

Competent Authority:	LEDET	Reference number:	16/1/7/2-G-27
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# ENVIRONMENTAL IMPACT ASSESSMENT REPORT

FOR THE PROPOSED  
**DEVELOPMENT OF INDUSTRIAL, BUSINESS &  
RESIDENTIAL EXTENSIONS ON PORTIONS 5, 58, 60, 62  
AND THE R/PORITION 27 OF THE FARM LEEUWVALLEI 297  
KT, GREATER TUBATSE MUNICIPALITY, BURGERSFORT,  
LIMPOPO PROVINCE**



Prepared by:  
Wandima Environmental Services  
P O Box 1072  
**NELSPRUIT**  
1200

Tel: (013) 752 5452

Fax: (013) 752 6877

## EXECUTIVE SUMMARY

The property owner Anglorand Holdings Limited and the developer, Gillyfrost 56 (Pty/Ltd), wish to develop the relevant properties into residential, business and industrial erven so as to cater for present and future demand of such premises within the Burgersfort SDF. The Environmental Assessment Practitioner (EAP), Wandima Consulting Services (Environmental and Development Consultants) was appointed to obtain authorization in terms of Chapter 5 of the National Environmental Management Act (Act 107 of 1998) in order to proceed with the development and activities listed in the EIA Regulations as published in Government notices no. 386 and 387 of April 21, 2006. An application for an Environmental Impact Assessment was submitted with the Limpopo Department of Economic Development, Environment & Tourism (LEDET) and has been officially acknowledged. Several activities as listed in the EIA Regulations (2006) as published in Government Notices No.'s 386 and 387 are applied for:

Number and date of the relevant notice:	Activity No (s) (in terms of the relevant or notice) :	Describe each listed activity:
386 21 April 2006	1(k)	Bulk transportation of sewage & storm water
386 21 April 2006	1(l)	Transmission and distribution of electricity
386 21 April 2006	15	Construction of roads wider than 4m and longer than 30m
386 21 April 2006	16 (b)	Transformation of derelict land
386 21 April 2006	17	Phased activities
386 21 April 2006	18	The subdivision of land 9ha or larger into portions 5ha or less
386 21 April 2006	1(n)	Storage of water in reservoirs exceeding 50 000m <sup>3</sup>
387 21 April 2006	1(p)	Treatment of waste with annual capacity more than 15000m <sup>3</sup>
387 21 April 2006	2	Development activity covering an area larger than 20 hectares

The preferred site is ideally located within the Burgersfort Local Municipality Spatial Development Framework (SDF) within the urban edge - zoned for future development. The preferred site is seen as a logical growth pattern of development for Burgersfort and has already been approved by the Mpumalanga Department of Agriculture and Land Administration Tribunal (DALA) for proposed activities.

All relevant Authorities - notably the Department of Water Affairs and Forestry (DWAF), the Local Municipality and Ward Councilors as well as the general public and surrounding landowners - was notified and invited to participate in the process. Issues and concerns was identified through a process of consultation with the proponent and then with relevant authorities and interested & affected parties and stakeholders. During the EIA process all potential environmental impacts have been identified and assessed. Alternatives related to technological and site conditions were considered upon review of the specialist reports and the impact assessment. The EAP did not find any detrimental environmental impacts that cannot be adequately controlled or mitigated to reduce their magnitude to acceptable levels and all issues have been adequately addressed and resolved. The EAP therefore recommends a positive final decision on authorization of the activity. Conditions that should be considered by the competent authority and may be required for authorization are given in the environmental impact statement as well as the draft environmental management plan.

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## 1. INTRODUCTION

The property owner Anglorand Holdings Limited and the developer, Gillyfrost 56 (Pty/Ltd), wish to develop the relevant properties into residential, business and industrial erven so as to cater for present and future demand of such premises within Burgersfort SDF. The Environmental Assessment Practitioner (EAP), Wandima Consulting Services (Environmental and Development Consultants) was appointed to obtain authorization in terms of Chapter 5 of the National Environmental Management Act (Act 107 of 1998) in order to proceed with the development and activities listed in the EIA Regulations as published in Government notices no. 386 and 387 of April 21, 2006. An application for an Environmental Impact Assessment was submitted with the Limpopo Department of Economic Development, Environment & Tourism (DEDET) and has been officially acknowledged (Appendix E-1).

This document presents the results of the Environmental Impact Assessment Process as required by the EIA regulations. The document also outlines the methodology of the tasks performed by the consultant in order to prepare the Environmental Impact assessment Report. The EIA Report aims to provide sufficient information regarding the environmental issues and potential impacts identified related to the proposed development. The information contained in the EIA Report will enable the relevant authorities to make an informed decision concerning the proposed project.

## 2. THE ENVIRONMENTAL PRACTITIONER (EAP)

Wandima Environmental Services is the appointed EAP and will conduct the EIA process for this project. This company has been practicing in environmental services since 2002 and has the following expertise:

Danie van der Walt: M.Sc. Natural Sciences and accredited courses in Environmental Management and Assessment as well as several accredited Ecological and Biological orientated courses.

Mandla Mbuyane: National Diploma in Public Health as well as various courses in Environmental Management and several years of practicing as Environmental Officer with the Department of Agriculture and Land Administration.

The contact details of the EAP are as follows:

Wandima Environmental Services

P O Box 1072

NELSPRUIT

1200

Tel: (013) 752 5452

Fax: (013) 752 6877

Cell: 073 415 4118

### 3. PROJECT DESCRIPTION

#### 3.1 Particulars of Proponent

Name Gillyfrost 56 (Pty/Ltd)  
 Address PO Box 204  
 Pretoria  
 0001

Contact Person Buks van der Wal  
 Tel/Fax (013) 238 0029  
 Cellular 082 259 0204

#### 1.1 Description of proposed Activity

The applicant wishes to establish residential, business and industrial townships on the relevant farm portions in terms of the Town Planning and Townships Ordinance, 1986 (Ordinance No. 15 of 1986). The aforementioned development will entail several activities as listed in the EIA Regulations (2006) as published in Government Notices No.'s 386 and 387:

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Due to the ideal location of the site within the Burgersfort Municipal boundaries and adjacent to existing residential and industrial activities, the site is ideally suited for such development (Appendix B-1). All alternatives will be evaluated to ensure that the one selected or recommended will have the least impact on the environment. The development will consist of residences, shops, small factories and workshops which will be built to the specifications of the Burgersfort Municipality and the South African National Building Regulations. The sizes of the houses, factories and workshops have not been finalized yet but will be of an acceptable and approved design. As this is a relatively large development, it will be divided into several phases, however the time span and structuring of the phases have not been finalized yet. Sewage will be treated at the existing municipal plant depending on it being upgraded. If this upgrading is not done before development of Leeuwallei commences, it will be necessary to construct a Sewage Treatment Package Plant on portion 5 of Leeuwallei to suit the interim

development needs in future. This site can also be used to construct a pump station to reticulate sewage to the municipal plant. The breakdown of construction is summarized in Table 1.

Table 1 Description of the land use and proposed activities

<u>Use</u>	<u>No of Erven</u>	<u>Area (ha)</u>	<u>% of Township</u>
<b>Burgersfort Ext 30</b> As per Plan no BURGERSF X /1-4			
Business 2	7	31.74	86.25
Streets		5.06	13.75
<b>Total</b>	<b>7</b>	<b>36.80</b>	<b>100.00</b>
<b>Burgersfort Ext 31</b> As per Plan no BURGERSF X /1-3			
Industrial 1	48	15.39	48.47
Residential 2 <sup>(1)</sup>	3	4.34	13.66
Municipal	1	0.29	0.91
Park	1	3.88	12.22
Streets		7.85	24.74
<b>Total</b>	<b>53</b>	<b>31.75</b>	<b>100.00</b>
<b>Burgersfort Ext 45</b> As per Plan no BURGERSF X (45)/1-4			
Business 2 <sup>(2)</sup>	5	21.10	81.81
Streets		4.69	18.19
<b>Total</b>	<b>5</b>	<b>25.79</b>	<b>100.00</b>
<b>Burgersfort Ext 46</b> As per Plan no BURGERSF			
Residential 2	8	12.56	66.77
Municipal	2	0.58	3.08
Park	1	4.65	24.72
Streets		1.02	5.43
<b>Total</b>	<b>11</b>	<b>18.81</b>	<b>100.00</b>
<b>Burgersfort Ext 47</b> As per Plan no BURGERSF X (47) /1-1			
Residential 2	2	5.01	21.83
Educational	1	2.80	12.20
Municipal	1	0.94	4.09
Park	1	13.46	58.67
Streets		0.73	3.21
<b>Total</b>	<b>5</b>	<b>22.94</b>	<b>100.00</b>
<b>GRAND TOTAL</b>	<b>81</b>	<b>136.09</b>	<b>-</b>

**Importantly, a Sewage Package Plant is also to be established on portion 5 as well as a reservoir for potable water on portion 58.**

### 3.3 Chronology of the EIA process

The regulating authority for this project is the Limpopo Department of Economic Development and Environment (LEDET): Directorate Impact Management. LEDET is commissioned to do the final decision making and authorization for this EIA application. The process is followed strictly according to the regulations as published in the Environmental Impact Assessment Regulations (2006). After the application for an EIA have been submitted, the application is acknowledged by LEDET and a reference number is allocated that is used during the whole process for administration.

The Scoping Process entails the pre- environmental impact screening – project description and evaluation of the project and its alternatives – and is aimed to address the following:

- Description of the project;
- Identification and description of alternatives;
- Identification of relevant legislation and authorities;
- Site and environment descriptions;
- Notification and participation of public and interested and affected parties (I&AP's);
- Identification and description of potential environmental issues and impacts;
- Identification and need of specialist studies to evaluate potential impacts;
- Plan of study for the EIA process and tasks to be performed

The Scoping Document also outlines the methodology of the tasks to be performed by the consultant in order to prepare the Environmental Impact Assessment Report. The Scoping Document is distributed to all I&AP's as well as the authorities for review and comment before commencement of the actual Environmental Impact Assessment.

The EIA process entails all the criteria of the Scoping process but importantly, also includes the assessment of impacts as well as a draft Environmental Management Plan (EMP). The EIA report aims to conclude all possible issues and to recommend the best possible alternative and activity to be authorized as well as recommending measures and activities to ensure the least impact on the environment.

### 3.4 Relevant Legislation

Legislation and guidelines that are being considered for the Scoping process are as follows:

- Constitution of the Republic of South Africa (No 108 of 1996)
- National Environmental Management Act (No 107 of 1998)
- Environment Conservation Act (No 73 of 1989)
- National Water Act (No 56 of 1998)
- Conservation of Agricultural Resources Act (No 43 of 1983)
- National Heritage Resources Act (No 25 of 1999)
- Occupational Health and Safety Act (No 85 of 1993)
- Promotion of Access to Information Act (2000)



- Atmospheric Pollution Prevention Act (No 45 of 1964)
- National Environmental Management Biodiversity Act (No 10 of 2004)
- National Roads Act (No. 7. 1998)
- Advertising on Roads and Ribbon Development Act (No. 21, 1940)
- National Heritage Resources Act (No. 25,1999)
- Promotion of Access to Information Act (No 2, 2000)
- EIA regulations and guidelines as listed in Government notices no's 385, 386 and 387 (2006)
- All relevant Provincial regulations and Municipal bylaws as well as guidelines identified during the EIA process

Section 24 of the National Environmental Management Act (1998) requires that 'activities that require authorization or permission by law which may significantly affect the environment, must be considered, investigated and assessed prior to their implementation and reported to the organ of state charged by law with authorizing, permitting, or otherwise allowing the implementation of an activity.' The EIA process is the tool used to apply for authorization from the regulating authority for the relevant activities identified that may impact on the environment.

