

# ENVIRONMENTAL IMPACT ASSESSMENT REPORT



**MASILONYANA**  
LOCAL MUNICIPALITY



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## 1. INTRODUCTION

Masilonyana Local Municipality (MLM) is proposing to establish a low-cost housing development on Portion 1 of the Farm Tevere 210, R/E of the Farm Leeuwfonteins 51,

Portion 14 and 17 of the Farm Louterbronnen 250, Farm Mooimeisjes Fontein 451 and R/E of the Farm Theunissens 610. Watercube Services (Pty) Ltd was appointed by Bageso Housing Development Consultants as independent environmental practitioners to undertake an application for environmental authorisation in the form of a Scoping and EIA for the proposed development on behalf of Masilonyana Local Municipality (MLM). The EIA conforms to the December 2014 Environmental Impact Assessment (EIA) Regulations as promulgated in terms of the National Environmental Management Act (Act 107 of 1998).

### 1.1. Purpose of Report

This report represents the Environmental Impact Report (EIR) and has been prepared in accordance with the EIA Regulations published in Government Notice No. R 982. These regulations fall under Section 24(5) read with Section 44 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA).

The NEMA Section 24(5) stipulates that "listed activities" (i.e. those activities that have been recognised as having a detrimental effect on the environment) require environmental authorisation from the competent authority..

**Table 1.** Summary of the listed activities associated with the project that require environmental authorisation.

<b>Government Notice.</b>	<b>Activity Number</b>	<b>Listed Activity</b>	<b>Project Activity</b>	<b>EIA Requirements</b>
GNR 984 of 4 December 2014	15	The clearance of an area of 20 hectares or more of indigenous vegetation.	The development of an area larger than 20 Hectares.	Full EIA

Given the listed activity in Table 1 above, a full EIA process has been followed. Furthermore, an activity in Table 1 have been assessed in this report.

## 2. ENVIRONMENTAL IMPACT REPORT PROCESS

The EIA process is controlled through Regulations published under Government Notice No. R. 983, R. 984 and R. 985 and associated guidelines promulgated in terms of Chapter 5 of the National Environmental Management Act (Act 107 of 1998).

Three phases in the EIA process are typically recognized as follows:

- Application Phase;
- Scoping Phase; and
- EIA Phase.

### **3. APPLICATION PHASE**

The Application Phase consists of completing the appropriate application form by the EAP and the proponent and the subsequent submission and registration of the project with the competent authority. An application form was completed and submitted to DESTEA, Bloemfontein office. The application has been accepted and registered (Attached)

#### **3.1. Details of Case Officer handling application**

Name: Ms R. Likhoele (Environmental Officer: Production Grade A: EIM)

Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA)

Private Bag X20801

**BLOEMFONTEIN**

9300

Tel: 051 400 4803

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#### **3.2. Registration Number of Application**

Department of Economic, Small Business Development, Tourism and Environmental Affairs (DESTEA)

Registered the project with reference number EMS/15/16/02.

#### **3.3. Scoping Phase**

The Scoping Phase aimed to identify the key environmental issues associated with the project, in part through public consultation; consider project alternatives; and provide

focus for the EIA Phase. During the Scoping Phase, as per Regulation, a draft Scoping Report was compiled and subjected to 30-day comment period by Interested and Affected Parties (I&APs). Thereafter, the draft Scoping Report was finalised into the final Scoping Report that was submitted to DESTEA.

An acknowledgement and acceptance of the final Scoping Report was received on 01 July 2016.

## **4. ENVIRONMENTAL IMPACT ASSESSMENT PHASE**

The EIA phase determines the significance of the impact of the proposed activity on the surrounding environment. During the EIA phase, an Environmental Impact Report (EIR) is produced by Watercube Services and submitted to DESTEA. The EIR (this report) provides an assessment of all the identified key issues and associated impacts from the Scoping Phase as well as a description of appropriate mitigation measures. All environmental impacts are assessed both before and after mitigation to determine:

- The significance of the impact despite mitigation; and
- The effectiveness of the proposed mitigation measures.

