammal diversity, and Tyger Valley Farm is no exception. The randjie is very rocky with dense grass, which would benefit rock elephant shrews and Namaqua rock mice, and a dense stand of shrubby woodland which may support the South African Galago. However, the slope and summit display no pockets of deep sand, which is a prerequisite for the occurrence of Juliana's golden mole.

Table 5: Mammal assemblage of Farm Tyger Valley; species which definitely or with a *high* probability to occur are marked with a √, those with a *medium* probability to occur based on ecological and distributional parameters are marked with a *, and those with a *low* probability to occur are marked with a ?. The conservation status of Red Data species are given in the first column, i.e. **R** = Rare, **V** = Vulnerable, **I** = Indeterminate.

Entries printed in Arial Black are species expected to occur on the randjies.

	SCIENTIFIC NAME	ENGLISH NAME
√	<i>Elephantulus myurus</i>	Eastern rock elephant shrew
√	<i>Lepus saxatilis</i>	Scrub hare
√	<i>Pronolagus randensis</i>	Jameson's red rock rabbit
√	<i>Cryptomys hottentotus</i>	African mole rat
√	<i>Hystrix africaeaustralis</i>	Cape porcupine
*	<i>Thryonomys swinderianus</i>	Greater cane rat
*	<i>Rhabdomys pumilio</i>	Four-striped grass mouse
*	<i>Mus minutoides</i>	Pygmy mouse
*	<i>Mastomys natalensis</i>	Natal multimammate mouse
*	<i>Mastomys coucha</i>	Southern multimammate mouse
*	<i>Aethomys ineptus</i>	Tete veld rat
√	<i>Aethomys namaquensis</i>	Namaqua rock mouse
?	<i>Otomys angoniensis</i>	Angoni vlei rat
?	<i>Otomys irroratus</i>	Vlei rat
?	<i>Tatera leucogaster</i>	Bushveld gerbil
?	<i>Saccostomus campestris</i>	Pouched mouse
?	<i>Dendromus melanotis</i>	Grey pygmy climbing mouse
?	<i>Galago moholi</i>	South African galago
?	<i>Crocidura cyanea</i>	Reddish-grey musk shrew
*	<i>Crocidura hirta</i>	Lesser red musk shrew
R?	<i>Atelerix frontalis</i>	Southern African hedgehog
*	<i>Neoromicia capensis</i>	Cape serotine bat
*	<i>Scotophilus dinganii</i>	African yellow house bat
*	<i>Scotophilus viridis</i>	Greenish yellow house bat
*	<i>Genetta genetta</i>	Small-spotted genet
*	<i>Genetta tigrina</i>	SA large-spotted genet
*	<i>Cynictis penicillata</i>	Yellow mongoose
*	<i>Galerella sanguinea</i>	Slender mongoose
?	<i>Sylvicapra grimmia</i>	Common duiker
?	<i>Raphicerus campestris</i>	Steenbok

Table 6: Mammal species positively confirmed from the study site, observed indicators and the observed habitat. **Entries printed in Arial Black are species expected to occur on the randjies.**

Scientific Name	Vernacular Name	Observation Indicator	Habitat
<i>Lepus saxatilis</i>	Scrub hare	Droppings	Short grassland
<i>Pronolagus randensis</i>	Jameson's red rock rabbit	Droppings	Mountain slopes with grass
<i>Hystrix africaeaustralis</i>	Cape porcupine	Droppings	Catholic

All three species found to be present based on the signs indicated above, are common and widespread and have a high ability to co-exist in close proximity of human activities.

Threatened and Red Listed Mammal Species

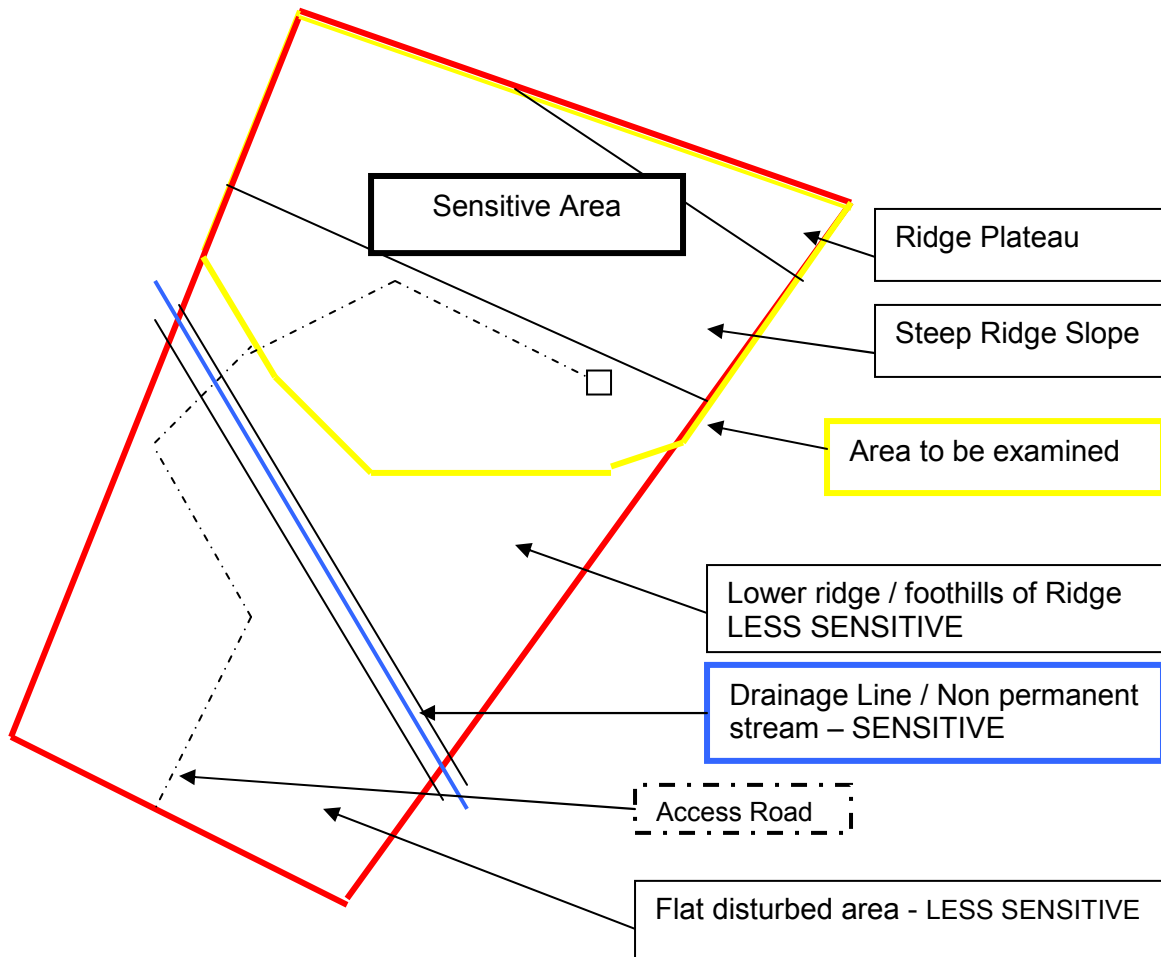
Only the hedgehog is rated as a Red Data mammal and is likely to be an inhabitant of the site. The active defensive mechanism of this insectivorous mammal is entirely ineffective to attack by medium-sized carnivores (including dogs) and raptors. They therefore rely on dense cover for protection during the day.

6.2.2 Birds:

Of the 167 species likely to occur on site, 23 species were recorded during the site visit. Almost all species were typical of woodland habitats.

Avifaunal Habitat Assessment:

Figure 2 illustrates the habitat types utilised by bird species expected to occur on the study site.



Three distinct bird habitat systems were identified. A short description of each habitat type is as follows ranked from most to least important (refer to figure 2):

Southern slope and summit of the ridge:

The area also known as the area to be examined forms the northern half of the study site and consists of vegetation that grows on the summit and southern cooler slope of the randjie/ridge that runs through the area. The plateau of the ridge consists of small open grassland areas surrounded by mainly small to medium sized *Acacia caffra* trees species (dominant). The tree cover becomes denser further to the south on the steep

ridge slope varying in density from place to place with few exotic plant species. Further south, inline with the main access road on the property the area is more disturbed through human activities in the past and various exotic trees such as Eucalyptus can also be found amongst the indigenous trees and vegetation. The grass cover between the exposed quartzite rocks is fairly dense and will produce seeds during late summer for seed eating bird species such as bishops, canaries and weavers and will also be an important food source during winter. Insect life is fairly abundant for insect eating bird species. Food availability for birds is greater than can be found on the northern slope of the ridge due to the denser tree cover and there is more cover available for birds for nest building and shelter.

This habitat will favour species typically associated with *Acacia* savanna habitat and more specifically mixed *Acacia* savanna woodland. The bird species within this habitat generally include a great variety of arboreal passerines such as drongos, warblers, flycatchers, shrikes, sunbirds, waxbills and weavers as well as arboreal non-passerines such as doves, cuckoos and woodpeckers. Many of these species make use of the thorny nature of these trees to build their nests. *Acacia* trees generally attract many insects and in turn attract a good diversity of typical *Acacia* savanna bird species. The rocky outcrops will favour birds associated with rocky habitats such as chats, wheateats, rock thrushes, buntings and cisticolas that will favour the rocky nature of the area for breeding and to perch from when hunting for insects and to scan surroundings for predators. The trees and shrubs growing between these rocks will also provide food in the form of seeds and fruits to various bird species and will also provide shelter and nest building sites for many birds especially passerines. This is the only area where possible Red Data bird species might be found but they will more than likely only move through the area than actually make use of the vegetation on site for breeding or foraging purposes.

Drainage line and surrounding vegetation

A non permanent stream or drainage line with generally steep banks runs through the middle of the property surrounded and overgrown by dense vegetation such as trees, weeds and grass. Little exposed water could be found and the impoundment on site does not retain water for a long time due to an eroded dam wall. This drainage line and associated vegetation is only likely to attract the more common bird species associated with semi aquatic habitat conditions. Large Eucalyptus surrounds the impoundment and grows at several places within the drainage line. Exotic Eucalyptus trees usually do not offer a large variation in plant communities and these trees are mostly unpalatable in their growing and live stage for insect and game species. As a result, a few insect eating bird species will occur within these plantations. A number of nectar feeding species such as white-eyes and sunbirds will feed on the nectar produced by the flowers of these trees. Some birds also make nest in these trees. None or little grass growth takes place on the ground where these trees grow and seed eating species are few. These trees are known to extract large volumes of water daily and the surrounding ground is normally hard and dry.

Open grassland:

The rest of the site consists mainly of open grassland dominated by *Hyperenia hirta* grass with scattered exotic and indigenous trees and shrubs on mainly disturbed soils and old lands. The presence and abundance of bird species in this habitat will vary from season to season being lush and green in summer after summer rains and dry and

brown or burnt during winter. The area will favour ground living bird species such as lapwings, francolins, pipits, long claws, larks and chats that either hunt for insects or breed on the ground, in burrows in the ground or between the grasses. Weavers and widow-birds will make use of this area for feeding (seeds) during late summer and early winter when the grass is not burnt and widow-birds and cisticolas will also breed in the tall grass during summer. Aerial feeding birds such as martins, swifts and swallows will hunt for insects over the grasslands.

Table 7: Bird species in species order according to *Robert - Birds of Southern Africa* VII th edition (Hockey *et al*, 2005) that were actually observed on site (**in bold**) or that are likely to occur within the specific habitat(s) found on site. This does not include over flying birds or rare vagrants. Reporting rate (%) according to Harrison *et al*. (1997). The habitat preference, SR = Southern Ridge slope, DL = Drainage Line and OG = Open Grassland are indicated next to the reporting rate with their possibility of occurrence in these specific habitats on site rated as H = High, M = Medium, L = Low, VL = very low, and X = Not likely to occur.

SCIENTIFIC NAME	ENGLISH NAME	R RATE (%) [*] 2528CD	HABITAT PREFERENCE		
			SR	DL	OG
<i>Peliperdix coqui</i>	Coqui Francolin	6	M	L	L
<i>Pternistis swainsonii</i>	Swainson's Spurfowl	19	M	L	H
<i>Numida meleagris</i>	Helmeted Guineafowl	52	H	H	H
<i>Dendrocygna viduata</i>	White-faced Duck	9	X	VL	X
<i>Alopochen aegyptiaca</i>	Egyptian Goose	33	X	M	X
<i>Anas undulata</i>	Yellow-billed Duck	16	X	L	X
<i>Indicator indicator</i>	Greater Honeyguide	4	H	H	M
<i>Indicator minor</i>	Lesser Honeyguide	8	H	M	H
<i>Prodotiscus regulus</i>	Brown-backed Honeybird	1	H	H	H
<i>Jynx ruficollis</i>	Red-throated Wryneck	32	H	H	H
<i>Campethera abingoni</i>	Golden-tailed Woodpecker	9	L	VL	VL
<i>Dendropicos fuscescens</i>	Cardinal Woodpecker	18	H	H	H
<i>Pogoniulus chrysoconus</i>	Yellow-fronted Tinkerbird	7	M	L	L
<i>Tricholaema leucomelas</i>	Acacia Pied Barbet	20	M	M	M
<i>Lybius torquatus</i>	Black-collared Barbet	74	H	H	H
<i>Trachyphonus vaillantii</i>	Crested Barbet	91	H	H	H
<i>Tockus nasutus</i>	African Grey Hornbill	4	M	L	L
<i>Upupa africana</i>	African Hoopoe	80	L	M	H
<i>Phoeniculus purpureus</i>	Green Wood-Hoopoe	62	H	H	H
<i>Halcyon senegalensis</i>	Woodland Kingfisher	7	L	L	L
<i>Halcyon albiventris</i>	Brown-hooded Kingfisher	22	M	H	H
<i>Merops bullockoides</i>	White-fronted Bee-eater	12	L	M	M
<i>Merops pusillus</i>	Little Bee-eater	2	VL	L	L
<i>Merops apiaster</i>	European Bee-eater	18	H	H	H
<i>Colius striatus</i>	Speckled Mousebird	79	H	H	H
<i>Urocolius indicus</i>	Red-faced Mousebird	38	H	H	H
<i>Cuculus solitarius</i>	Red-chested Cuckoo	25	H	H	H
<i>Cuculus clamosus</i>	Black Cuckoo	9	L	L	L
<i>Chrysococcyx klaas</i>	Klaas's Cuckoo	6	L	L	L
<i>Chrysococcyx caprius</i>	Diderick Cuckoo	33	M	H	H

SCIENTIFIC NAME	ENGLISH NAME	R RATE (%)* 2528CD	HABITAT PREFERENCE		
			SR	DL	OG
<i>Centropus burchellii</i>	Burchell's Coucal	64	M	H	M
<i>Cypsiurus parvus</i>	African Palm-Swift	22	H	H	H
<i>Apus barbatus</i>	African Black Swift	3	M	M	M
<i>Apus affinis</i>	Little Swift	33	H	H	H
<i>Apus caffer</i>	White-rumped Swift	24	H	H	H
<i>Corythaixoides concolor</i>	Grey Go-away-bird	55	H	H	H
<i>Tyto alba</i>	Barn Owl	7	H	H	H
<i>Ptilopsis granti</i>	Southern White-faced Scops-Owl	<1	L	VL	VL
<i>Bubo africanus</i>	Spotted Eagle-Owl	12	H	H	H
<i>Glaucidium perlatum</i>	Pearl-spotted Owlet	1	VL	VL	VL
<i>Caprimulgus pectoralis</i>	Fiery-necked Nightjar	1	M	VL	X
Caprimulgus rufigena	Rufous-cheeked Nightjar	<1	M	VL	X
<i>Columba livia</i>	Rock Dove	31	M	L	H
<i>Columba guinea</i>	Speckled Pigeon	57	H	H	H
Streptopelia senegalensis	Laughing Dove	96	H	H	H
Streptopelia capicola	Cape Turtle-Dove	81	H	H	H
Streptopelia semitorquata	Red-eyed Dove	22	H	H	H
<i>Treron calvus</i>	African Green-Pigeon	1	L	L	L
<i>Burhinus capensis</i>	Spotted Thick-knee	40	L	L	H
<i>Charadrius tricollaris</i>	Three-banded Plover	15	X	VL	X
<i>Vanellus armatus</i>	Blacksmith Lapwing	39	X	M	L
<i>Vanellus senegallus</i>	African Wattled Lapwing	15	X	M	L
<i>Vanellus coronatus</i>	Crowned Lapwing	80	VL	L	H
<i>Aviceda cuculoides</i>	African Cuckoo Hawk	<1	VL	X	X
<i>Elanus caeruleus</i>	Black-shouldered Kite	48	L	H	H
<i>Milvus migrans</i>	Black Kite	14	L	L	L
<i>Accipiter minullus</i>	Little Sparrowhawk	1	L	M	L
<i>Accipiter ovampensis</i>	Ovambo Sparrowhawk	2	M	M	L
<i>Accipiter melanoleucus</i>	Black Sparrowhawk	1	VL	VL	X
<i>Buteo vulpinus</i>	Steppe Buzzard	4	M	M	VL
<i>Falco rupicolus</i>	Rock Kestrel	1	VL	X	X
<i>Falco rupicoloides</i>	Greater Kestrel	3	VL	X	X
<i>Ardea melanocephala</i>	Black-headed Heron	33	X	L	M
<i>Bubulcus ibis</i>	Cattle Egret	75	X	H	H
<i>Scopus umbretta</i>	Hamerkop	24	X	M	X
Bostrychia hagedash	Hadeda Ibis	91	M	H	H
<i>Oriolus larvatus</i>	Black-headed Oriole	20	H	H	M
<i>Dicrurus adsimilis</i>	Fork-tailed Drongo	35	H	H	H
<i>Terpsiphone viridis</i>	African Paradise-Flycatcher	18	H	H	H
<i>Nilaus afer</i>	Brubru	9	M	L	VL
<i>Dryoscopus cubla</i>	Black-backed Puffback	18	H	H	H
Tchagra senegalus	Black-crowned Tchagra	25	H	H	L

SCIENTIFIC NAME	ENGLISH NAME	R RATE (%)* 2528CD	HABITAT PREFERENCE		
			SR	DL	OG
<i>Tchagra australis</i>	Brown-crowned Tchagra	10	H	M	M
<i>Laniarius ferrugineus</i>	Southern Boubou	36	M	H	H
<i>Laniarius atrococcineus</i>	Crimson-breasted Shrike	8	M	L	L
<i>Telophorus zeylonus</i>	Bokmakierie	68	H	H	H
<i>Malaconotus blanchoti</i>	Grey-headed Bush-Shrike	1	M	M	M
<i>Batis molitor</i>	Chin-spot Batis	23	H	M	M
<i>Corvus albus</i>	Pied Crow	56	H	H	H
<i>Lanius collurio</i>	Red-backed Shrike	2	M	L	L
<i>Lanius collaris</i>	Common Fiscal	93	M	H	H
<i>Campephaga flava</i>	Black Cuckooshrike	6	M	X	X
<i>Parus niger</i>	Southern Black Tit	3	M	X	X
<i>Parus cinerascens</i>	Ashy Tit	6	VL	X	X
<i>Riparia paludicola</i>	Brown-throated Martin	7	X	L	X
<i>Riparia cincta</i>	Banded Martin	4	X	VL	VL
<i>Hirundo rustica</i>	Barn Swallow	23	H	H	H
<i>Hirundo albigularis</i>	White-throated Swallow	24	L	H	L
<i>Hirundo dimidiata</i>	Pearl-breasted Swallow	2	L	L	L
<i>Hirundo cucullata</i>	Greater Striped Swallow	41	H	H	H
<i>Hirundo abyssinica</i>	Lesser Striped Swallow	33	H	H	H
<i>Hirundo semirufa</i>	Red-breasted Swallow	9	VL	VL	VL
<i>Hirundo fuligula</i>	Rock Martin	13	M	VL	VL
<i>Delichon urbicum</i>	Common House-Martin	4	L	L	L
<i>Pycnonotus tricolor</i>	Dark-capped Bulbul	94	H	H	H
<i>Stenostira scita</i>	Fairy Flycatcher	5	M	L	L
<i>Sphenoeacus afer</i>	Cape Grassbird	15	X	H	VL
<i>Sylvietta rufescens</i>	Long-billed Crombec	13	M	VL	VL
<i>Acrocephalus baeticatus</i>	African Reed-Warbler	2	X	L	X
<i>Acrocephalus palustris</i>	Marsh Warbler	<1	H	M	H
<i>Acrocephalus arundinaceus</i>	Great Reed-Warbler	1	L	M	M
<i>Phylloscopus trochilus</i>	Willow Warbler	9	H	H	H
<i>Turdoides jardineii</i>	Arrow-marked Babbler	18	H	H	H
<i>Parisoma subcaeruleum</i>	Chestnut-vented Tit-Babbler	24	M	VL	VL
<i>Sylvia borin</i>	Garden Warbler	2	M	M	M
<i>Zosterops virens</i>	Cape White-eye	78	H	H	H
<i>Cisticola aberrans</i>	Lazy Cisticola	4	M	X	X
<i>Cisticola chiniana</i>	Rattling Cisticola	7	M	M	M
<i>Cisticola lais</i>	Wailing Cisticola	2	M	X	X
<i>Cisticola tinniens</i>	Levaillant's Cisticola	12	X	M	L
<i>Cisticola fulvicapilla</i>	Neddicky	28	H	H	H
<i>Cisticola juncidis</i>	Zitting Cisticola	12	L	M	H
<i>Cisticola aridulus</i>	Desert Cisticola	4	X	X	L
<i>Cisticola textrix</i>	Cloud Cisticola	2	X	X	VL
<i>Prinia subflava</i>	Tawny-flanked Prinia	32	L	H	M
<i>Prinia flavicans</i>	Black-chested Prinia	37	H	M	H

SCIENTIFIC NAME	ENGLISH NAME	R RATE (%)* 2528CD	HABITAT PREFERENCE		
			SR	DL	OG
<i>Apalis thoracica</i>	Bar-throated Apalis	17	H	H	L
<i>Mirafraga africana</i>	Rufous-naped Lark	16	X	X	L
<i>Psophocichla litsitsirupa</i>	Groundscraper Thrush	8	VL	L	L
<i>Turdus libonyanus</i>	Kurrichane Thrush	14	M	H	H
<i>Turdus smithi</i>	Karoo Thrush	84	M	H	H
<i>Sigelus silens</i>	Fiscal Flycatcher	46	H	H	H
<i>Muscicapa striata</i>	Spotted Flycatcher	7	H	H	H
<i>Cossypha caffra</i>	Cape Robin-Chat	78	H	H	H
<i>Cossypha humeralis</i>	White-throated Robin-Chat	9	H	L	L
<i>Cercotrichas leucophrys</i>	White-browed Scrub-Robin	8	L	VL	VL
<i>Saxicola torquatus</i>	African Stonechat	20	X	M	L
<i>Oenanthe monticola</i>	Mountain Wheatear	24	VL	X	X
<i>Cercomela familiaris</i>	Familiar Chat	5	M	L	VL
<i>Onychognathus morio</i>	Red-winged Starling	10	M	L	L
<i>Lamprotornis nitens</i>	Cape Glossy Starling	33	H	H	H
<i>Cinnyricinclus leucogaster</i>	Violet-backed Starling	5	M	M	M
<i>Acridotheres tristis</i>	Common Myna (INT)	7	M	H	H
<i>Chalcomitra amethystina</i>	Amethyst Sunbird	51	H	H	H
<i>Cinnyris talatala</i>	White-bellied Sunbird	59	H	H	H
<i>Ploceus capensis</i>	Cape Weaver	33	L	M	L
Ploceus velatus	Southern Masked-Weaver	84	H	H	H
<i>Ploceus cucullatus</i>	Village Weaver	6	L	L	L
<i>Quelea quelea</i>	Red-billed Quelea	4	H	H	H
<i>Euplectes afer</i>	Yellow-crowned Bishop	3	X	VL	X
<i>Euplectes orix</i>	Southern Red Bishop	44	M	H	H
<i>Euplectes albonotatus</i>	White-winged Widowbird	27	X	H	M
<i>Euplectes ardens</i>	Red-collared Widowbird	28	X	H	L
<i>Amblyospiza albifrons</i>	Thick-billed Weaver	<1	L	M	M
<i>Sporaeginthus subflavus</i>	Orange-breasted Waxbill	7	X	M	L
<i>Ortygospiza atricollis</i>	African Quailfinch	4	X	M	M
<i>Estrilda astrild</i>	Common Waxbill	20	L	H	H
<i>Lagonosticta rhodopareia</i>	Jameson's Firefinch	3	H	H	H
<i>Spermestes cucullatus</i>	Bronze Mannikin	30	M	H	H
<i>Vidua macroura</i>	Pin-tailed Whydah	24	M	H	H
<i>Vidua paradisaea</i>	Long-tailed Paradise-Whydah	6	VL	VL	VL
<i>Passer domesticus</i>	House Sparrow	71	L	X	X
<i>Passer melanurus</i>	Cape Sparrow	93	H	H	H
<i>Passer diffusus</i>	Southern Grey-headed Sparrow	28	H	H	H
<i>Motacilla capensis</i>	Cape Wagtail	70	X	M	L
<i>Macronyx capensis</i>	Cape Longclaw	20	X	VL	L
<i>Anthus lineiventris</i>	Striped Pipit	1	M	X	X
<i>Anthus cinnamomeus</i>	African Pipit	8	X	VL	H
<i>Crithagra mozambicus</i>	Yellow-fronted Canary	15	H	H	H
Crithagra atrogularis	Black-throated Canary	30	H	H	H

SCIENTIFIC NAME	ENGLISH NAME	R RATE (%)* 2528CD	HABITAT PREFERENCE		
			SR	DL	OG
<i>Crithagra gularis</i>	Streaky-headed Seedeater	23	H	H	H
<i>Emberiza tahapisi</i>	Cinnamon-breasted Bunting	7	M	X	X

*The reporting rate is calculated as follow: Total number of cards on which a species was reported X 100 ÷ total number of cards for a particular quarter degree grid cell.

INT = Introduced or alien birds species to Southern Africa.

Red Data Species Categories for the birds (Barnes, 2000)

RE = Regionally extinct, **CR** = Critically Endangered **EN** = Endangered, **VU** = Vulnerable, **NT** = Near-threatened.

6.2.3. Reptiles and Amphibians:

No termitaria were noticed on the site and the area does not appear to be particularly suitable for reptiles nor amphibians, due to the hard substrate and lack of other shelter, such as burrows or retreats under rocks or other debris. Accumulated dry vegetable matter is available temporarily. Dead and fallen aloes provide ideal shelter for small reptiles.

The area south of the drainage line appears to consist of a rather hard clayey substrate without noticeable retreats, such as burrows or dead termitaria, apart from a relatively dense accumulation of dry grass, with added fresh growth. There are indications that this area was ploughed in the past. Consequently, the species diversity and population densities would be low.

The area of special interest against the southern slope of the ridge at the northern end of the site also lacks obvious, suitable retreats for amphibians and reptiles. The substrate consists of stony to rocky clayey soil, not suitable for burrowing or sand swimming reptiles. Less specialised terrestrial reptile species may utilise the limited available possibilities provided by accumulated dry vegetable matter. No amphibians are expected to occur here.

The wetland and the drainage line may be suitable for the reproduction of some toads and sandfrogs. The bottom of the valley does not appear to be suitable for the formation of breeding ponds for the 'Near Threatened' Giant Bullfrog (*Pixycephalus adspersus*) nor is the substrate of the adjacent terrain suitable for burrowing for the purposes of aestivation and hibernation. Occasionally individual specimens from adjacent areas may appear on this site.

The ruins of the former farm buildings are still utilised by the most common commensals, such as the Speckled Skink (*Trachylepis punctatissima*) and the Cape Dwarf Gecko (*Lygodactylus capensis*).

Based on the impressions gathered during the visit and records in the Transvaal Museum, as well as the documentation of the herpetofauna of the then Transvaal by Dr N. H. G. Jacobsen (Unpublished Ph.D. thesis, University of Pretoria, 1989), his internal report for the Gauteng Province (1995) and the 'Atlas and Red Data Book of the Frogs of

South Africa, Lesotho and Swaziland' (Minter, *et al*, 2004) the following list of species seen to occur and which may occur on this site was compiled.

Table 8: List the amphibians and reptiles which may still occur on this site:-

SCIENTIFIC NAME	ENGLISH NAME	PROBABILITY OF OCCURRENCE
CLASS: AMPHIBIA	AMPHIBIANS	
Order: ANURA	FROGS	
Family: Bufonidae	Toads	
<i>Bufo gutturalis</i>	Guttural Toad	Low
<i>Bufo rangeri</i>	Ranger's Toad	Low
<i>Schismaderma carens</i>	Red Toad	Medium
Family: Ranidae	Common Frogs	
<i>Tomopterna cryptotis</i>	Tremolo Sand Frog	Low
CLASS: REPTILIA	REPTILES	
Order: SQUAMATA	SCALE-BEARING REPTILES	
Suborder: LACERTILIA	LIZARDS	
Family: Gekkonidae	Geckos	
<i>Lygodactylus capensis</i>	Cape Dwarf Gecko	Medium
<i>Pachydactylus affinis</i>	Transvaal Thick-toed Gecko	Low
<i>Pachydactylus capensis</i>	Cape Thick-toed Gecko	Low
Family: Chamaeleonidae	Chameleons	
<i>Chamaeleo dilepis</i>	Flap-necked Chameleon	Medium
Family: Scincidae	Skinks	
<i>Trachylepis capensis</i>	Cape Skink	Low
<i>Trachylepis punctatissima</i>	Speckled Skink	High
<i>Lygosoma sundevallii</i>	Sundevall's Writhing Skink	Low
<i>Panaspis wahlbergii</i>	Wahlberg's Snake-eyed Skink	Low
Family: Gerrhosauridae	Plated Lizards	
<i>Gerrhosaurus flavigularis</i>	Yellow-throated Plated Lizard	Low
Family: Cordylidae	Girdled Lizards	
<i>Chamaesaura aenea</i>	Transvaal Grass Lizard	Low
Sub-order: SERPENTES	SNAKES	

SCIENTIFIC NAME	ENGLISH NAME	PROBABILITY OF OCCURRENCE
Family: Leptotyphlopidae	Thread Snake	
<i>Leptotyphlops incognitus</i>	Eastern Thread Snake	Low
Family: Atractaspidae	African Burrowing Snakes	
<i>Atractaspis bibronii</i>	Bibron's Stiletto Snake	Low
<i>Aparallactus capensis</i>	Cape Centipede Eater	Low
Family: Colubridae	Typical Snakes	
<i>Lamprophis capensis</i>	Brown House Snake	Medium
<i>Lycophidion capense</i>	Cape Wolf Snake	Low
<i>Psammophis brevirostris</i>	Short-snouted Sand Snake	Low
<i>Prosymna sundevallii</i>	Sundevall's Shovel-snout	Low
<i>Crotaphopeltis hotamboeia</i>	Herald or Red-lipped Snake	Medium
<i>Telescopus s. semiannulatus</i>	Eastern Tiger Snake	Low
<i>Dispholidus typus</i>	Boomslang	Low
<i>Dasypeltis scabra</i>	Common or Rhombic Egg-eater	Low
Family: Elapidae	Cobras, Mambas and others	
<i>Hemachatus haemachatus</i>	Rinkhals	Low
<i>Naja annulifera</i>	Snouted Cobra	Low
<i>Naja mossambica</i>	Mozambique Spitting Cobra	Low
Family: Viperidae	Adders	
<i>Causus rhombeatus</i>	Rhombic Night Adder	Low

7. FINDINGS AND POTENTIAL IMPLICATIONS

7.1 Flora

A plant survey was not required for the lower third of the site, which included the drainage line. However, notes were made of the vegetation in these areas and opinions given in clauses 6.1.4, 6.1.9 and 6.1.10 above.