### **3.5 Authorities Consultation**

The regulating authority for this project is the Limpopo Department of Economic Development and Environment (DEDET): Directorate Impact Management. Consultation with DEDET has included the following process:

- Submission of an application for authorization of the activities in terms of section 24 of the National Environmental Management Act of 1998;

Completed consultation includes the following:

- Submission of the Scoping Report and plan of study for EIA for approval;
- Site inspection with a provincial LEDET official;
- Completing tasks for compiling the EIA report;
- Submission of the EIA Report for approval.

The following authorities have also been informed of the project and provided with background information and/or the draft Scoping report:

- The Greater Tubatse Municipality;
- The Burgersfort Town Council;
- Department of Water Affairs and Forestry;
- Land Claims Commissioner.

## 4. PROPERTY AND LOCAL ENVIRONMENTAL CONDITIONS

### 4.1 Description of the property

#### 4.1.1 Locality and present land use

The properties consist of Portions 5, 58, 60, 62 and the remainder of Portion 27 of the farm Leeuwvallei 297 KT. A letter of consent from the property owner is included with Appendix A-1. The total area of the proposed township is 140ha in size and is situated on the northwestern outskirts of Burgersfort on both sides of the National Road R37. Presently, the property is in a neglected state and consists mainly of unused agricultural lands as well as several dwellings, and small areas of disturbed natural vegetation. The proposed development will transform the largest part of the property. Land use change has already been granted and is supported by NDALA (Appendix B-1).

A central GPS reference is **24°40.527"S; 30°18.477"E**. The site for the proposed development is located on the north-western slopes of the Morole Mountain, which lies adjacent to the western edge of the town of Burgersfort. Extensions 31, 47 & 46 lie to the south of the R37 provincial road from Burgersfort to Pietersburg and on the northern and southern side of the R555 road to Steelpoort. The western boundary of the site is the Steelpoort River. Extensions 30 and 45 are located on the northern side of the R37. The northern boundary of the site is the Spekboom River.

### 4.2 Description of the environment

#### 4.2.1 Topography and present site conditions

The topography of the property is predominantly flat with a slight downward slope towards the Spekboom River to the north. The site is largely in a disturbed state due to transformed agriculture lands (Appendix C). The area to the south of the R37 is located on the lower slopes of the Morole Mountain where disturbed natural vegetation is present. However, all of the large and valuable species of trees has been removed due to illegal wood- and traditional medicine collecting. Other disturbances on this portion include historic mining activities, shallow borrow pits, and illegal dumping.

#### 4.2.2 Climate and biology

The site falls in the Mixed Bushveld Biome (Low & Rebelo, 2002) veld type and is regionally conserved in the Ohrigstad and Khumula Nature Reserves. Due to the mentioned disturbances the site is of little biological or ecological importance. The biological integrity was ascertained by an ecological investigation (Appendix E). The climate is characterized by hot summers and mild winters with the majority of the rainfall occurring during the summer. The average annual rainfall is 560mm and area has a high evaporation rate of 1705mm. This is an indication that the area has a water stressed climate. A specialist report regarding this subject aspects is summarized in section 10.

#### 4.2.3 Geology and soils

Two geological terrains dominate the project area (Appendix F). The first geological setting is that of the floodplain, which consists of alluvial material overlying the rocks of

the Bushveld Complex. The second geological terrain, the slope area, is characterised by scree slopes comprising rocks from the underlying Shelter Norite and older pyroxenites of the Rustenburg Layered Suite. The Shelter Norite is made up of fine to medium grained norites with some pyroxenite found intermittently along the base. Underlying the Shelter Norite are older medium to coarse grained pyroxenites which occur sporadically. A specialist report regarding this subject aspects is summarized in section 10.

#### **4.2.4 Surface water**

No permanent or seasonal streams or wetlands are located on the property but the Steelpoort and Spekboom Rivers are located nearby to the north and west of the property. Surface water from the Spekboom River will be used as partial supply to the development.

#### **4.2.5 Groundwater**

The occurrence of groundwater was established by a geohydrological report (Appendix I). Several boreholes are present on the farm portions. Water will be extracted from these boreholes to partially supply the development with water. A specialist report regarding this subject aspects is summarized in section 10.

#### **4.2.6 Cultural and Heritage importance**

Grave sites have been identified on site and the existence of other significant sites on the property that may be affected by the development was determined by a heritage assessment which is summarized in section 10. All of these sites will be treated as recommended in the heritage report.

#### **4.2.7 Socio-economic environment**

Burgersfort is experiencing large economic development and inputs, mainly due to the rapidly expanding mining activities in the region. The proposed development can be viewed as critical for the development cycle of Burgersfort as it will:

- Create sustainable jobs;
- Create infra structure to lure investment to the region;
- Address the need created for such a development as a natural occurrence due to the expansion of Burgersfort's residential growth.

The site is ideally located near to low income areas with high unemployment figures and will be positive for improving the lives of these people. It is envisaged that the proposed development will have only positive social and economic impacts for the local area. Furthermore, one of the aims of this project is to facilitate Black Economic Empowerment at all levels.

## 5. SITE & ACTIVITY ALTERNATIVES

### 5.1 Site alternatives

The preferred site is ideally located within the Burgersfort Local Municipality Spatial Development Framework (SDF) within the urban edge - zoned for future development. The preferred site is seen as a logical growth pattern of development for Burgersfort and has already been approved by the Department of Agriculture and Land Administration Tribunal (DALA) for proposed activities (Appendix B-1). Furthermore, a services agreement regarding the development has also been signed with the Tubatse Municipality (Appendix B-2). The proposed portions are therefore motivated as the only alternative site for the application. There is already a need for such a development due to mining activities that are having far reaching positive economic impacts on the region.

The development will trust on both proven as well as the latest approved materials and technologies for building, services and engineering purposes after evaluating alternatives by the appointed specialists. As such no substandard materials or technologies will be considered for the proposed activities. Alternatives that will be investigated are site layout and recommendations of specialist reports. Additional alternatives that will be considered in finalizing the layout plan will be:

- Geotechnical considerations and recommendations
- Specialist studies - recommendations
- Engineering considerations and recommendations

### 5.2 Activity alternatives

The site is in a derelict state and poses environmental issues if conditions such as storm water drainage, illegal dumping and sustainable use of the land are not improved or controlled. The development will trust on both proven as well as the latest approved materials and technologies for building, services and engineering purposes after evaluating alternatives by the appointed specialists. As such no substandard materials or technologies will be considered as alternatives for the proposed activities. Alternatives related to technology and site conditions such as geology, biology and services are discussed in section 9 of this report.

### 5.3 No-go alternative

The no-go alternative is the option not to go ahead with the development. As there exists a definite need for housing and industrial development in the region, the future of development potential for the region will be negatively affected if the proposed alternatives are not considered. The operational phase of the development will have mainly positive impacts for the local and national socio-economic environments, therefore the no-go alternative will only be considered as an alternative in the case that significantly negative impacts which' magnitude cannot be adequately reduced by mitigation are identified.

## 6. PUBLIC PARTICIPATION PROCESS

A public participation process was followed in accordance of the EIA regulations (2006). This process was executed as elaborated in the following section.

### 6.1 Identification and notification of Interested & Affected Parties

After acknowledgement and a reference number (16/1/7/2 G-27) was received from DEDET (Appendix D-1) the public participation process was initiated. An on-site consultation with DEDET representatives were held (2008-09-25) where the EIA process for this project was discussed to ensure that all the relevant subjects are covered during the process. All possible Interested & Affected parties was contacted and afforded an opportunity to meaningfully participate with the proposed development. Site notices was placed at strategic places (Appendix D-2) and adverts in the local newspaper (*Steelburger*) was also placed (August 17, 2007) so as to ensure maximum exposure to all the potential interested and affected parties (Appendix D-2). Contact was made with adjacent property owners and key interested & affected parties. This was done through telephone conversation, actual visits and notices distributed to adjacent property owners (Appendix D-2).

A public meeting was scheduled for 14h00, 2007-09-05 at the conference centre of the *Gethlane Lodge*, with the aim of discussing the project and also to distribute background information (Appendix D-2) and receive initial comments from the public as well as interested parties. The minutes of the public meeting and the attendance register are included with Appendix D-4. All relevant Authorities - notably the Department of Water Affairs and Forestry (DWAF), the Local Municipality and Ward Councilors as well as the Land Claims Commissioner were notified and invited to participate in the process (Appendix D-3). The Scoping and EIA Reports was made available to all the I&AP's (Appendix D-3). Comments received during the response periods are included with Appendix D-5.

### 6.2 Issues & Concerns

Issues and concerns was identified through a process of consultation with the proponent and then with relevant authorities and interested & affected parties and stakeholders. Proven methods were used which included checklists, matrices, and networks and map overlays. The comments received are included with Appendix D-5. The following issues were identified:

- **Authorization for change of land use**

In the past an EIA application was submitted for the same properties under ECA legislation. However, the EIA process was not completed and a Record of Decision (RoD) was not issued. Furthermore, the relevant portions have already been approved by the Department of Agriculture and Land Administration Tribunal (DALA) for the proposed activities (Appendix B-1).

- **Land claims**

A land claim was lodged by Mr. John Mathladi as a "family claim" (Appendix D-5). The Land Claim Commissioner has been notified and asked to comment on the issue. However, no written comments have been received to date after several requests to do so.

- **Authorized activities (Petroleum Depot)**

Authorization has been issued (under ECA, 1989) by DALA for the installation of aboveground diesel tanks and a truck filling station on a portion of portion 6 of Leeuwallei 297KT (Appendix B-1). There is some discrepancy regarding the EIA process followed during that application, comments received from affected parties during the present process are included with Appendix D-5. However, this activity has been authorized in the past and is not included with the present application or owned by the applicant. The affected parties are advised to take the issue up with the relevant authorities. This issue was resolved during the scoping phase and no additional comments were raised regarding this subject.

- **Comments from Greater Tubatse Municipality**

The municipality has indicated that they have no objection to the proposed development and a service agreement was reached (Appendix B-2) but general concerns and impacts have to be addressed (Appendix D-5). These are addressed in Table 2.

- **Comments from DWAF**

DWAF has indicated that they have no objection to the proposed development but general concerns and impacts have to be addressed and the necessary applications has to be made for water uses and waste disposal (Appendix D-5). These are addressed in Table 2.

A summary of the relevant responses received from I&AP's are given in the Table 2. Written comments received are included with Appendix D-5.