As in the Scoping Phase the public participation process continues to ensure that all (I&APs) are informed of the proposed activity and, provided an opportunity to comment.

### **4.1. Environmental Impact Report**

The aim of the EIR is to document the outcome of the EIA Phase and includes the following:

Details and expertise of the Environmental Assessment Practitioner (EAP) undertaking the EIA as well as the applicant's details;

A description of the legislation and guidelines applicable to the proposed activity;

- The location of and a detailed description of the proposed activity;
- A description of the need and desirability for the project;
- A description and assessment of feasible and reasonable alternatives;
- A description of the receiving environment;
- Documentation of the Public Participation Process and a register of Interested and Affected Parties;



- A summary of the findings/recommendations of any required specialists
- A description of environmental issues and impacts associated with the project proposal and alternatives;
- A description of the methodology used in the assessment of impacts;
- An assessment of each impact and a description of appropriate mitigation measures;
- Details of any assumptions, uncertainties or gaps in knowledge;
- An environmental impact statement that includes an opinion on the authorisation of the proposed activity a summary of the findings, and an assessment of the positive and negative impacts;
- An Environmental Management Plan (EMP)
- Copies of any specialist reports; and
- Any other information required by the authorities.

The public review period has now elapsed and the Final EIR has been submitted to DESTEA for their approval.

## 5. DETAILS OF THE ENVIRONMENTAL IMPACT ASSESSMENT PRACTITIONER

This chapter is intended to provide details on the organisation and the Environmental Assessment Practitioners (EAPs) that undertook the Scoping and EIA.

**Table 2. . Environmental Consulting Company and Environmental Assessment Practitioner Details**

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35 Dave Herman Street	Tel: 076 806 4293
The Orchards	Fax: 086 608 2143
0182	E-mail:watercubeservices@gmail.com

## 6. DETAILS OF THE APPLICANT

Masilonyana Local Municipality

**Contact Person:** David Nthau (Mr)

**Postal Address**

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THEUNISSEN

9410

Physical Address

47 Le Roux Street

THEUNISSEN

9410

## **7. LEGISLATION AND POLICY GUIDELINES CONSIDERED**

The Constitution of South Africa (Act 108 of 1996)

The legal reference source for environmental law in South Africa is found in the Constitution of the Republic of South Africa, Act 108 of 1996. All environmental aspects should be interpreted within the context of the Constitution. The Constitution has enhanced the status of the environment by virtue of the fact that environmental rights have been established (Section 24) and because other rights created in the Bill of Rights may impact on environmental management. An objective of local government is to provide a safe and healthy environment (Section 152) and public administration must be accountable, transparent and encourage participation (Section 195(1) (e) to (g)).

The National Environmental Management Act (Act 107 of 1998)

The National Environmental Management Act (Act 107 of 1998) commonly known as "NEMA" is South Africa's overarching framework for environmental legislation. The object of NEMA is to provide for operative environmental governance by establishing principles for decision-making on matters affecting the environment, institutions that will promote co-operative governance, and procedures for co-ordinating environmental functions exercised by organs of state.

It sets out a number of principles that aim to give effect to the environmental policy of South Africa. These principles are designed to, amongst others, serve as a general framework for environmental planning, as guidelines by reference to which organs of state must exercise their functions and guide other law concerned with the protection or management of the environment.

The principles include a number of internationally recognised environmental law norms and some principles specific to South Africa, i.e. the:

- Preventive principle;
- Precautionary principle;
- Polluter pays principle; and
- Equitable access for the previously disadvantaged to ensure human wellbeing.