The upper two thirds of the site, except for the area with residences that comprised alien and indigenous vegetation, consisted of natural vegetation of which two plant communities were considered sensitive with good connectivity.

7.2 Fauna

7.2.1 Mammals

The following section is an impact assessment in terms of development on the site:

The site is scheduled for residential development, and as such much of the habitat elements on the plain will be destroyed, with a domino effect on most of the mammals bar the bats. It is not certain whether development is intended on the randjie slope and ridge, but even if not the woodland may be subjected to wilful destruction during the construction phase.

From a conservation perspective, reducing the few listed alien trees and plants will be advantageous, especially if new residents will eventually use garden plants proven to benefit garden birds.

- *Loss of ecological sensitive and important vegetation units*

Nature of Impact	Extent	Duration	Probability	Intensity	Significance
Ridge vegetation	Site specific	Medium term	Requires mitigation	Requires intervention	High
Semi-aquatic vegetation	Site and adjoining areas	Medium term	Requires mitigation	Requires directed restoration	Medium

It would be inadvisable to develop the higher slopes and ridge of the randjie so as to retain the indigenous woodland and associated fauna. As such this portion should be protected against destructive practices such as fire and snaring during development, and once the development is completed active management would be advisable. It is suggested that the semi-aquatic vegetation be restored.

- Loss of ecosystem function (e.g. reduction in water quality, soil pollution)

Nature of Impact	Extent	Duration	Probability	Intensity	Significance
Loss of wetland ecosystem function	Site specific	Long-term	Probable	Low	Low

At present the semi-aquatic vegetation along the drainage courses are disturbed and weakly developed. However, as such they still support habitat-specific vertebrates. Should these water courses be destroyed by lining with concrete, it will be at the cost of biodiversity. A better option would be restoration and conversion in an open-air recreational site.

- Loss of faunal habitat

Nature of Impact	Extent	Duration	Probability	Intensity	Significance
Wetland vegetation	Site and adjoining properties	Long-term “	Probable “	Low “	Low “

Apart from supporting a number of narrowly-adapted faunal species, semi-aquatic vegetation along drainage lines as well as woodlands along the randjies/ridge also act as dispersal corridors. However, since none of the species reliant on the wetlands or on the ridge of the site is deemed Red Data, the intensity and significance of loss is rated as low.

(See Appendix B for definitions)

7.2.2 Birds

The following Red Data Species were recorded for the 2528CD quarter degree grid cell (q.d.g.c) (Table 9).

Table 9: Red Data species recorded for the 2528CD q.d.g.c according to Harrison *et al.* (1997) and Tarboton *et al.* (1987).

SCIENTIFIC NAME	ENGLISH NAME	REPORTING RATE (%)* 2528CD RIETVLEI DAM
<i>Alcedo semitorquata</i>	Half-collared Kingfisher (NT)	<1(T)
<i>Tyto capensis</i>	African Grass-Owl (VU)	1(Tb)
<i>Neotis denhami</i>	Denham's Bustard (VU)	(T)
<i>Eupodotis caerulescens</i>	Blue Korhaan (NT)	<1(T)
<i>Eupodotis senegalensis</i>	Barrow's Korhaan (VU)	<1(T)
<i>Anthropoides paradiseus</i>	Blue Crane (VU)	3(Tb)
<i>Podica senegalensis</i>	African Finfoot (VU)	(T)
<i>Crex crex</i>	Corn Crake (VU)	<1
<i>Rostratula benghalensis</i>	Greater Painted-snipe (NT)	<1
<i>Glareola nordmanni</i>	Black-winged Pratincole (NT)	<1(T)
<i>Sterna caspia</i>	Caspian Tern (NT)	<1
<i>Gyps coprotheres</i>	Cape Vulture (VU)	(T)
<i>Aegypius tracheliotus</i>	Lappet-faced Vulture (VU)	(T)
<i>Terathopius ecaudatus</i>	Bateleur (VU)	(T)
<i>Circus ranivorus</i>	African Marsh-Harrier (VU)	(T)
<i>Aquila rapax</i>	Tawny Eagle (VU)	<1
<i>Aquila ayresii</i>	Ayres's Hawk-Eagle (NT)	<1
<i>Polemaetus bellicosus</i>	Martial Eagle (VU)	(Tb)
<i>Sagittarius serpentarius</i>	Secretarybird (NT)	2(T)
<i>Falco naumanni</i>	Lesser Kestrel (VU)	1(T)
<i>Falco biarmicus</i>	Lanner Falcon (NT)	1(Tb)
<i>Falco peregrinus</i>	Peregrine Falcon (NT)	<1

SCIENTIFIC NAME	ENGLISH NAME	REPORTING RATE (%)* 2528CD RIETVLEI DAM
<i>Phoenicopterus ruber</i>	Greater Flamingo (NT)	<1(T)
<i>Mycteria ibis</i>	Yellow-billed Stork (NT)	(T)
<i>Ciconia nigra</i>	Black Stork (NT)	<1
<i>Mirafra cheniana</i>	Melodious Lark (NT)	(Tb)
	Very Low :	15
	Low :	2
	Meduim :	0
	High :	0
	TOTAL :	17
	Tarboton :	14
	Tarboton breeding:	5
		19

*The reporting rate is calculated as follow: Total number of cards on which a species was reported X 100 ÷ total number of cards for a particular quarter degree grid cell.

Red Data Species Categories for the birds (Barnes, 2000)

RE = Regionally extinct, **CR** = Critically Endangered **EN** = Endangered, **VU** = Vulnerable, **NT** = Near-threatened.

Br? = Suspected breeding, Br = Confirmed breeding, V = Vagrant, RV = Rare Vagrant, VRV = Vary Rare Vagrant, OV = Occasional Visitor and (?) or (X) Unlikely to occur on site

Twenty-six Red Data bird species have been recorded within the 2528CD q.d.g.c (Table 9). Nine of these have disappeared from the area or have not been recorded for this quarter degree grid cell during the time of the southern African Bird Atlas project. It is unlikely that they will ever be seen in this region again except maybe on rare occasions in protected areas. Five of these species used to breed within the said q.d.g.c (Tarboton 1987) and none have been recorded breeding for the q.d.g.c. during the period of the Southern African bird atlas project. All of the red data species that have been recorded shows a low to very low reporting rate. This decline in breeding species is probably due to the large extent of development that has taken place in the area during a short space of time.

On site habitat assessment:

With regards to the specific habitat found on site none of the Red Data bird species listed in the Eskom Red Data Book of Birds of Southern Africa, Lesotho and Swaziland (Barnes, 2000) are likely to make use of the study site due to the lack of sufficient breeding and foraging habitat and the large scale of development surrounding the site and the disturbance caused by these developments. Species such as the Peregrine and Lanner Falcon might on occasion move through the area and use the ridge as a route to move through.

Table 9 provides a list of the Red Data birds recorded for the 2528CD q.d.g.c according to Harrison *et al.* (1997) and an indication of the likelihood of occurring on the study site based on habitat and food availability on site.

Table 10: Red Data bird species assessment for all red data species recorded for the 2527CD q.d.g.c according to Harrison *et al.* (1997) with particular reference to the availability of suitable habitat and food on the study site.

SCIENTIFIC NAME	PRESENCE OF SUITABLE HABITAT	LIKELIHOOD OF OCCURRENCE ON STUDY SITE
<i>Alcedo semitorquata</i> (Half-collared Kingfisher) (NT)	None, prefers clear fast-flowing rivers fringed with riparian growth.	Highly unlikely
<i>Tyto capensis</i> (African Grass-Owl) (VU)	None. prefers rank moist grassland bordering vleis	Highly Unlikely
<i>Eupodotis caerulescens</i> (Blue Korhaan) (NT)	None: prefers natural open grassland, karoo scrub and cultivated lands.	Highly unlikely
<i>Eupodotis senegalensis</i> (Barrow's Korhaan) (VU)	None: preferred tall vegetation, typically fairly dense grassland in either open or lightly wooded regions and seems abundant in hilly areas (Barnes 2000).	Highly unlikely
<i>Anthropoides paradiseus</i> (Blue Crane) (VU)	None. Prefers more open grassland and Karriod grassland.	Highly unlikely
<i>Crex crex</i> (Corn Crake) (VU)	None. Tall grass bordering wetlands and marsh	Highly unlikely
<i>Rostratula benghalensis</i> (Greater Painted-snipe) (NT)	None. Prefers marshes within wetland habitat	Highly unlikely
<i>Glareola nordmanni</i> (Black-winged Pratincole) (NT)	None:	Highly unlikely
<i>Sterna caspia</i> (Caspian Tern) (NT)	None. Prefers coastline and estuaries and large inland impoundments.	Highly unlikely
<i>Aquila rapax</i> (Tawny Eagle) (VU)	None. Their presence is dependent on the availability of food and it is a rare visitor to the region.	Highly unlikely
<i>Aquila ayresii</i> (Ayres's Hawk-Eagle) (VU)	None. They are only likely to move over the area on rare occasions.	Highly unlikely. Only on rare occasions
<i>Circus ranivorus</i> (African Marsh-Harrier) (VU)	None. Dependent on permanent wetlands for breeding, roosting and foraging.	Highly unlikely
<i>Sagittarius serpentarius</i> (Secretarybird) (NT)	None. Restricted to large conservation areas in the region. Avoids densely wooded or rocky, hilly or mountainous areas.	Highly unlikely. Only on rare occasions.
<i>Falco naumanni</i>	Palaeartic migrant. Prefers open country	Unlikely:

SCIENTIFIC NAME	PRESENCE OF SUITABLE HABITAT	LIKELIHOOD OF OCCURRENCE ON STUDY SITE
(Lesser Kestrel) (VU)	such as pristine open grassland and pastures for foraging purposes	Occasional
<i>Falco biarmicus</i> (Lanner Falcon) (NT)	May hunt over and move through the area on rare occasions.	Unlikely: Might hunt over the area on occasion
<i>Falco peregrinus</i> (Peregrine Falcon) (NT)	May hunt over the area on rare occasions	Unlikely:
<i>Phoenicopterus ruber</i> (Greater Flamingo) (NT)	None. Prefers extensive systems of wetland, notably pans, marshes, lakes and floodplains	Highly unlikely
<i>Ciconia nigra</i> (Black Stork) (NT)	None. Prefers shallow waterbodies such as estuaries and rivers	Unlikely

To ensure future bird diversity and free movement of birds on site it is important that no development be allowed on the steep slope and summit of the ridge as well as within 50 meters on both side of the drainage line.

7.2.3 Reptiles and Amphibians

The area south of the drainage line appears to consist of a rather hard clayey substrate without noticeable retreats, such as burrows or dead termitaria, apart from a relatively dense accumulation of dry grass, with added fresh growth. There are indications that this area was ploughed in the past. Consequently, the species diversity and population densities would be low.

The area of special interest against the southern slope of the ridge at the northern end of the site also lacks obvious, suitable retreats for amphibians and reptiles. The substrate consists of stony to rocky clayey soil, not suitable for burrowing or sand swimming reptiles. Less specialised terrestrial reptile species may utilise the limited available possibilities provided by accumulated dry vegetable matter. No amphibians are expected to occur here.

The wetland and the drainage line may be suitable for the reproduction of some toads and sandfrogs. The bottom of the valley does not appear to be suitable for the formation of breeding ponds for the 'Near Threatened' Giant Bullfrog (*Pixycephalus adspersus*) nor is the substrate of the adjacent terrain suitable for burrowing for the purposes of aestivation and hibernation. Occasionally individual specimens from adjacent areas may appear on this site.

The ruins of the former farm buildings are still utilised by the most common commensals, such as the Speckled Skink (*Trachylepis punctatissima*) and the Cape Dwarf Gecko (*Lygodactylus capensis*).

8. LIMITATIONS, ASSUMPTIONS AND GAPS IN KNOWLEDGE

To date, only the new SANBI vegetation map was published. No details of the composition of the various vegetation communities were published as yet and assumptions about the status of the natural vegetation on the site were made on the basis of past experience of natural pristine vegetation in the area.

Part of the site was burned in late winter, followed by months of drought until the first rains in September/October 2006. Most species had sprouted sufficiently to facilitate identification. Some grass species had not yet formed inflorescences and could therefore not be identified.

9. RECOMMENDED MITIGATION MEASURES

- No development should be allowed on the steep slope and summit of the ridge (vegetation communities: *Acacia karroo* – *Rhus lancea* bushveld and Plateau Savannah).
- No development should be allowed within the 1:100 year floodline of the drainage line.
- Development should be restricted to disturbed areas.
- Development on the randjies slope and ridge is deemed inadvisable.
- It is suggested that the drainage course be retained and ecologically developed as such.
- Hedgehogs (if any) that are found on site must be relocated to suitable protection areas as identified by GDACE.
- The contractor must ensure that no fauna species are disturbed, trapped, hunted or killed during the construction phase. Conservation-orientated clauses should be built into contracts for construction personnel, complete with penalty clauses for non-compliance.
- Alien and invasive plants must be removed from site.
- No plants not indigenous to the area, or exotic plant species, especially lawn grasses and other ground-covering plants, should be introduced in the landscaping of the proposed site, as they might spread into the natural vegetation areas;
- The cultivation of trees and shrubs indigenous to the area in gardens should be encouraged. With proper cultivation of specific indigenous plant species natural to the area, butterfly and bird numbers and species in the area would increase. Lists of plant species, which attract butterflies and birds to gardens, are available.
- Where possible work should be restricted to one area at a time. This will give the smaller birds, mammals and reptiles a chance to weather the disturbance in an undisturbed zone close to their natural territories.
- No vehicles must be allowed to move in or across the wet areas or drainage lines (except over the existing bridge and access road) and possibly get stuck. This leaves visible scars and destroys habitat. It is important to conserve areas where there are tall reeds or grass and areas where there are short grass and mud.
- It is suggested that where work is to be done close to the drainage lines, these areas be fenced off during construction to prevent heavy machines and trucks from trampling the plants, compacting the soil and dumping in the system.

- It is important to note that birds inhabiting one of the named microhabitats on site will in most cases not move into a different habitat. In other words, birds found on the open woodland will not now, with the development, move into the grassland areas or the wetland area. If the objective is to keep these species on site, suitable open spaces must be kept for these species.
- During the construction phase noise must be kept to a minimum to reduce the impact of the development on the fauna residing on the site.

10. CONCLUSIONS

Flora:

The vegetation in the *Acacia karroo* – *Rhus lancea* bushveld and in the Plateau savannah is deemed sensitive and should be excluded from the development and where possible, these areas must be connected to other natural vegetation areas on the neighbouring properties to facilitate connectivity. The drainage line should be cleared of all Category 1 Declared weeds and Category 2 Declared invaders and its flow into the neighbouring site be properly managed. All alien weeds and invader plants should likewise be removed from the rest of the site. Dumping of builders' rubble and other waste in the areas earmarked for exclusion must be prevented, through fencing or other management measures. These areas must be managed throughout the lifespan of the project in terms of fire, eradication of exotics etc. to ensure continuous biodiversity.

Mammals:

Of the 30 mammal residents of the site; no Red Data mammals are identified.

Birds:

The proposed development should not have a negative affect on any Red Data bird species recorded for the 2528CD q.d.g.c. Within the area to be examined, no development should be allowed on the steep slope and summit of the ridge on site as this area consists of indigenous and undisturbed vegetation and will act as a corridor for birds and other fauna species to move through and will also ensure foraging and breeding habitat for many bird species. The area between the access road at the foothill of the steep slope of the ridge and the drainage line is less sensitive as well as the southern portion of the site south of the drainage line.

Reptiles and Amphibians:

Development on this site would require the removal of most of the vegetation cover, which at present is the most important shelter for the herpetofauna. If the steepest and rocky areas above the former farm buildings would be left untouched, this could provide a small retreat for a few individuals of the more common species.

The study site is not very suitable at present as habitat for amphibians or reptiles. A further reduction of species diversity and population densities is expected after development on this site.

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APPENDIX A

Red and Orange-listed plants of the 2528CD quarter degree grid

Species	Flowering season	Suitable habitat	Priority grouping	Conservation status	PRESENCE ON SITE
<i>Bowiea volubilis</i>	Sep-Apr	Shady places, steep rocky slopes and in open woodland, under large boulders in bush or low forest.	N/A	Declining ²	Habitat not suitable
<i>Ceropegia decidua</i> subsp. <i>pretoriensis</i>	Nov-Apr	Direct sunshine or shaded situations, rocky outcrops of the quartzitic Magaliesberg mountain series, in pockets of soil among rocks, in shade of shrubs and low trees, can be seen twining around grass spikes.	A1	Vulnerable ¹	Habitat not suitable
<i>Delosperma gautengense</i>	Nov-Apr	Among rocks of Magaliesberg quartzite in grassland in transition to sour grassveld.	A1	Vulnerable ¹	Habitat not suitable
<i>Eucomis autumnalis</i> subsp. <i>clavata</i>	Nov-Apr	Open grassland, marshes.	N/A	Declining ²	Habitat suitable
<i>Eulophia coddii</i>	Early Dec	Steep hillsides on soil derived from sandstone, grassland or mixed bush.	A2	Vulnerable ¹	Habitat not suitable
<i>Habenaria bicolor</i>	Jan-Mar	Terrestrial in drained grassland, recorded from about 1800m.	B	Near Threatened ²	Habitat not suitable
<i>Habenaria kraenzliniana</i>	Feb-Apr	Terrestrial in stony, grassy hillsides, recorded from 1000 to 1400m.	A3	Near Threatened ¹	Habitat not suitable
<i>Habenaria mossii</i>	Mar-Apr	Open grassland on dolomite or in black sandy soil.	A1	Endangered ¹	Habitat not suitable
<i>Holothrix randii</i>	Sep-Jan	Grassy slopes & rocky ledges.	B	Near Threatened ²	Habitat not suitable
<i>Hypoxis hemerocallidea</i>	Sep-Mar	Grassland and mixed woodland.	N/A	Declining ²	Habitat suitable
<i>Lithops lesliei</i> subsp. <i>lesliei</i>	Mar-Apr	Brown shale on hilltops.	N/A	Declining ²	Habitat suitable
<i>Trachyandra erythrorrhiza</i>	Sep-Nov	Marshy areas, grassland, usually in black turf marshes.	A3	Near Threatened ¹	Habitat not suitable

¹) global status;

²) national status

* Orange listed plants have no priority grouping and are designated 'N/A'

APPENDIX B: DEFINITIONS OF IMPACT RATINGS.

Extent Rating	
High	Widespread Far beyond site boundary Regional / national / international scale
Medium	Beyond site boundary Local area
Low	Within site boundary

Intensity Rating / Nature of Impact	
High	Disturbance of pristine areas that have important conservation value Destruction of rare or endangered species
Medium	Disturbance or areas that have potential conservation value or are of use as resources Complete change in species occurrence or variety
Low	Disturbance of degraded areas, which have little conservation value Minor change in species occurrence or variety

Duration Rating	
High (Long term)	Permanent Beyond decommissioning Long term (more than 15 years)
Medium	Reversible over time Lifespan of the project Medium term (5-15 years)
Low	Quickly reversible Less than the project lifespan Short term (0-5 years)

Impact Magnitude and Significance Rating	
High	Of the highest order possible within the bounds of impacts that could occur. In the case of adverse impacts, there is no possible mitigation that could offset the impact, or mitigation is difficult, expensive, time-consuming or some combination of these. Social, cultural and economic activities of communities are disrupted to such an extent that these come to a halt. In the case of beneficial impacts, the impact is of a substantial order within the bounds of impacts that could occur.
Medium	Impact is real, but not substantial in relation to other impacts that might take effect within the bounds of those that could occur. In the case of adverse impacts, mitigation is both feasible and fairly easily possible. Social, cultural and economic activities of communities are changed, but can be continued (<i>albeit</i> in a different form). Modification of the project design or alternative action may be required. In the case of beneficial impacts, other means of achieving this benefit are about equal in time, cost and effort.
Low	Impact is of a low order and therefore likely to have little real effect. In the case of adverse impacts, mitigation is either easily achieved or little will be required, or both. Social, cultural and economic activities of communities can continue unchanged. In the case of beneficial impacts, alternative means of achieving this benefit are likely to be easier, cheaper, more effective and less consuming.
No impact	Zero impact

Visual Impact Assessment



Appendix G8

**PORTION 5 TYGERVALLEI 334 – JR
VISUAL IMPACT ASSESSMENT**

Summary

The visual impact for the above mentioned project will be summarized and described as follows:

After all the mitigation measure has been applied Loss of sense of place and visual quality will have a moderate effect and the significance of the impact will be low.

The visual impact due to incompatible land-use, low visual absorption capacity, and high visibility and critical views from Lynwood road and surrounding properties will have a slight impact but the significance of the impact will be low.

According to these conclusions the visual impact of the above mentioned project will not be negative to the surrounding areas and the site.

Insite landscape Architects cc
012 567 2780

**PORTION 5 TYGERVALLEI 334 – JR
VISUAL IMPACT ASSESSMENT**

INTRODUCTION

This Visual Impact Assessment is a specialist study to determine the visual effects of the proposed Residential Development of Portion 5 Tygervallei 334 - JR on the surrounding environment. This study forms part of the overall environmental impact assessment for the Residential Development of Portion 5 Tygervallei 334 – JR project.

The primary goal of this specialist study is to identify potential risk sources resulting from the project that may impact on the visual environment of the study area, and to assess their significance. This goal will be reached through the realisation of the following objectives:

1. Determine the extent of the study area; this includes the site and the surrounding landscape, which is visually connected to the site.
2. Determine the visual character of the study area.
3. Identify the project components that may potentially impact on the visual environment.
4. Assess the significance of the identified impacts on the visual environment.
5. Identify elements of particular visual quality that could be affected by the proposed project, and
6. Recommend generic mitigation measures to reduce the potential visual impacts generated in the study area by the proposed project.

1. STUDY APPROACH

1.1 Method

The following methodology was followed:

The extent of the study area was identified as the area falling within a five-kilometre radius of the Site.

The proposed site was visited for orientation purposes and to capture the landscape character, views and proposed alignments in photographic images.

Topocadastral plans at 1:50 000 scale were used to determine the visual absorption capacity of the study area.

A report was prepared which describes: the visual environment, the project components, the potential risk sources and their assessed impact on the visual environment. This report examines the following visual aspects:

- Genius Loci (Sense of place)
- Visual Quality (Aesthetics)
- Landscape Character
- Surrounding Landscape Compatibility
- Scale
- Visual Absorption Capacity (VAC)
- Visibility (view shed and viewing distance)
- Critical Views

A summary of the identified visual impacts and their significance was compiled based on the visual aspects mentioned above.

2. STUDY AREA

The proposed site for the Residential Development project considered in this report is situated on the of Portion 5 Tygervallei 334 – JR. An area within a 5 km radius from the site was included in the study area, taking into consideration views toward the site.

Figure 1: Locality Plan Shows the Site position and the 5km radius from the site.

3. DESCRIPTION OF THE PROJECT COMPONENTS

3.1 Access road network.

A proposed new access road network will be constructed to accommodate traffic (See attached layout plan).

Road surface material: The major road surface material will be Asphalt blocks. At all intersections and major nodes red coloured concrete blocks will be laid in a pattern to accommodate traffic calming and create an aesthetic pleasing effect. Concrete kerbs will be placed on either side of the road surface.

Landscaping: Manicured lawns, veldgrass and indigenous trees will be installed next to all major roads. Indigenous trees, shrubs and groundcovers will be planted next to all intersections and major nodes to enhance the aesthetic effect.

3.2 Cut and fill operations – access road.

Cut and fill operations would be necessary to obtain the desired levels to accommodate the plots. After the removal of vegetation in the area of the road footprint, the existing soil and rock level would be cut on the slope, the slopes of the excavation stabilized and earth retaining measures put in place. Some blasting could be required (unknown). In the area requiring fill, soil from the cut operations and other imported soil would be placed on appropriate areas and stabilized, also taking care to stabilize the sides and finally covering with topsoil before being rehabilitated either through re-vegetation or according to the requirements of its identified use.

Two types of distinctive slope has been identified, moderate and steep.

Soft slopes: Cut and fill operations will be minimum, and the impact will be mitigated with general landscaping solutions.

Steep slopes: Cut and fill operations will be balanced out, landscaping and retaining structures will be implemented. All

retaining structures will be designed to blend into the surrounding area and architectural theme. Indigenous landscaping will be used as a visual support.

3.3 Erven

There will be a number of 132 erven all approximately 1 000m² in size with Highdensity housing situated at the entrance. Most of the erven of a rectangular shape, and some pan-handle erven to fill open spaces.

Open spaces: Many green 'Finger' open spaces have been provided for between designated areas. Areas will be landscape with indigenous trees, shrubs and ground covers to soften the visual impact. In areas where the slope is too steep to build on, the existing landscape will remain (most of the area of the hill/small ridge).

3.1 Architecture

The architectural theme for this English village was derived from a typical 'English Country' style. It is characterized by one and two story residential buildings using building material such as natural stone, timber, plaster and paint and clay roof tiles. Roof forms are simple, yet accentuated by dormers and double pitch gable end roofs. The architectural style is natural and truly English. The use of chimneys that protrude above the roof apex of the house, natural timber window frames and natural stone walls become distinctive and legible elements in this village.

Boundary walls and screening walls will only be allowed in the yard areas of the house. Yard walls shall not be higher than 1.8m. Low 'werf-type' walls are allowed on the sides of dwellings, not higher than 600mm. Boundary walls may not protrude beyond any housing unit.

All roofs must be double pitched with gable ends. The roofs will be finished with mazista clay tile.

Gutters and down pipes must be unobtrusive and must match the colour palette of the house

Only square-type small pane casement windows are allowed. Window timber frames to be of natural wood colour.

Only earthy colours will form part of the total colour scheme.

4. DESCRIPTION OF THE AFFECTED ENVIRONMENT

This study was prepared at a sub-regional level therefore the study area was divided into six broad landscape types. These landscape types were derived from 1:50 000 topocadastral maps. The six landscape types are:

- * Rocky Hillside.
- * Open or mostly undeveloped grassland.
- * Smallholdings/ small farm lots.
- * Residential.
- * Commercial.
- * Quarry areas.

Figure 2: Landscape Types Plan shows the general position of these areas within the study area.

4.1 Rocky Hillside

This landscape is characterised by rocky outcrops and general rocky terrain sloping up to the crest of the hill. The vegetation occurring in this landscape is typical of the southern slope of the mountain range. The rocky features are considered noteworthy and would difficult to build and excavate these areas for development. 30% of the upper portion of the site does have these rocky outcrops.

4.2 Open undeveloped grassland

Open land is land where very little building development has taken place. This includes areas that are currently or have previously been cultivated or used for grazing. Large parcels of vacant land that may be zoned for some other use other than agricultural or public open space have been included in this landscape type.

This landscape can be described as having few or no structures and low vegetation profile less than 1 m in height, dominated by grasslands with limited areas of trees. Since this study is conducted at a sub-regional level large but scattered groups of trees are disregarded in this category.

4.3 Smallholdings/ Small farm lots

Smallholdings typically have a low density of buildings and structures with relatively large areas of undeveloped land spread evenly around and between them. Buildings are generally single or double storey structures. The vegetation has a low profile less than 1 m in height.

4.4 Residential

The buildings in the residential area are generally single or double story structures. The vegetation in this area has a very high profile with trees and palms up to 10 m in height. The viewing distance within the residential areas are mostly limited due to the high profile trees.

4.5 Commercial

The commercial zones are along the main traffic route, approximately 3 km + from the proposed building site. The commercial zone lies in an Eastern and western direction along Lynwood road.

4.6 Quarry areas

The quarry areas are approximately 2 and 4 km + to the east and western direction respectively of the proposed building site. The quarry areas typically have a lower density of buildings and structures. Buildings are generally single or double storey structures. The vegetation has a low profile, dominated by grasslands with limited areas of trees.

5. METHOD

This section describes the method of assessing the visual aspects, which have been considered in order to determine the intensity of the visual impact on the area.

5.1 Genius Loci (Sense of place)

The spirit, or sense, of place is that quality imparted by the aspects of scale, colour, texture, landform, enclosure, and in particular, the land use. According to Lynch (1996), "it is the extent to which a person can recognise or recall a place as being distinct from other places as having a vivid, or unique, or at least a particular, character of its own."

Table 1: Genius Loci Rating

A particularly definite place with an almost tangible dominant ambience or theme.	High
A place, which projects a loosely defined theme or ambience.	Moderate
A place having little or no ambience with which it can be associated.	Low

5.2 Visual Quality (Aesthetics)

The visual quality is the viewer's impression of a landscape, influenced by their own cultural values and past associations and the landscape's intrinsic physical properties. While cultural and past associations are individual to each viewer, the aesthetic properties, which invoke a reaction to the landscape character, can be identified and evaluated.

These aesthetic properties include the degree of visual diversity or complexity, any discernible textures or patterns, and the presence of unique or striking visual features in the landscape. The viewer's impression of the landscape is also significantly influenced by the degree of human intrusion into the landscape. The degree and compatibility of the human intrusion determines the intactness of the visual character. Together, these properties can be assessed in terms of the overall vividness, intactness and unity of the landscape.

Table 2: Visual Quality Rating

A very attractive setting with great variation and interest but no clutter.	High
A setting, which has some aesthetic and visual merit.	Moderate
A setting, which has little aesthetic value.	Low

5.3 Landscape Character

The topography, vegetation cover and settlement patterns are the chief aesthetic properties, which define the landscape character of the study area. The study area can be divided into a number of landscape types.

5.4 Surrounding Landscape Compatibility

Two methods are used to assess the compatibility of a proposed project with the surrounding landscape. Firstly by comparing the proposed land use to that of the existing use and secondly by comparing the level of complexity between the proposed and existing use in terms of the technology, cultural style, and design philosophy evident.

The design philosophy is considered to be the degree of a formal, academic or western science response, as apposed to an evolved response where development is informed by, and is the result of the overlaying of natural and social patterns. Table 3 defines the landscape compatibility factors and rating.