Table 2 Comments and issues table

Dept/Institution	Issues	EAP Comments
DWAF (Appendix D-6)	1) Surface & Groundwater	1) Refer to Appendixes H and I, all relevant water uses will be applied for.
	2) Flood line	2) Included (Appendix A)
	3) Sewage disposal	3) Included (Appendix H; B-2)
	4) Storm water management	4) Included (Appendix H-1)
	5) Waste disposal	5) Included (Appendix B-2)
	6) Rehabilitation	6) Included with EMP
	7) Stockpiling	7) Included with EMP
	8) Chemical toilets	8) Included with EMP
	9) Chemical storage	9) Included with EMP
	10) Compliance	10) Included with EMP

	11) Rehabilitation	11) Included with EMP
Tubatse Municipality Department Environmental Mangement (Appendix D-6)	1) Waste Management 2) Sewage 3) Grave sites  4) Air Quality Management Plan 5) Environmental Pollution Stressor 6) Chemical Safety Management Plan 7) Indigenous Species 8) Rehabilitation  9) BEE involvement  10) Occupational Health and Safety Act 11) Air Quality Act 12) Environmental Pollution  13) Environmental Management Monitoring	1) An services agreement is in place with the Tubatse Municipality; 2) A sewage package plant is proposed; 3) Three grave yards were recorded including approximately 56 graves. The next of kin have not yet been identified. Graves will be preserved and be treated according to SAHRA legislation; 4) Air quality will be monitored to be within the limits set by the Air Quality Act; 5) Appropriate measures will be in place to address these issues (EMP) 6) Appropriate measures will be in place to address these issues (EMP) 7) Only species of low concern are expected on site; 8) Topsoil must be removed and stockpiled for rehabilitation purposes; Rehabilitation of disturbed areas must comply with standards of legislation and be monitored by the Environmental Department of Tubatse; 9) Although an official model is not yet in place, BEE involvement will be a priority and will include BEE companies involved with the anticipated needs of the development as well as basic unskilled labor and skills training and possibly shares disrtribution. 10) All activities will have to comply with the Occupational Health and Safety Act; 11) All activities will have to comply with the Air Quality Act; 12) A services agreement is in place with the Tubatse Municipality that address waste management; 13) Monitoring will be complied with as is stipulated by the authorities. Refer also to section 11 (EMP). The appointment of an Environmental Control Officer is also recommended.
Land Claim John Matladi	14) Consent for development	14) Agreements have to be made through the correct channels. The EIA process cannot be constrained through a land claim.
<p><b>It should be noted that all of these issues are also addressed in the draft Environmental Management Plan (EMP) included with section 11 and as such the applicant will have to comply with these.</b></p>		

## 7. ENVIRONMENTAL ISSUES

During the EIA process the following potential environmental issues have been identified and will be addressed as described in the following section:

- **Loss of Fauna & Flora**

In general, development has a negative impact on the ecological integrity of natural areas. However, the specialist ecological investigation found that the site is subject to several impacts due to human encroachment and is already in such a disturbed state so as to be of low conservation importance (Appendix E).

- **Generation of dust**

It is expected that dust will be generated during the construction phase. As the development will take place in phases this occurrence should be reduced and with the use of dust suppressants this will be further minimized. Construction is not to take place during exceptionally windy periods.

- **Noise levels**

It is expected that noise will be generated during the construction and operational phases. As the development will take place in phases this occurrence should be reduced and with the use of encasings around noisy machinery this will be further minimized.

- **Provision of services**

All services can be adequately catered for as is discussed in the services engineering report (Appendix H) and a services agreement has been approved by the Municipality (Appendixes B-2).

- **General neighborhood disruption**

Activities on and near the site will increase during the construction and operational phase. However, with proper signage and detours where necessary the inconveniences will be minimized during the construction phase.

- **Land Claims**

The property is subject to a land claim (Appendix D-5). The applicant has forwarded a legal enquiry and relevant information to the Commissioner on October 27, 2007, stating that the claim has no validity. His response is still outstanding and no concrete outcome is foreseen in the near future. However, a land claim is not critical to the EIA process as this issue is to be concluded by legislation other than the relevant EIA legislation.

- **Loss of land zoned for agriculture**

The relevant portions have already been approved by the Department of Agriculture and Land Administration Tribunal (DALA) for the proposed activities (Appendix B-1).



- **Final layout and design**

This issue is addressed by the services engineering report as well as the recommendations of the other specialist reports. The layout is presented in Appendix A.

The abovementioned issues are also included with the impact assessment (section 8) and alternatives are discussed in section 9.

## **8. IMPACT ASSESSMENT**

### **8.1 Methodology**

So as to evaluate impacts objectively and assign an order of priority for individual impacts, it is necessary to identify the following characteristics of each impact:

- The *nature* of the impact entails a description of the cause of the impact, what will be affected and how it will be affected;
- The *extent* refers to the area where the impact will be significant e.g. on site, local area, regional, provincial, national or international;
- The *duration* refers to the lifetime of the impact. The time frames used in this assessment are as follows:
  - Short term: 0-5 years
  - Medium term: 5-15 years
  - Long term: >15 years
  - Permanent
- The *probability* describes the likelihood of the impact occurring during the duration:
  - Improbable (Low likelihood)
  - Probable (Distinct possibility)
  - Highly Probable (Most likely)
  - Definite (Impact to occur regardless of any preventative measures)
- The *significance* is determined by analyzing the above subjects and is assessed as low, medium or high;
- The *status* indicates whether the impact is positive, negative or neutral.

### **8.2 Assessment of potential environmental impacts**

During the EIA process all potential environmental impacts have been identified related to the following subjects:

#### **Planning phase**

- Land use
- Topography
- Geology and soils
- Availability of services and waste management
- Surface and Groundwater
- Increased motorized traffic
- Construction phase impacts

- Visual impacts
- Heritage sites
- Fauna & Flora
- Flooding and storm water management

### **Construction phase**

- Fauna & Flora
- Generation of noise
- Generation of dust
- Generation of spoil material and waste
- Traffic and Neighborhood disruptions
- Visual impact
- Construction camp
- Workforce management
- Stockpiles of building materials
- Pollution and spillages of hazardous substances
- Positive social and economic impacts for the local area

### **Operational phase**

- Flooding and storm water management
- Availability of services and waste management
- Increased motorized traffic
- Fauna & Flora
- Surface and Groundwater
- Access control
- Visual impacts
- Positive social and economic impacts for the local area

In the following section there will be elaborated on these impacts and the methodology for assessing and addressing them are also given. Relevant specialist surveys that have been undertaken are referred to. The potential impacts are discussed in a chronological order as far as possible in the following section and are also summarized in section 8.3. Overlapping impacts – or impacts present during more than one phase of the development process are referred to as such.

#### **8.2.1 Land use**

The site is zoned for township establishment and is supported as such by the NDALA (Appendix B-1). Economic activities in the past include agriculture. Presently, no viable economic activities are engaged on the property. No negative impacts are expected in this regard.

#### **8.2.1 Topography**

The topography of the site is flat with a gentle downward slope towards the Steelpoort- and Spekboom Rivers, located to the north and west. The southern section will encroach

the slope of a hill but no negative negative impacts are anticipated with regards thereto if recommendations of the Geotechnical Report is followed (Appendix F).

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Topography	Site	Long term	Unlikely	Medium	Low

### 8.2.2 Geology and soils

The geology and soil composition of the site were investigated to establish its suitability for residential development. The geotechnical report indicates that soils and geology are adequate for the development and gives recommendations regarding foundations and structures. Relevant alternatives, mitigation and management are discussed in section 9. The final layout plan was planned according to the relevant findings of the geotechnical specialist report (Appendix F).

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
General Geology	Site	Long term	Definite	Low	Low
Soils	Site	Long term	Definite	Low	Low
Erosion	Local Downstream	unlikely	Probable	Low	Low

### 8.2.3 Availability of services and waste management

The quantity of services needed by the proposed development and the capacity of services available by the relevant service providers will include the following:

- Electricity
- Water supply
- Sewage disposal
- Solid waste management
- Storm water management
- Roads infrastructure

A services agreement has been reached with the Tubatse Municipality regarding the provision of services (Appendix B-2). No negative impacts regarding the provision of services are anticipated as the final layout plan and services infrastructure was planned according to the relevant findings of the specialist reports as discussed in section 9.

### 8.2.4 Surface and Groundwater

No surface water is permanently present on site. Surface and groundwater will be used during all phases of development. Water rights to this effect exist but will have to be changed from agriculture to domestic use. The extent of groundwater was established by the specialist Geohydrological Report that elaborate on the underlying groundwater table and capacities available (Appendix I). According to these, adequate water is available to provide the demand of the operational phase of the activity. Water and electricity is also available on site for the construction phase. Pollution of water

resources during the operational phase is seen as unlikely as sewage treatment will be via an acceptable sewage plant and only treated water will be released into the environment.

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Groundwater use	Local	Long term	Definite	Medium	Low
Surface water use	Local Downstream	Long term	Definite	Medium	Low
Groundwater pollution	Local	unlikely	Probable	Low	Low
Surface water pollution	Downstream	unlikely	Probable	Low	Low

### 8.2.5 Flooding and storm water management

The implementation of the storm water infrastructure will serve to the benefit of the local community as it will address the inadequate infrastructure of the area. The topography of the site is flat with a gentle slope towards the Steelpoort- and Spekboom Rivers, located to the north and west. The flood lines are indicated in Appendix A-2. These rivers form the natural drainage channels and all storm water will be directed to these channels.

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Flooding	Site	Long term	Unlikely	Medium	Low
Storm water management	Site	Long term		Medium	Low

### 8.2.6 Increased motorized traffic

It is anticipated that the development will not have a large impact on the traffic patterns of the immediate area as it is located on the outskirts of the town and a four way access road controlled by traffic lights will serve as the main access. Agreement has also been reached with the Tubatse Municipality on all services including roads infrastructure (Appendix B-2). No negative impacts are envisaged if proper designs are followed.

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Traffic Patterns	Local	Long term	Definite	Medium	Low
Design	Site	Long term	Definite	Medium	Low

### 8.2.7 Biology and Fauna & Flora

The site is in a rather disturbed state and little natural habitat remains intact for naturally occurring fauna and flora (Appendix E). No significant negative impacts are expected if mitigation measures are adhered to.

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Fauna	Site	Long term	Definite	Medium	Low
Flora	Site	Long term	Definite	Medium	Low
Habitats	Site	Long term	Low	Low	Low

### 8.2.8 Heritage sites

The possibility of the occurrence of archeological and heritage sites on the property was ascertained by a heritage assessment (Appendix G). Significant sites were found to be present but will be treated as recommended by the heritage report.

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Heritage Sites	Site	Long term	Definite	High	Low

### 8.2.9 Construction camp and materials stockpiles

An inadequately planned construction camp and stockpiles depot may result in pollution, littering and noise. The construction camp and sanitation facilities for labor must be concentrated on a pre-designated site with adequate sanitation and waste disposal collection points to address littering and traffic. Berms or applicable mitigation must be constructed to prevent pollution, resulting from construction materials and chemicals, where applicable. These issues are considered in the Draft EMP (section 11).

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Littering & pollution	Site	Short term	Probable	Medium	Low
Safety/Injury	Site	Short term	Probable	Medium	Low
Groundwater pollution	Local	Short term	Probable	Medium	Low
Surface water pollution	Downstream	Short term	Probable	Medium	Low

### 8.2.10 Workforce management

An undisciplined and badly managed workforce will have a negative affect on the neighboring landowners. A management plan must be adhered to so as to prevent related impacts. These issues are considered in the Draft EMP (section 11).

### 8.2.11 Generation of noise and dust during construction

Noise will be generated during construction. Appropriate measures will be emplaced to minimize this impact. Dust will be generated during construction. Appropriate measures will be emplaced to minimize this impact. These issues are considered in the Draft EMP (section 12).

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Noise	Site	Construction	Definite	Medium	Low
Dust	Site	Construction	Definite	Medium	Low

### 8.2.12 Visual impacts during construction

During construction the site may be untidy and unused items and spoil materials as well as stockpile areas may not be visually attractive. However, this will be of and temporary nature to attain the operational phase. In order to lessen this impact, stockpiles have to be centralized and excavations and spoil materials must not be left untended.

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Visual	Site	Construction	Definite	Medium	Low

**8.2.13 Generation of spoil material and waste during construction**

Spoil material and solid waste will be generated during construction. Appropriate measures will be emplaced to minimize this impact and disposal of waste will have to be done at a permitted site.

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Spoil & waste	Site	Construction	Definite	Medium	Low

**8.2.14 Traffic and Neighborhood disruptions during construction**

During construction, vehicles and detours may pose traffic disruptions. Appropriate measures will be emplaced to minimize this impact.