Chapter 5 of NEMA is designed to promote integrated environmental management. Environmental management must place people and their needs at the forefront of its concerns, and serve their physical, psychological, developmental, cultural and social interests equitably. Development must be socially, environmentally and economically sustainable. Sustainable development therefore requires the consideration of all relevant factors including:

The avoidance, or minimisation and remediation, of disturbance of ecosystems and loss of biological diversity;

The avoidance, or minimisation and remediation, of pollution and degradation of the environment;

The avoidance, or minimisation and remediation, of disturbance of landscapes and sites that constitute the nation's cultural heritage;

That waste is avoided, or, minimised and re-used or recycled where possible and otherwise disposed of in a responsible manner;

That the use and exploitation of non-renewable natural resources should be undertaken responsibly and equitably;

That the development, use and exploitation of renewable resources and the ecosystem of which they are part should not exceed the level beyond which their integrity is jeopardised;

The application of a risk-averse and cautious approach; and

That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

Regulations promulgated under NEMA include the Environmental Impact Assessment regulations published under Government Notice No. 983 for those activities that require environmental authorisation by means of a Basic Assessment Process or an Environmental Impact Assessment (EIA) Process.

## **7.1. EIA Guidelines published under NEMA**

The following guidelines have been considered in the production of this EIAR Report:

DEAT (2002) Scoping, Integrated Environmental Management, Information Series 2, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT (2005) Guideline 3: General Guide to the Environmental Impact Assessment Regulations, 2005, Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT (2005) Guideline 4: Public Participation in support of the EIA Regulations, 2005. Integrated Environmental Management Guideline Series. Department of Environmental Affairs and Tourism (DEAT), Pretoria.

DEAT (2006) Guideline 5: Assessment of Alternatives and Impacts in support of the Environmental Impact Assessment Regulations, 2006. Integrated Environmental Management Guideline Series, Department of Environmental Affairs and Tourism (DEAT), Pretoria.

## **7.2. Environment Conservation Act 73 of 1989**

The objectives of the Environment Conservation Act 73 of 1989 ("ECA") are to provide for the effective protection and controlled utilization of the environment. Following the enactment of NEMA, a number of the powers of the Act have either been repealed or assigned to the provinces. These include the EIA Regulations for activities that were regarded as detrimental to the environment and were published under Government Notice Regulation 1182 of 05 September 1997, as amended. New EIA Regulations have been promulgated under Section 24(5) of NEMA and are published under Government Notices No. 982, 983, 984 and 985.

# **8. DESCRIPTION OF PROPOSED ACTIVITY & ALTERNATIVES**

## **8.1. Location of the proposed activity**

The proposed development is located on Portion 1 of the Farm Tevrede 210, R/E of the Farm Leeuwfonteins 51, Portion 14 and 17 of the Farm Louterbronnen 250, Farm Mooimeisjes Fontein 451 and R/E of the Farm Theunissens 610, Masilonyana Local Municipality, Free State Province.

The site is located approximately 2km north of Theunissen. The co-ordinates of the site are

Latitude (S):			Longitude (E):		
28°	24'	42.11"	26°	42'	47.35 "

The proposed site is not largely disturbed beside the informal foot path roads by the neighbouring Masilo residents.

### 8.2. Ownership, Responsibilities and Zoning

MLM is both the landowner of the proposed site and the proponent and applicant for environmental authorisation. The total area of the proposed site is approximately 90 Ha. The land is currently undeveloped and zoned as "undetermined" but earmarked for residential township establishment.

### 8.3. Description of Proposed Activity

The proposed activity is the establishment of a low-cost housing development the construction of low-cost housing units as well as associated infrastructure, bulk services, and social and economic facilities. As the area is close to existing infrastructure it should be easily integrated into the bulk service infrastructure. With regard to services, running water will be supplied, either to each stand or to RDP standards every 200 meters. It is expected that electricity will be supplied from the existing supply and water-borne sewage will feed into the MLM reticulation system.

### 8.4. Need and Desirability of Proposed Activity

In 2004, the Department of Housing declared the desire to eradicate informal settlements in South Africa by 2014 following the unprecedented housing backlog, proliferation of informal settlements, social exclusion and the inability of municipalities to provide basic infrastructure to the urban poor households.

Housing and service delivery is a key challenge facing the Masilonyana Local Municipality (MLM). According to the MLM's Integrated Development Plan (2014/15 – 12th edition) the MLM has a housing backlog of 47,442 units (15,752 units in informal areas and 30,202 backyard shacks) and has identified the provision of quality housing and the structured upgrading of informal settlements as one of their main objectives.