Table 3: Landscape Compatibility factors and rating

LANDSCAPE FACTOR	CATEGORIES	COMMENT
Land-use	Range	
	High	Complements and enhances the existing visual character of the land-use.
	Moderate	Complements the visual character of the existing land-use.
	Indifferent	Neither complements nor detracts from the visual character of the existing land-use.
	Low	Detracts from the visual character of the existing land-use.
	None	The visual character of the proposed and existing land-uses is not at all compatible.
Complexity	Range	
	High	The existing technology, cultural style, and design philosophy is complimented and enhanced through refinement.
	Moderate	The existing technology, cultural style, and design philosophy is complimented.
	Indifferent	The proposed technology, cultural style, and design philosophy neither complements nor is it in conflict with the existing.
	Low	The proposed technology, cultural style, and design philosophy is it in conflict with the existing.
	None	The proposed technology, cultural style, and design philosophy is not only in conflict with but also overwhelms the existing.

A final value is determined by combining the value given for Land-use and Complexity compatibility. The final value must be None, Low, Moderate or High.

5.5 Scale

The scale of an area relates to the vertical and horizontal dimensions of the landscape. The vertical and horizontal dimensions of the topography and natural features including vegetation, rock outcrops, water bodies and rivers influence on one's spatial interpretation of the landscape.

A repetition or layering of either horizontal or vertical elements emphasises these dimensions and adds perspective to the landscape, thereby increasing its visual quality.

Upright features in the landscape typically define the vertical scale while the horizontal scale and depth of field are defined by natural and man-made features that block or interrupt the field of vision along the horizontal plane or the line of sight to the horizon respectively.

5.6 Visual Absorption Capacity (VAC)

The visual absorption capacity (VAC) is a measure of the landscape's ability to visually accept / accommodate or embrace a development. Areas that have a high visual absorption capacity are able to easily accept features or structures so that their visual impact is less noticeable. Conversely areas with low visual absorption capacity will suffer a higher visual impact from structures imposed on them.

In this case, the VAC has been defined as a function of three factors:

- Slope
- Vegetation height
- Visual pattern (diversity) with regard to vegetation and structures

Three ranked categories are defined within each factor and each category has been assigned a numerical value to enable an arithmetic calculation of the VAC of different zones. The VAC factors, categories and their values are shown in Table 4.

As this study was undertaken at a local to sub-regional level, the areas of varying visual pattern (diversity) and vegetation height were based on the landscape types as discussed under section above. A 5 km buffer was drawn around the proposed site (where possible). Figure 2: Landscape Types Plan shows how this buffer area was divided into zones according to the six landscape types.

For the purpose of this study in terms of vegetation height the following was assumed:

Rocky Hillside, with shrubbery, medium size trees and grass	> 5m
Undeveloped land, which is characterised by grassland	1 < > 5m
Smallholdings are characterised by grassed areas with spread out structures	< 1m
Residential, with gardens: lawn, shrubs, medium to large trees	>5m

For the purpose of this study in terms of visual pattern/diversity the following was assumed:

Hillside with Rocky features, Shrubbery and Medium size trees has High VAC
 Undeveloped land, where grassland is typically uniform has Low VAC value.

Smallholdings with grassed areas with spread out structures have a Moderate VAC value.

Table 4: Visual Absorption Capacity (VAC) factors and their numerical values

VAC Factor	Categories			
Slope	Range	0-3 *	3-7 *	> 7 *
	Numerical	3	2	1
	Value	Low	Moderate	High
	VAC			
Vegetation Height	Range	< 1 m	1-5 m	5 m
	Numerical	3	2	1
	Value	Low	Moderate	High
	VAC			
Visual Pattern	Description	Uniform	Moderate	Diverse
	Numerical	3	2	1
	Value	Low	Moderate	High
	VAC			

5.7 Visibility (View Shed and Viewing Distance)

A Visibility survey was done for various selected viewpoints within the study area. These points were selected by assessing the areas and transport corridors most often frequented by potential viewers. Lynwood road was considered to be the most frequented transport corridor, and strategic viewpoints were selected along the road within the 5 km study area. Additional points were selected such as points within the residential area, which had a clear view on the proposed building site.

Figure 3: Viewpoints shows the various viewpoint positions within the study area.

Figures 4: Visuals from Viewpoints features photographs from each viewpoint towards the site.

Table 5: Descriptions of Viewpoints

Viewpoint No.	Description
1.	View from cnr. Hans strydom and Lynwood.
2.	View from filling station at the Hans strydom intersection.
3.	View from cnr. Lynwood and Silver lakes road.
4.	View from Silver lakes road.
5.	View from Silver lakes road.
6.	View from Lynwood road as indicated on the map.
7.	View from Lynwood road close to Lombardy estate.
8.	View from Lynwood road close to Lombardy estate.
9.	View from Lynwood at the entrance of the estate
10.	View in front of the estate
11.	View from La Campagnola
12.	View from Lynwood road as indicated on the map.
13.	View from Lynwood road as indicated on the map.
14.	View from Lynwood road as indicated on the map.
15.	View from the bridge at Swawe/ poort and Lynwood street
16.	View from Lynwood road as indicated on the map.

Visibility ratings were derived by determining the degree of visibility from the viewpoint.

Table 6: Visibility ratings

Where a significant area allows uninterrupted view distances to the site from the source	High
Where a significant area allows limited visibility of the site from the source.	Moderate
Where a significant area none or very limited visibility of the site from the source.	Low

5.8 Critical Views

Table 7: Critical view ratings

Views of the project are to be seen by many people passing on main roads and from prominent areas i.e. communities and settlements.	High
Some views of the project from surrounding main roads and communities.	Moderate
Limited views to the project from main roads and communities.	Low

6. VISUAL INTERPRETATION

This section describes the visual aspects, which have been considered in order to determine the potential visual impact on the area resulting from the proposed House Weltz. Certain visual aspects are assumed to be consistent throughout large sections of the study area. The interpretation of these aspects is therefore undertaken at a sub-regional level.

6.1 Visual Aspects

- Landscape Character

This area is characterised by a natural ridge with vegetation is that typical of the southern aspect of hillsides, including hardy shrubbery, succulents, several grass species and medium size trees including *Acacia species*, *Rhus species* and *Combretum species*, to name a few. The character of the study area could further be described as having a lower more even area, filled with veld-grass and exotic blue gum trees and a area recessed to form a pond. The upper portion has less grass with some areas consisting only of rock.

Figures 5: Panoramas & Figure 6: Landscape Character shows images of the site.

- Scale

The Ridge defines the vertical and horizontal planes. The ridge is typically elevated 32 m to the general landscape. The significance of the ridge as vertical feature diminishes as one move further away. Some views toward the ridge from Lynwood road are obscured with large exotic and indigenous tree clumps

6.2 Visual Aspects Sensitive to Visual Impacts

Ratings for the following visual aspects are given in Table 8.

- Sense of Place

The site generally and partly lies between the Bronberg ridge and part of a small ridge minimizes the visual impact from areas other than between the two ridges see figure 1. The Bronberg Ridge (2km south of the site) has a distinct sense of place although it has already been developed in some areas. The rest of the study area, consisting of a mixture of residential, commercial, smallholdings open grassland and small quarry areas also have a distinct sense of place that contrasts greatly from that of the City and Suburbs of Pretoria.

- Visual Quality

Due to the natural environment and varying topography of the study area, the visual quality is considered to be moderate. The seasonal dam and trees add to the unique visual quality to the site itself.

- Visibility

Figure 1: Locality Plan shows the view shed from the site that defines the study area. This includes a 5 km zone from the site to the east and west and 1,5 km zone south. The reason for this is because the Bronberg ridge and to a lesser degree the small ridge block the view from areas else where. It is anticipated that visibility within this view shed would be highest close to the site, diminishing as one continues towards the 5 km boundary or beyond the ridges. Factors such as the 10m high tree clumps growing next to the roads and adjacent properties, clusters of buildings and residential estates and adjacent ridges reduce the visibility at critical points within the view shed. A moderate visibility would be considered for this area.

- Critical Views

Lynwood carries a moderate volume of traffic that might increase in the future, and all views toward the site would thus be considered moderate. Clear views of the site are found along certain parts of the road within the view shed, mostly to the east of the site.

6.4 Project Components

- Construction such as the gate house, clubhouse, tennis court and dam restorations, walking trails, bird hide and construction of new dwellings as proposed (mainly on the relatively flat areas of the site).
- Access road to the site and within the site to the new Erven.
- Cut and fill operations for the road construction and driveways to the houses

6.5 Visual Impact Potential (Checklist)

The potential visual impact of each project component on each visual aspect is assessed using Table 9. Potential impacts are given a Low, Moderate or High rating. The significance of the impact is not considered at this stage, i.e. it is not relevant whether an impact is positive or negative or whether it would be considered significant in the overall context of either the proposed project or the receiving environment.

Table 10: Assessment of potential visual impacts

Visual Aspect		Project Components			
		Construction	Cut & Fill	Access Road	Pond
Sense of place		high	moderate	low	low
Visual quality		high	moderate	low	moderate
Landscape character		high	high	moderate	low
Surrounding landscape compatibility		Moderate	moderate	moderate	moderate
Scale		high	low	low	low
Visual Absorption Capacity (VAC)	Slope	low	n/a	n/a	n/a
	Vegetation height	moderate	moderate	moderate	moderate
	Diversity	moderate	moderate	moderate	moderate
Visibility		high	moderate	moderate	moderate
Critical views		moderate	moderate	low	low

7. RECOMMENDED MITIGATION MEASURES

7.1 Introduction

Typical modifications to the topography and therefore the visual environment can be linked to the project components:

- Buildings
- Planting adjacent roads
- Pond
- 'Green-finger' – extensive open spaces
- Limited development at the small ridge

7.2 Mitigation of Project Components

Mitigation measures to address visual impacts for each construction method are as follows:

7.2.1 Building

Mitigation measures to minimise the visual impact of the house:

The building

- The use of natural stone cladding will be highly recommended to the buyers of each home, and cement based coatings such as 'Cemcrete' and 'earthcoat' will also be recommended
- All roofs to be tiled with 'earth coloured' tiles
- Only low 'verf-type' boundary walls (600mm high) will be allowed round the dwellings, only at the yard/ service may boundary walls (1800mm high) be built.
- No building to be higher than 2 stories.
- The placement of the buildings on site in such a manner that it has the least obtrusive effect on neighbouring communities. (Only 3 buildings paced on the small ridge)

- The building texture of the façade surface could be made less visually intrusive through the placement of medium to large planting in front of the façade.
- Almost all building work will be constructed in the valet below the small-ridge

7.2.2 Planting adjacent roads

Requires mitigation of visual impacts, primarily resulting from scarring of the landscape during construction of the roads and sidewalks. Mitigation during construction and at completion of construction period would include:

- Cut slopes should be stabilized and retained; using planting and materials colour and texture finishes which match that of the visual environment.
- Immediate rehabilitation and re-vegetation of areas cleared. Treatment of exposed surfaces should match that of the surrounding visual landscape character (planting).
- The soil profile of Fill should be shaped to blend in with the gradients of the surrounding landscape.
- Planting adjacent roads will include indigenous tree planting to soften the visual impact of the buildings
- Landscape the areas affected by construction using natural materials and indigenous plants to blend in with the surrounding landscape.

7.2.3 Pond

This will be a mitigation measure; the construction and upgrade of the existing pond will add value to the visual quality of the site and surrounding environment. The upgraded pond will also act as a wild life magnet, attracting all sort of animal, bird and insect life to the site.

Mitigation during operational phase should include:

- Using material, colour and texture finishes that match that of the visual environment.
- Planting of large indigenous tree species and shrubbery along the edge and immediate surroundings.
- Immediate rehabilitation and re-vegetation of cut slopes.

- Shaping of remaining and exposed soil profile to blend in with the gradients of the surrounding landscape.
- Creating of an island, this will act as a habitat creation feature.
- Using of natural stone cladding when upgrading the existing bridge, this will blend into the exiting landscape.
- Planting of wetlands so that the quality of the water will improve

7.2.4 'Green-fingers' – extensive open spaces

This will be a mitigation measure; the introduction of extensive 'green-fingers' into the residential development will act as a softening element. The network of open spaces will create important green links between the pond and small ridge and into the development it self. The planting of indigenous trees, shrubs and groundcovers will add to the mitigation effect of softening the residential façade. This 'green-fingers' will also act as lungs for the development and act as a wildlife-magnet.

7.2.5 Conservation of the 'small-ridge'

This will be a mitigation measure; the conservation of the 'small-ridge' will be achieved by limiting the construction activities on the ridge to the minimum. The ridge will also be upgraded by introducing limited indigenous planting. This will give the development a unique natural character. The existing planting theme of the 'small-ridge' will also be introduced into the residential landscape and planted next to the road. The home owners will be encouraged to plant these floras into their gardens.

8. REFERENCES

LYNCH, K. (1996). *Good City Form*. 10th Printing. Massachusetts Institute of Technology (MIT) Press, Cambridge, Massachusetts, USA.

APPENDIX 1

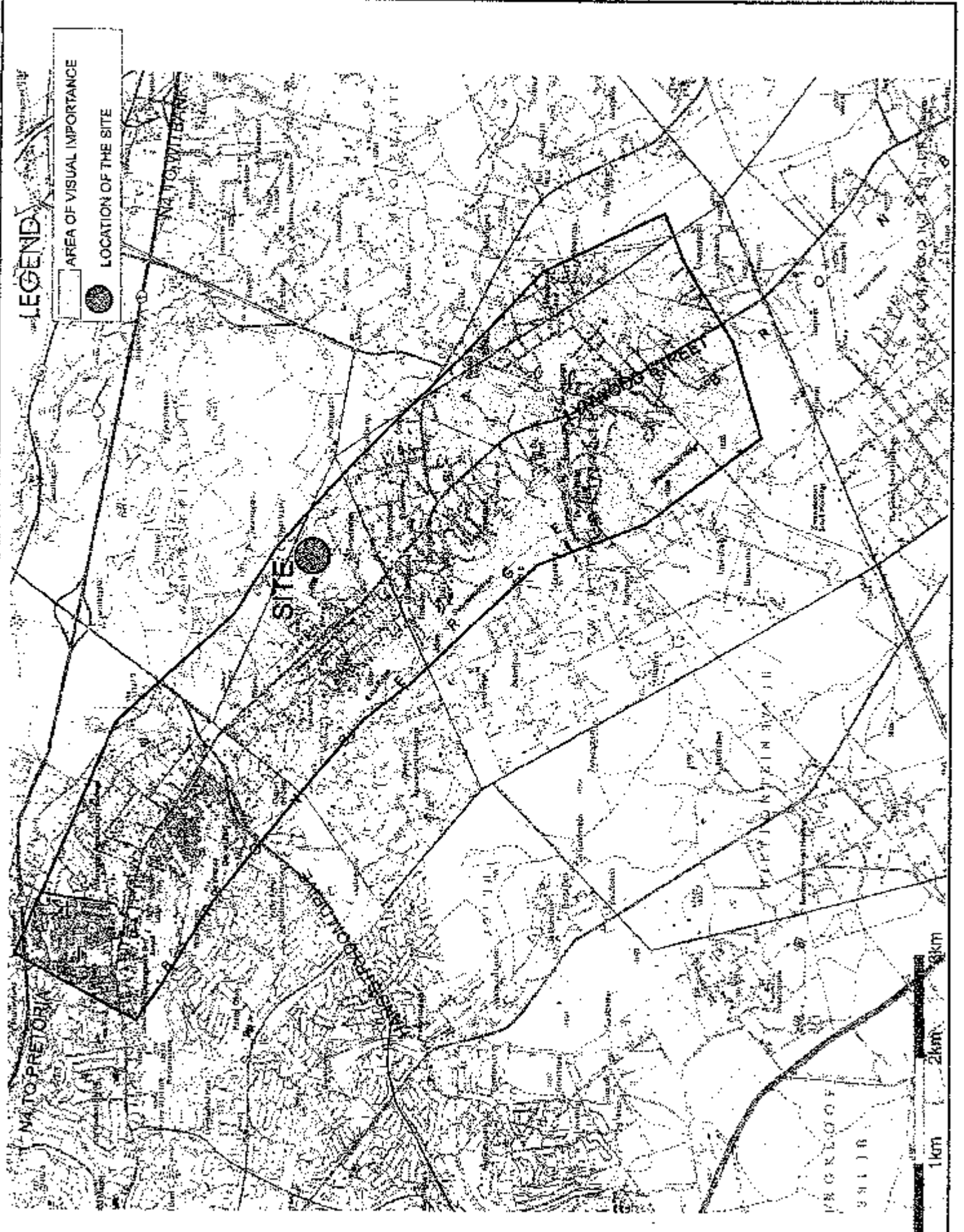
SUMMARY OF POTENTIAL VISUAL IMPACTS PORTION 5 TYGERVALLEI 334 - JR

Issue/Impact	Without mitigation					With mitigation		
	Risk	Temporal	Spatial	Probability	Severity	Significance	Severity	Significance
Loss of sense of place and visual quality	Moderate	Permanent	Localised	Probable	Moderate	Moderate	Moderate	Low
Visual impact due to incompatible land-use, low visual absorption capacity, and high visibility and critical views from Lynwood road and surrounding properties.	Definite	Permanent	Localised	Probable	Moderately severe	Moderate	Slight	Low

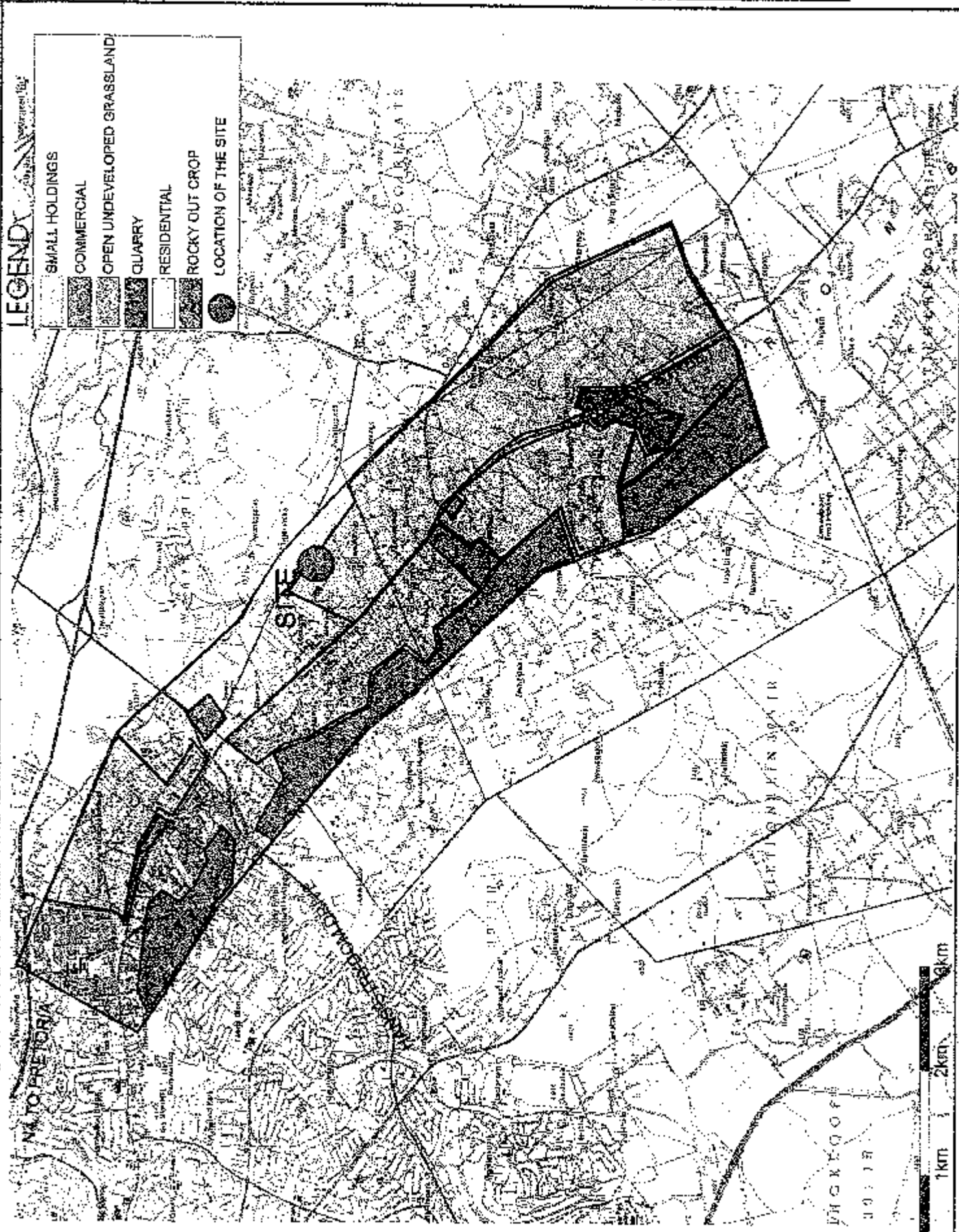
LEGEND

AREA OF VISUAL IMPORTANCE

LOCATION OF THE SITE



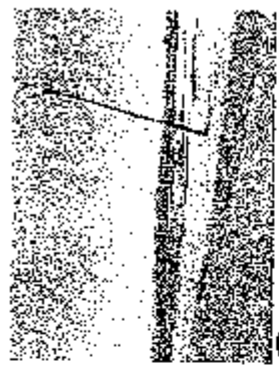
- SMALL HOLDINGS
- COMMERCIAL
- OPEN UNDEVELOPED GRASSLAND
- QUARRY
- RESIDENTIAL
- ROCKY OUT CROP
- LOCATION OF THE SITE



PORTION 5
 TYGERVALLEI 334 - JR

VIEWS FROM VIEWPOINTS

PORTION 5
TYGHEVILLE 334 - JR
VISUAL IMPACT



④ VIEW # 4



⑥ VIEW # 6



⑫ VIEW # 12



⑯ VIEW # 16



③ VIEW # 3



⑦ VIEW # 7



⑪ VIEW # 11



⑮ VIEW # 15



② VIEW # 2



⑥ VIEW # 6



⑩ VIEW # 10



⑭ VIEW # 14



① VIEW # 1



⑤ VIEW # 5



⑨ VIEW # 9



⑬ VIEW # 13



① VIEW FROM THE SITE FROM THE TOP OF THE HILL



② VIEW OF THE SITE NEAR THE ENTRANCE



VIEW OF INDIGENOUS PLANTING ON SITE



VIEW OF DRY POND



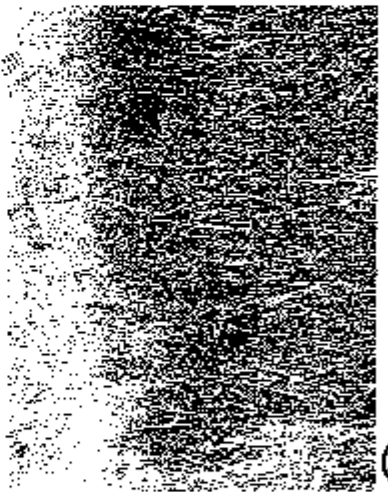
VIEW OF LARGE EXOTIC TREES



VIEW OF EXISTING DWELLINGS ON SITE



VIEW OF DRY RIVER BED WITH VELDGRASS



VIEW OF WATER TOLERANT PLANTING



VIEW OF ROCKY OUT CROPS



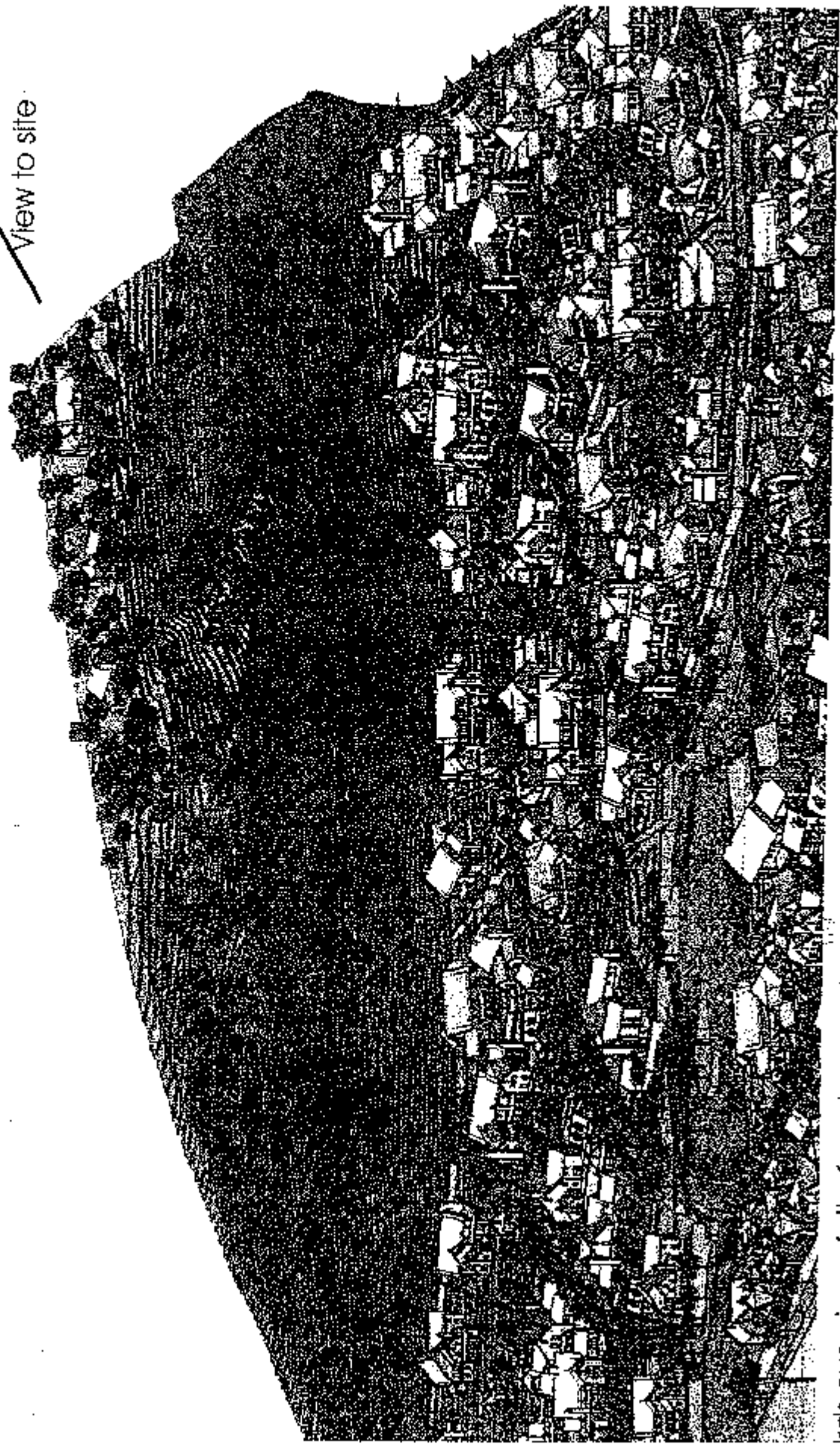
VIEW OF ALOE SPECIES ON SITE



VIEW OF ROCKY OUT CROPS



View to site



birds eye view of site form Lynwood street. A view of the pond and the small-ridge

Environmental Management Plan (EMP)



Appendix H

April
2015

Draft Environmental Management Plan (EMP) for the Proposed Tijger Valley Extension 14 & 34

Ref No. GAUT: 002/14-15/0091

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1 Project Outline

1.1 Background

Bokamoso Landscape Architects & Environmental Consultants was appointed by **Andre Wright** to compile a Basic Assessment Report for the proposed development of **Tijger Valley Extension 14 & 34** and its associated activities.

1.2 Project description

The proposed development is situated on a Part of Portion 5 of the Farm Tyger Valley 334 JR, Pretoria. The proposed study area is located approximately 1km North-East of Graham Road (Lynnwood Rd) and approximately 1km East of Lombardy Estate.

Refer to Figure 1 for the Locality Map and Figure 2 for the Aerial Map.

The study area is approximately 15, 8 hectares in extent and falls within the area of jurisdiction of the City of Tshwane Local Municipality

Timeframe for construction:

It is expected that construction of the proposed development will commence as soon as authorisation from the involved Authorities has been granted.

The EMP will be a binding document for purposes of compliance.

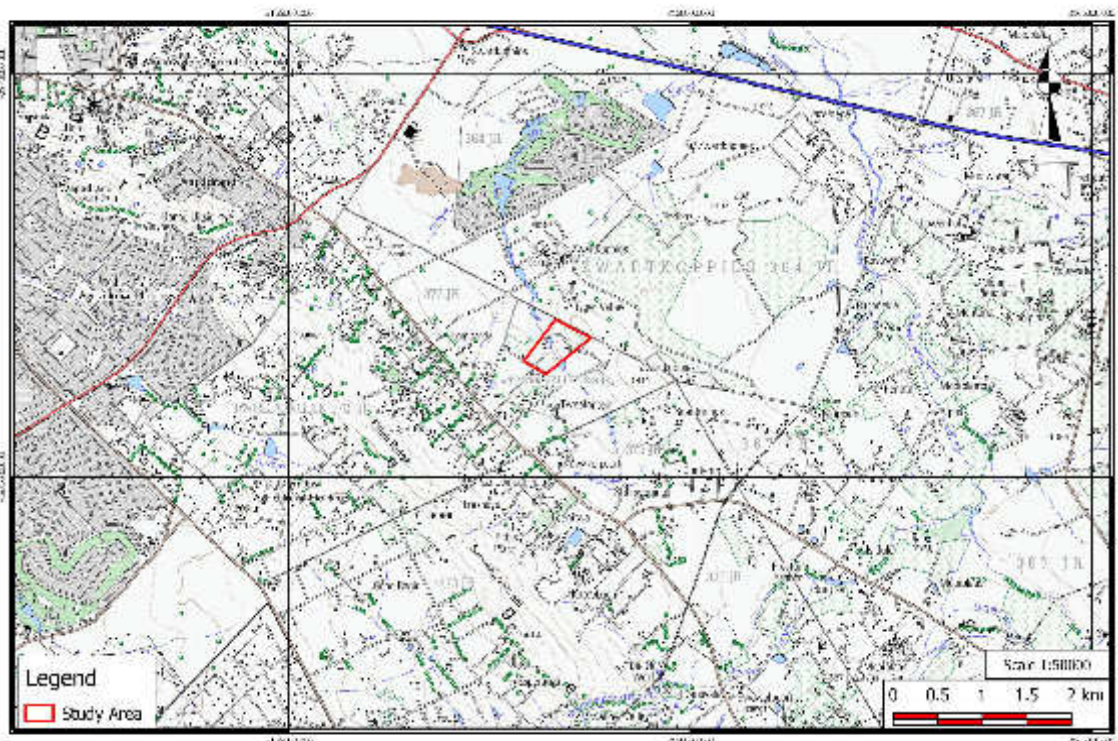


Figure 1 – Locality Map



Figure 2 – Aerial Map

Hydrology:

There is a wetland / drainage line that traverses the site. No construction will take place in the drainage line as it will be zoned private open space except for a road crossing.