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Traffic disruptions	Site	Construction	Definite	Medium	Low

**8.2.15 Pollution and spillages of hazardous substances during construction**

During construction pollution and spillages may occur. Adequate sanitation must also be available for this phase. Berms and applicable mitigation must be constructed to prevent pollution, resulting from construction materials and chemicals, where applicable. Appropriate measures will be emplaced to minimize this impact. Air quality is not anticipated to be affected. These issues are considered in the Draft EMP (section 11).

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Pollution & Spillages	Site	Construction	Definite	Medium	Low

**8.2.16 Positive social and economic impacts for the local area**

It is anticipated that the development will have far reaching positive impacts to the local society and community such as availability of houses, job creation, improved infrastructure and roads.

Impact	Extent	Duration	Probability	Significance	Status
Socio-Economic	Local	Construction Operational	Definite	High	Positive

**8.2.17 Visual impacts during operational phase**

The final product will be well designed suburbs and business areas forming an integral part of the local municipality and no negative visual impacts are foreseen.

Impact	Extent	Duration	Probability	Significance Before Mitigation	Significance After Mitigation
Visual	Site	Construction	Definite	Medium	Low

### 8.3 Impact assessment table

The cumulative impact assessment of the impacts assessed in the previous section is summarized in Table 3.

Table 3 Impact Assessment Table for the proposed phases of development

Phase	Nature of Impact	Extent	Duration	Intensity/Severity	Probability/Certainty	Significance	
						Before mitigation	After mitigation
Planning	Topography	Site	Long term	Low	Definite	Low	Low
	Land use	Site	Long term	Low	Definite	Low	Low
	Biophysical & Geology	Site	Long term	Low	Definite	Medium	Low
	Locality	Site	Long term	Low	Definite	Low	Low
	Provision of Services	Site	Long term	Low	Definite	Low	Low
Construction	Surface & groundwater	Site	Short term	Low	Probable	Low	Low
	Generation of noise & dust	Site	Short term	Medium	Definite	Medium	Low
	Generation of spoil material and general waste	Site	Short term	Low	Definite	Medium	Low
	Fauna & Flora - Loss of vegetation, habitats, wetlands and animals	Site	Long term	Low	Unlikely	Medium - Low	Low
	Heritage sites	Site	Long term	Low	Probable	High	Low
	Traffic & neighborhood disruptions	Local	Short term	Low	Definite	Medium	Low
	Construction camp & stockpiles	Local	Short term	Low	Definite	Medium	Low
	Workforce management, Littering & Domestic waste	Site	Short term	Medium	Probable	Medium	Low
	Visual	Site	Short term	Medium	Probable	Medium	Low

	Erosion	Local	Long term	Low	Probable	Low	Low
	Spillages & Pollution	Site	Short term	Medium	Probable	Medium	Low
<b>Operational</b>	Visual impacts/topography	Local	Long term	Low	Definite	Medium	Low
	Availability of services and waste management	Local	Long term	Low	Unlikely	Low	Low
	Surface & groundwater use	Local	Long term	Low	Definite	Medium	Low
	Surface & groundwater pollution	Local	Long term	High	Unlikely	Low	Low
	Flooding and storm water management	Local	Long term	Medium	Probable	Medium	Low
	Increased motorized traffic	Local	Long term	Medium	Definite	Medium	Low
	Positive Social & Economic Impacts	Local	Short term	Medium	Definite	Status positive	High



## 9. SUMMARY OF SPECIALIST REPORTS AND ALTERNATIVES CONSIDERED

Alternatives related to the locality/activity are discussed in section 5 of this report. Alternatives related to technological and site conditions were considered upon review of the specialist reports and the impact assessment. Alternatives that were considered in finalizing the layout plan and technology are summarized in the following section.

The specialist reports was studied and summarized and recommendations and alternatives were discussed with the authorities and I&AP's to get a clear understanding of the activity and impacts.

### 1) Ecological Report (Appendix E)

The abovementioned report came to the following conclusions:

- The site is of low ecological and biological integrity
- No stringent mitigation or alternatives are recommended and no areas are to be considered for conservation purposes

#### Recommendations and Alternatives

- Conserve as much of the indigenous vegetation as possible.
- Implement weed control and use indigenous flora for landscaping.
- Rehabilitate the stream banks by removing weeds and invaders and replant with indigenous vegetation.
- Sewerage systems and waste disposal must be properly managed so that no polluted water is released into the groundwater or storm water drainage system.
- Important fauna & flora that may become apparent at a later stage should be reported to a specialist and be relocated or conserved.

### 2) Geotechnical Study (Appendix F)

#### Underlying geology:

Two geological terrains dominate the project area. The first geological setting is that of the floodplain, which consists of alluvial material overlying the rocks of the Bushveld Complex. The second geological terrain, the slope area, is characterised by scree slopes comprising rocks from the underlying Shelter Norite and older pyroxenites of the Rustenburg Layered Suite. The Shelter Norite is made up of fine to medium grained norites with some pyroxenite found intermittently along the base. Underlying the Shelter Norite are older medium to coarse grained pyroxenites which occur sporadically

#### Recommendations and alternatives:

Overall, the property is suitable for township development providing the precautionary measures recommended are implemented.

- Building foundations will not be problematic but terrace construction will have to be professionally supervised.
- No servicing problems are envisaged but a fully imported road prism will be required.

### 3) Heritage Assessment (Appendix G)

Several significant sites were found. These are listed as follows and alternative recommendations are made:

- **Site GY01; GY002; GY03:** Highly significant informal graveyards.
- **Recent Past:** This site is linked to modern times and no actions are recommended.
- **Possible Late Iron Age site:** These late Iron Age sites are disturbed and partially destroyed and therefore not of high significance. A watching brief is recommended to monitor and document any finds. A destruction permit should be obtained from SAHRA before development commences on this site.

#### General recommendations should be adhered to:

- The gravesites will have to be conserved or exhumed and relocated – following the correct legislation and procedure;
- If any other significant finds are made during construction, activities must be ceased and an accredited specialist be consulted regarding the find;
- A destruction permit is obtained from SAHRA before development commences;
- A watching brief is recommended to monitor and document any finds.

### 4) Services Agreement (Appendix B-1); Services and Engineering Report (Appendix H-1) and Electricity Agreement (Appendix H-2)

#### Services agreement

A services agreement has been reached with the Tubatse Municipality regarding the provision of services (Appendix B-2). No negative impacts regarding the provision of services are anticipated. No problematic issues regarding the provision of services are foreseen by the services engineering report. The individual services provision is summarized as follows:

#### Design Standards

All Civil Engineering Services will be designed according to the Department of Housing's 'Guidelines for human settlement planning and design'. Variations from these standards will be fully motivated in the services DESIGN REPORT to the Developer and Local Authority.

#### Roads

Access to Burgersfort Ext 30, 31 (industrial portion) & 45 will be from the existing provincial road R37 from Polokwane to Lydenburg. Access to Burgersfort Ext 31 (residential 2 portion), 46 & 47 will be from the existing provincial road R555 from Steelpoort to Burgersfort. The adequacy of access to the business areas of Ext 31 & 45 from the R37 had been confirmed by Transportation Engineering Specialist Leon Roets. (See letter of confirmation under appendix A). Also see annexure A for approval from the road authority for accesses shown on Layout drawings as compiled by Urban Consult. No major changes to accesses were made to the new township layouts compiled by Pieterse, du Toit and Associates.

All roads will be surfaced with a camber section. Mountable kerbs will be placed on both sides of the road. 7.4m Roads are proposed. Passing lanes, acceleration lanes and de-acceleration lanes will be constructed according to the Provincial Roads Department standards at access points.

### **Storm water**

A number of storm water structures exist under the R555 – Steelpoort road. These structures will be taken into account when designing internal storm water systems. It is proposed to install a pipe system with a minimum diameter of 450mm that will handle the minor storm water of 1:2 year. The major storms will be handled with the roads, pipe systems and channel system. At all low points, outlet storm water servitudes between stands will be allowed to ensure outlets for the major storms. All out flow will be into the Steelpoort River and Spekboom River. The Steelpoort River traverse the Western boundary and the Spekboom river the Northern boundary of Leeuwvallei.

### **Water Reticulation**

Expected water demand for Burgersfort extensions 30, 31, 45, 46 & 47 will be approximately 3396KL per day. The ground water resources available on Leeuwvallei must be developed and utilized until the Tubatse Municipality's capacity to purify surface water resources is upgraded. The capacity of the ground water resource on Leeuwvallei was determined as 208KL/day by WSM LESHKA Consulting (Pty) Ltd. For a full hydrogeological report see Appendix I.

### **Water Storage capacity**

For the development of Burgersfort Extensions 30, 31, 45, 46 & 47 a reservoir storage capacity of  $2(3, 4) + 1.44 = 8$  ML is required. For the interim a 2,5ML reservoir with full water level on 750 m above msl can be built on Leeuwvallei on Burgersfort Ext 47. Water will be pumped from the borehole field along the eastern boundary of Ext 47 to the reservoir.

### **Sewage**

Expected sewage discharge for Burgersfort Extensions 30, 31, 45, 46 & 47 was calculated at 2717KL per day. The municipal treatment works requires urgent upgrading. If this upgrading is not done before development of Leeuwvallei commences, it will be necessary to construct a Sewage Treatment Package Plant on portion 5 of Leeuwvallei to suit the interim development needs in future this site can also be used to construct a pump station to reticulate sewage to the municipal plant. Outflow from this plant can be irrigated but must conform to DWAF standards.

### **Internal sewerage reticulation**

A standard sewer reticulation network consisting of pipes with minimum diameter of 150 mm to suit the development is proposed. Sewage coming from extensions 31, 46 and 47 will have to be pumped from the lowest point on extension 31 along the Northern boundary of extension 31, crossing the R37 at the junction between the R555 and the

R37 into the reticulation of extensions 30 and 45. The total sewage outflow from extensions 30, 31, 45, 46 and 47 will have to be pumped from the lowest point on Leeuwvallei to the municipal sewage treatment works.

### **Electricity**

Electricity will be provided by ESKOM, discussions are presently undertaken in this regard. ESKOM has indicated that electricity can be provided and a cost estimate is included (Appendix H-2).

### **5) Geohydrological Report (Appendix I)**

The area is underlain by lower zone pyroxenite of the Bushveld complex and covered in places by coarse nodular calcrete. Groundwater potential in the surrounding area is high and the main aquifers are associated with the alluvial deposits of the Spekboom- and Steelpoort Rivers.

According to the Parsons classification, the aquifer is a major system with a moderate to high vulnerability rating. Due to the erratic water supply to Burgersfort, developers need their own resources until the bulk supply from the De Hoop Dam is available.

- The groundwater assessment indicates that 129KL/day may be safely extracted with minimal impact on the surrounding users and the resource;
- Converted water rights from the Spekboom River allocated are 2982KL/day (70% of allocation);
- Registered water rights available from the Steelpoort River are 408KL/day (70% of allocation);
- Total available water for the development is approximately 3519KL/day which is adequate for the development until such time that the De Hoop Dam can supply a reliable source of water;
- Threat to groundwater due to sewage pollution is minimal except for ruptured pipelines or overland spillage.

### **Recommendations**

- Establishment of a new borehole on the fractured pyroxenite aquifer;
- Use borehole 05 as a dedicated monitor borehole;
- Establishment of a monitor borehole from the Spekboom River.

## 10. STATEMENTS

### 10.1 Assumptions and uncertainties

No uncertainties or assumptions were made during the assessment. However, the E.A.P. trusted on the integrity and professional opinions of the specialists, officials and public that was consulted during the process.