In terms of the Municipal Systems Act 32 of 2000, all municipalities (i.e. metropolitan, district and local) have to undertake an Integrated Development Plan (IDP) process to produce IDPs. As the IDP is a legislative requirement it has a legal status and it

supersedes all other plans that guide development at local government level. The provision of integrated and sustainable human settlements is listed as one of the strategic objectives of the Municipality's IDP (13th ed.), which means that housing must be accompanied by the provision of other services and amenities required to improve the socio-economic conditions of the residents of that area (i.e. access to community facilities such as educational, entertainment, cultural, health, sports and welfare services).

The area of Theunissen was identified in the 13th edition of the MLM IDP as a restructuring zone for social housing and Theunissen was identified as a precinct where residential expansion needs to take place

### **8.5. Potential Alternatives**

The applicant requests exemption from having to assess alternatives, because Masilonyana Local Municipality (MLM) in line with the SDF has already set aside and subdivided the site for low-cost housing. MLM, in line with the SDF, has identified

Portion 1 of the Farm Tevrede 210, R/E of the Farm Leeuwfonteins 51, Portion 14 and 17 of the Farm Louterbronnen 250, Farm Mooimeisjes Fontein 451 and R/E of the Farm Theunissens 610 as an area that can be used for a high-density settlement. The low cost housing development would not only provide much needed housing, social services and community facilities, but also enable the area to be serviced more economically.

This low-cost housing development will, in terms of the MLM Implementation Plan redress the number of informal settlements and address the housing shortage within the MLM area; it will accommodate previously disadvantaged individuals who cannot afford houses; and it will create employment opportunities in both the construction and operational phases.

### **8.6. No-go Alternative**

The No-go Alternative would mean that the proposed low-cost housing development would not be constructed at the proposed site and the land would remain vacant. Vacant land may result in more informal settlement development; illegal dumping; vegetation clearing for firewood; and alien plant invasion.

## **9. PUBLIC PARTICIPATION PROCESS**

The EIA Regulations specify that a public participation process must be conducted as an integral part of the EIA. The public participation followed the process stipulated in Section 56 of the 2006 EIA Regulations. This chapter outlines the public participation process followed.

### **9.1. Notification of Interested and Affected Parties (I&AP's)**

Section 56 of the EIA Regulations outlines the requirements for the notification of all potential I&AP's. These requirements typically include the following:

- Giving notification to:
  - The landowners and occupiers of the project site and those within 100m of the project site and alternative sites, or those directly influenced by the activity under consideration;
  - The municipality that has jurisdiction over the area;
  - The municipal councillors of the affected wards; and
  - Any organ of state having jurisdiction in respect of any aspect of the activity.
- Placing an advertisement in a local and a provincial newspaper; and
- Fixing a notice board at a conspicuous place on all alternative sites.

Notification of Landowners, Authorities, and Organs of State

Surrounding landowners and occupiers of land within 100 metres of the proposed project site were notified by hand delivered letters of the applicant's intention to submit an application to the competent authority.

### **9.2. Newspaper Advertisement**

A newspaper advertisement detailing information about the project and the EIA process that has since been finalised, as well as calling for the registration of I&AP's, was placed on 01 March 2016 in the Masilonyana Newspaper, the regional newspaper for the surrounding area. The advertisement provided I&APs 30 days to register and to submit their comments in writing to Watercube Services. The closing date for registration was therefore 31 March 2016.

### **9.3. Notice Board**

An A3 size notice board detailing information about the project and the EIA process was erected on site at a recognised public area.



*Figure 1. Notice board erected on site*

It should be noted that an exemption was granted not to undertake further consultation.

#### **9.4. Background Information Document**

At commencement of the project a Background Information Document (BID) was prepared and sent to I&APs that provided a summary of the details of the proposed project as well as the EIA process that was to follow.

#### **9.5. Public Meeting**

As the proposed activity was limited in extent and very little interest was received from the public, a public meeting was not deemed necessary. Instead, the I&APS were consulted individually.