Fauna and flora:

The proposed study area falls within the Marikana Thornveld which forms part of the Savannah biome. The Orange-Listed plant species, *Hypoxis hemerocallidea*, which was identified on site, was found within the Disturbed moist secondary grassland. It is recommended by the specialist that this plant species be relocated to an area where it can be preserved. No Red-Listed plant species were found on site.

Cultural /Historical:

A heritage impact assessment was conducted for the proposed development on the larger study area. One site of heritage importance was found on this larger study area. This site consisted of a number of smaller stone circles. There is a possibility that these relate to the Late Iron Age habitation that was found east of the site. This important site centres around the coordinates S-25.79229; E28.37379. The specialist recommended that a 25m buffer zone be established around the site.

Visual:

The study area is partly visible to the surrounding land uses (such as a rose farm and game lodge) to the west and north of the proposed development.

Geology:

The site is underlain by alluvial and colluvial clayey soils overlying residual soils and shale bedrock. These belong to the Silverton Shale Formation, Pretoria Group, Transvaal Supergroup. The area proposed for development consists of the Sepane soil form. Around the drainage line area there is dark fine structured clayey top soils. The soils on the site suggest low to moderate agricultural potential.

2 EMP Objectives and context

Objectives

The objectives of this plan are to:

- Identify the possible environmental impacts of the proposed activity;
- Develop measures to minimise, mitigate and manage these impacts;
- Meet the requirements of the Environmental Authorisation (EA) of GDARD and requirements of other Authorities; and
- Monitor the project.

EMP context

This EMP fits into the overall planning process of the project by carrying out the conditions of consent set out by the Gauteng Department of Agriculture and Rural Development. In addition, mitigation measures recommended in the Basic Assessment Report are included in the EMP.

This EMP addresses the following three phases of the development:

- Pre-construction planning phase;
- Construction phase; and
- Operational phase.

3 Monitoring

In order for the EMP to be successfully implemented all the role players involved must have a clear understanding of their roles and responsibilities in the project.

These role players may include the Authorities (A), other Authorities (OA), Developer/proponent (D), Environmental Control Officer (ECO), Project Manager (PM), Contractors (C), Environmental Assessment Practitioner (EAP) and Environmental Site Officer (ESO). Landowners, interested and affected parties and the relevant environmental and project specialists are also important role players.

3.1 Roles and responsibilities

Developer (D)

The developer is ultimately accountable for ensuring compliance with the EMP and conditions contained in the EA. The developer must appoint an independent Environmental Control Officer (ECO), for the duration of the pre-construction and construction phases, to ensure compliance with the requirements of this EMP. The developer must ensure that the ECO is integrated as part

of the project team. The responsibility of compliance will be carried across to the home owner as soon as transfer of the erven has taken place. It will be ensured that a copy of this document accompanies the purchase agreements for the erven.

Project Manager (PM)

The Project Manager is responsible for the coordination of various activities and ensures compliance with this EMP through delegation of the EMP to the contractors and monitoring of performance as per the Environmental Control Officer's monthly reports.

Environmental Control Officer (ECO)

An independent Environmental Control Officer (ECO) shall be appointed, for the duration of the pre-construction and construction phase of the services and bulk infrastructure, by the developer to ensure compliance with the requirements of this EMP. Thereafter the Home Owners Association will be responsible for the further appointment of the ECO.

- The Environmental Control Officer shall ensure that the contractor is aware of all the specifications pertaining to the project.
- Any damage to the environment must be repaired as soon as possible after consultation between the Environmental Control Officer, Consulting Engineer and Contractor.
- The Environmental Control Officer shall ensure that the developer staff and/or contractor are adhering to all stipulations of the EMP.
- The Environmental Control Officer shall be responsible for monitoring the EMP throughout the project by means of site visits and meetings. This should be documented as part of the site meeting minutes.
- The Environmental Control Officer shall be responsible for the environmental training program.
- The Environmental Control Officer shall ensure that all clean up and rehabilitation or any remedial action required, are completed prior to transfer of properties.
- A post construction environmental audit is to be conducted to ensure that all conditions in the EMP have been adhered to.

Contractor (C):

The contractors shall be responsible for ensuring that all activities on site are undertaken in accordance with the environmental provisions detailed in this document and that sub-contractor and labourers are duly informed of their roles and responsibilities in this regard.

The contractor will be required, where specified to provide Method Statements setting out in detail how the management actions contained in the EMP will be implemented.

The contractors will be responsible for the cost of rehabilitation of any environmental damage that may result from non-compliance with the environmental regulations.

Environmental Site Officer (ESO):

The ESO is appointed by the developer and then finally the home owner as his/her environmental representative to monitor, review and verify compliance with the EMP by the contractor. The ESO is not an independent appointment but must be a member of the contractor's management team. The ESO must ensure that he/she is involved at all phases of the construction (from site clearance to rehabilitation).

Authority (A):

The authorities are the relevant environmental department that has issued the Environmental Authorisation. The authorities are responsible for ensuring that the monitoring of the EMP and other authorization documentation is carried out by means of reviewing audit reports submitted by the ECO and conducting regular site visits.

Other Authorities (OA):

Other authorities are those that may be involved in the approval process of the EMP.

Environmental Assessment Practitioner (EAP):

According to section 1 of NEMA the definition of an environmental assessment practitioner is “the individual responsible for the planning, management and coordination of environmental impact assessments, strategic environmental assessments, environmental management plans or any other appropriate environmental instruments through regulations”.

3.1 Lines of Communication

The Environmental Control Officer in writing should immediately report any breach of the EMP to the Project Manager. The Project Manager should then be responsible for rectifying the problem on-site after discussion with the contractor. Should this require additional cost, then the developer should be notified immediately before any additional steps are taken.

3.2 Reporting Procedures to the Developer

Any pollution incidents must be reported to the Environmental Control Officer immediately (within 12 hours). The Environmental Control Officer shall report to the Developer on a regular basis (site meetings).

3.3 Site Instruction Entries

The site instruction book entries will be used for the recording of general site instructions as they relate to the works on site. There should be issuing of stop work order for the purposes of immediately halting any activities of the contractor that may pose environmental risk.

3.4 ESA/ESO (Environmental Site Officer) Diary Entries

Each of these books must be available in duplicate, with copies for the Engineer and Environmental Site Officer. These books should be available to the authorities for inspection or on request. All spills are to be recorded in the ESA/Environmental Site Officer's diary.

3.5 Methods Statements

Methods statements from the contractor will be required for specific sensitive actions on request of the authorities or ESA/ESO (Environmental Site Officer). All method statements will form part of the EMP documentation and are subject to all terms and conditions contained within the EMP document. For each instance wherein it is requested that the contractor submit a method statement to the satisfaction of ESA/ESO, the format should clearly indicate the following:

- What – a brief description of the work to be undertaken
- How – a detailed description of the process of work, methods and materials
- Where – a description / sketch map of the locality of work; and

- When – the sequencing of actions with due commencement dates and completion date estimate.

The contractor must submit the method statement before any particular construction activity is due to start. Work may not commence until the method statement has been approved by the ESA/ESO.

3.6 Record Keeping

All records related to the implementation of this management plan (e.g. site instruction book, ESA/ESO dairy, methods statements etc.) must be kept together in an office where it is safe and can be retrieved easily. These records should be kept for two years and at any time be available for scrutiny by any relevant authorities.

4 Acts

4.1 The National Water Act, 1998 (Act No: 36 of 1998)

The purpose of this Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways that take into account, amongst other factors, the following:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Reducing and preventing pollution and degradation of water resources;
- Facilitating social and economic development; and
- Providing for the growing demand for water use.

Impact on proposed Development:

Significant – The proposed residential development is subject to flood lines (non-perennial river) as the proposed residential township is planned to border the 1:100 year flood line, thus it will be less than 500 meters away from the river. The drainage line area will be private opens space and apart for a road crossing there will be no construction in this area.

4.2 National Environmental Management: Air Quality Act, 2004 (Act 39 of 2004)

The NEMA: AQA serves to repeal the Atmospheric Pollution Prevention Act (45 of 1965) and various other laws dealing with air pollution and it provides a more comprehensive framework within which the critical question of air quality can be addressed.

The purpose of the Act is to set norms and standards that relate to:

- Institutional frameworks, roles and responsibilities
- Air quality management planning
- Air quality monitoring and information management
- Air quality management measures
- General compliance and enforcement.

Amongst other things, it is intended that the setting of norms and standards will achieve the following:

- The protection, restoration and enhancement of air quality in South Africa
- Increased public participation in the protection of air quality and improved public access to relevant and meaningful information about air quality
- The reduction of risks to human health and the prevention of the degradation of air quality.

The Act describes various regulatory tools that should be developed to ensure the implementation and enforcement of air quality management plans. These include:

- Priority Areas, which are air pollution 'hot spots'
- Listed Activities, which are 'problem' processes that require an Atmospheric Emission Licence
- Controlled Emitters, which includes the setting of emission standards for 'classes' of emitters, such as motor vehicles, incinerators, etc.
- Control of Noise
- Control of Odours.

Impact on proposed Development:

During the construction phase, dust and the generation of noise can become a significant factor, especially to the surrounding landowners. However if the development is well planned and the mitigating measures are successfully implemented the proposed township's contribution to air pollution and the generation of air pollution can become less significant. None of the listed activities, according to this Act, have been triggered.

4.3 National Environmental Management Act (Act 107 of 1998)

The NEMA is primarily an enabling Act in that it provides for the development of environmental implementation plans and environmental management plans. The principles listed in the act serve as a general framework within which environmental management and implementation plans must be formulated.

The principles in essence state that environmental management must place people and their needs at the forefront of its concern and that development must be socially, environmentally and economically sustainable.

Please note that the NEMA EIA Regulations were amended on 4 December 2014 and came into effect on 8 December 2014.

Impact on proposed Development:

Significant – Section 28 (1) of NEMA stated that every person who causes, has caused or may cause significant pollution or degradation of the environment must take reasonable measures to prevent such pollution or degradation from occurring, continuing or recurring, or, in so far as such harm to the environment is authorised by law or cannot reasonably be avoided or stopped, to minimise and rectify such pollution or degradation of the environment.

The EMP is compiled in terms of Section 28 of NEMA.

4.4 National Environmental Management: Waste Act (Act 59 of 2008)

This Act came into effect on 11 June 2009. It aims to consolidate waste management in South Africa, and contains a number of commendable provisions, including:

- The establishment of a national waste management strategy, and national and provincial norms and standards for, amongst others, the classification of waste, waste service delivery, and tariffs for such waste services;
- Addressing reduction, reuse, recycling and recovery of waste;
- The requirement for industry and local government to prepare integrated waste management plans;
- The establishment of control over contaminated land;
- Identifying waste management activities that requires a licence, which currently include facilities for the storage, transfer, recycling, recovery, treatment and disposal of waste on land;
- Co-operative governance in issuing licenses for waste management facilities, by means of which a licensing authority can issue an integrated or consolidated license jointly with other organs of state that has legislative control over the activity; and
- The establishment of a national waste information system.

On 3 July 2009 the Minister of Environmental Affairs and Tourism promulgated a list of waste management activities that might have a detrimental effect on the environment. These listed activities provide the activities that require a Waste Management License. Two Categories is specified: Category A and Category B. As part of Category a Waste Management License application a Basic Assessment in terms of Section 24(5) of the National Environmental Management Act (Act 107 of 1998) must be submitted to the relevant Authority. As part of a Category B Waste Management License a Scoping and EIA process in terms of Section 24(5) of the National Environmental Management Act (Act 107 of 1998) must be followed and submitted to the relevant Authority.

Please note that on 29 November 2013 the listed activities for waste licenses have been amended.

Impact on proposed Development:

Not Significant – No waste management license will be required during the construction or operational phases of the proposed residential township. Due to the fact that a small amount of solid construction waste will be stored and handled on the site, before it is hauled away and dumped at the nearest registered landfill site.

4.5 National Veld and Forest Fire Act, 1998 (Act No. 101, 1998)

The purpose of this Act is to prevent and combat veld, forest and mountain fires throughout the Republic. Furthermore the Act provides for a variety of institutions, methods and practices for achieving the prevention of fires.

Impact on proposed Development:

Significant – Fires of construction workers may only be lit in the designated site camp as indicated in assistance with the ECO. It is important that a site development camp be located on a part of the application site that is already disturbed.

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

The National Heritage Resources Act legislates the necessity and heritage impact assessment in areas earmarked for development, which exceed 0.5ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).

Impact on proposed Development:

Not significant- Due to the highly disturbed and totally transformed state of the study area, it was not deemed necessary to conduct a Heritage Impact Assessment in terms of the requirements as provided for in Section 38 of the NHRA, 1999. If any remains/cultural resources are exposed or uncovered during the construction phase, it should immediately be reported to the South African Heritage Resources Agency (SAHRA). Burial remains should not be disturbed or removed until inspected by an archaeologist.

4.7 Conservation of Agricultural Resources Act (Act No. 43 of 1983)

This Act provides for control over the utilization of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants; and for matters connected therewith.

Impact on proposed Development:

Not Significant – According to the Gauteng Agricultural Potential Atlas (GAPA 3), Tijing Valley Extension 14 and 34 is located on land with very low agricultural potential. The study area does not fall within any of the Seven Agriculture Hubs identified for the Gauteng province.

4.8 Water Services Act, 1997 (Act No. 108 of 1997)

This Act provides for the minimum standards and measures of which the following Water Services should adhere to:

- Basic sanitation
- Basic water supply
- Interruption in provision of water services
- Quality of potable water
- Control of objectionable substances
- Disposal of grey water
- Use of effluent
- Quantity and quality of industrial effluent discharged into a sewerage system
- Water services audit as a component in the Water Services Development Plan
- Water and effluent balance analysis and determination of water losses
- Repair of leaks
- Consumer installations other than meters

- Pressure in reticulation system

Impact on proposed Development:

Significant – The application will need to adhere to the water services act.

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

The purpose of the Biodiversity Act is to provide for the management of South Africa's biodiversity within the Framework of the NEMA and the protection of species and ecosystems that warrant National protection. As part of the implementation strategy, the National Spatial Biodiversity Assessment was developed.

Impact on proposed Development:

The proposed development is situated within the Marikana Thornveld vegetation type according to Mucina and Rutherford (2006). The area south-west of the Degraded Drainage Line was identified as a Disturbed Moist Secondary Grassland and not considered sensitive. The drainage line was not considered sensitive during the specialist assessment. The orange-listed plant species, *Hypoxis hemerocallidea*, occur on the site and the specialist recommended that they be relocated to an area where they can be preserved.

4.10 National Spatial Biodiversity Assessment

The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.

Impact on proposed Development:

Not Significant – Situated within an urban area.

4.11 Protected Species – Provincial Policies

Provincial ordinances were developed to protect particular plant species within specific provinces. The protection of these species is enforced through permitting requirements associated with provincial lists of protected species. Permits are administered by the Provincial Departments of Environmental Affairs.

Impact on proposed Development:

The Degraded drainage line however could be suitable for some of these species, this area will however be zoned as private open space in the proposed development. No Red Listed Plant species have been encountered during the specialist's assessments and none are expected to occur due to the high level of disturbance. The Orange-Listed plant species, *Hypoxis hemerocallidea*, was found on the proposed development area and it was recommended that the species be relocated to an area where it can be preserved.

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

The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological biodiversity and its natural landscapes.

Impact on proposed Development:

Not Significant – The study area is not situated in a Protected Area identified in terms of the Protected Areas Act.

4.13 National Road Traffic Act, 1996 (Act No. 93 of 1996)

This Act provides for all road traffic matters which shall apply uniformly throughout the Republic and for matters connected therewith.

Impact on proposed Development:

Not significant – Not Applicable.

10.14 Environmental Conservation Act: Noise Regulations, 1989 (Act no.73 of 1989)

The purpose of this Act is to provide measures and management relating Noise levels. This Act enables Noise levels to be acceptable to standards within a specific area and community.

Impact on proposed Development:

Significant – The proposed development may include activities which can produce noise during the construction phase.

4 Project activities

4.1 Pre-Construction Phase

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
General	Project contract	To make the EMP enforceable under the general conditions of the contract.	The EMP document must be included as part of the tender documentation	The EMP is included as part of the tender documentation	Developer	-
Design and planning	Stability of structures	To ensure stability of structures	1) The foundation recommendations by the involved geotechnical engineers must be implemented	The foundation recommendations are implemented.	Individual Developer Engineer	-
	Storm water design		The applicant must comply with the DWA's Best Practise Guidelines for Stormwater Management The proposed stormwater design must be submitted to DWA for approval.	Complied	Developer Engineer	
		To prevent erosion and saturation of the soil profile and to prevent problems with dampness in surface structures and installation of services	Good site drainage must be ensured.			
		To prevent and restrict erosion, siltation and groundwater pollution	1) The storm water design for the proposed development must be designed to reduce and/ or prevent siltation, erosion and water pollution. 2) Storm water runoff should not be concentrated as far as possible and sheet flow should be implemented. 3) Attenuation ponds and energy	Compilation and approval of storm water management plan	Engineer Individual Developer	-

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>dissipaters must be installed on the study area to break the speed of the water and to act as siltation ponds where required.</p> <p>4) Surface storm water generated as a result of the development must not be channeled directly into any natural drainage system or wetland.</p> <p>5) The storm water management plan should be designed in a way that aims to ensure that post development runoff does not exceed predevelopment values in:</p> <ul style="list-style-type: none"> - Peak discharge for any given storm; - Total volume of runoff for any given storm; - Frequency of runoff; and - Pollutant and debris concentrations reaching water courses. 			
	Services	To ensure adequate capacity is available for services	A written agreement between the relevant municipality and the applicant regarding the supply and availability of water should be made available to the DWA.	Agreement in place	Engineer	
	Light pollution	To minimise light pollution	The generation of light by night events, security lighting and other lighting shall be effectively designed so as not to spill unnecessary outward into the oncoming traffic, or into the yards of the neighbouring properties or open spaces.	Lightning effectively designed.	Architect	-
	Visual impact	To minimize the visual impact of the proposed development.	Architectural guidelines to minimise the visual impact: The chosen roof and wall colours should blend in with the surrounding environment. Suitable plant materials should be used at strategic points to screen off impacts caused by roofs and cars in large parking areas. Existing trees	Architectural guidelines minimizes visual impact	Architect	-

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			should be retained as far as possible as it will soften the impact of the proposed development.			
Climate	Extreme change in micro climate temperatures	To prevent the extreme change in micro climate temperatures	Where open parking bays are involved, one tree for every two parking bays shall be indicated on Landscape Development Plan which shall be approved by the Design Review Committee / Local Authority.	Landscape Development Plan complies	Landscape Architect	-
Fauna and flora	Floral biodiversity and ecological health	To ensure that the species introduced to the area, are compatible with the current and future quality of the ecological processes.	1) The Landscape Development Plan for the proposed development shall be submitted to the local authority for approval. 2) It is important that all the plant positions, quantities and coverage per m ² be indicated on the Landscape Development Plan. 3) The proposed planting materials for the areas to be landscaped shall be non-invasive, and preferably indigenous and /or endemic. 4) Where possible, trees naturally growing on the site should be retained as part of the landscaping.	The landscape development plan submitted to the local authority for approval.	Landscape Architect	-
	Loss of orange listed species	To ensure the relocation of orange listed species.	Should any <i>Hypoxis hemerocallidae</i> species be encountered on site, it should be relocated to another nearby site of similar habitat.		Developer Flora specialist	
Preparing Site Access	Environmental integrity	To avoid erosion and disturbance to indigenous vegetation	Designated routes shall be determined for the construction vehicles and designated areas for storage of equipment. Clearly mark the site access point and routes on site to be used by construction vehicles and pedestrians. Provide an access map to all contractors whom in turn must provide copies to the	Access to site is erosion free. Minimum disturbance to surrounding vegetation.	Contractor	Continuous

<i>TYPE</i>	<i>Environmental risk or issue</i>	<i>Objective or requirement</i>	<i>Mitigation measure</i>	<i>Performance indicator</i>	<i>Responsibility</i>	<i>Frequency of Action</i>
			construction workers. Instruct all drivers to use access point and determined route.	Vehicles make use of established access routes.		
		Entrance of Vehicles	Entrance by vehicles, especially off-road cars and bakkies, off-road bicycles and quad bikes should be prohibited prior to commencement of construction. During construction only vehicles required for construction purposes may be allowed on site.			
	Waste storage	To control the temporary storage of waste.	Temporary waste storage points on site shall be determined. These storage points shall be accessible by waste removal trucks and these points should not be located in sensitive areas/areas highly visible from the properties of the surrounding land-owners/tenants/in areas where the wind direction will carry bad odours across the properties of adjacent tenants or landowners.		Contractor ESO	-
		Ensure waste storage area does not generate pollution	Build a bund around waste storage area to stop overflow into storm water.		Contractor	-

4.2 Construction Phase

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
Contractors Camp	Vegetation and topsoil	To minimise damage to and loss of vegetation and retain quality of topsoil	1) Site to be established under supervision of ECO. 2) Clearing and relocation of plants to be undertaken in accordance with site specific requirements.	Minimal vegetation removed/ damaged during site activities.	Contractor	As and when required
	Surface and ground water pollution	To minimise pollution of surface and groundwater resources.	1) Sufficient and temporary facilities including ablution facilities must be provided for construction workers operating on the site. 2) A minimum of one chemical toilet shall be provided per 10 persons. The contractor shall keep the toilets in a clean, neat and hygienic condition. Toilets provided by the contractor must be easily accessible and a maximum of 50m from the works area to ensure they are utilised. The contractor (who must use reputable toilet-servicing company) shall be responsible for the cleaning, maintenance and servicing of the toilets. The contractor (using reputable toilet-servicing company) shall ensure that all toilets are cleaned and emptied before the builders' or other public holidays. 3) No person is allowed to use any other area than chemical toilets. 4) No French drain systems may be installed. 5) No chemical or waste water must be allowed to contaminate the run-off on site. 6) Avoid the clearing of the site camp (of specific phase) or paved surfaces with	Effluents managed effectively. No pollution of water resources from site. Workforce use toilets provided.	Contractor ESO	As and when required

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			soap.			
		To minimise pollution of surface and groundwater resources due to spilling of materials.	<p>1) Drip trays and/ or lined earth bunds must be provided under vehicles and equipment, to contain spills of hazardous materials such as fuel, oil and cement.</p> <p>2) Repair and storage of vehicles only within the demarcated site area.</p> <p>3) Spill kits must be available on site.</p> <p>4) Oils and chemicals must be confined to specific secured areas within the site camp. These areas must be bunded with adequate containment (at least 1.5 times the volume of the fuel) for potential spills or leaks.</p> <p>5) All spilled hazardous substances must be contained in impermeable containers for removal to a licensed hazardous waste site.</p> <p>6) No leaking vehicle shall be allowed on site. The mechanic/ the mechanic of the appointed contractor must supply the environmental officer with a letter of confirmation that the vehicles and equipment are leak proof.</p> <p>7) No bins containing organic solvents such as paints and thinners shall be cleaned on site, unless containers for liquid waste disposal are placed for this purpose on site.</p>	No pollution of the environment	Contractor ESO	Daily
		To minimise pollution of surface and groundwater resources by cement	The mixing of concrete shall only be done at specifically selected sites, as close as possible to the entrance, on mortar boards or similar structures to prevent run-off into drainage lines, streams and natural vegetation.	No evidence of contaminated soil on the construction site.	Contractor ESO	Daily
		To minimise pollution of surface and	No effluent (including effluent from any storage areas) may be discharged into any water surface or ground water resource.	No evidence of contaminated water resources.	Contractor ESO	Daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
		Groundwater resources due to effluent.				
			The DWA must be notified in the event of any pollution of the water resource. Proper management measures must be employed towards the appropriate clean-up of the leaking or spilled substance and its proper disposal in an acceptable manner as required by Section 19 of the National Water Act, 1998 (Act 36 of 1998). If any pollution incident is experienced, the DWA must be notified immediately (within 24 hours) as required in terms of Section 20 of the National Water Act, 1998 (Act 36 of 1998).		Contractor ESO	
	Pollution of the environment	To prevent unhygienic usage on the site and pollution of the natural assets.	<p>1) Weather proof waste bins must be provided and emptied regularly.</p> <p>2) The contractor shall provide labourers to clean up the contractor's camp and construction site on a daily basis.</p> <p>3) Temporary waste storage points on the site should be determined. THESE AREAS SHALL BE PREDETERMINED AND LOCATED IN AREAS THAT IS ALREADY DISTURBED. These storage points should be accessible by waste removal trucks and these points should be located in already disturbed areas /areas not highly visible from the properties of the surrounding landowners/ in areas where the wind direction will not carry bad odours across the properties of adjacent landowners. This site should comply with the following:</p> <ul style="list-style-type: none"> • Skips for the containment and disposal of waste that could cause 	<p>No waste bins overflowing</p> <p>No litter or building waste lying in or around the site</p>	Contractor ESO	Daily Weekly

<i>TYPE</i>	<i>Environmental risk or issue</i>	<i>Objective or requirement</i>	<i>Mitigation measure</i>	<i>Performance indicator</i>	<i>Responsibility</i>	<i>Frequency of Action</i>
			<p>soil and water pollution, i.e. paint, lubricants, etc.;</p> <ul style="list-style-type: none"> • Small lightweight waste items should be contained in skips with lids to prevent wind littering; • Bunded areas for containment and holding of dry building waste. <p>4) No solid waste may be disposed of on the site.</p> <p>5) No waste materials shall at any stage be disposed of in the open veld or on adjacent properties.</p> <p>6) The storage of solid waste on the site, until such time as it may be disposed of, must be in a manner acceptable to the local authority and DWA.</p> <p>7) Cover any wastes that are likely to wash away or contaminate storm water.</p>			
		Recycle material where possible and correctly dispose of unusable wastes	<p>1) Waste shall be separated into recyclable and non-recyclable waste, and shall be separated as follows:</p> <ul style="list-style-type: none"> • General waste: including (but not limited to) construction rubble, • Reusable construction material. <p>2) Recyclable waste shall preferably be deposited in separate bins.</p> <p>3) All solid waste including excess spoil (soil, rock, rubble etc) must be removed to a permitted waste disposal site on a weekly basis.</p> <p>4) No bins containing organic solvents such as paints and thinners shall be cleaned on site, unless containers for liquid waste disposal are placed for this purpose on site.</p> <p>5) Keep records of waste reuse, recycling</p>	<p>Sufficient containers available on site</p> <p>No visible signs of pollution</p>	Contractor ESO	Daily Weekly

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			and disposal for future reference. Provide information to ECO.			
	Increased fire risk to site and surrounding areas	To decrease fire risk.	<p>1) Fires shall only be permitted in specifically designated areas and under controlled circumstances.</p> <p>2) Food vendors shall be allowed within specified areas.</p> <p>3) Fire extinguishers to be provided in all vehicles and fire beaters must be available on site.</p> <p>4) Emergency numbers/ contact details must be available on site, where applicable.</p>	No open fires on site that have been left unattended	Contractor	Monitor daily
Construction site	Geology and soils	To prevent the damaging of the existing soils and geology.	<p>1) The top layer of all areas to be excavated for the purposes of construction shall be stripped and stockpiled in areas where this material will not be damaged, removed or compacted.</p> <p>2) All surfaces that are susceptible to erosion, shall be protected either by cladding with biodegradable material or with the top layer of soil being seeded with grass seed/planted with a suitable groundcover.</p>	<p>Excavated materials correctly stockpiled</p> <p>No signs of erosion</p>	Contractor	Monitor daily
		<p>To prevent the loss of topsoil</p> <p>To prevent siltation & water pollution.</p>	<p>1) Stockpiling will only be done in designated places where it will not interfere with the natural drainage paths of the environment.</p> <p>2) In order to minimise erosion and siltation and disturbance to existing vegetation, it is recommended that stockpiling be done/ equipment is stored in already disturbed/exposed areas.</p> <p>3) Cover stockpiles and surround downhill sides with a sediment fence to stop materials washing away.</p> <p>4) Remove vegetation only in areas designated during the planning stage.</p>	<p>Excavated materials correctly stockpiled</p> <p>No visible signs of erosion and sedimentation</p> <p>Minimal invasive weed growth</p> <p>Vegetation only removed in</p>	Contractor of the Individual Developer	Monitor daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>5) Rehabilitation/ landscaping are to be done immediately after the involved works are completed.</p> <p>6) All compacted areas should be ripped prior to them being rehabilitated/landscaped by the contractor as appointed by the individual erf owner.</p> <p>7) The top layer of all areas to be excavated must be stripped and stockpiled in areas where this material will not be damaged, removed or compacted. This stockpiled material should be used for the rehabilitation of the site and for landscaping purposes.</p> <p>8) Strip topsoil at start of works and store in stockpiles no more than 1,5 m high in designated materials storage area.</p> <p>9) During the laying of any cables, pipelines or infrastructure (on or adjacent to the site) topsoil shall be kept aside to cover the disturbed areas immediately after such activities are completed.</p>	designated areas		
	Erosion and siltation	To prevent erosion and siltation	<p>1) It is recommended that the construction of the development be done in phases.</p> <p>2) Each phase should be rehabilitated immediately after the construction for that phase has been completed. The rehabilitated areas should be maintained by the appointed rehabilitation contractor until a vegetative coverage of at least 80% has been achieved as appointed by the individual erf owner.</p> <p>3) Mark out the areas to be excavated.</p> <p>4) Large exposed areas during the construction phases should be limited. Where possible areas earmarked for</p>	<p>No erosion scars</p> <p>No loss of topsoil</p> <p>All damaged areas successfully rehabilitated</p>	Contractor ESO	Monitor daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>construction during later phases should remain covered with vegetation coverage until the actual construction phase. This will prevent unnecessary erosion and siltation in these areas.</p> <p>5) Unnecessary clearing of flora resulting in exposed soil prone to erosive conditions should be avoided.</p> <p>6) All embankments must be adequately compacted and planted with grass to stop any excessive soil erosion and scouring of the landscape if required.</p> <p>7) The eradication of alien vegetation should be followed up as soon as possible by replacement with indigenous vegetation to ensure quick and sufficient coverage of exposed areas by the individual erf owner.</p> <p>8) Storm water outlets shall be correctly designed to prevent any possible soil erosion.</p> <p>9) All surface run-offs shall be managed in such a way so as to ensure erosion of soil does not occur.</p> <p>10) Implementation of temporary storm water management measures that will help to reduce the speed of surface water by the individual erf owner / developer.</p> <p>11) All surfaces that are susceptible to erosion shall be covered with a suitable vegetative cover as soon as construction is completed by the individual erf owner / developer.</p>			
	Hydrology	To minimise pollution of soil, surface and groundwater	1) Increased run-off during construction must be managed using berms and other suitable structures as required to ensure flow velocities are reduced.	<p>No visible signs of erosion.</p> <p>No visible signs</p>	Contractor	Monitor daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			2) The contractor shall ensure that excessive quantities of sand, silt and silted water does not enter the storm water system.	of pollution		
	Fauna and flora	To protect the existing fauna and flora.	<p>1) All exotic invaders and weeds must be eradicated on a continuous basis.</p> <p>2) Exotic invaders must be included in an alien management programme for the site. Eradication must occur every 3 months.</p> <p>3) No plants not indigenous to the area, or exotic plant species, especially lawn grasses and other ground-covering plants, should be introduced in the communal landscaping of the proposed site, as they will drastically interfere with the nature of the area</p> <p>4) Where possible, trees naturally growing on the site should be retained as part of the landscaping.</p> <p>5) As much vegetation growth as possible should be promoted within the proposed development area.</p>	No exotic plants used for landscaping	Contractor ESO / Home Owners Association / Design Review Committee	As and when required Every 6 months
		To protect the existing fauna and flora.	<p>1) Trees that are intended to be retained shall be clearly marked on site.</p> <p>2) Snaring and hunting of fauna by construction workers on or adjacent to the study area are strictly prohibited and the Council shall prosecute offenders.</p> <p>3) All mitigation measures for impacts on the indigenous flora of the area should be implemented in order to limit habitat loss as far as possible and maintain and improve available habitat, in order to maintain and possibly increase numbers and species of indigenous fauna.</p> <p>4) Wood harvesting of any trees or shrubs</p>	No measurable signs of habitat destruction	Contractor ESO	As and when required