### 10.2 Professional opinion

The E.A.P. did not find any detrimental environmental impacts that cannot be controlled or adequately mitigated to reduce its magnitude to acceptable levels and all issues have been adequately addressed and resolved. The E.A.P. therefore recommends a positive final decision on authorization of the activity. Conditions that should be considered by the competent authority and may be required for authorization are given in the following section as well as the draft environmental management plan (section 11).

### 10.3 Environmental impact statement

The assessment exercise, input from specialists, comments from relevant authorities and interested parties concludes that the site can be used for the proposed purpose, with the necessary mitigation measures in place, and provided the management recommendations outlined in this report are implemented.

An environmental impact statement is included as Table 4 and presents a summary of the key findings and a comparative assessment of positive and negative implications of the proposed activity as well as alternatives and relevant mitigation measures where appropriate.



**Table 4 Environmental Impact Statement and Impact Mitigation Table for the proposed activities**

Phase	Impact	Mitigation	Significance	
			Before	After mitigation
<b>C O N S T R U C T I O N</b>	Loss of vegetation and fauna during construction	<ul style="list-style-type: none"> <li>▪ Conserve indigenous vegetation wherever possible.</li> <li>▪ Re-vegetate disturbed areas with indigenous species.</li> <li>▪ All construction workers must be informed and trained regarding the EMP requirements.</li> </ul>	Low	Low
	Impacts on surface and ground water resources	<ul style="list-style-type: none"> <li>▪ Construction camp, facilities and material must be located away from water resources and courses.</li> <li>▪ Hazardous materials must be handled and disposed of correctly.</li> <li>▪ Monitor construction water consumption.</li> <li>▪ Set up emergency response mechanisms in advent of pollution.</li> <li>▪ Vehicle movement must be limited to demarcated areas.</li> </ul>	Low	Low
	Land disturbance due to construction activities	<ul style="list-style-type: none"> <li>▪ Excavation activities to be confined to the area to be developed (footprint) as per planning and should be done to achieve desired outcome.</li> <li>▪ Limit activities to disturbed areas.</li> <li>▪ There must be no other land excavation, besides those stipulated for construction purposes.</li> <li>▪ Ensure that the site is cleaned and that rehabilitation of affected areas is undertaken.</li> <li>▪ The Tubatse Local Municipality, through their supervision, is to ensure that the site is successfully and adequately rehabilitated, before release of the contractor.</li> </ul>	Low	Low
	Soil erosion	<ul style="list-style-type: none"> <li>▪ Vegetation removal must be limited to construction sites only.</li> <li>▪ Divert storm water from stockpile and other sites sensitive to erosion.</li> <li>▪ Prevent silting of watercourses by timeouts re-vegetation of disturbed areas.</li> </ul>	Low	Low
	Increase in dust levels	<ul style="list-style-type: none"> <li>▪ Use dust-suppressing agents.</li> <li>▪ Limit vehicle speed.</li> <li>▪ Avoid dust generating activities during strong winds.</li> </ul>	Low	Low
	Noise pollution from construction equipment (e.g. rollers, diggers)	<ul style="list-style-type: none"> <li>▪ Construction activities to operate Mon – Saturday 8hrs per day. No work is to be done on Sundays and public holidays.</li> <li>▪ All equipment must be in good working order and must be serviced regularly.</li> <li>▪ Any noise generating equipment used near residential areas must be encased.</li> </ul>	Low	Low
	Spillage, stockpiles and other construction related activities	<ul style="list-style-type: none"> <li>▪ Stockpiling is to be done on demarcated area.</li> <li>▪ Concrete mixing will be done on pre-designed slabs underlined by PVC lining, on an area previously disturbed. Alternatively, maintain one mixing site and transport the concrete to the construction site.</li> <li>▪ Any concrete spillage must be cleaned immediately.</li> <li>▪ All construction material must be sourced off-site from commercial sources.</li> </ul>	Medium	Low
	Traffic disruptions	<ul style="list-style-type: none"> <li>▪ Provide clear signage on detours and other deviation routes, where necessary.</li> </ul>	Low	Low
	Heritage	<ul style="list-style-type: none"> <li>▪ Recommendations given in the heritage report must be strictly complied with</li> </ul>	High	Low
	Geotechnical zoning and foundation designs	<ul style="list-style-type: none"> <li>▪ Adhere to recommendations of geotechnical report.</li> </ul>	High	Low

	Work force management (litter, ablution facilities, safety etc.).	<ul style="list-style-type: none"> <li>▪ Site manager to educate construction workers on pollution control and other related matters.</li> <li>▪ Litter bins to be provided</li> <li>▪ Adequate ablution facilities are to be provided. The contractor is to ensure that chemical toilets are provided on site if necessary and are regularly maintained. The contract workers will not be allowed to use the bush for these purposes.</li> <li>▪ Construction workers are to use protective clothing where necessary.</li> </ul>	Medium	Low
OPERATIONAL	Pollution/Litter	<ul style="list-style-type: none"> <li>▪ Rest areas with waste bins must be provided and must be regularly maintained.</li> <li>▪ Signs to encourage no littering should be placed at strategic points.</li> <li>▪ Educate residents as to the need to minimize litter and the benefits of such.</li> <li>▪ Provide central point for collection of refuse.</li> </ul>	Medium	Low
	Storm water management	<ul style="list-style-type: none"> <li>▪ Final design and layout of storm water infrastructure as per design included with services engineering report</li> </ul>	High	Low
	Provision of services	<ul style="list-style-type: none"> <li>▪ Services agreement has been reached with the Municipality and will be implemented as such</li> </ul>	Low	Low
	Soil erosion	<ul style="list-style-type: none"> <li>▪ Maintain storm water infrastructure in good condition.</li> <li>▪ Establish gabions and/or vegetate areas susceptible to erosion.</li> </ul>	Low	Low
	Visual	<ul style="list-style-type: none"> <li>▪ Building designs and township management to be according to acceptable standards.</li> </ul>	Medium	Low
	Water pollution	<ul style="list-style-type: none"> <li>▪ Water resources must be monitored for pollution.</li> <li>▪ Sewage treatment plant must be maintained to DWAF standards</li> </ul>	Medium	Low
	Water usage	<ul style="list-style-type: none"> <li>▪ Water resources must be monitored for significant changes in water levels and availability.</li> </ul>	Medium	Low
ADDITIONAL RECOMMENDATIONS	Socio-economic impact	<ul style="list-style-type: none"> <li>▪ No mitigation measures required, as the proposed project is likely to have a positive direct and indirect socio-economic impact, with an increase in the number of people employed.</li> </ul>	N/A	N/A
	Archaeological	<ul style="list-style-type: none"> <li>▪ Should any grave or burial ground be found in the course of the building of the proposed development, the developer will comply with Section 12 (2B) (e) of the National Monuments Act (Act 28 of 1996). which reads as follows: “ No person shall destroy, damage, alter or export from the Republic – any burial ground or grave referred to in Section 3A (2), except under the authority of / and in accordance with a permit issued under this section. Thus, construction must cease if any archaeological remains are unearthed during construction and the relevant authority notified.</li> <li>▪ Recommendations given in the heritage report must be strictly complied with.</li> </ul>	N/A	N/A
	Final Design and Site Plans	<ul style="list-style-type: none"> <li>▪ All relevant codes of practice and SABS Codes must be adhered to in the development and operation of the township</li> <li>▪ Final designs should consider the safety and accessibility of people, surface, slope and storm water channel should be adjusted accordingly.</li> </ul>	N/A	N/A



## 11. DRAFT ENVIRONMENTAL MANAGEMENT PLAN

The draft environmental management plan (EMP) presented has been compiled to comply with E.I.A regulation 34.

### ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR THE PROPOSED MIXED TOWNSHIP ESTABLISHMENT

#### Introduction

An Environmental Management Plan (EMP) is a tool used to ensure the implementation of mitigation measures recommended in an Environmental Impact Report. It is also this tool that gives guidance during monitoring, auditing and taking corrective actions during its implementation, thereby ensuring continuous monitoring of the environment. An EMP is normally drawn up after an environmental assessment, depending on the level of such assessment. It can also be drawn after the Record of Decision (RoD) by the environmental authority, to incorporate the conditions of such decision.

An EMP is normally implemented throughout the project life-cycle, i.e. during pre-construction, construction, operation and decommissioning, in order to minimize negative impacts and enhance positive ones. An effective EMP will be a practical working document that sets out the requirements and the goals required in mitigation.

#### Requirements of an EMP

- To define measures to be taken during pre-construction, construction, and operation and decommissioning/closure.
- To define the actions needed to implement those measures
- To describe how these will be achieved
- To allocate responsibilities
- To provide time frames

#### Objectives of an EMP

- To ensure that the proponent, construction team, the operational and maintenance workers are acquainted with their responsibilities.
- To ensure there is sufficient allocation of resources.
- To ensure compliance with regulatory authorities requirements.
- To respond to changes in the project implementation not considered during the assessment phase, and respond to unforeseen events.
- To verify environmental performance through information on impacts as they occur.
- To establish proper communication channels and provide feedback for continual improvement.

### Services of an Environmental Control Officer (ECO)

- The developer may be required to appoint an Environmental control Officer (ECO) who must monitor the contractor's compliance with the environmental management plan.
- The developer must provide the contractor with a copy of the EMP and any other relevant documentation or supporting documents.
- The contractor must attend a site inspection and orientation session with the ECO to identify and be informed of the sensitive elements of the site and take cognizance of the boundaries of the construction area. The ECO must point out any particular site-specific elements of importance.
- The priority of the ECO is to ensure that minimal environmental damage is done during construction and adequate measures is emplaced to ensure that future operations and maintenance does not significantly impact on the environment.
- The ECO must form part of the project management team and attend all project meetings.
- The ECO shall keep a record of all communication with external interested and affected parties on site.
- The contractor must ensure that the construction crew attends an environmental briefing and training session presented by the ECO prior to commencing activities on site.
- The applicant is responsible for compliance with the provisions for Duty of Care and Remediation of Environmental Damage contained in Section 28 of the National Environmental Management Act (Act 107 of 1998).

### Construction phase

Environmental management considerations for the construction phase are given below (Table 5.1). Table 5.1 is an elaboration of the different environmental components and appropriate measures to manage likely impacts of the proposed activities.

Table 5.1 EMP for the pre-construction and construction phases

COMPONENT	MANAGEMENT - MITIGATION
1. General Pre-construction requirements	a) No development may take place without the necessary permits/approvals or other agreements with other relevant authorities/institutions. b) The holder of the authorization must comply with all relevant legislation applicable to the proposed activities. c) Copies of such legislation must be forwarded to LEDET before commencement of construction. d) A copy of the authorization must be available on-site at all times and all personnel must be familiar and adhere to its contents. e) LEDET must be given 14 days notice before commencement of construction activities.
2. Geology & Soils (Conservation of Agricultural Resources Act no. 43 of 1983))	a) Before construction, topsoil must be stripped and stockpiled separately to prevent removal and compaction by vehicles. It must be used for future rehabilitation purposes. b) Topsoil shall be stockpiled in heaps and be protected from erosion. c) Re-usable subsoil stripped from construction sites must be stockpiled separately and clearly identified as such. d) Avoid contamination of soil with oil, diesel, petrol, waste or any other foreign matter, which may impact on the capability of the soil as a growth medium. e) Soil must not be stockpiled on drainage lines or near watercourses. f) Appropriate soil erosion and control procedures must be applied to all embankments that are disturbed and destabilized. g) All equipment to be inspected daily for oil or fuel leaks before it is operated. Leakages must be repaired on mobile equipment or containment trays placed underneath immobile equipment until such leakages has been repaired. h) Soil contaminated with oil must: <ul style="list-style-type: none"> <li>• Be removed to 300mm below the saturated oil mark;</li> <li>• Disposed at permitted landfill site;</li> <li>• The soil can be regenerated using bio-remediation methods.</li> </ul>
3. Surface & Ground Water (National Water Act,1998)	a) Permission from DWAF must be obtained for all relevant water uses, water storage and chemical sanitation. b) Adequate sedimentation control measures must be instituted at any prominent drainage lines and construction trenches. c) Construction activities must be positioned away from drainage lines and areas with a high water table where possible. d) Concrete shall not be mixed directly on the ground. Plastic liners or mixing trays are to be used. e) All fuel, chemical, oil, etc must be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods to confined areas f) No dumping of foreign material in streams, rivers and/or wetland areas is allowed.