### **10. DESCRIPTION OF THE RECEIVING ENVIRONMENT**

#### **10.1. Introduction**

This chapter provides a description of the receiving environment within the study area. This description has not been informed by any specialist studies undertaken for this assessment but includes information attained from various literature sources and is described at a level deemed appropriate for a Scoping study. Additional detailed information will unfold in the EIA phase. Three components to the environment are recognised:

- Physical Environment;
- Biological Environment; and
- Socio-Economic Environment; and
- Built Environment



Only those elements of the environment that have a direct bearing on the impact assessment process of the project are discussed. The severity of the potential impacts is largely determined by the state of the receiving environment. For example, the construction of a housing development in a pristine wetland habitat would have far more significant ecological impacts than the construction of a housing development in a residential area.

## **11. PHYSICAL ENVIRONMENT**

### **11.1. Climate**

The study area is located in the summer rain fall zone of the Republic of South Africa. The mean annual precipitation of the study area is approximately 670mm according to the weather station. The maximum temperature seldom rises above 35 degrees Celsius and the minimum seldom reach -3 degree Celsius. The mean daily temperatures averaging from 14 to 26 °C

### **11.2. Topography**

The topography of the area is characterised as moderately flat. The average slope is approximately 2.5% north-east.

### **11.3. Geology**

According to the Geological Map of South Africa, 1985, Scale 1:250 000 the site is underlain by Sediments (sandstones, shale, siltstones) and dolomite which are the Karoo Super Group.