<i>TYPE</i>	<i>Environmental risk or issue</i>	<i>Objective or requirement</i>	<i>Mitigation measure</i>	<i>Performance indicator</i>	<i>Responsibility</i>	<i>Frequency of Action</i>
			<p>on the study area or adjacent areas shall be prohibited.</p> <p>5) Where possible, work should be restricted to one area at a time.</p> <p>6) Noise should be kept to a minimum and the development should be done in phases to allow faunal species to temporarily migrate into the conservation areas in the vicinity.</p> <p>7) The integrity of remaining wildlife should be upheld, and no trapping or hunting by construction personnel should be allowed. Caught animals should be relocated to the conservation areas in the vicinity.</p>			
			<p>1) Vehicles should be restricted to travelling only on designated roadways to limit the ecological footprint of the proposed development activities.</p> <p>2) All areas affected by the construction should be rehabilitated once construction activities are complete. Areas should be reseeded with indigenous grasses as required. All rehabilitated areas should be rehabilitated to a point where natural processes will allow the pre-development ecological functioning and biodiversity of the area to be re-instated.</p> <p>3) Prior to construction and operation it is advised to perform a “flush out” in order to help warn faunal species to move and relocate naturally</p> <p>4) Educate construction and project personnel about the importance of the natural faunal species and biodiversity of the natural surroundings.</p>			

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
Social	Noise impact	To maintain noise levels below “disturbing” as defined in the national Noise Regulations.	1) Site workers must comply with the Provincial noise requirements as outlined in Provincial Notice No. 5479 of 1999: Gauteng Noise Control Regulations. 2) Noise activities shall only take place during working hours	No complaints from surrounding residents and I & AP	Contractor	Monitored daily
	Dust impact	Minimise dust from the site	1) Dust pollution could occur during the construction works, especially during the dry months. Regular and effective damping down of working areas (especially during the dry and windy periods) must be carried out to avoid dust pollution that will have a negative impact on the surrounding environment. 2) When necessary, these working areas should be damped down in the mornings and afternoons.	No visible signs of dust pollution No complaints from surrounding residents and I & AP	Contractor	Monitored daily
	Safety and security	To ensure the safety and security of the public.	1) Although regarded as a normal practice, it is important to erect proper signs indicating the operations of heavy vehicles in the vicinity of dangerous crossings and access roads or even in the development site if necessary. 2) With the exception of the appointed security personnel, no other workers, friend or relatives will be allowed to sleep on the construction site (weekends included) 3) Construction vehicles and activities to avoid peak hour traffic times 4) Presence of law enforcement officials at strategic places must be ensured 5) Following actions would assist in management of safety along the road <ul style="list-style-type: none"> ▪ Adequate road marking ▪ Adequate roadside recovery areas ▪ Allowance for pedestrians and 	No incidences reported	Contractor ESO	Monitored daily

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<ul style="list-style-type: none"> ▪ cyclists where necessary <p>Although regarded as a normal practice, it is important to erect proper signs indicating the danger of the excavation in and around the development site. Putting temporary fencing around excavations where possible.</p>			
	Infrastructure and services	Installation of services	Determine areas where services will be upgraded and relocated well in advance. Discuss possible disruptions with affected parties to determine most convenient times for service disruptions and warn affected parties well in advance of dates that service disruptions will take place	No complaints from I & AP	Contractor ESO	When required
	Cultural Resources		If any graves or archaeological sites are exposed during construction work it should immediately be reported to a museum. The report from the archaeologist must be provided to GDARD if any graves are recovered.	No destruction of or damage to graves or known archaeological sites	Contractor ESO	Monitor daily
	Visual impact	In order to minimise the visual impact.	<ol style="list-style-type: none"> 1) The disturbed areas shall be rehabilitated immediately after the involved construction works are completed. 2) Shade cloth must be used to conceal and minimise the visual impact of the site camps and storage areas 	Visual impacts minimised	Contractor ESO	Monitor daily
	Vegetation	Landscaping	<ol style="list-style-type: none"> 1) When planting trees, care should be taken to avoid the incorrect positioning of trees and other plants, to prevent the roots of trees planted in close proximity to the line of water-bearing services from causing leaking in, or malfunctioning of the services. 2) The proposed planting materials for the areas to be landscaped should preferably be endemic and indigenous. 	Landscaping done according to landscape development plan	Landscape architect Contractor / Individual Developer	When required

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			<p>3) All new trees and shrubs to be planted on the study area shall be inspected for pests and diseases prior to them being planted.</p> <p>4) The inspection shall be carried out by the maintenance contractor at the property of the supplier and not on the study area.</p> <p>5) All trees to be planted shall be in at least 20L containers with a height of approximately 1,8 metres and a main stem diameter of approximately 300 mm.</p>			
		Loss of plants	<p>1) Aerate compacted soil and check and correct pH for soils affected by construction activities.</p> <p>2) Make sure plant material will be matured enough and hardened off ready for planting. Water in plants immediately as planting proceeds.</p> <p>3) Apply mulch to conserve moisture Plant according to the layout and planting techniques specified by the Landscape Architect in the Landscape Development plans for the site.</p>	Landscaping done according to landscape development plan	Landscape architect Contractor / Individual Developer	When required
		Spread of weeds	<p>Ensure that materials used for mulching and topsoil/ fertilisers are certified weed free. Collect certifications where available.</p> <p>Control weeds growth that appears during construction.</p>	Weed growth controlled	Landscape architect Contractor	When required
		To ensure rehabilitation of the site	<p>1) Compacted soils shall be ripped at least 200mm.</p> <p>2) All clumps and rocks larger than 30mm diameter shall be removed from the soil to be rehabilitated</p> <p>3) The soil shall be leveled before seeding</p> <p>4) Hydroseed the soil with appropriate mixture</p> <p>5) Watering shall take place at least once</p>	Grass have hardened off	Landscape architect Contractor	Once a day Then every 4 days

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Performance indicator	Responsibility	Frequency of Action
			per day for the first 14 days until germination of seeds have taken place 6) Thereafter watering should take place at least for 20 minutes every 4 days until grass have hardened off.			

4.3 Operational Phase

TYPE	Environmental risk or issue	Objective or requirement	Mitigation measure	Responsibility	Frequency of Action
SITE CLEAN UP AND PREPARED FOR USE	Storm water pollution	Do not allow any materials to wash into the storm water system.	Remove erosion and sediment controls only if all bare soil is sealed, covered or re-vegetate. Sweep roadways clean and remove all debris from kerb and gutter areas. Do not wash into drains.	Contractor	-
		Minimise waste	Decontaminate and collect waste in storage area ready for off-site recycling or disposal Arrange for final collection and removal of excess and waste materials.	Contractor	-
ESTABLISHING PLANTS	Slow or no Revegetation to stabilise soil; loss or degradation of habitat	To ensure Revegetation to stabilize soil	Agreed schedule for regular follow-up watering, weed control, mulch supplements and amenity pruning, if needed. Replace all plant failures within three month period after planting.	Contractor	To be agreed
MATERIALS FAILURE	Structural damage. Loss of site materials.		Inspect all structures monthly to detect any cracking or structural problems. Confirm with designer if there are design problems. Rectify with materials to match, or other agreed solution.	Contractor	-
DRAINAGE	On-site and	Storm water	Inspect all site drainage works and repair any	Contractor	-

<i>TYPE</i>	<i>Environment al risk or issue</i>	<i>Objective or requirement</i>	<i>Mitigation measure</i>	<i>Responsibility</i>	<i>Frequency of Action</i>
<i>FAILURE</i>	<i>downstream drainage pollution or flooding</i>	management plan	failures. Confer with design engineer to correct site problems.		
<i>SITE AUDIT</i>	<i>Eventual project failure</i>	Successful project establishment	Routinely audit the works and adjust maintenance schedule accordingly.	Contractor	-
<i>GENERAL</i>			Open fires and smoking during maintenance works are strictly prohibited.	Contractor	-

5 Procedures for environmental incidents

5.1 Leakages & spills

- Identify source of problem.
- Stop goods leaking, if safe to do so.
- Contain spilt material, using spills kit or sand.
- Notify Environmental Control Officer
- Remove spilt material and place in sealed container for disposal (if possible).
- Environmental Control Officer to follow Incident Management Plan.

5.2 Failure of erosion/sediment control devices

- Prevent further escape of sediment.
- Contain escaped material using silt fence, hay bales, pipes, etc.
- Notify ECO.
- Repair or replace failed device as appropriate.
- Dig/scrape up escaped material; take care not to damage vegetation.
- Remove escaped material from site.
- ECO to follow Incident Management plan.
- Monitor for effectiveness until re-establishment.

5.3 Bank/slope failure

- Stabilize toe of slope to prevent sediment escape using aggregate bags, silt fence, logs, hay bales, pipes, etc.
- Notify ECO.
- ECO to follow Incident Management plan.
- Divert water upslope from failed fence.

- Protect area from further collapse as appropriate.
- Restore as advised by ECO.
- Monitor for effectiveness until stabilized.

5.4 Discovery of rare or endangered species

- Stop work.
- Notify ECO.
- If a plant is found, mark location of plants.
- If an animal, mark location where sighted.
- ECO to identify or arrange for identification of species and or the relocation of the species if possible.
- If confirmed significant, ECO to liaise with Endangered Wildlife Trust.
- Recommence work when cleared by ECO.

5.5 Discovery of archeological or heritage items

- Stop work.
- Do not further disturb the area.
- Notify ECO.
- ECO to arrange appraisal of specimen.
- If confirmed significant, ECO to liaise with National, Cultural and History Museum.
P.O. Box 28088
SUNNYSIDE
0132
Contact Mr. J. van Schalkwyk
or
Mr. Naude
- Recommence work when cleared by ECO.

6 EMP review

1. The Site supervisor is responsible for ensuring the work crew is complying with procedures, and for informing the work crew of any changes. The site supervisor is responsible for ensuring the work crew is aware of changes that may have been implemented by GDARD before starting any works.
2. If the contractor cannot comply with any of the activities as described above, they should inform the ECO with reasons within 7 working days.

Enlarged Figures

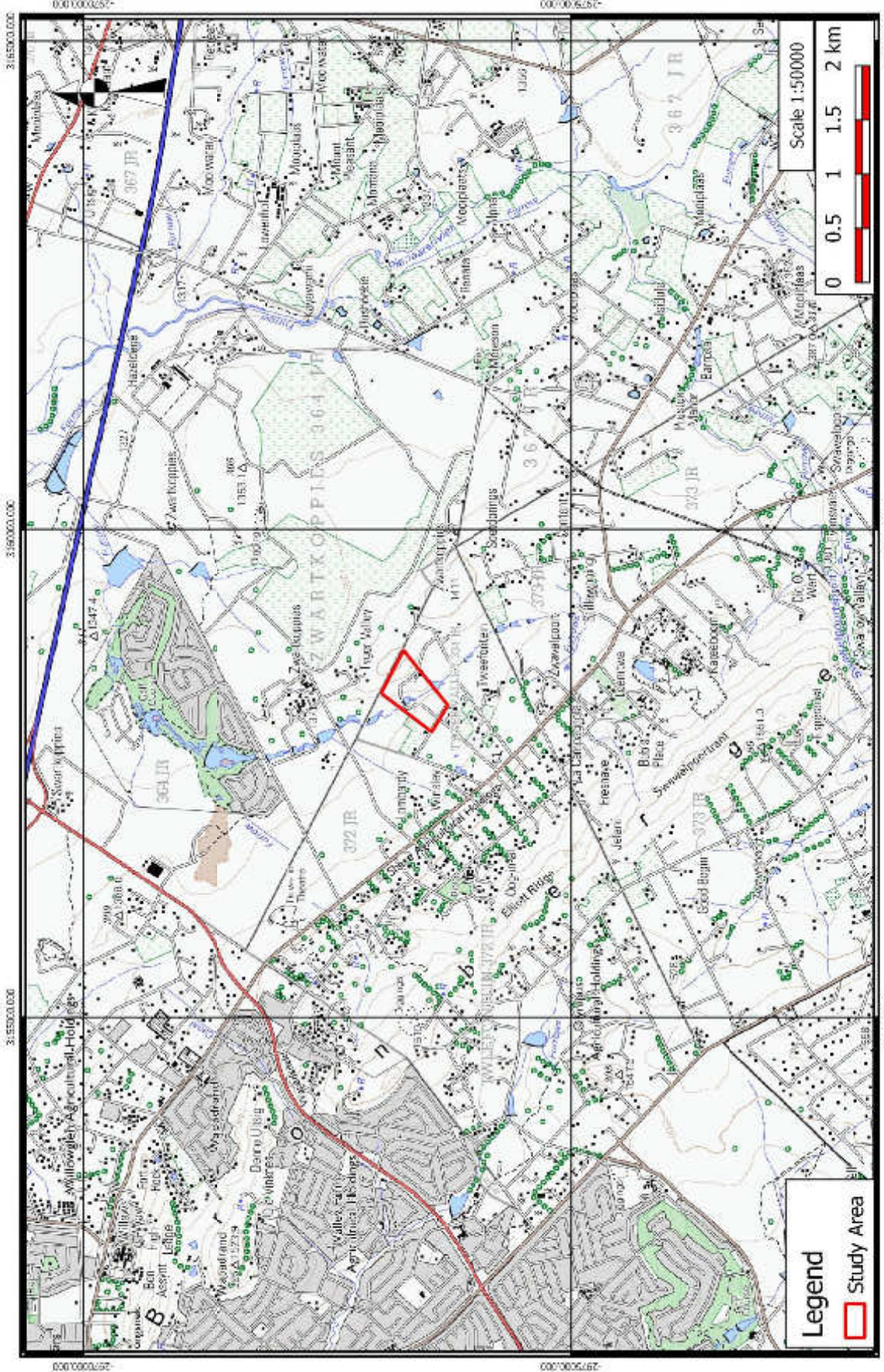


Appendix I

Locality Map



Appendix I1



Datum WGS 84

Aerial Map



Appendix 12

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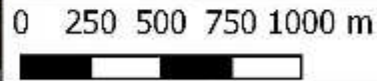
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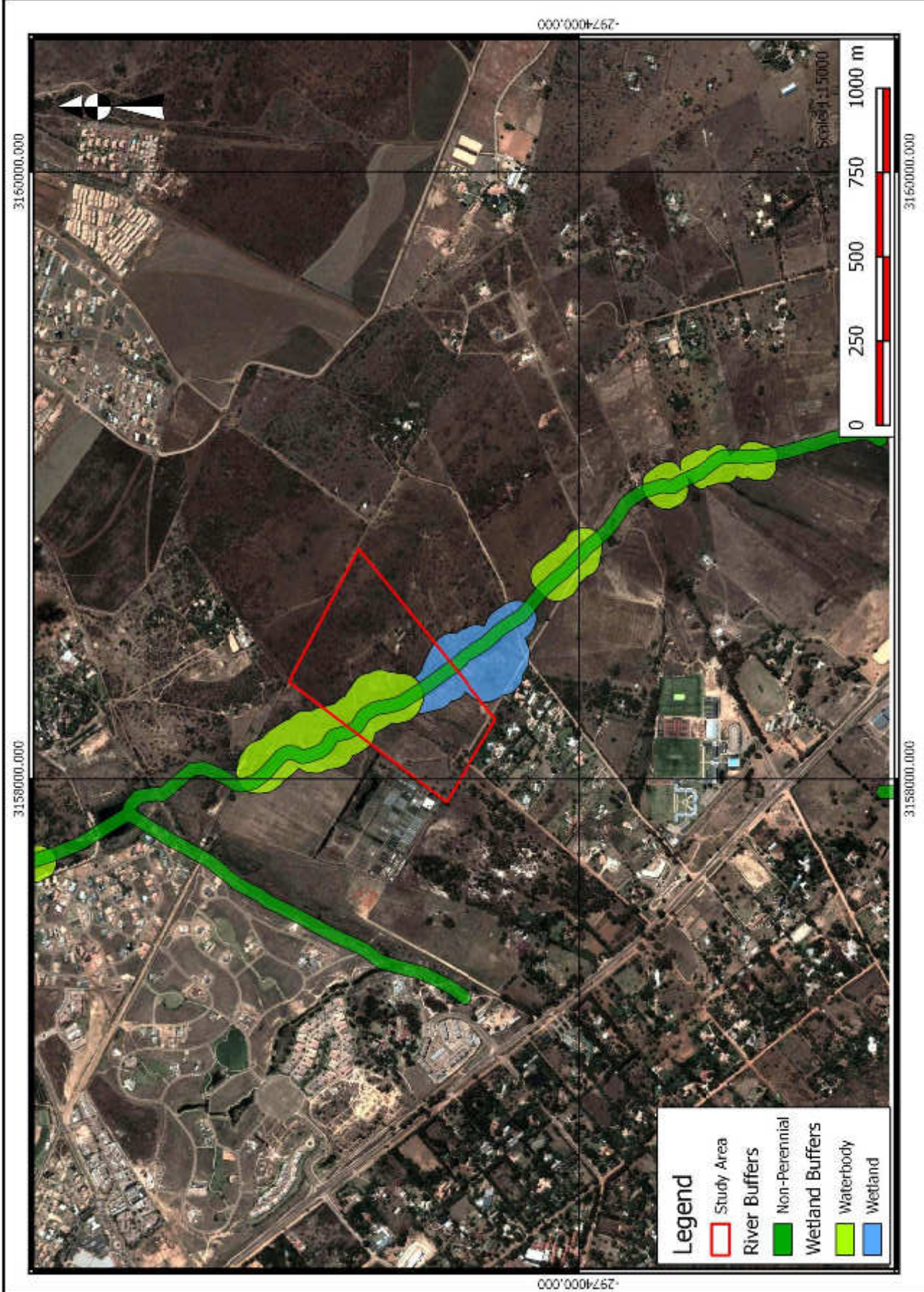
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Hydrology Map



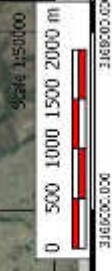
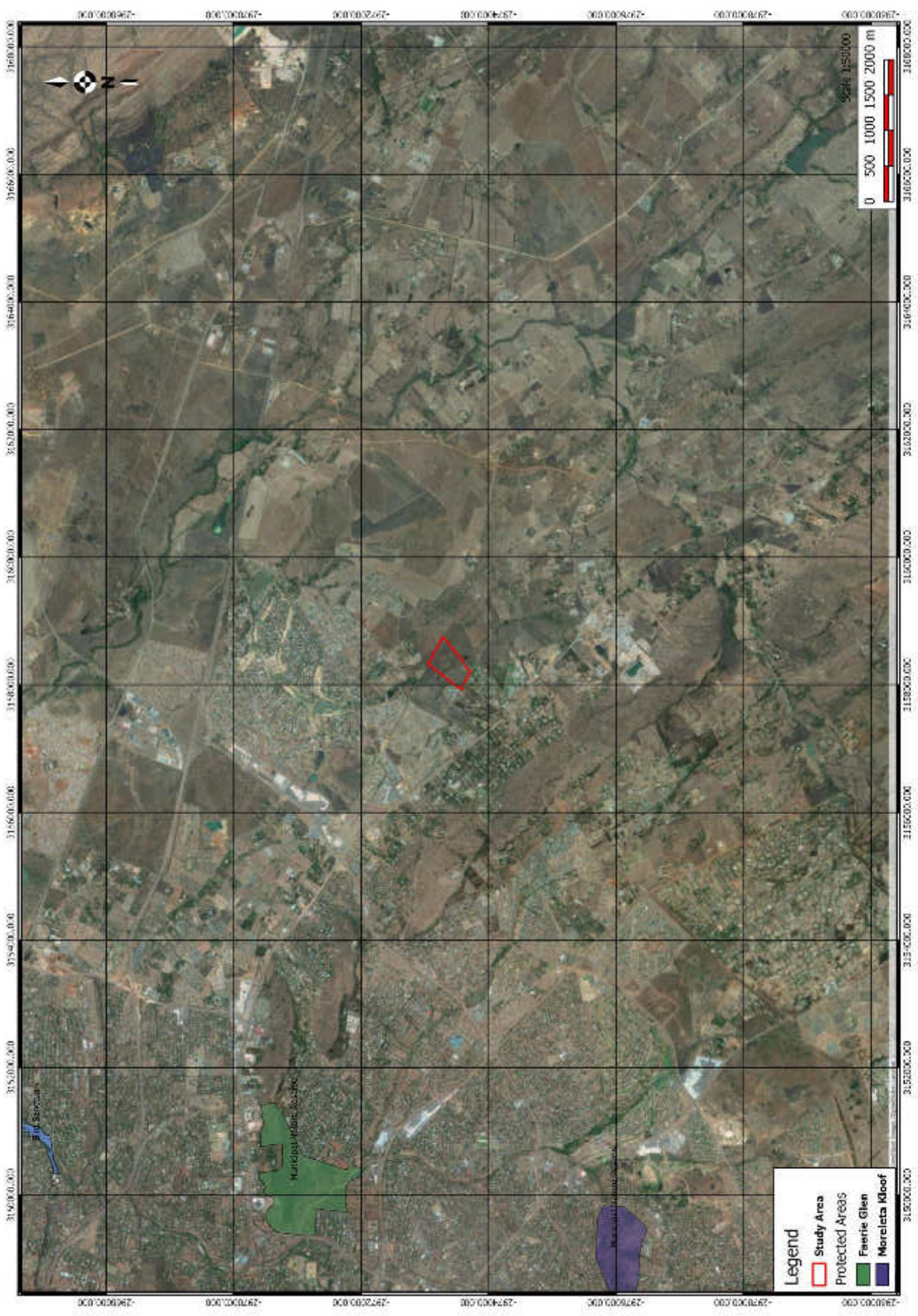
Appendix 13



Protected Areas



Appendix 14



Legend

-  Study Area
-  Protected Areas
-  Faerie Glen
-  Mariceta Kloof

Municipal Water Supply

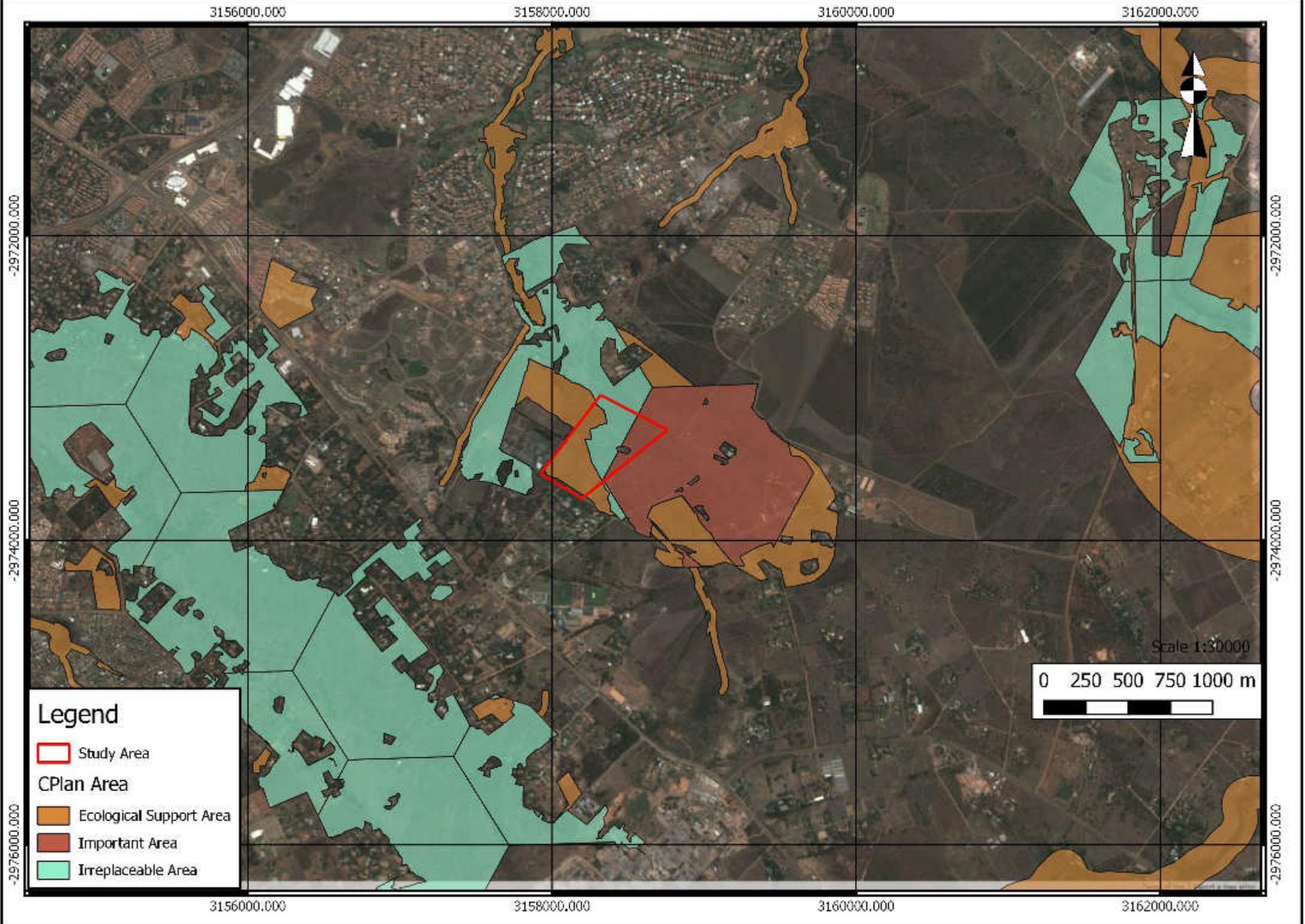
Municipal Water Supply

Municipal Water Supply

GDARD C-Plan



Appendix 15



Irreplaceable Areas



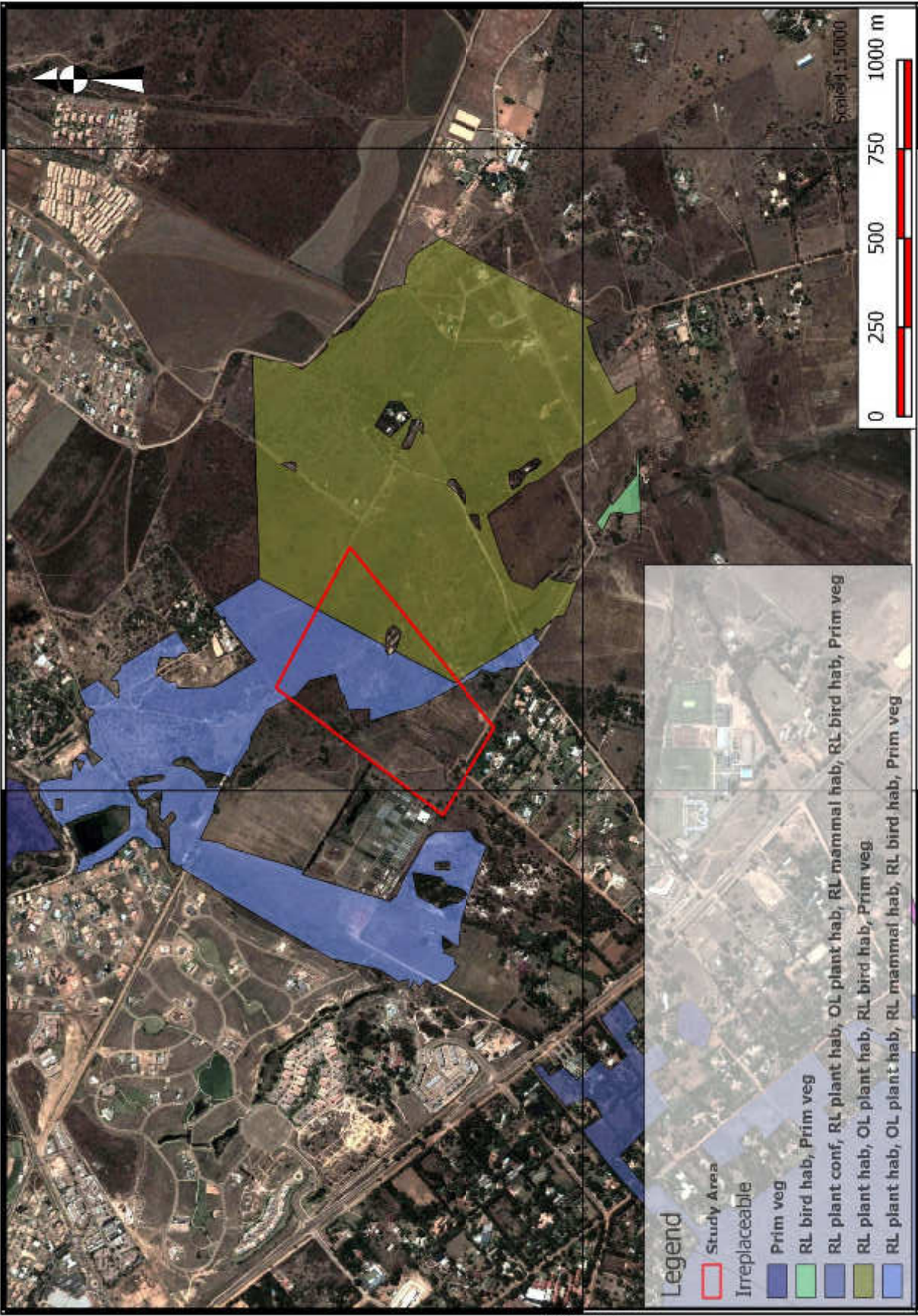
Appendix 16

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Legend

Study Area

Irreplaceable

Prim veg

RL bird hab, Prim veg

RL plant conf, RL plant hab, OL plant hab, RL mammal hab, RL bird hab, Prim veg

RL plant hab, OL plant hab, RL bird hab, Prim veg

RL plant hab, OL plant hab, RL mammal hab, RL bird hab, Prim veg

Scale: 1:5000



3160000.000

3158000.000

Ridges



Appendix 17

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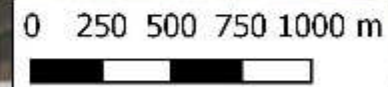
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Legend