<p>4. Flora (National Forests Act, 1998)</p>	<p>a) All important and rare flora and seeds must be conserved on-site or rescued/removed where applicable. It must be stored at a suitable location/ nursery, for future use in rehabilitation. b) Where alien invasive plants occur they must be uprooted, cut and /or chemically treated. (Use only approved chemicals).</p>
<p>5. Fauna (Mpumalanga Nature Conservation Ordinance, 1988)</p>	<p>a) Avoid injury to or death of wild animals by reducing speed of construction vehicles.</p>
<p>6. Nature conservation</p>	<p>a) Weed control must be applied</p>
<p>7. Air Quality, Dust &amp; Odours (Atmosphere Pollution Act No. 45 of 1965)</p>	<p>a) Speed limit must be enforced in all areas to limit the levels of dust pollution. b) Dust must be suppressed on access roads and construction sites during dry periods by the regular application of water or a biodegradable soil stabilization agent. Water used for this purpose must be in quantities that will not result in the generation of run-off. c) The contractor's representative or environmental officer must notify all people living within 50m of the construction site of proposed activities. d) An operational water cart must be permanently available on-site. e) In the event of serious levels of dust pollution, the implementation of constant dust monitoring by qualified consultants must be undertaken. f) Vehicles used on, or entering the site must be serviced regularly to ensure that they do not emit smoke or fumes.</p>
<p>8. Noise Occupational Health and Safety Act, (Act 85 of 1993) and provincial and local by-laws.</p>	<p>a) Noise control measures must be implemented. All noise levels must be controlled at the source. b) All employees must be given the necessary ear protection gear if the noise levels exceed 70dB. c) Interested &amp; Affected parties must be informed about impending excessive noise. d) Generators and pumps must be housed in casings to help reduce any noises in operation. e) No loud music is allowed on site and in construction camps.</p>
<p>9. Aesthetics and visual impacts</p>	<p>a) The clearing of site must be kept to a minimum and surrounding vegetation must, as far as possible, be left intact as a natural shield. b) Use shade cloth for areas that are exposed to the public, particularly near busy roads. c) Cut and fill areas and other soil stabilization works must be constructed to blend in with the natural environment. d) Borrow pits must be shaped to have undulating slopes and surfaces such that they blend into the natural landscape as much as possible. e) Excavated material must be flattened (not compacted) or removed from site. No heaps of spoil material must be left on site once the contractor has moved to a new construction site. f) Any complaints from interested groups regarding the appearance of the construction site must be recorded and addressed promptly by the site manager or the contractor's representative.</p>
<p>10. Archaeological &amp; Cultural</p>	<p>a) Work in areas where artifacts are found must cease immediately.</p>

<p>Resources (National Monuments Act 28 of 1969) (National Heritage Act 25 of 1999)</p>	<p>The excavation must be examined by an archaeologist as soon as possible. All necessary actions to ensure that delays are minimized must be taken.</p> <p>b) Under no circumstances must the contractor, his employees, his sub-contractor's employees remove, destroy or interfere with archaeological artifacts. Any person who causes international damage to archaeological or historical sites or artifacts could be penalized or legally prosecuted in terms of the National Heritage Resources Act, (Act 25 of 1999).</p> <p>c) A three- strand fence 2m outside the extremities of the site must be erected to protect archaeological sites. The fence must be clearly marked with danger tape. Vehicular traffic must not be allowed on archaeological and historical site, within a 5m radius from the perimeter of the site.</p> <p>d) All known and identified archaeological and historical sites must be treated as recommended in the heritage report. No stones or rocks must be removed from such sites. These rocks must not be painted, whitewashed or similarly treated.</p> <p>e) The contractor's representative must ensure that employees do not gain access to any archaeological areas (whether fenced or unfenced), except when authorized to do so.</p> <p>f) Recommendations given in the heritage report must be strictly complied with.</p>
<p>11. Waste Management (National Water Act, 1998); (Hazardous Substances Act 15 of 1973)</p>	<p>a) Littering on site and the surroundings areas is prohibited. Clearly marked litterbins must be provided on site. The contractor's representative must monitor the presence of litter on the work sites as well as the construction campsite. All bins must be cleaned.</p> <p>b) Excess concrete building rubble or other material must be disposed of in areas designed specifically for this purpose and not indiscriminately over construction site,</p> <p>c) All plastic material must be removed from area where livestock could swallow it.</p> <p>d) Waste must be disposed, as soon as possible and not be allowed to stand on to decay, resulting in bad odors and attracting vermin.</p> <p>e) Adequate sanitation and water supply must be installed for the construction personnel (authorization from DWAF may be required).</p> <p>f) All waste removed from site must be disposed at the municipal/permitted waste disposal site.</p>
<p>12. Loss of essential resources</p>	<p>a) The amount of essential resource lost must be minimized through alternative project design;</p> <p>b) Alternatives to compensate for lost resources must be found;</p> <p>c) Damage to crops or other food resources must be compensated for.</p> <p>d) Any borrow pits must be established according to relevant legislation.</p> <p>e) All construction and final constructions must be executed without causing erosion, where construction results in erosion, appropriate mitigation must be put in place.</p>
<p>13. Disturbance of graves</p>	<p>a) If unmarked graves are discovered, the EO must be contacted immediately. The relatives of the deceased must be contacted immediately. The local chief, SAHRA and Local Authority must also be informed of the situation.</p> <p>b) All finds of human remains must be reported to the nearest police</p>

	station to ascertain if there was any crime involved.
14. Security	<ul style="list-style-type: none"> <li>a) Construction camp must be planned with detail. Such that affected parties do not feel threatened by the presence of construction workers.</li> <li>b) If possible, local labor must be employed to avoid the need to construct a camp for off site contracted labor.</li> </ul>
15. Safety (Occupational Health & Safety Act)	<ul style="list-style-type: none"> <li>a) Best practice methods must always be employed and appropriated regulations adhere to.</li> <li>b) No open trenches should be permitted without the use of demarcation tape.</li> <li>c) Speed limits must be enforced in all areas, including public roads and private property to avoid potential accidents.</li> <li>d) There must be a first aid facility onsite.</li> <li>e) Regular auditing of safety requirements must be undertaken in order to monitor and control the problems before they become unmanageable.</li> <li>f) A safety and health officer must be employed to monitor project activities for any potential problems.</li> <li>g) Workers rights to refuse work in unsafe condition must be respected.</li> <li>h) A record must be kept of all incidents on site.</li> <li>i) Personnel must be trained in basic site safety procedures.</li> <li>j) Secure storage of materials on site particularly hazardous material e.g. chemicals and fuels.</li> <li>k) Adequate signage on and off the site about potential hazards must be provided</li> <li>l) A registered blaster must supervise all blasting and rock splitting and adequate warning must be given to the surrounding occupants prior to blasting and suppression mats must be used.</li> <li>m) Damage due to blasting on surrounding properties must be monitored.</li> <li>n) Areas to be blasted must be surveyed beforehand by a specialist to ensure that all important fauna &amp; flora are removed/protected.</li> </ul>
16. HIV & AIDS	<ul style="list-style-type: none"> <li>a) An AIDS awareness program must be provided for all project workers</li> <li>b) Condoms should be supplied at a health facility / First AID center and at all strategic areas.</li> <li>c) Recreational facilities for project workers, particularly those residents at the construction camp, must be provided.</li> </ul>
17. Other economic spin- offs	<ul style="list-style-type: none"> <li>a) The project must be as far as is appropriate, in consultation with local authorities and aligned with local plans such as IDP's.</li> <li>b) Labor intensive methods must be used where feasible, cost effective and not time constraining.</li> <li>c) Local labor must be employed as far as practical.</li> <li>d) Training of the unskilled must be undertaken.</li> <li>e) Local suppliers must be used, as far as possible.</li> </ul>
18. Disruption of services	<ul style="list-style-type: none"> <li>a) Where service disruption is inevitable, the contractor must advice the project manager at least 7 days in advance, allowing enough time to inform affected parties.</li> <li>b) A complaint register must be maintained on site.</li> <li>c) Updated information boards must be maintained on site and must include contact details for complaints by the public in accordance with details provided by the engineer.</li> </ul>

19. Other	<p>a) The contractor’s representative or environmental officer must inform all adjacent landowners of any after-hour construction activities and any other activity that could cause a nuisance e.g. the application of chemicals to the work surface. Normal working hours are between 07h00 and 17h00 Monday to Friday. Arrangements are to be made with the Local Authority for after-hours work.</p> <p>b) The contractor’s representative or environmental officer must ensure that all on-site vehicles comply with the SABS 0180 standards.</p> <p>c) No random cooking fires are to be allowed on site expect designated cooking areas.</p> <p>d) The EMP can be amended if the actual impacts on-site, exceeds the significance level of the predicted impacts on which the RoD was based.</p>
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**ENVIRONMENTAL MANAGEMENT PROGRAMME**

Table 5.2 Summarize the monitoring of the Construction phase by the site manager or responsible person appointed. Reporting frequency will be predetermined DALA. Proper records must be kept by the site manager of all monitoring and site visits as well as complaints so as to be made available for auditing.

Table 5.2 Monitoring of the Construction phase

ENVIRONMENTAL COMPONENT	OBJECTIVE	Monitoring Frequency (site manager)	Reporting Frequency (site manager)
j) Geology & Soils	Prevent/control soil erosion	Daily	Manager/ owners association / ECO
k) Surface & Ground Water	Prevent water pollution Storm water management	Daily	Manager/ owners association / ECO
l) Air Quality, Dust & Odours	Prevent air pollution	Daily	Manager/ owners association / ECO
m) Noise	Minimize noise impacts	Daily	Manager/ owners association / ECO
n) Blasting	Minimize damages and injury.	Whenever blasting takes place	Manager/ owners association / ECO
o) Aesthetics	Reduce negative impact	Daily	Manager/ owners association / ECO
p) Archaeological & Cultural Resources	Preserve archaeological sites. Adhere to recommendations of heritage report.	Daily	Manager/ owners association / ECO
q) Waste Management	Correct disposal of waste	Daily	Manager/ owners association / ECO
r) Loss of essential resources	Prevent the loss of such	Daily	Manager/ owners association / ECO
s) Disturbance of graves	Preserve graves	Daily	Manager/ owners association / ECO

t) Security	Improve security	Daily	Manager/ owners association / ECO
a) Safety	Minimize risks and injuries	Daily	Manager/ owners association / ECO
u) HIV & AIDS	Prevent the spread of Aids	Daily	Manager/ owners association / ECO
v) Other economic spin- offs	Maximize employment	Daily	Manager/ owners association / ECO
w) Disruption of services	Prevent disruptions	Daily	Manager/ owners association / ECO

### Operational Phase

Environmental management considerations for the operational phase are given below (Table 5.3). Table 5.3 is an elaboration of the different environmental components and appropriate measures to manage likely impacts of the proposed activities.