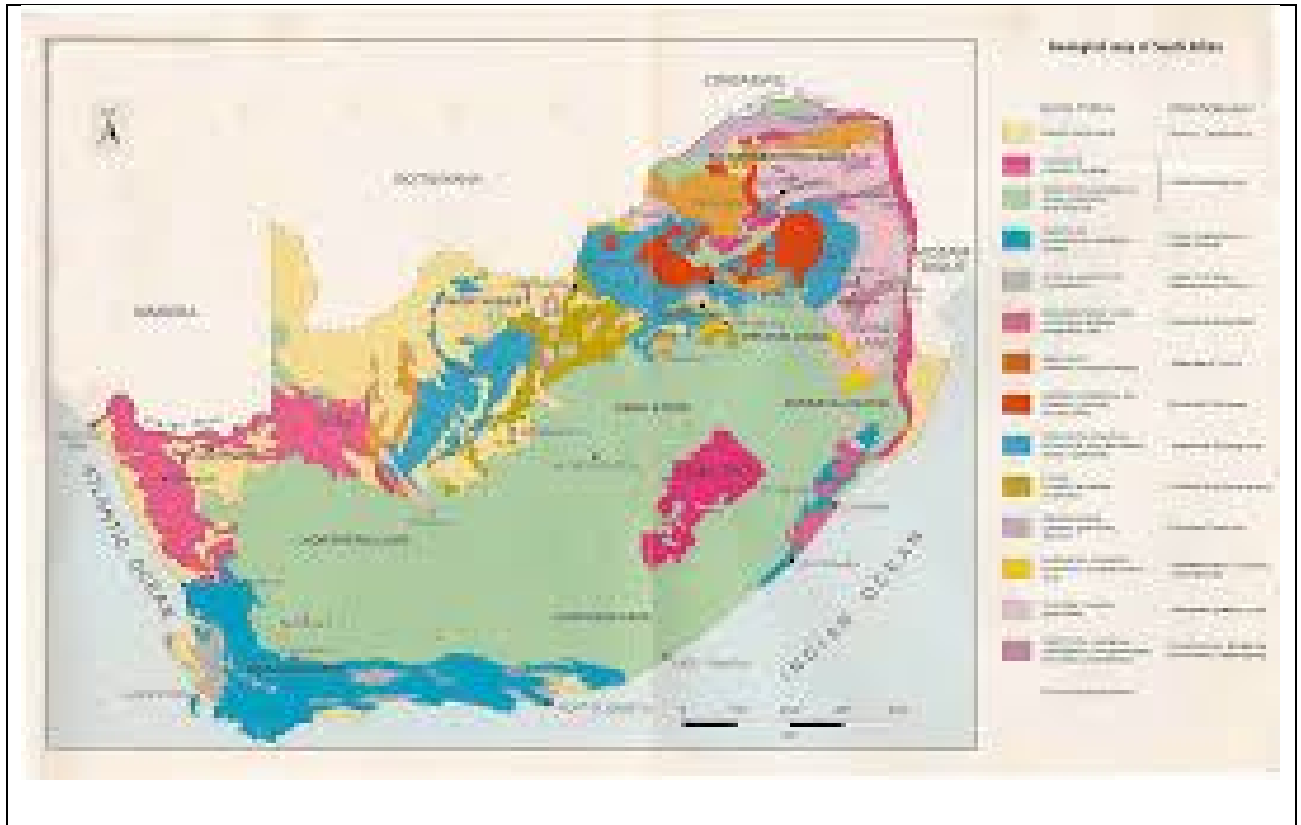


Figure 2. Indicating soil distribution.

The area is covered by two main soil types:

- Slightly moist, reddish brown to dark brown fine grained, sandy clay with roots.
- Dry olive brown medium grained clayey weathered rock

## 12. SURFACE HYDROLOGY

The study area falls within the Quaternary catchment area C41G. Surface water mainly flows overland to small streams that drain to the Taalboschspruit.

The mean annual runoff is 50 – 100 mm over the total area. The mean annual evaporation is 1600 - 1700mm according to the Surface Water Resources of SA 1990.

### 12.1. Biological Environment

Faunal populations are dependent on the flora that supports them therefore assumptions regarding the presence of fauna can be made based on the flora present. Habitats within the study area are dominated by grassland biome vegetation type. The site falls in Vaal-Vet Sandy Grassland, which has an ecosystem status of vulnerable. This habitat will then further disturbed / degraded during the construction of the township development and impact of the vulnerable ecosystem within Theunissen will be permanent.

The study areas fall under the Vaal-Vet Sandy Grassland vegetation which is vulnerable and conserved biodiversity area. According to Mucina and Rutherford, (2006), only about 1% of the vegetation type is already transformed.

No Red Data plant species were recorded in this study. This could be attributed to the destruction and fragmenting of natural habitats and in some alternative routes, disturbance from human settlements. Currently this vegetation unit is considered to be Least threatened with a conservation target of 24%.

### **12.2. Socio-Economic Environment**

It is known for its diversified economy: agriculture, mining and tourism are the dominant sectors. Level of education is low with only 27.60% of the population having higher education and 7.8 having no education at all. MLM is further characterized by low level of income, with 50.60% of the population earning below R800.00 per month. Unemployment is high at 30.40% of which youth unemployment (15-34) accounts for 38.2 (Masilonyana Local Municipality IDP, 2015).

### **12.3. Built Environment**

The built environment surrounding the proposed development area ranges from high density low-income housing and informal rural type settlements to large mining and agriculture developments. Developments located adjacent to the proposed settlement are informal settlement, with limited infrastructure that only meets RDP Standards. Social facilities within the area are lacking, with the nearest school being located some few kilometres from the site.

### **12.4. Service Infrastructure**

No infrastructure is currently in place on site; however, electricity, sewer and water will be connected onto existing bulk infrastructure currently servicing the surrounding areas.

### **12.5. Roads**

One access route to the site is proposed, via existing roads. Access to the majority of the area will take place from Main road (where a 60 – 80 m length of 6 m wide tarred road surface is proposed)

### **12.6. Bulk Water supply**

Water will be supplied from the nearest reservoir. Bulk sewer infrastructure sewerage from the development will be conveyed via an existing 1200 mm diameter pipeline to the existing Wastewater Treatment Works. A proposed 150 mm diameter and a proposed 150 mm diameter pipeline from the south-west of the site.

## 12.7. Bulk Electricity Supply

The MLM has confirmed that electricity supply can be made available to the proposed development, and it is proposed that existing power lines in the area will be used.