-  Study Area
-  Transformed Ridges
-  Ridges

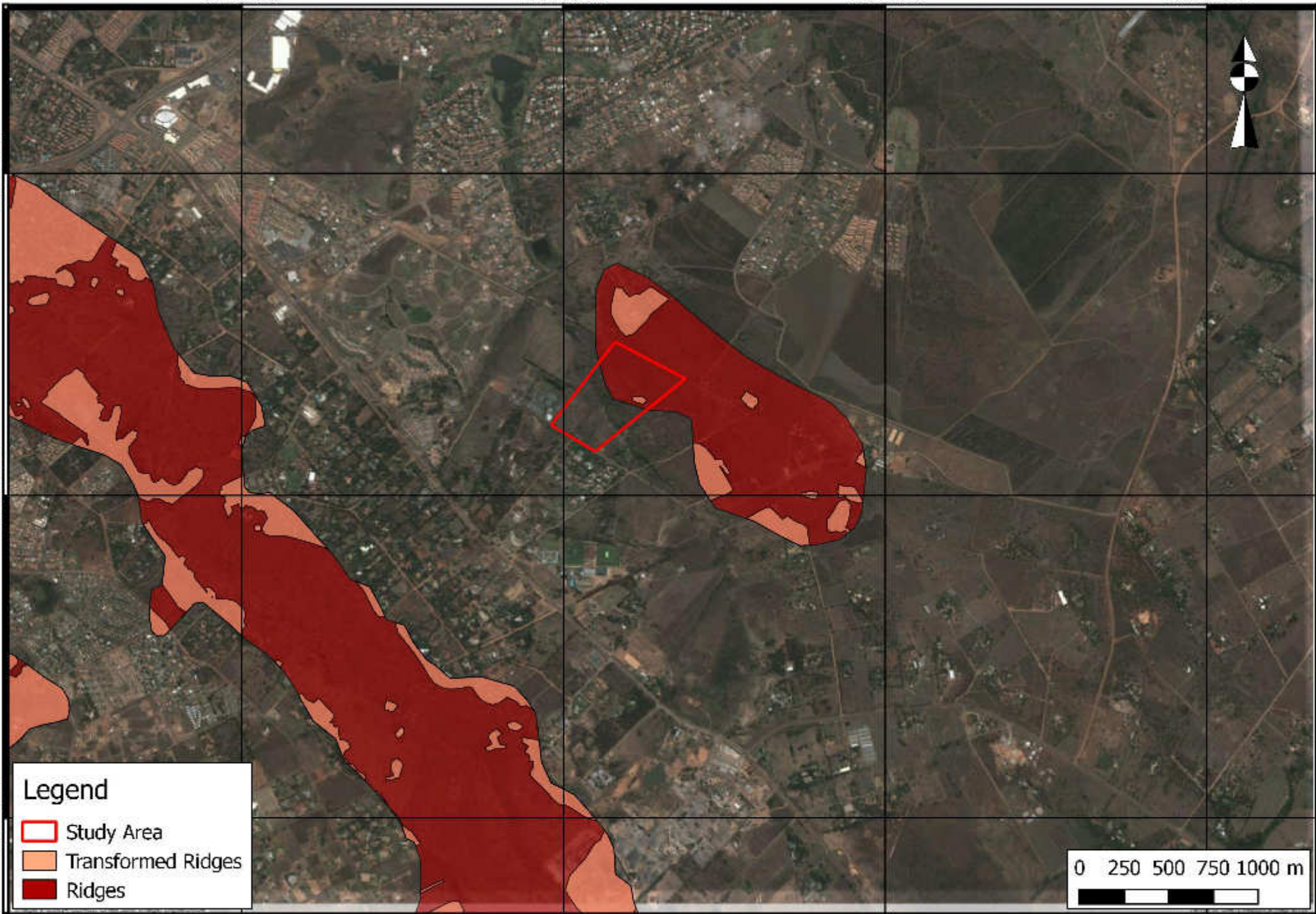


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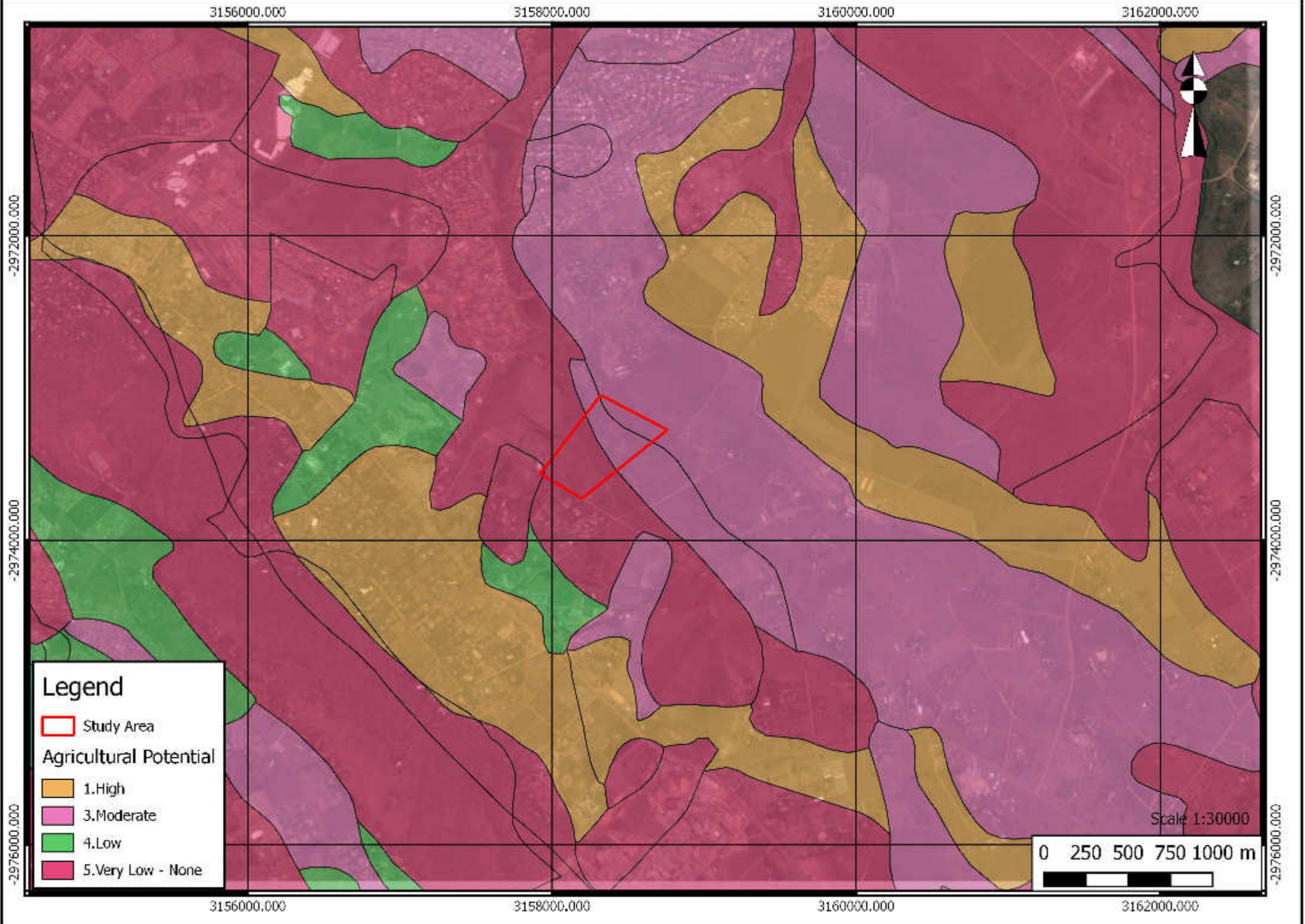
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Agricultural Potential



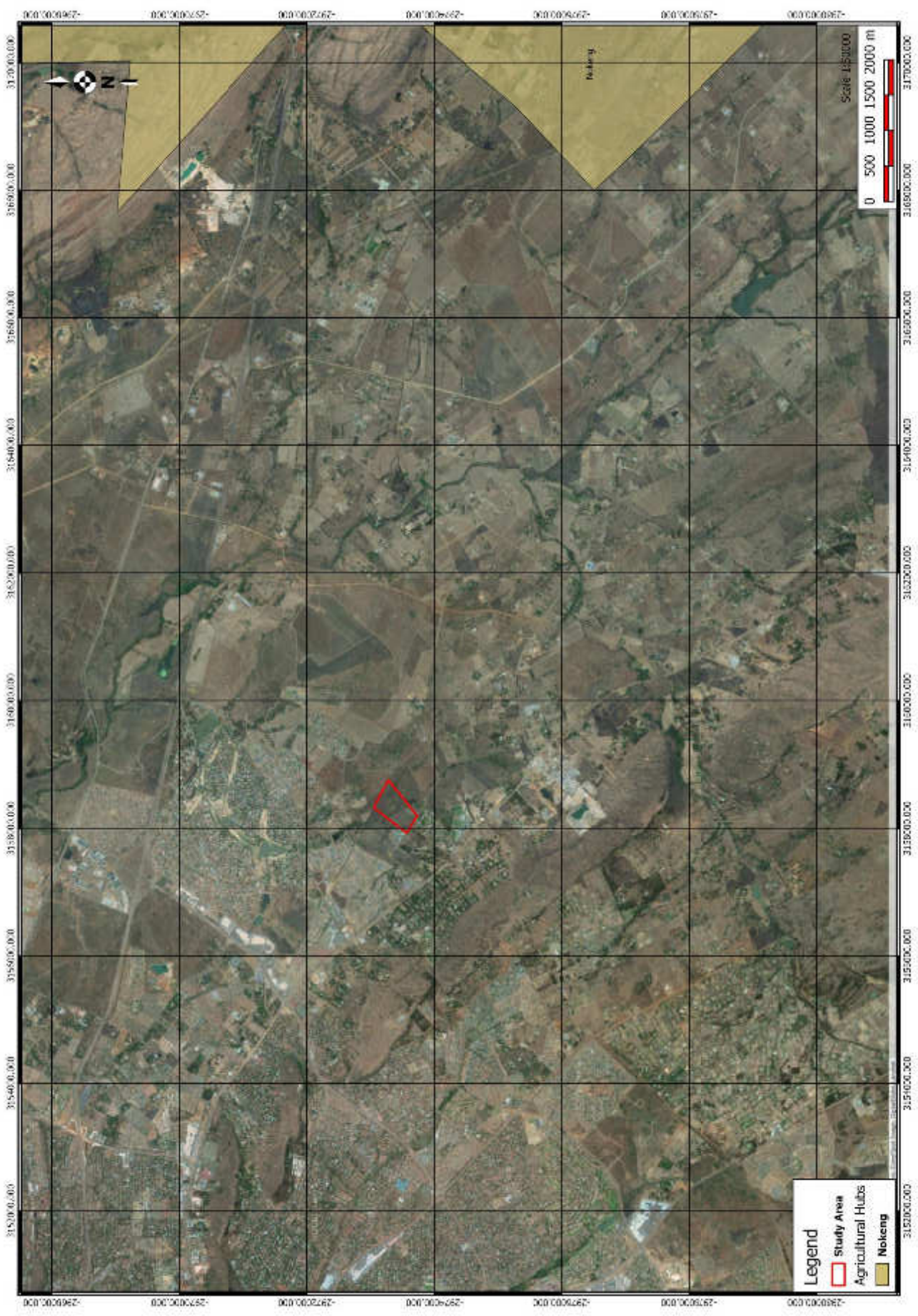
Appendix 18



Agricultural Hubs



Appendix 19



Urban Edge



Appendix I10

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Legend

-  Study Area
-  Urban Edge

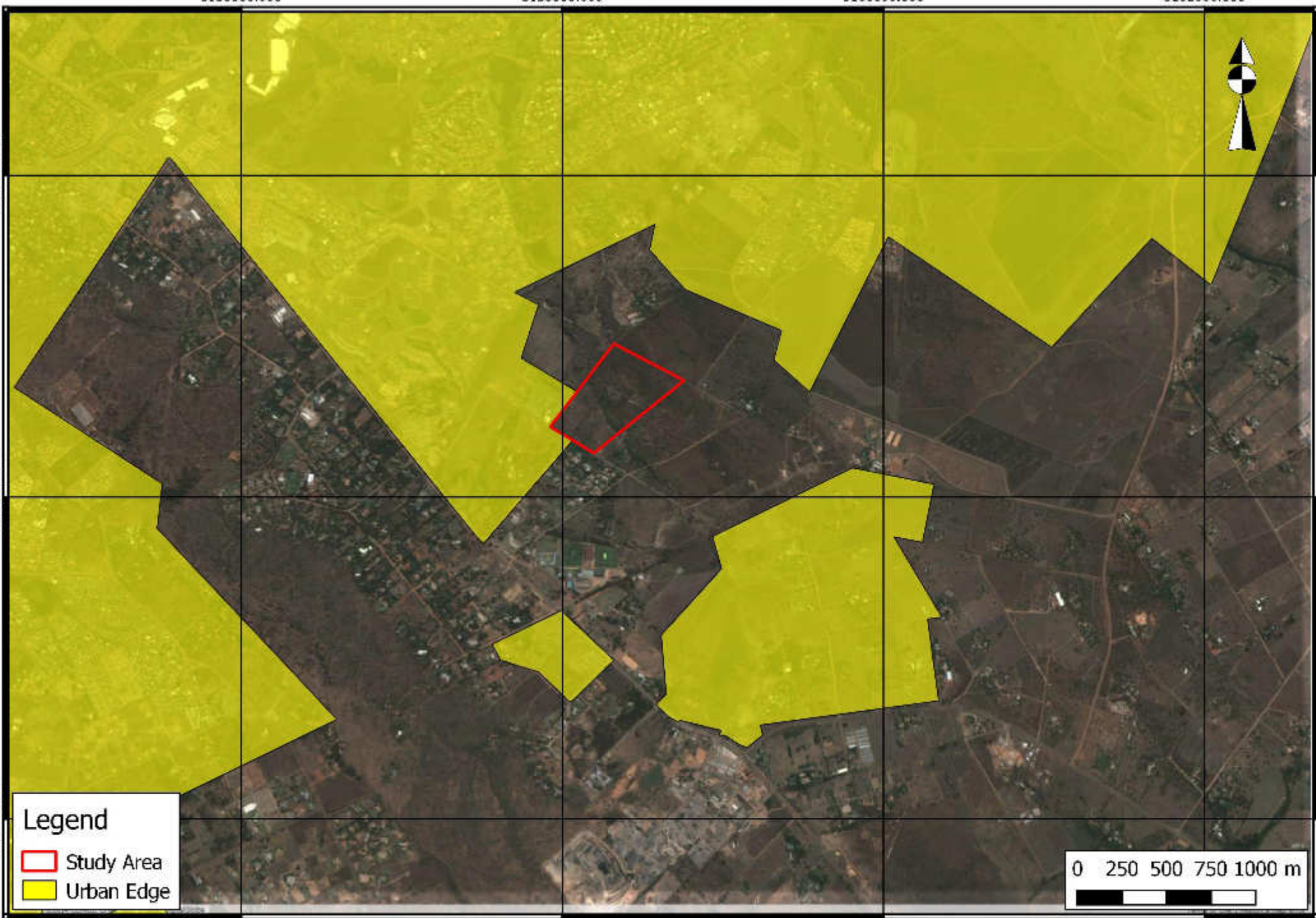
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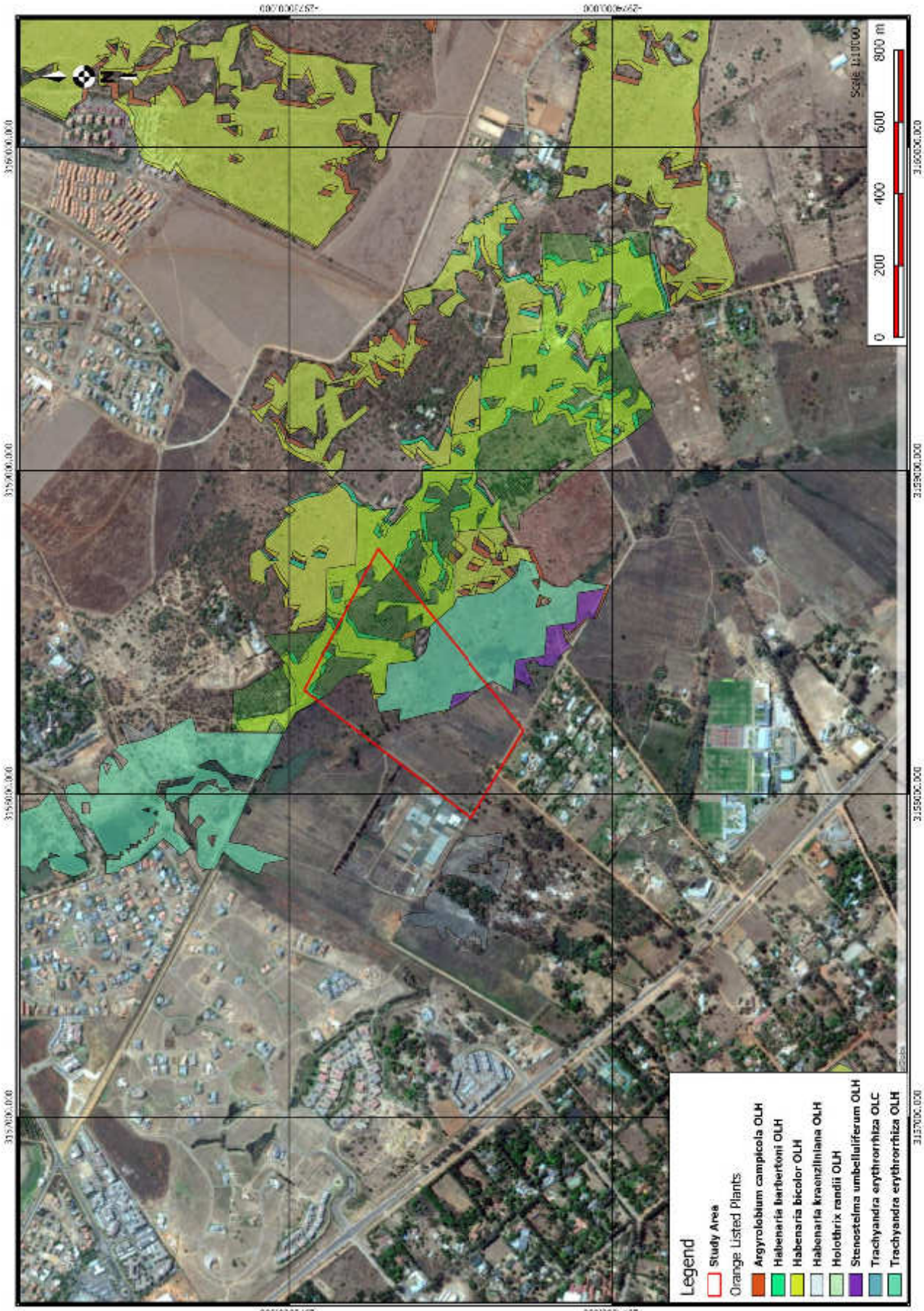
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Orange Listed Plants



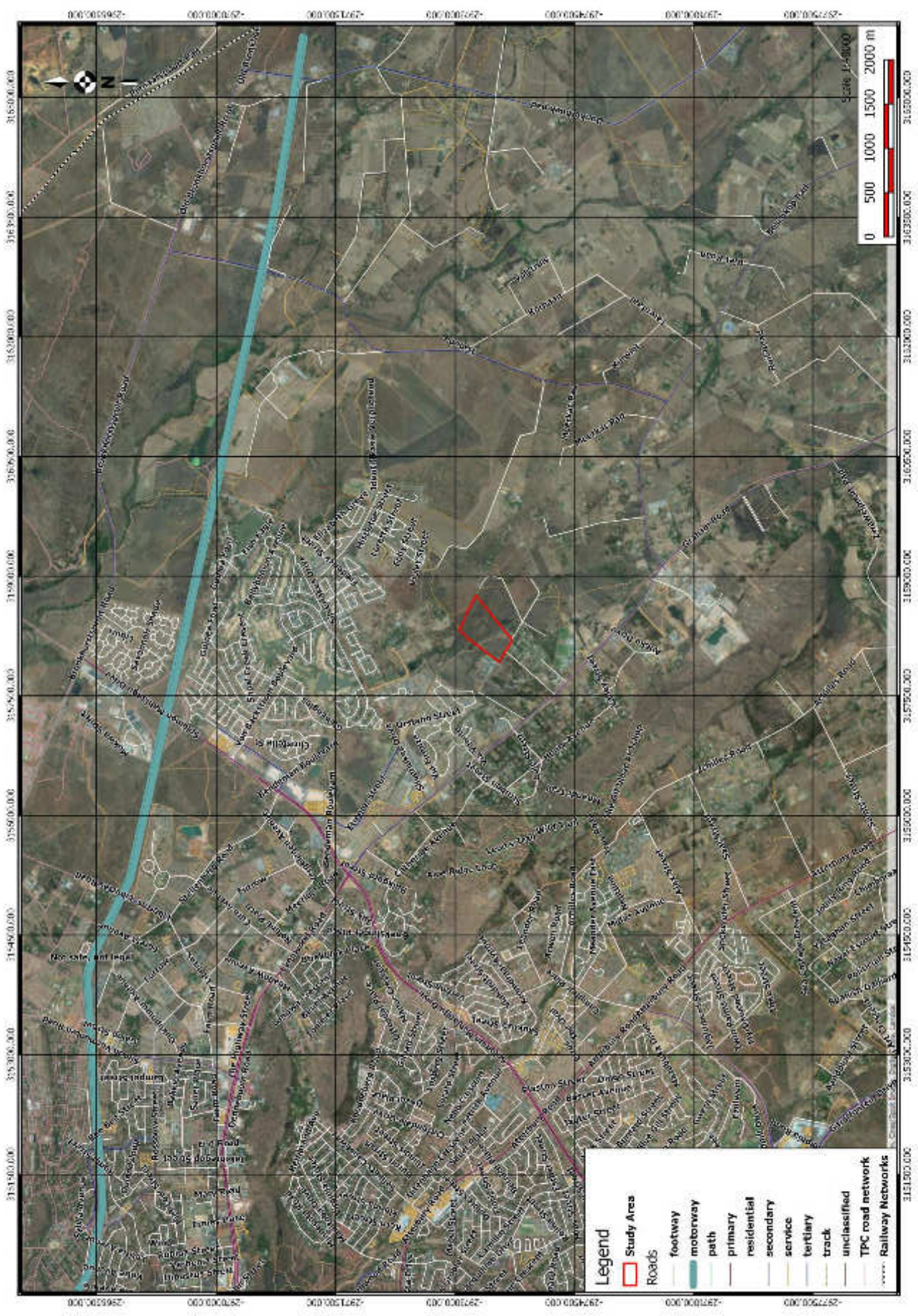
Appendix I11



Roads and Railways



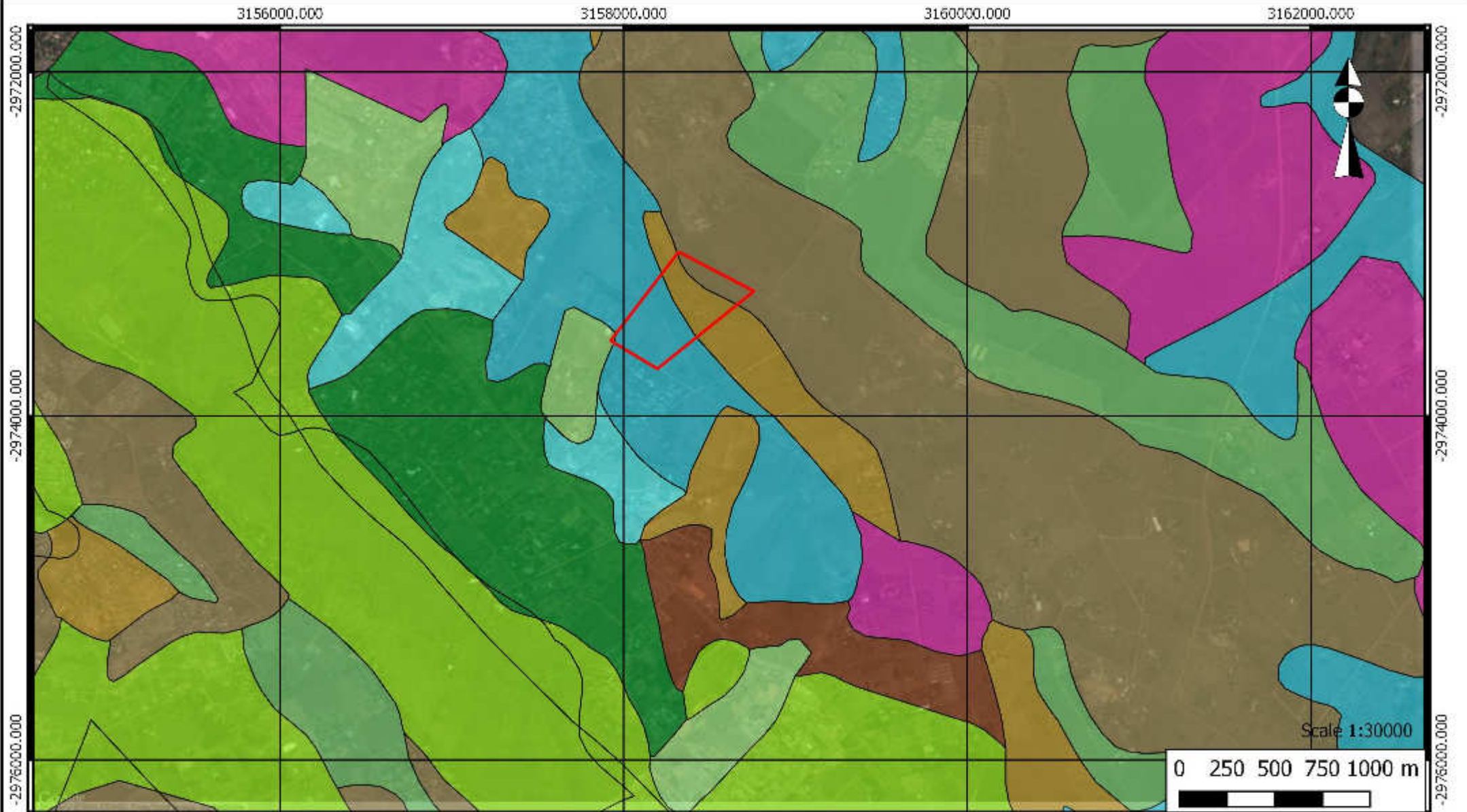
Appendix I12




Soils



Appendix I13





Legend

 Study Area


Soils


 Disturbed sites

 Impeded internal drainage, flood hazard


 Impeded internal drainage, limiting soil depth


 Limiting soil depth


 Limiting soil depth, impeded internal drainage in subsoil


 Limiting soil depth, moderate to strong structure, high clay content


 Limiting soil depth, rainfall efficiency, rock outcrops

 Limiting soil depth, rock outcrops, steepness

 Low clay content

 Moderate to strong structure, high clay content

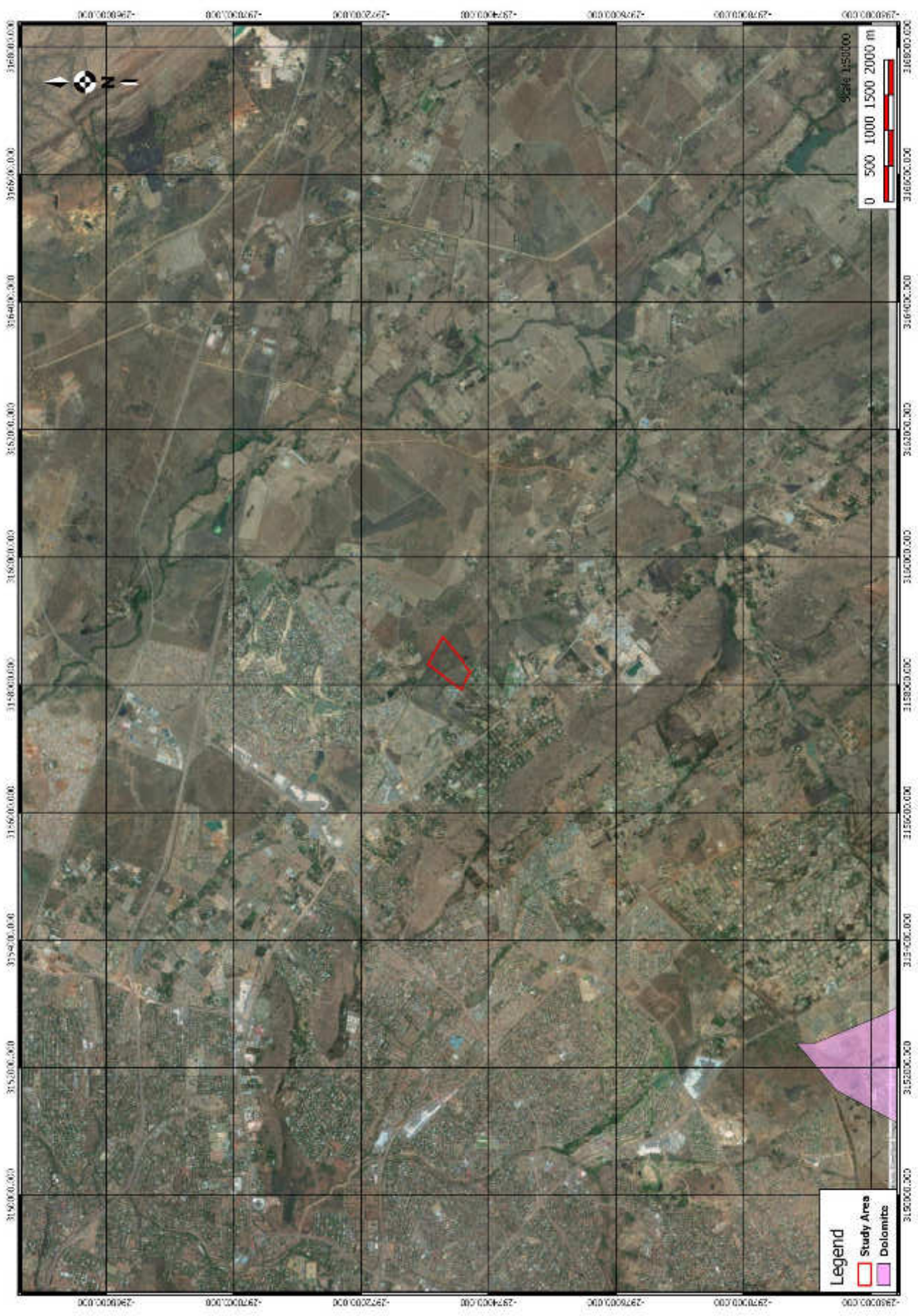
 Moderate to strong structure, high clay content, rainfall efficiency