Table 5.3 EMP for operational phase

COMPONENT	MANAGEMENT PLAN
1. Geology & Soils (Conservation of Agricultural Resources Act no. 43 of 1983)	<ul style="list-style-type: none"> <li>a) Avoid contamination of soil with oil, diesel, petrol, waste or any other foreign matter, which may impact on the capability of the soil as a growth medium.</li> <li>b) Appropriate soil erosion and control procedures must be applied to all steep embankments.</li> <li>c) Stormwater infrastructure must be serviced and kept clear of debris.</li> </ul>
2. Surface & Ground Water (National Water Act,1998)	<ul style="list-style-type: none"> <li>a) Permission from DWAF must be obtained for all relevant water uses, storage and chemical sanitation.</li> <li>b) All fuel, chemical, oil, etc must be confined to areas where the drainage of water can be controlled. Use appropriate structures and methods to confined areas.</li> <li>c) No dumping of foreign material in streams, rivers and/or wetland areas is allowed.</li> <li>d) Sewage and waste disposal must be managed according to agreement with municipality.</li> <li>e) Stormwater management infrastructure to be conceived strictly according to engineering plans and recommendations</li> </ul>
3. Flora	<ul style="list-style-type: none"> <li>a) Indigenous flora must be conserved and used as far as possible for landscaping.</li> <li>b) Where alien invasive plants occur they must be uprooted, cut and /or chemically treated. (Use only approved chemicals).</li> </ul>
4. Fauna	<ul style="list-style-type: none"> <li>a) Avoid injury to or death of wild animals by reducing speed of vehicles and avoid disturbance of natural habitats.</li> <li>b) Free-roaming cats and dogs should not be allowed.</li> </ul>
5. Nature conservation	<ul style="list-style-type: none"> <li>b) Weed control must be applied.</li> </ul>
6. Aesthetics	<ul style="list-style-type: none"> <li>a) Landscaping and buildings must be of such a theme as to blend with the environment and local character of the area</li> </ul>
7. Archaeological & Cultural Resources (National Monuments Act 28 of 1969)	<ul style="list-style-type: none"> <li>b) All known and identified archaeological and historical sites must be left untouched. No stones or rocks must be removed from such sites. These rocks must not be painted, whitewashed or similarly treated.</li> </ul>



(National Heritage Act 25 of 1999)	c) The owner’s representative must ensure that all home-owners/public do not gain access to any archaeological areas (whether fenced or unfenced), except when authorized to do so.
8. Waste Management (National Water Act,1998)  (Hazardous Substances Act 15 of 1973)	a) Littering on site and the surroundings areas is prohibited. Clearly marked litterbins must be provided on site. All waste removed from site must be disposed at the municipal/permitted waste disposal site. b) Waste must be disposed of at a permitted site, as soon as possible and not be allowed to decay, resulting in bad odors and attracting vermin. c) Hazardous Substances must be handled and disposed of as prescribed by the HSA.
9. Air Quality (Atmosphere Pollution Act No. 45 of 1965); (Occupational Health & Safety Act); (National Water Act,1998); (Hazardous Substances Act 15 of 1973)	a) All present and future activities on site – especially in the industrial sector must comply with relevant legislation and be monitored accordingly.
9. Fire management	a) Fire-breaks and fire management must be kept up to the standards of the municipality. b) No random fires are to be allowed on site except designated areas.
10. Activities	a) Operational & recreational activities must be of such a nature as not to disturb I&AP’s and neighboring land owners b) Any complaints must be addressed accordingly c) All future activities must comply with relevant legislation, especially the industrial activities.
11. Safety (Occupational Health & Safety Act)	a) Best practice methods must always be employed and appropriated regulations adhere to. b) Speed limits must be enforced in all areas, including public roads and private property to avoid potential accidents. c) There must be a first aid facility onsite. d) Regular auditing of safety requirements must be undertaken in order to monitor and control the problems before they become unmanageable. e) Workers rights to refuse work in unsafe condition must be respected. f) A record must be kept of all incidents on site. g) Personnel must be trained in basic site safety procedures. h) Secure storage of materials on site particularly hazardous material e.g. chemicals and fuels. i) Adequate signage on and off the site about potential hazards must be provided
12. HIV & AIDS	a) An AIDS awareness program must be provided for all project workers b) Condoms should be supplied at a health facility / First AID center and at all strategic areas.
13. Other economic spin- offs	a) The project must be as far as is appropriate, in consultation with local authorities and aligned with local plans such as IDPs. b) Labor intensive methods must be used where feasible, cost effective and not time constraining.

	<ul style="list-style-type: none"> <li>c) Local labor must be employed as far as practical.</li> <li>d) Training for the unskilled must be undertaken.</li> <li>e) Local suppliers must be used, as far as possible.</li> </ul>
14. Other	<ul style="list-style-type: none"> <li>a) The contractor's representative or environmental officer must ensure that all on-site vehicles comply with the SABS 0180 standards.</li> <li>b) It is recommended that future residents create a Home Owners Association/Conservation Forum to ensure that the EMP is carried forward and the goals set for conservation and a better environment are reached.</li> <li>c) The EMP can be amended if the actual impacts on-site exceeds the significance level of the predicted impacts on which the RoD was based.</li> </ul>

### ENVIRONMENTAL MANAGEMENT PROGRAMME

Table 5.4 Monitoring Operational phase

ENVIRONMENTAL COMPONENT	OBJECTIVE	MONITORING FREQUENCY	RESPONSIBLE PERSON
a) Geology & Soils	Prevent/control soil erosion	annually	Manager/ owners association / ECO
b) Surface & Ground Water	Prevent water pollution Storm water management		Manager/ owners association / ECO
c) Flora	Ensure conservation	annually	Manager/ owners association / ECO
d) Fauna	Ensure conservation	annually	Manager/ owners association / ECO
e) Air Quality, Dust & odors	Prevent air pollution	Daily	Manager/ owners association / ECO
f) Noise	Minimize noise impacts	Daily	Manager/ owners association / ECO
g) Aesthetics	Reduce negative impacts. Structures to blend with surrounds.	annually	Manager/ owners association / ECO
h) Archaeological & Cultural Resources	Preserve archaeological sites	annually	Manager/ owners association / ECO
i) Waste Management	Correct disposal of waste	annually	Manager/ owners association / ECO
j) Loss of essential resources	Prevent the loss of such resources	Daily	Manager/ owners association / ECO
k) Disturbance of graves	Preserve graves	Annually	Manager/ owners association / ECO
l) Security	Improve security	Daily	Manager/ owners association / ECO
d) Safety	Minimize risks and injuries	Daily	Manager/ owners association / ECO
m) HIV & AIDS	Prevent the spread of Aids	Daily	Manager/ owners association / ECO
n) Other economic spin- offs	Maximize employment		Manager/ owners association / ECO

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## **APPENDIXES**

Specialist reports and processes as well as specific information required by the competent authority as required by E.I.A. regulation 33 are included as Appendixes in the following section.



# COMPILATION LAYOUT PLAN 1



PROPOSED TOWNSHIPS  
**BURGERSFORT EXTENSIONS 30, 31, 45, 46 & 47**  
 MAGISTERIAL DISTRICT LYDENBURG  
 GREATER TUBATSE MUNICIPALITY

ANGLORAND HOLDINGS LIMITED

LOCAL AUTHORITY  
 GEODETIC SYSTEM  
 W.G. 31°

DESCRIPTION: SITUATED ON PORTIONS OF PORTION 5, 27, 58, 60 & 62 OF THE FARM LEEUWVALEI 297-KT

USE TABLE					
USE	NO OF ERVEN	AREA (Ha)	PROVINCIAL REF NUMBERS	% OF TOWNSHIP	REFERENCE
RESIDENTIAL 2	13	21,92 Ha	8295-8297, 8311-8318, 8324, 8326	15,29%	RES 2
BUSINESS 2	13	54,15 Ha	8241-8243, 8245, 8247, 8248, 8249, 8250, 8255-8258, 8261-8263, 8265-8268, 8271-8273, 8275-8277, 8281-8283, 8285-8288, 8291-8293, 8295-8298, 8301-8303, 8305-8308, 8309, 8321, 8322, 8325, 8327, 8328, 8329	37,77%	
INSTITUTIONAL	1	2,80 Ha	8323	1,95%	
INDUSTRIAL 1	48	15,38 Ha	8284, 8286, 8287, 8289, 8290, 8292, 8294, 8296, 8299, 8300, 8302, 8304, 8306, 8307, 8308, 8310, 8312, 8313, 8314, 8315, 8316, 8317, 8319, 8320, 8322, 8324, 8326, 8328, 8329	10,73%	
MUNICIPAL	4	1,83 Ha	8284, 8310, 8319, 8322	1,28%	
SPECIAL	1	0,44 Ha	8246	0,31%	
SPECIAL (PRIVATE STREET)	4	3,01 Ha	8249, 8298, 8320, 8325	2,10%	
PRIVATE OPEN SPACE	5	21,99 Ha	8304, 8321, 8327, 8328, 8329	15,34%	
STREET		21,84 Ha		15,23%	
TOTAL	89	143,36 Ha		100%	

SIZE OF ERVEN		STREETS	
USE	MINIMUM sqm	RULING sqm	MINIMUM GRADIENT
RESIDENTIAL	-	-	MAXIMUM GRADIENT SEE ENG. DESIGN
			TOTAL LENGTH - 15m
			TOTAL LENGTH - 25m
			TOTAL LENGTH - 40m/60m
			TOTAL LENGTH

NOTES:  
 1) Serviceability of erven to be confirmed by Civil/Electrical Engineer.  
 2) All areas and values are approximate and awaiting final surveying and subject to approval by the Greater Tubatse Municipality.

LEGEND

	TOWNSHIP BOUNDARY		EXISTING STRUCTURES		EMBANKMENT/ EXCAVATIONS
	LINE OF NO ACCESS (A-N)		LINE OF NO ACCESS (O-Z)		

RECOMMENDED FOR APPROVAL:

SIGNED: \_\_\_\_\_ Pr-Engineer  
 Reg nr: \_\_\_\_\_

CONTOUR INTERVAL 1m  
 DATE: M.J.S.L./TRIG  
 DECEMBER 2006 & JANUARY 2007  
 CONTOUR SURVEY BY: MD JORDAAN SURVEY SERVICES

It is hereby certified that with reference to SECTION 144 of the NATIONAL WATER ACT (ACT NO. 36 OF 1998) THE TOWNSHIP SHOWN ON THIS PLAN IS AFFECTED BY A 1:100 YEAR RETURN PERIOD FLOODLINE. THE 1:100 YEAR FLOODLINE IS SHOWN ON THE PLAN. THE FLOODLINE WAS PROPERLY DETERMINED BY USING ACCEPTED CALCULATION PROCEDURES. THE DUTY REST UPON THE DEVELOPER AND THE LOCAL AUTHORITY TO MINIMISE THE RISK OF DAMAGE DUE TO STORMWATER FLOWING OVER THE LAND, BY DESIGNING, CONSTRUCTING AND MAINTAINING A STORMWATER AND FLOOD DEFENCE MANAGEMENT SYSTEM, WHERE APPLICABLE.

DATE	AMENDMENT	DATE	AMENDMENT
23/06/2008	COMPILATION LAYOUT PLAN 1		

DESIGN BY: P.J. BUYS  
 DRAWN BY: P.D.S.