 Moderate to strong structure, high clay content, water erosion hazard

Dolomite



Appendix I14



Company Profile & CV of Lizelle Gregory (Environmental Assessment Practitioner)



Appendix J



Bokamoso

**Landscape Architects &
Environmental consultants**

**P.O.BOX 11375
Maroelana
0161**

**Tel: (012) 346 3810
Fax: (086) 570 5559**

**E-mail: lizelleg@mweb.co.za
Website: www.bokamoso.biz**

- 01** Executive Summary
- 02** Vision, Mission & Values
- 03** Human Resources
- 04** Services
- 05** Landscape Projects
- 06** Corporate Highlights
- 07** Environmental Projects
- 08** Indicative Clients
- 09** Tools

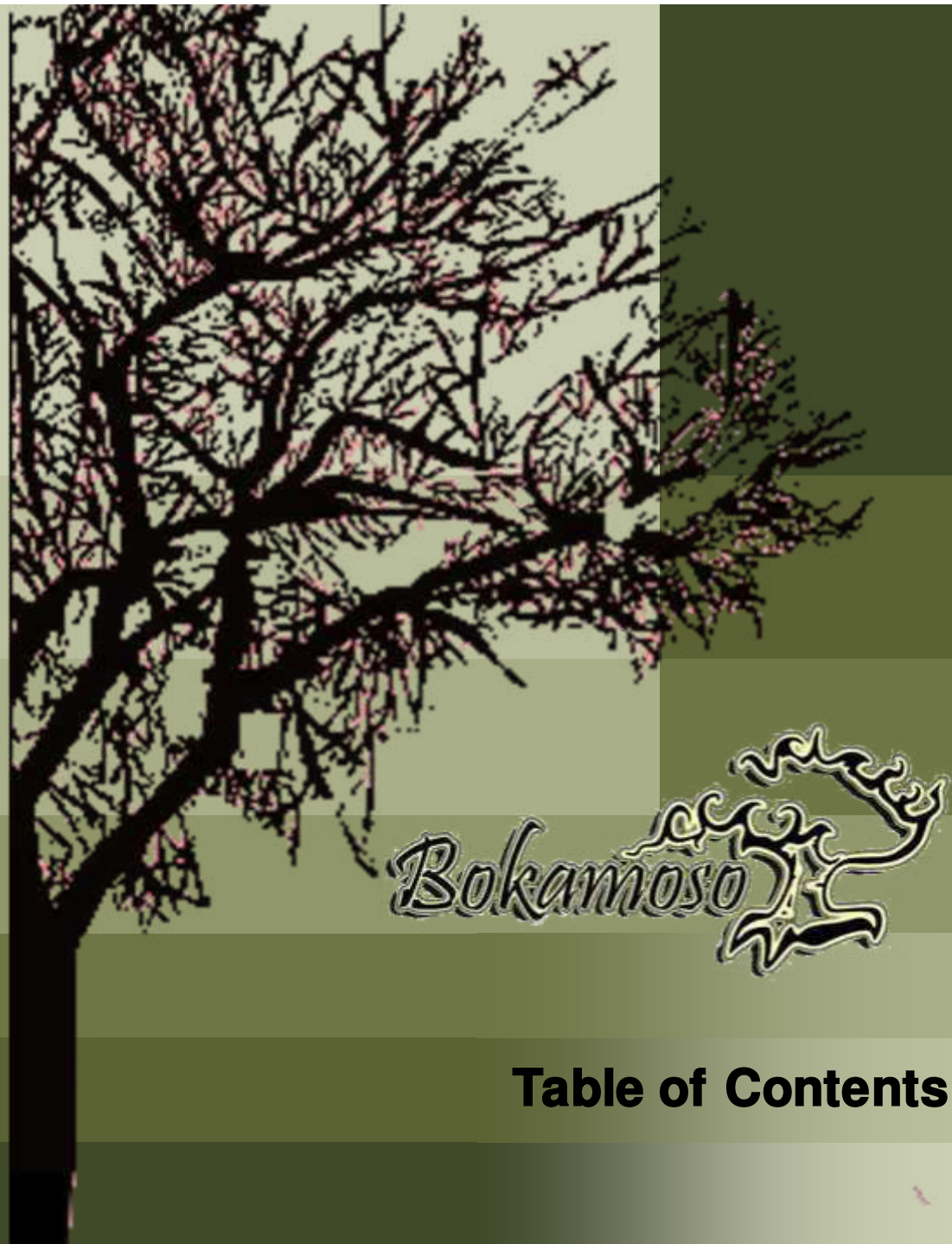


Table of Contents

Bokamoso specialises in the fields of Landscape Architecture and all aspects of Environmental Management and Planning. Bokamoso was founded in 1992 and has shown growth by continually meeting the needs of our clients. Our area of expertise stretches throughout the whole of South Africa. Our projects reflect the competence of our well compiled team. The diversity of our members enables us to tend to a variety of needs. Our integrated approach establishes a basis for outstanding quality. We are well known to clients in the private, commercial as well as governmental sector.

At Bokamoso we stand on a firm basis of environmental investigation in order to find unique solutions to the requirements of our clients and add value to their operations.



01 Executive Summary

011 Company Overview



Vision:

At Bokamoso we strive to find the best planning solutions by taking into account the functions of a healthy ecosystem. Man and nature should be in balance with each other.

Mission:

We design according to our ethical responsibility, take responsibility for successful completion of projects and constitute a landscape that contributes to a sustainable environment. We add value to the operations of our clients and build long term relationships that are mutually beneficial.

Values:

Integrity

Respect



Bokamoso stands on the basis of fairness. This include respect within our multicultural team and equal opportunities in terms of gender, nationality and race.

We have a wide variety of projects to tend to, from complicated reports to landscape installation. This wide range of projects enables us to combine a variety of professionals and skilled employees in our team.

Bokamoso further aids in the development of proficiency within the working environment. Each project, whether in need of skilled or unskilled tasks has its own variety of facets to bring to the table.

We are currently in the process of receiving our BEE scorecard. We support transformation in all areas of our company dynamics.



03 Human Resources

031 Employment Equity

Lizelle Gregory (100% interest)

Lizelle Gregory obtained a degree in Landscape Architecture from the University of Pretoria in 1992 and passed her board exam in 1995.

Her professional practice number is PrLArch 97078.

Ms. Gregory has been a member of both the Institute for Landscape Architecture in South Africa (ILASA) and South African Council for the Landscape Architecture Profession (SACLAP), since 1995.

Although the existing Environmental Legislation doesn't yet stipulate the academic requirements of an Environmental Assessment Practitioner (EAP), it is recommended that the Environmental Consultant be registered at the International Association of Impact Assessments (IAIA). Ms. Gregory has been registered as a member of IAIA in 2007.

Ms. Gregory attended and passed an International Environmental Auditing course in 2008. She is a registered member of the International Environmental Management and Assessment Council (IEMA).

She has lectured at the Tshwane University of Technology (TUT) and the University of Pretoria (UP). The lecturing included fields of Landscape Architecture and Environmental Management.

Ms. Gregory has more than 20 years experience in the compilation of Environmental Evaluation Reports:

Environmental Management Plans (EMP);

Strategic Environmental Assessments;

All stages of Environmental input ;

EIA under ECA and the new and amended NEMA regulations and various other Environmental reports and documents.

Ms. Gregory has compiled and submitted more than 600 Impact Assessments within the last 5-6 years. Furthermore, Ms. L. Gregory is also familiar with all the GDARD/Provincial Environmental policies and guidelines. She assisted and supplied GAUTRANS/former PWV Consortium with Environmental input and reports regarding road network plans, road determinations, preliminary and detailed designs for the past 12 years.



03 Human Resources

032 Members

Consulting

Anè Agenbacht

Introduction to Sustainable Environmental Management—An overview of Principles, Tools, & Issues (Potch 2006)
Leadership Training School (Lewende Woord 2010)
BA Environmental Management (UNISA 2011)
PGCE Education (Unisa 2013) - CUM LAUDE
Project Manager
More than 10 years experience in the compilation of various environmental reports

Mary-Lee Van Zyl

Msc. Plant Science (UP)
BSc (Hons) Plant Science (UP)
BSc Ecology (UP)
More than 3 years working experience in the Environmental field
Specialises in ECO works, Basic Assessments, EIA's, and Flora Reports
Compilation of various Environmental Reports

Dashentha Naidoo

BA Honours Degree in Environmental Management (UNISA) - CUM LAUDE
Bachelor Social Science in Geography & Environmental Management (UKZN)
More than 4 years experience in WUL Application & Integrated Environmental Management within water resource management.
Senior Environmental Practitioner & Water Use Licences Consultant
Specialises in Water Use License & Compilation of various Env. Reports

Ben Bhukwana

BSc Landscape Architecture (UP)
More than 5 years experience in the field of Landscape Architecture (Design, Construction, and Implementation).
Specialises in Landscape Design, ECO, Rehabilitation Plans and Compilation Basic Assessment Reports
Compilation of Tender documents



03 Human Resources

033 Personnel

Anton Nel

B-Tech Landscape Technology (TUT)
N Dip Landscape Technology (TUT)
Hazardous Waste Management Short Course
2 years experience in ECO.
Specialises in Basic Assessment Reports.

Juanita de Beer

Diploma Events Management and Marketing (Damelin)
Specializes in Public relations and Public Participation Processes (3 years experience)

Alfred Thomas

CIW Foundation& Internet Marketing (IT Academy)
12 years experience in GIS and IT in general.
GIS Operator and Multimedia Specialist.

Bianca Reyneke

Applying SHE Principles and Procedures (NOSA)
Intro to SAMTRAC Course (NOSA)
SHEQ Coordinator and compilation of environmental reports
Specialises in compiling various environmental reports

A.E. van Wyk

BSc. Environmental Sciences (Zoology and Geography)
Specialises in compiling various environmental reports



03 Human Resources

034 Personnel

Elsa Viviers

Interior Decorating (Centurion College)

(Accounting/ Receptionist) and Secretary to Lizelle Gregory

Loura du Toit

N. Dip. Professional Teacher (Heidelberg Teachers Training College)

Librarian and PA to Project Manager

Merriam Mogalaki

Administration Assistant with in-house training in bookkeeping

Landscape Contracting

Elias Maloka

Site manager overseeing landscape installations.

Irrigation design and implementation.

Landscape maintenance

18 years experience in landscape contracting works.

The contracting section comprises of six permanently employed black male workers. In many cases the team consists of up to 12 workers, depending on the quantity of work.



03 Human Resources

035 Personnel



01 Environmental Management Services

- Basic Assessment Reports
- EIA & Scoping Reports
- Environmental Management Plans
- Environmental Scans
- Strategic Environmental Assessments
- EMP for Mines
- Environmental Input and Evaluation of Spatial Development Frameworks
- State of Environmental Reports
- Compilation of Environmental Legislation and Policy Documents
- Environmental Auditing and Monitoring
- Environmental Control Officer (ECO)
- Visual Impact assessments
- Specialist Assistance with Environmental Legislation Issues and Appeals
- Development Process Management
- Water Use License applications to DWA
- Waste License Application



04 Services

041 Consulting Services

02 Landscape Architecture

- Master Planning
- Sketch Plans
- Planting Plans
- Working Drawings
- Furniture Design
- Detail Design
- Landscape Development Frameworks
- Landscape Development Plans (LDP)
- Contract and Tender Documentation
- Landscape Rehabilitation Works

03 Landscape Contracting

Implementation of Plans for:

- Office Parks
- Commercial/ Retail / Recreational Development
- Residential Complexes
- Private Residential Gardens
- Implementation of irrigation systems



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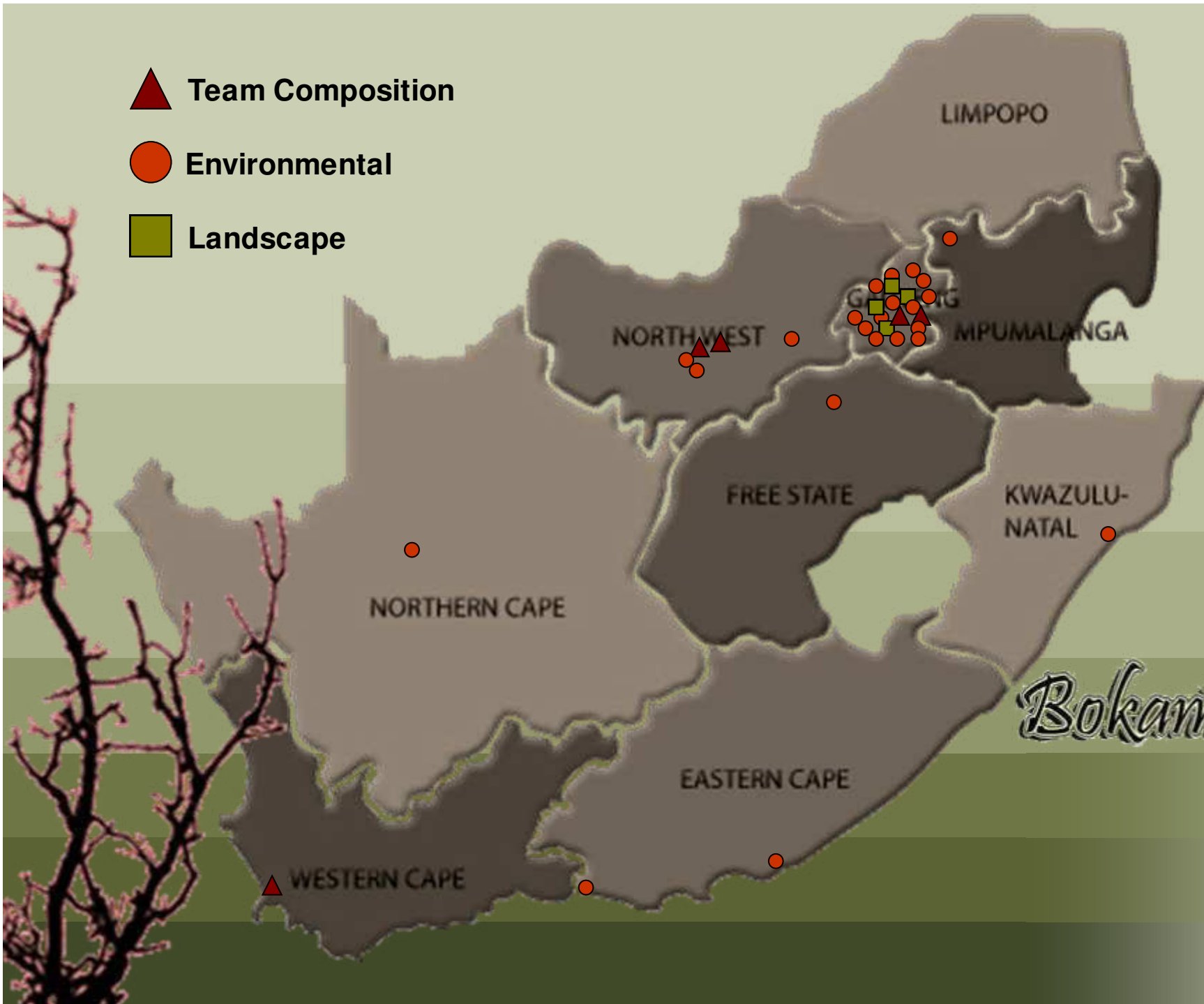
04 Services

042 Contracting Services

▲ Team Composition

● Environmental

■ Landscape



04 Services

043 Orientation

01 Valpre Bottling Plant, Heidelberg



project
shelter- site plan

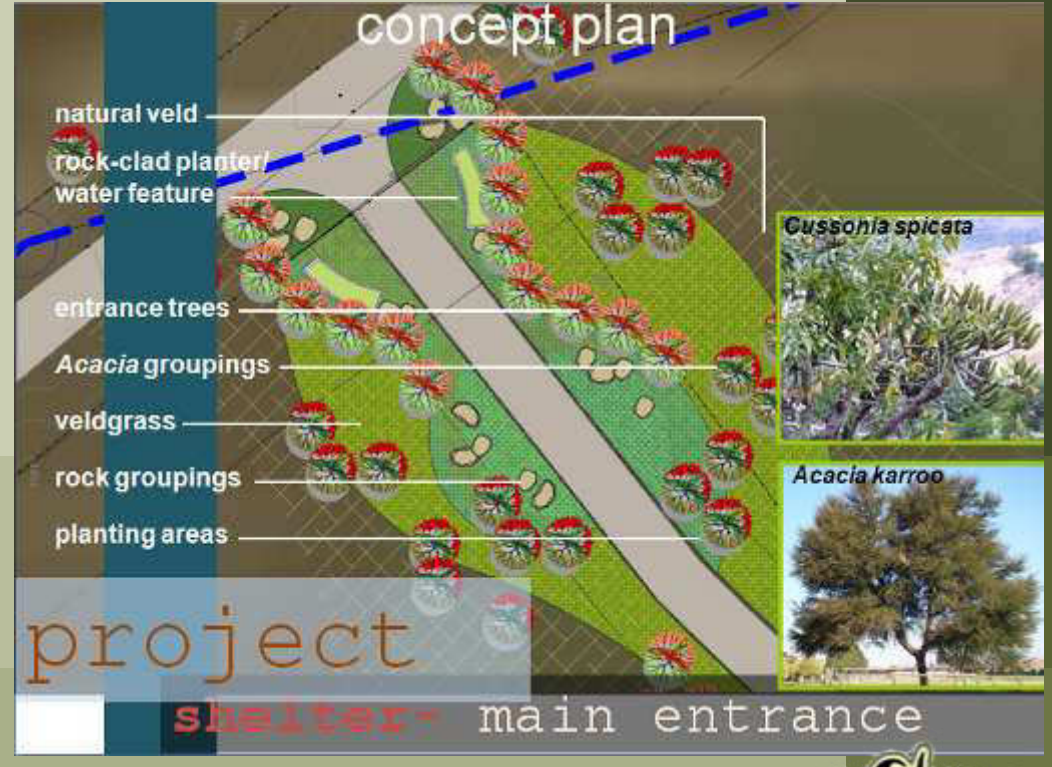
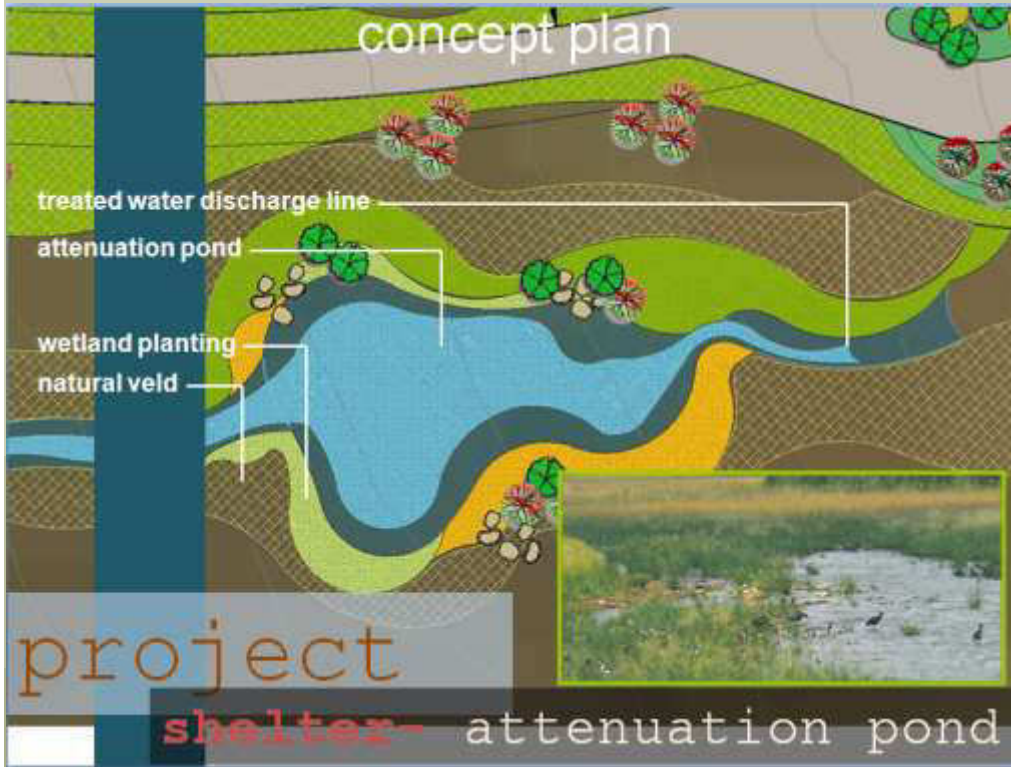


05 Landscape Projects- Current

051 Commercial



01 Valpre Bottling Plant, Heidelberg

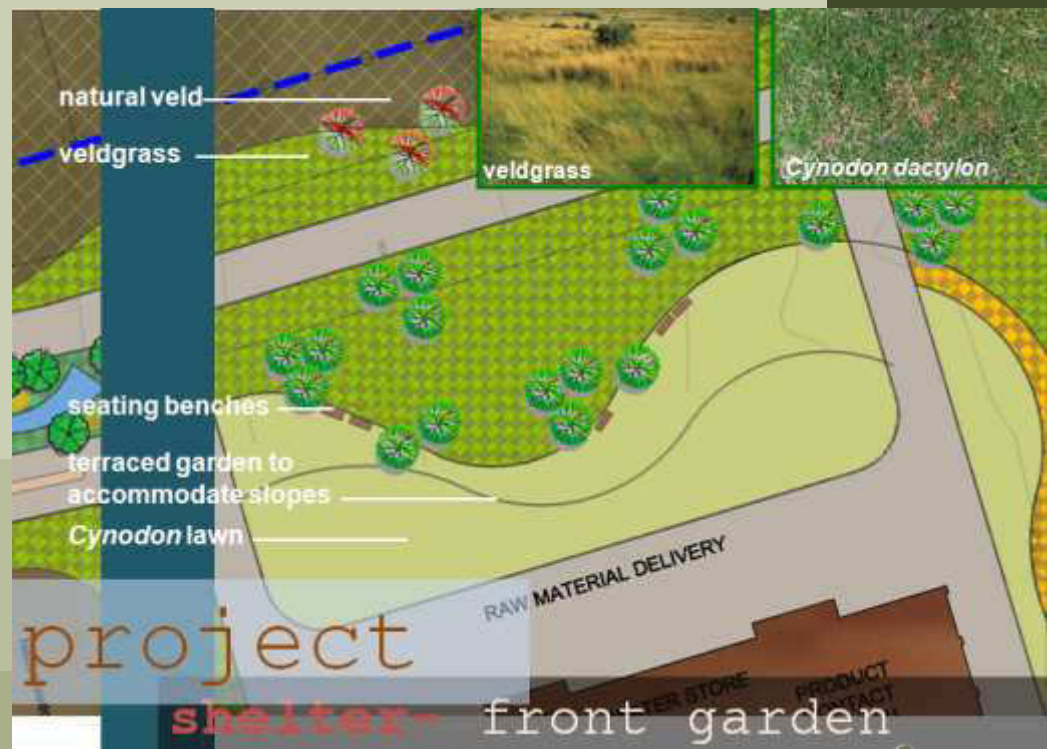


05 Landscape Projects- Current

051 Commercial



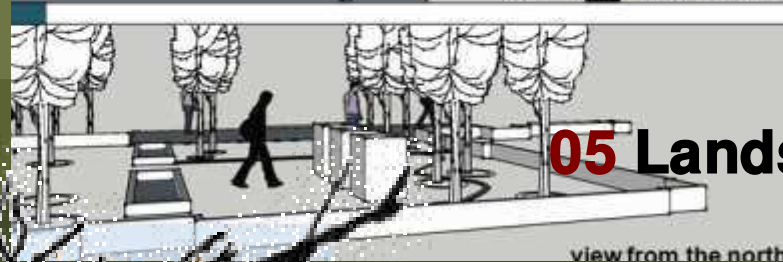
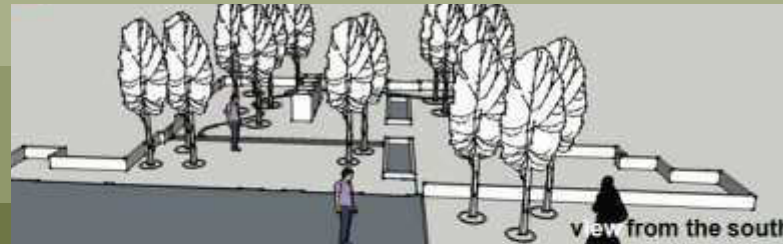
01 Valpre Bottling Plant, Heidelberg



05 Landscape Projects— Current

051 Commercial

01 Valpre Bottling Plant, Heidelberg



05 Landscape Projects- Current

051 Commercial

02 Melodie Waters, Hartebeespoortdam



Streetscape

Indigenous Planting

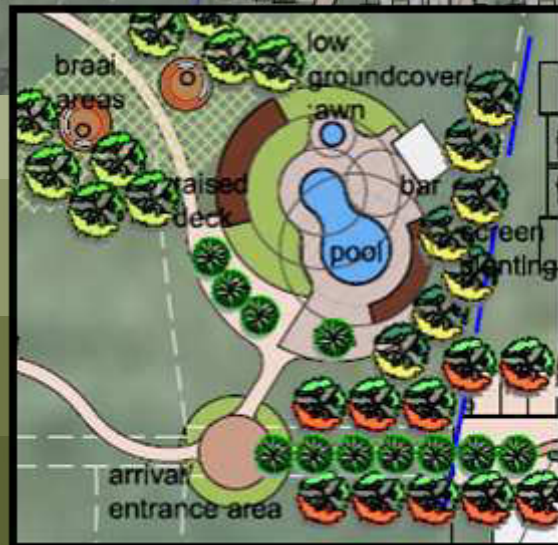


05 Landscape Projects – Current

052 Commercial/Recreational



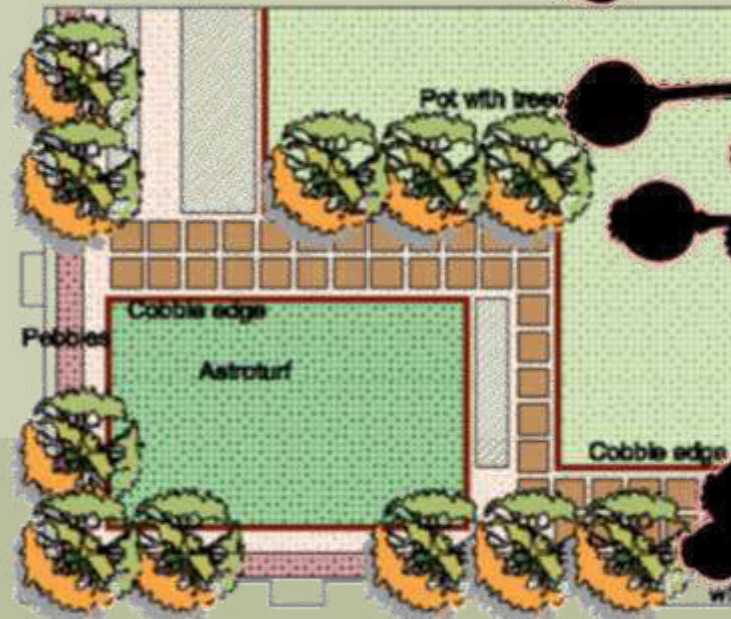
02 Melodie waters, Hartebeestpoortdam



05 Landscape Projects– Current

052 Commercial/Recreational

03 Grain Building, Pretoria



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05 Landscape Projects– Completed

053 Offices

04 Ismail Dawson offices, Pretoria



Bokamoso

05 Landscape Projects – Conceptual

053 Offices

05 Celtic Manor, Pretoria

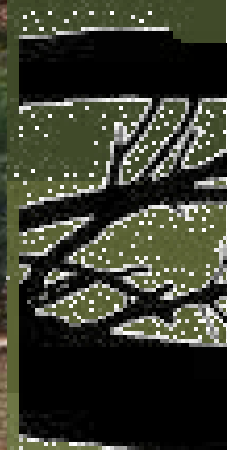
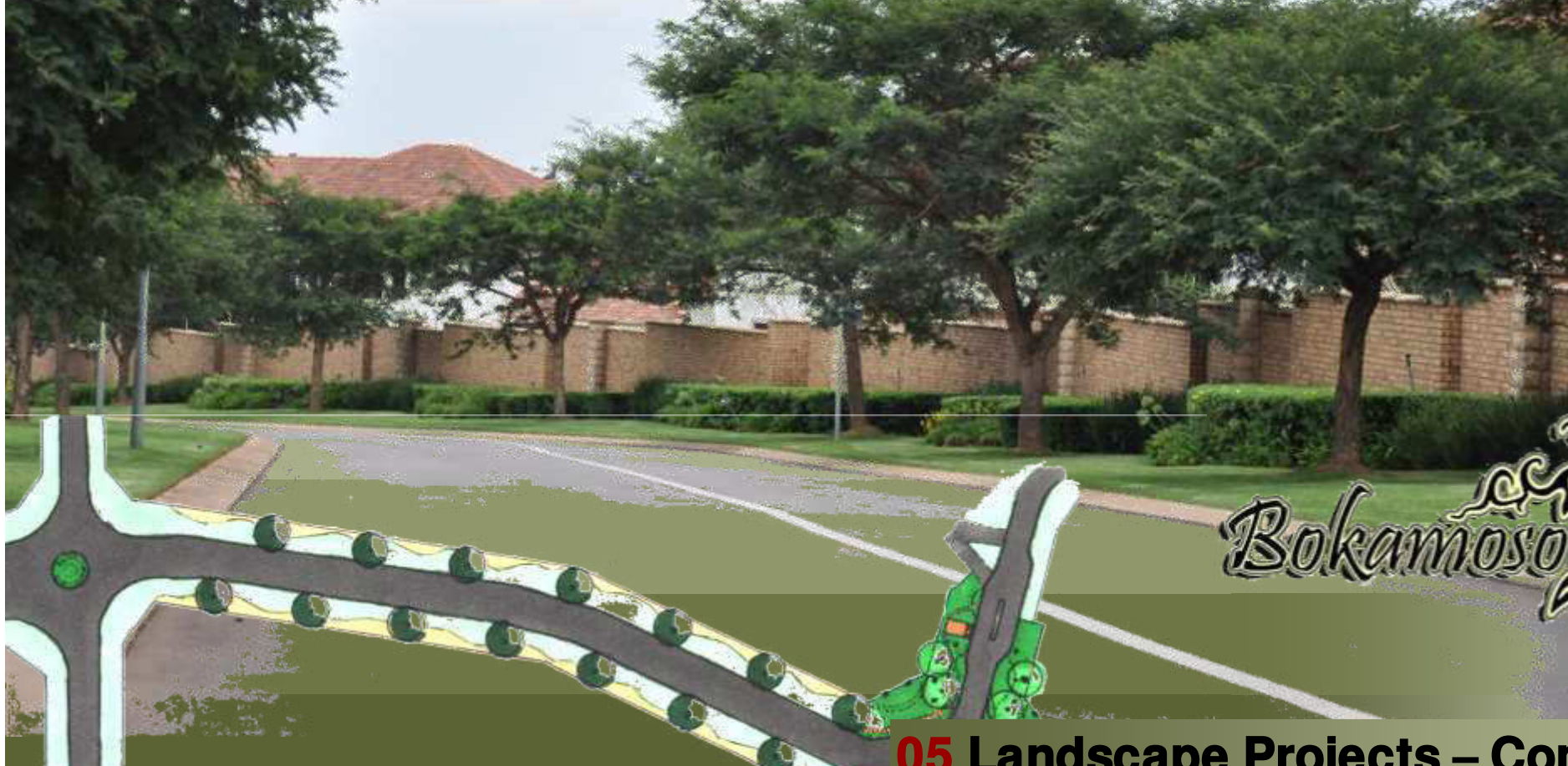


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05 Landscape Projects - Completed

054 Complex Development

06 The Wilds, Pretoria



Bokamoso

05 Landscape Projects – Completed

054 Complex Development

07 The Wilds, Pretoria

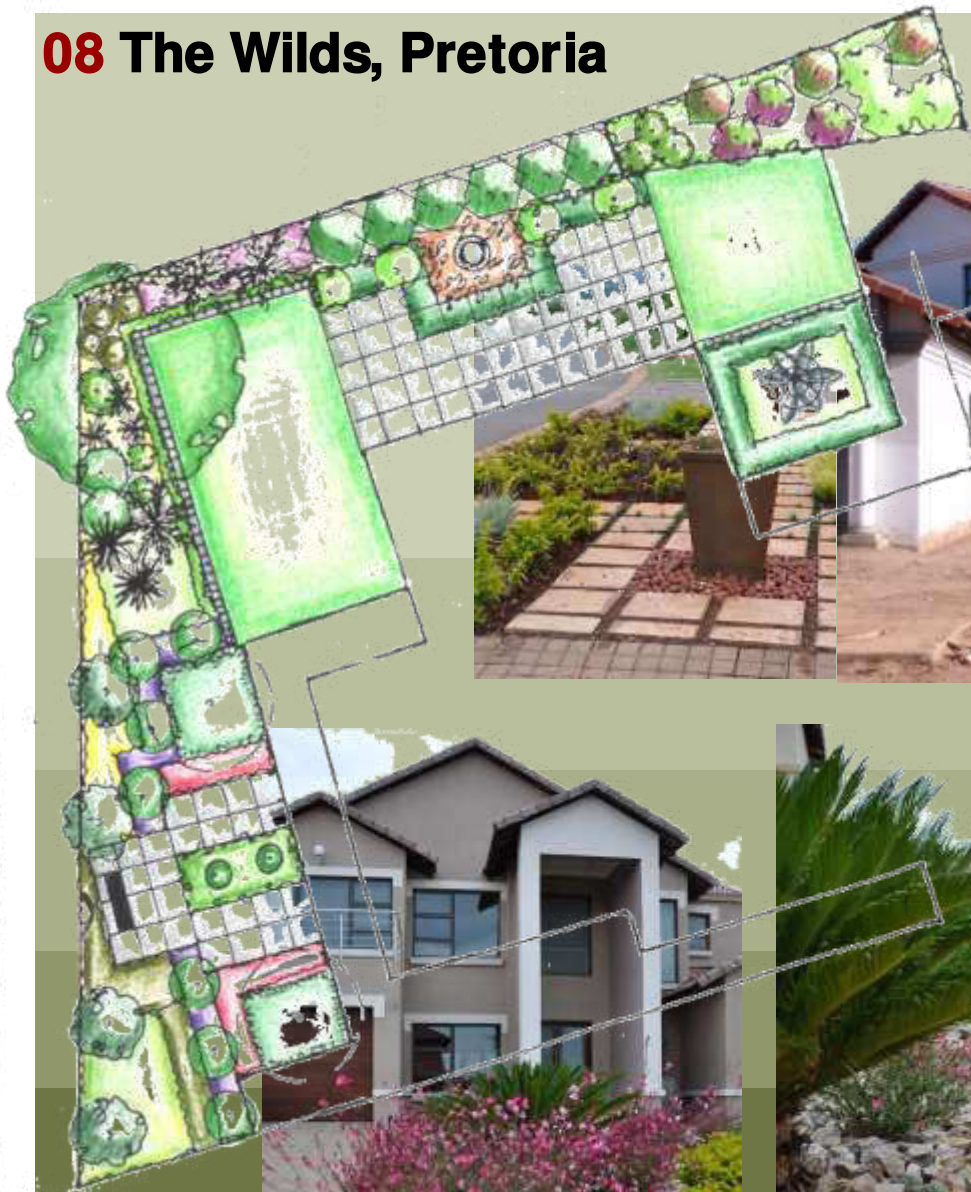


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05 Landscape Projects – Completed

055 Residential

08 The Wilds, Pretoria



Bokamoso

05 Landscape Projects – Completed

055 Residential

09 The Wilds, Pretoria

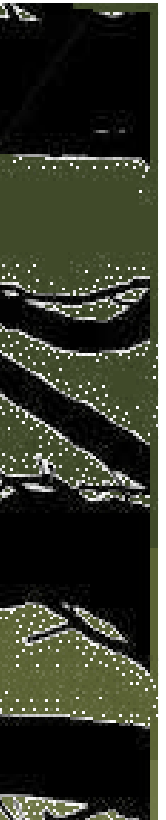


Bokamoso

05 Landscape Projects – Completed

055 Residential

010 The Wilds, Pretoria



Bokamoso

05 Landscape Projects – Completed

055 Residential



011 Governor of Reserve Bank's Residence, Pretoria



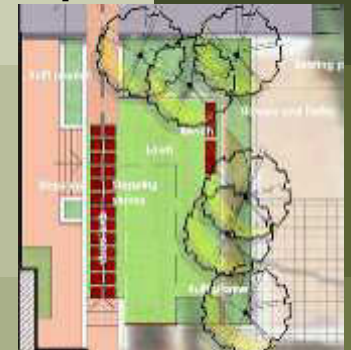
Plant Palette



Option 1



Option 2



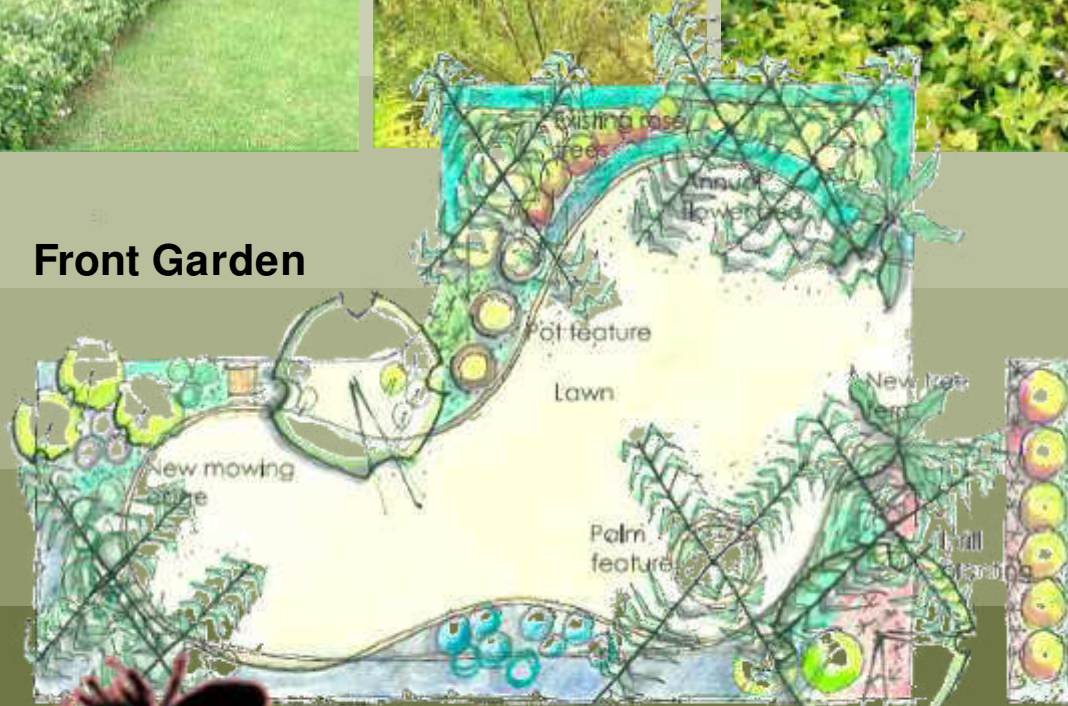
05 Landscape Projects – Conceptual

055 Residential

012 House Ismail, Pretoria



Front Garden

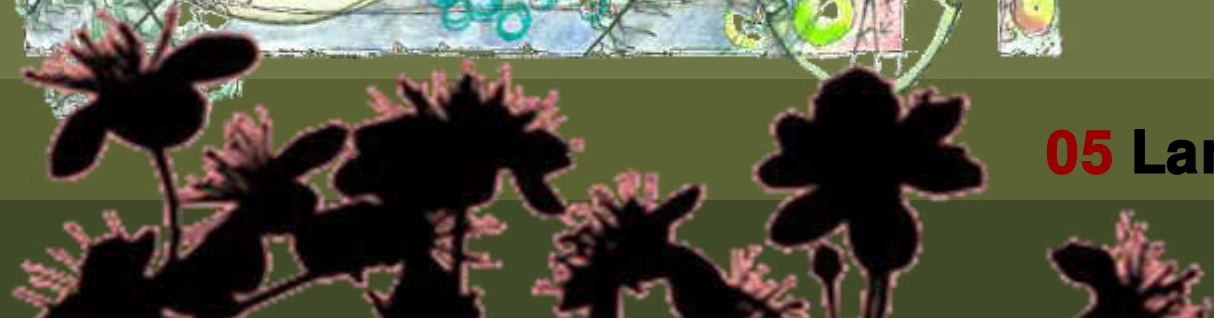


Back Garden



05 Landscape Projects - Conceptual

055 Residential



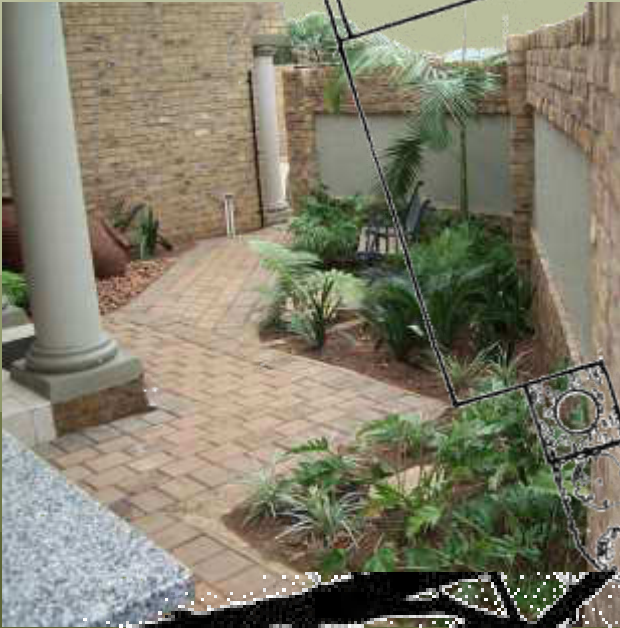
013 Forest Garden, Pretoria



05 Landscape Projects – Completed

055 Residential

015 Forest Garden, Pretoria



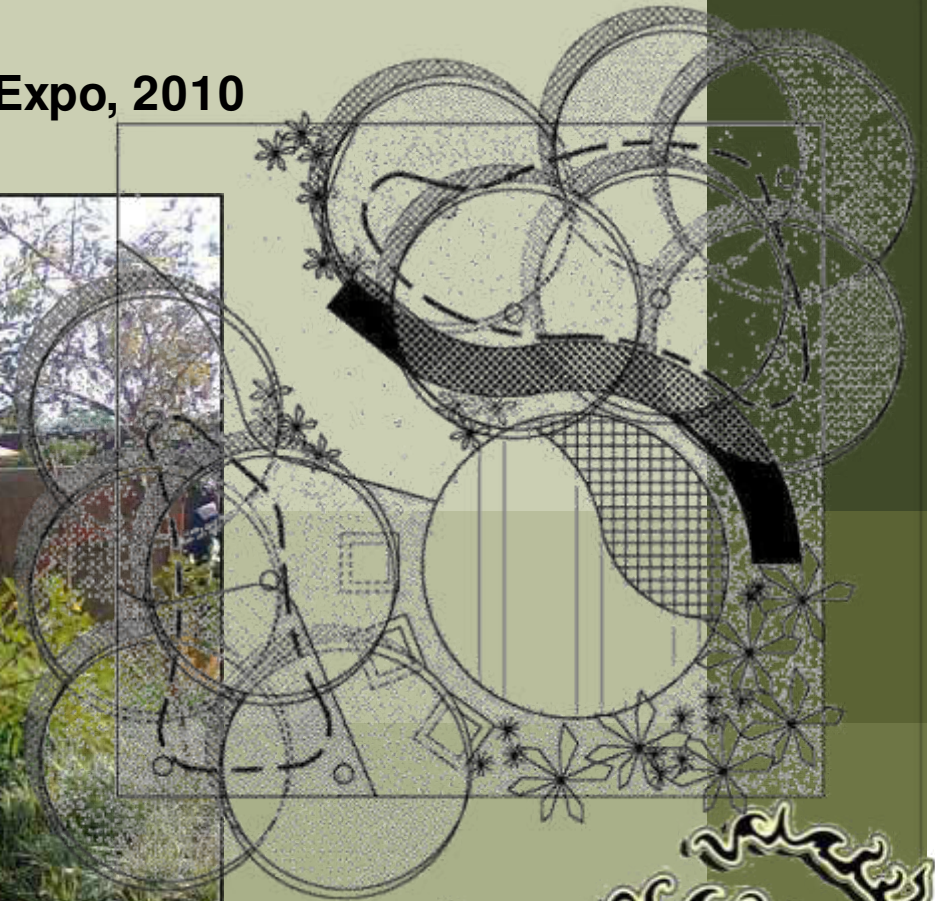
Bokamoso

05 Landscape Projects - Completed

055 Residential

01 Safari Garden Expo

Received a Silver Certificate at the Safari Garden Expo, 2010



Bokamoso 

06 Corporate Highlights

061 Awards

02 UNISA Sunnyside Campus, Pretoria

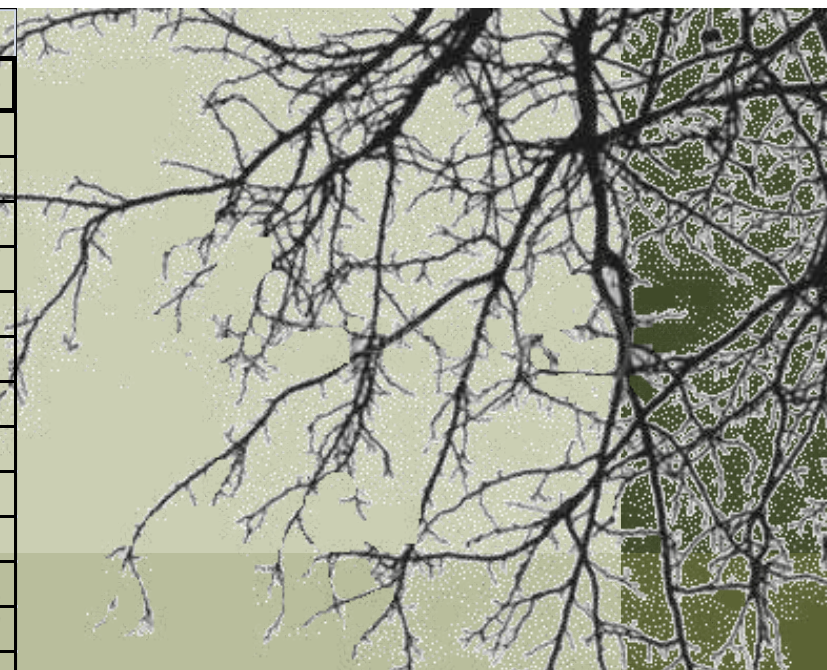
Best Commercial Paving Plan in Gauteng, 1997



06 Corporate Highlights

061 Awards

Project Name	Status	Project
Environmental Impact Assessment(EIA) and Scoping Report		
Junction 21	ROD	EIA
5 O'clock site access	In Progress	EIA
Bokamoso X 1	In Progress	Scoping & EIA
Doornvallei Phase 6 & 7	In Progress	EIA
Engen Interchange	In Progress	Scoping & EIA
Erasmia X15	In Progress	EIA
Franschkloof	In Progress	EIA
K113	Amendment of ROD	EIA
K220 East	ROD	EIA
K220 West	ROD	EIA
K54 ROD conditions	In Progress	EIA
Knopjeslaagte 95/Peachtree	ROD	EIA
Knopjeslaagte portion 20 & 21	ROD	EIA
Lillieslief/Nooitgedacht	In Progress	EIA
Mooiplaats 70 (Sutherland)	In Progress	EIA
Naauwpoort 1 - 12/Valley View	In Progress	EIA
PeachTree X5	In Progress	EIA
Strydfontein 60	In Progress	EIA
Thabe Motswere	In Progress	Scoping & EIA
Vlakplaats	In Progress	EIA
Waterval Valley	In Progress	EIA
Environmental Opinion		
Doornkloof 68 (Ross)	In Progress	Opinion
Monavoni X 53	In Progress	BA & Opinion
Mooikloof (USN)	In Progress	Opinion
Norwood Mall/Sandspruit	In Progress	Opinion
Riversong X 9	In Progress	Opinion
Sud Chemie	In Progress	Opinion
USN Benjoh Fishing Resort	In Progress	Opinion



The adjacent list host the status of our current projects. Only a selected amount of projects are displayed.



07 Current Environmental Projects

071 EIA, Scoping & Opinion

Project Name	Status	Project
Basic Assessment(BA)		
Annlin X 138	In Progress	BA
Clubview X 29	ROD	BA
Darrenwood Dam	In Progress	BA
Durley Holding 90 & 91	In Progress	BA
Elim	In Progress	BA
Fochville X 3	In Progress	BA
Hartebeeshoek 251	In Progress	BA
Klerksdorp (Matlosana Mall)	In Progress	BA
Monavoni External Services	ROD	BA
Monavoni X 45	Amendment of ROD	BA
Montana X 146	In Progress	BA
Rooihuiskraal X29	In Progress	BA
Thorntree Mall	In Progress	BA

Environmental control officer (ECO)		
Grace Point Church	In Progress	ECO
R 81	In Progress	ECO
Highveld X 61	In Progress	ECO
Mall of the North	In Progress	ECO
Olievenhoutbosch Road	In Progress	ECO
Orchards 39	In Progress	ECO
Pierre van Ryneveld Reservoir	In Progress	ECO
Project Shelter	In Progress	ECO

S24 G		
Wonderboom	In Progress	S24 G
Mogwasi Guest houses	Completed	S24 G



07 Current Environmental Projects

072 BA, ECO & S24 G

Project Name	Status	Project
Objection		
Colesberg WWTW	In Progress	Objection
Nigel Steelmill	Completed	Objection
Chantilly Waters	Completed	Objection

Development facilitation Act- Input (DFA)		
Burgersfort	In Progress	DFA & BA
Doornpoort Filling Station	In Progress	DFA & EIA & Scoping
Eastwood Junction	In Progress	DFA
Ingersol Road (Erf 78, 81 - 83)	In Progress	DFA
Roos Senekal	In Progress	DFA & EIA & Scoping
Thaba Meetse 1	In Progress	DFA & EIA & Scoping

Water Use License Act (WULA)		
Britstown Bulk Water Supply	In Progress	WULA
Celery Road / Green Channel	In Progress	WULA
Clayville X 46	In Progress	WULA
Dindingwe Lodge	In Progress	WULA
Doornpoort Filling Station	In Progress	WULA+DFA+EIA+SC
Eco Park Dam	In Progress	WULA
Groote Drift Potch	In Progress	WULA
Jozini Shopping Centre	In Progress	WULA+BA
K60	Completed	WULA
Maloto Roads	In Progress	WULA
Kwazele Sewage Works	In Progress	WULA
Monavoni External Services	In Progress	WULA+BA
Nyathi Eco Estate	In Progress	WULA
Prairie Giants X 3	In Progress	WULA
Waveside Water Bottling Plant	Completed	WULA



07 Current Environmental Projects

073 Objection, DFA & WULA

Project Name	Status	Project
Environmental Management Plan(EMP)		
Heidelberg X 12	ROD	EMP
Monavoni Shopping Centre	Completed	EMP
Forest Hill Development	Completed	EMP
Weltevreden Farm 105KQ	Completed	EMP+EIA
Raslouw Holding 93	Completed	EMP+BA
Durley Development	Completed	EMP+BA
Rooihuiskraal North X 28	Completed	EMP

Rehabilitation Plan		
Norwood Mall/Sandspruit	In Progress	Rehabilitation
Project Shelter Heidelberg	In Progress	Rehabilitation
Sagewood Attenuation Pond	ROD	Rehabilitation
Velmore Hotel	Completed	Rehabilitation
Grace Point Church	Completed	Rehabilitation
Mmamelodi Pipeline	Completed	Rehabilitation

Visual Impact Assessment		
Swatzkop Industrial Developme	Completed	Assessment +DFA
Erasmia	Completed	Assessment

Signage Application		
Menlyn Advertising	Completed	Signage
The Villa Mall	Completed	Signage+EMP+BA



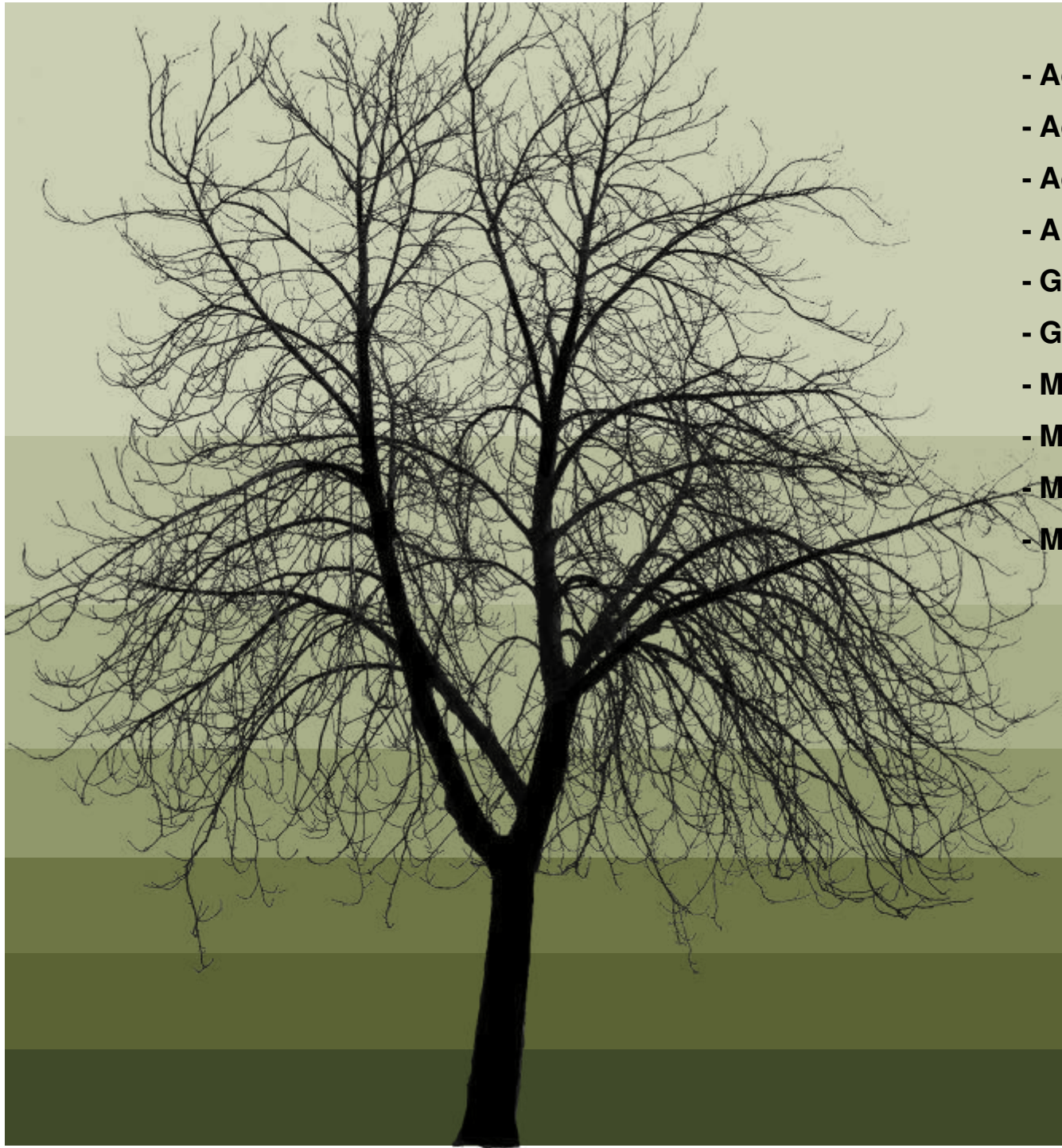
07 Current Environmental Projects

074 EMP, Rehabilitation , Waste Management & Signage Application

- Billion Property Group
- Cavaleros Developments
- Centro Developers
- Chaimberlains
- Chieftain
- Century Property Group
- Coca Cola
- Elmado Property Development
- Flanagan & Gerard
- Gautrans
- Hartland Property Group
- Moolman Group
- MTN
- M&T Development
- Old Mutual
- Property Investment Company
- Petroland Developments
- RSD Construction
- SAND
- Stephan Parsons
- Twin City Developments
- Urban Construction
- USN



08 Indicative Clients



- Adobe Illustrator CS3
- Adobe Photoshop CS3
- Adobe InDesign CS3
- AutoCAD
- Google SketchUP
- GIS
- Microsoft Office Word
- Microsoft Office Excel
- Microsoft Office Publisher
- Microsoft Office Power Point

Bokamoso 

Qualifications And Experience In The Field Of Environmental Planning And Management (Lizelle Gregory (Member Bokamoso)):

Qualifications:

- Qualified as **Landscape Architect** at UP 1991;
- Qualified as **Professional Landscape Architect in 1997**;
- A Registered Member at The **South African Council for the Landscape Architect Profession (SACLAP)** with Practise Number: **PrLArch97078**;
- A Registered Member at the **International Association for Impact Assessment Practitioners (IAIA)**;
- Qualified as an **Environmental Auditor in July 2008** and also became a Member of the International Environmental Management Association (IEMAS) in 2008.

Working Experience:

- Worked part time at Eco-Consult – 1988-1990;
- Worked part time at **Plan Associates as Landscape Architect in training** – 1990-1991;
- Worked as Landscape Architect at **Environmental Design Partnership (EDP)** from 1992 - 1994
- Practised under **Lizelle Gregory Landscape Architects** from 1994 until 1999;
- Lectured** at Part-Time at **UP** (1999) – Landscape Architecture and **TUT** (1998- 1999)- Environmental Planning and Plant Material Studies;
- Worked as **part time Landscape Architect and Environmental Consultant at Plan Associates** and **managed their environmental division for more than 10 years** – 1993 – 2008 (assisted the **PWV Consortium** with various road planning matters which amongst others included environmental Scans, EIA's, Scoping reports etc.)
- Renamed business as **Bokamoso in 2000** and is the only member of Bokamoso Landscape Architects and Environmental Consultants CC;
- More than 20 years experience in the compilation of Environmental Reports**, which amongst others included the compilation of various **DFA Regulation 31 Scoping Reports**, EIA's for EIA applications in terms of the applicable environmental legislation, Environmental Management Plans, Inputs for Spatial Development Frameworks, DP's, EMF's etc. Also included EIA Application on and adjacent to mining land and slimes dams (i.e. Brahm Fisherville, Doornkop)

Qualifications And Experience In The Field Of Landscape Architecture (Lizelle Gregory (Member Bokamoso)):

Landscape Architecture:

-Compiled landscape and rehabilitation plans for more than 22 years.

The most significant landscaping projects are as follows:

-Designed the Gardens of the Witbank Technicon (a branch of TUT). Also supervised the implementation of the campus gardens (2004);

-Lizelle Gregory was the Landscape Architect responsible for the paving and landscape design at the UNISA Sunnyside Campus and received a Corobrick Golden Award for the paving design at the campus (1998-2004);

-Bokamoso assisted with the design and implementation of a park for the City of Johannesburg in Tembisa (2010);

-The design and implementation of the landscape gardens (indigenous garden) at the new Coca-Cola Valpre Plant (2012-2013);

-Responsible for the rehabilitation and landscaping of Juksei River area at the Norwood Shopping Mall (Johannesburg) (2012-2013);

-Designed and implemented a garden of more than 3,5ha in Randburg (Mc Arthurpark). Bokamoso also seeded the lawn for the project (more than 2,5 ha of lawn successfully seeded) (1999);

-Bokamoso designed and implemented more than 800 townhouse complex gardens and submitted more than 500 Landscape Development Plans to CTMM for approval (1995 – 2013);

-Assisted with Landscape Designs and the Masterplan at Eco-Park (M&T Developments) (2005-2011);

-Bokamoso designed and implemented an indigenous garden at an office park adjacent to the Bronberg. In this garden it was also necessary to establish a special garden for the Juliana Golden Mole. During a recent site visit it was established that the moles are thriving in this garden. Special sandy soils had to be imported and special indigenous plants had to be established in the natural section of the garden.

-Lizelle Gregory also owns her own landscape contracting business. **For the past 20 years she trained more than 40 PDI jobless people (sourced from a church in Mamelodi)** to become landscape contracting workers. All the workers are (on a continuous basis) placed out to work at nurseries and other associated industries;

-Over the past 20 years the Bokamoso team compiled more than 800 landscape development plans and also implemented most of the gardens. Bokamoso also designed and implemented the irrigation for the gardens (in cases where irrigation was required). Lizelle regarded it as important to also obtain practical experience in the field of landscape implementation.