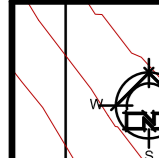
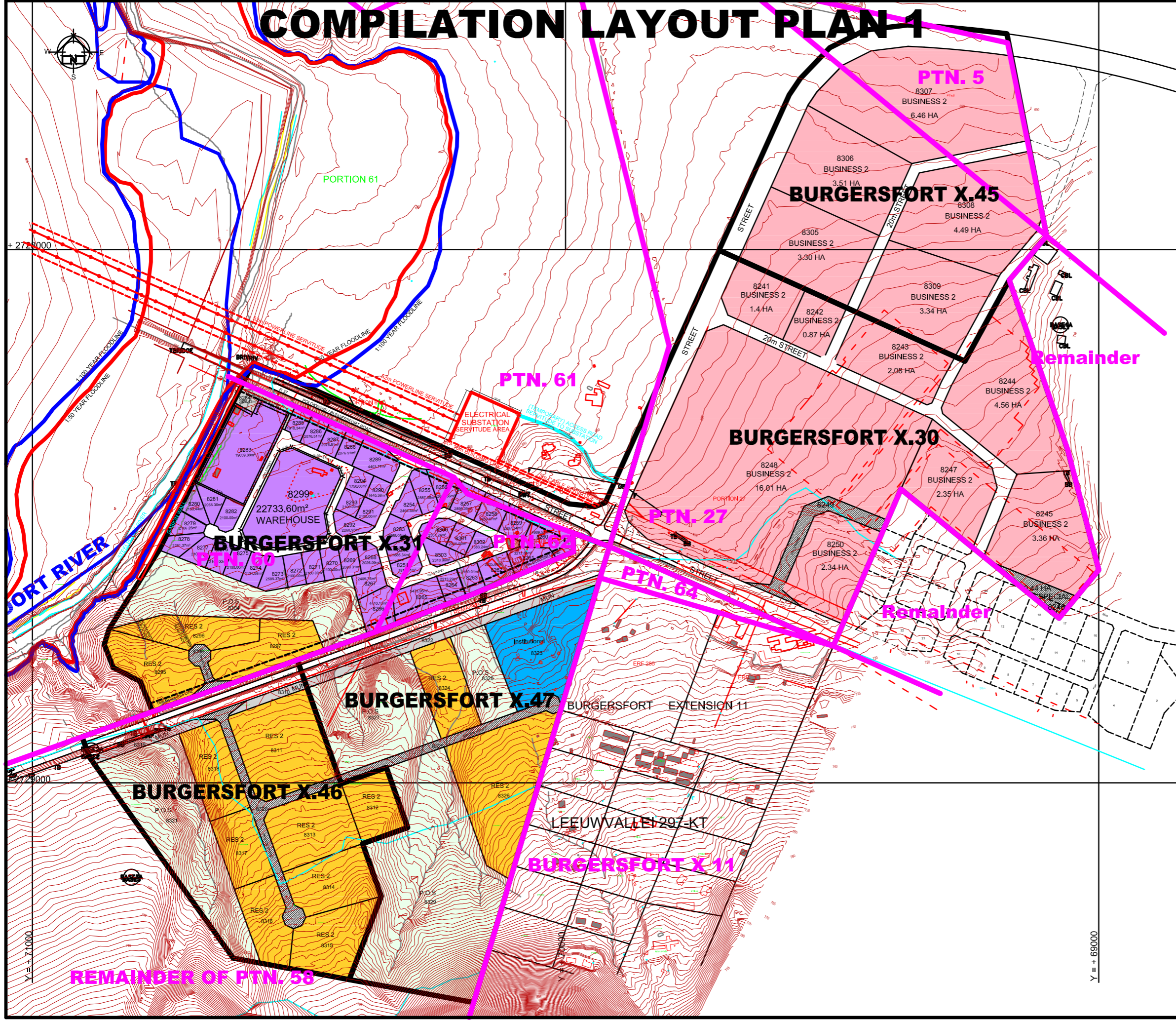
PLAN NO: BURGER/COMP/1-1  
 SCALE: 1:7 000

TOWN AND REGIONAL PLANNERS & ASSOCIATES CC  
 118 GARA, BRAAM STREET  
 1146 TONKORP, JOHANNESBURG  
 011 808 1000  
 011 808 1001  
 011 808 1002

The information as indicated on this map has been compiled with the required accuracy within the parameters of this project. Any decisions based on this information are however the sole responsibility of the decision maker.



SA 1:50 000 SHEET 2430CB



+ 2728000

Y = + 69000

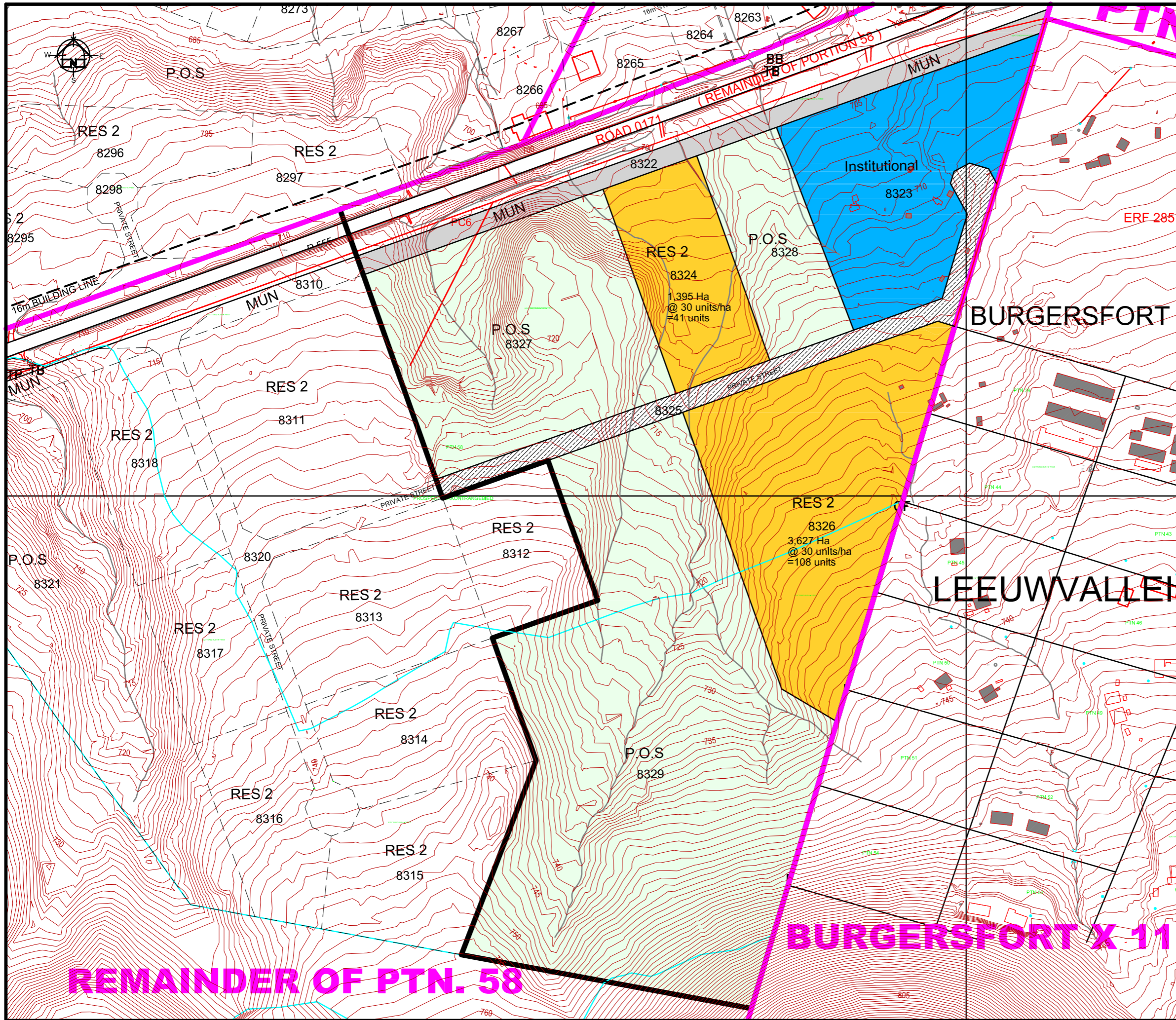
Y = + 69000

REMAINDER OF PTN. 58

Remainder

Remainder






**ANGLORAND HOLDINGS LIMITED**  
 PROPOSED TOWNSHIP  
**BURGERSFORT EXTENSION 47**  
 MAGISTERIAL DISTRICT LYDENBURG  
 GREATER TUBATSE MUNICIPALITY  
 LOCAL AUTHORITY  
 GEODETIC SYSTEM W.G. 31°

DESCRIPTION OF LAND: SITUATED ON A PORTION OF PORTION 58 OF THE FARM LEEUWVALEI 297-KT

USE TABLE					
USE	NO OF ERVEN	AREA (Ha)	PROVINCIAL REF NUMBERS	% OF TOWNSHIP	REFERENCE
RESIDENTIAL 2	2	5,03 Ha	8324 & 8326	19,48%	RES 2
INSTITUTIONAL	1	2,51 Ha	8323	9,72%	
MUNICIPAL	1	0,94 Ha	8322	3,64%	
PRIVATE OPEN SPACE	3	13,46 Ha	8327-8329	52,13%	
SPECIAL	1	1,00 Ha	8325	3,86%	
STREET		2,88 Ha		11,17%	
TOTAL	8	25,82 Ha		100%	

SIZE OF ERVEN	STREETS		
	USE	MINIMUM sq.m	RULING sq.m
RESIDENTIAL	-	-	-

- NOTES:
- Serviceability of erven to be confirmed by Civil/Electrical Engineer.
  - All areas and values are approximate and awaiting final surveying and subject to approval by the Greater Tubatse Municipality.
  - Total number of dwelling units:  
 Residential 2 Erven = 5,032 Ha @ 30 units / Ha = 150 Units

LEGEND

- TOWNSHIP BOUNDARY
- EXISTING STRUCTURES
- EMBANKMENT/ EXCAVATIONS
- LINE OF NO ACCESS (A-N)
- LINE OF NO ACCESS (O-Z)

RECOMMENDED FOR APPROVAL:

SIGNED: \_\_\_\_\_ Pr. Engineer  
CAPACITY: \_\_\_\_\_ Reg nr: \_\_\_\_\_

CONTOUR INTERVAL 1m  
 DATE: M.J.S.L. (TRIG)  
 DECEMBER 2006 & JANUARY 2007  
 CONTOUR SURVEY BY: MD JORDAAN SURVEY SERVICES

It is hereby certified that with reference to SECTION 44 of the NATIONAL WATER ACT (ACT NO. 36 OF 1998) THE TOWNSHIP SHOWN ON THIS PLAN IS AFFECTED BY A 1:100 YEAR RETURN PERIOD FLOODLINE. THE 1:100 YEAR FLOODLINE IS SHOWN ON THE PLAN. THE FLOODLINE WAS PROPERLY DETERMINED BY USING ACCEPTED CALCULATION PROCEDURES. THE DUTY REST UPON THE DEVELOPERS AND THE LOCAL AUTHORITY TO MINIMISE THE RISK OF DAMAGE DUE TO STORMWATER FLOWING OVER THE LAND, BY DESIGNING, CONSTRUCTING AND MAINTAINING A STORM-WATER AND FLOOD DEFENCE MANAGEMENT SYSTEM, WHERE APPLICABLE.

DATE	AMENDMENT	DATE	AMENDMENT
22/03/2007	CONCEPT RE-LAYOUT	03/07/2008	FINAL SG-NUMBERS
11/09/2007	FINAL LAYOUT	20/08/2008	AMENDED FINAL SG-NUMBERS
18/10/2007	AMENDED FINAL LAYOUT		
23/06/2008	FINAL SG-NUMBERS		


DESIGN BY: P.J. BUYS  
 DRAWN BY: P.D.S.

PLAN NO: BURGERFX(47)/1-6

SCALE: 1:3 000

PIETERSE DU TOIT & ASSOCIATES CC  
 TOWN AND REGIONAL PLANNERS

LOCALITY PLAN



SA 1:50 000 SHEET 2430CB