Substations may be required but the location thereof has not yet been determined, and any environmental authorisations required fall outside the scope of this EIA.

## 12.8. Solid Waste Management

Solid waste management services are to be provided by the MLM, in accordance with the national Domestic Waste Collection Standards. This will include regular weekly removal of domestic refuse to the approved Landfill site.

## 13. METHODOLOGY IN ASSESSING IMPACTS

### 13.1. Introduction

This chapter outlines the generic methodology that will be followed when evaluating impacts. This generic methodology will be used when assessing the significance of the impacts related to the key issues and impacts raised in Section 8 Environmental Issues and Impacts.

### 13.2. Methodology

#### 13.2.1. Significance of Impact

This should be described as follows:

**High:** Where it could have a no-go implication for the project irrespective of any possible mitigation.

**Medium:** Where the impact could have a moderate influence on the environment, which would require modification of the project design or alternative mitigation.

**Low:** Where the impact would have little influence on the environment and would not require the project design to be significantly accommodated.

**None:** Where the impact would have no influence on the environment and would not require the project design to be accommodated at all.

The significance of the impact should be determined through the following criteria:

#### (a) Nature of Impact

This includes a brief description of how the proposed activity will impact on the environment. This should be stated as:

- Positive (a benefit),

- Negative (a cost) or
- Neutral.

#### **(b) Extent**

This refers to the geographic area on which the activity will have an influence and can include the following extents:

- Project site – the immediate location of the activity;
- Study area – the proposed area and its immediate environs within a 5 km radius of the activity;
- Catchment – area of land from which rainfall drains into a river;
- Local – Local Municipality;
- District;
- Regional – Province;
- National – Country; or
- International

#### **(c) Duration**

This refers to the expected timeframe of an impact and can be expressed as:

- Short term (0 – 5 years);
- Medium (5 – 15 years);
- Long term (15 – 40 years, but where the impact ceases after operation); or
- Permanent (over 40 years and resulting in a permanent and lasting change that will always be there).

#### **(d) Likelihood**

This considers the likelihood of the impact occurring and should be described as:

- Unlikely (where the impact is unlikely to occur);
- Likely (where there is a good probability, < 50 % chance that the impact will occur);
- Highly likely (where it is most likely, 50-90 % chance, that the impact will occur); or

· Definite (where the impact will occur, > 90 % chance of occurring, regardless of any prevention measures).

#### **(e) Severity Scale**

The severity is used to evaluate how severe negative impacts would be on the environment, and is described as follows:

- Very high (an irreversible and permanent change that cannot be mitigated);
- High (long term impacts that could be mitigated, however this mitigation would be difficult, expensive or time consuming);
- Medium (medium term impacts that could be mitigated);
- Low (short term impacts with mitigation being very easy, cheap, less time consuming or not necessary); or
- No effect (no impact by the proposed development).

#### **(f) Beneficial Scale**

The beneficial scale is used to evaluate how beneficial positive impacts would be on the environment, and is described as follows:

- Very High (a permanent and very substantial benefit with no real alternative to achieving this benefit);
- High (a long term impact with substantial benefit, and alternative ways of achieving this benefit being difficult, expensive or time consuming);
- Medium (a medium term impact of benefit with other ways of achieving this benefit being difficult, expensive and time consuming);
- Low (a short term impact and negligible benefit with other ways of optimising the benefits being easier, cheaper and quicker); or
- No effect (no impact by the proposed development).

#### **(g) Degree of confidence**

It is also necessary to indicate the degree of confidence with which one has predicted the significance of an impact, based on the availability of information and specialist knowledge. For this reason, a 'degree of confidence' scale has been provided to enable the reader to determine the certainty of the assessment of significance:

- High - More than 90% sure of a particular fact.

- Medium - Over 70% sure of a particular fact, or of the likelihood of that impact occurring.
- Low - Over 40% sure of a particular fact or of the likelihood of an impact occurring.
- Unsure - Less than 40% sure of a particular fact or of the likelihood of an impact occurring.

#### **(h) Other Aspects**

Other aspects that should be taken into consideration are:

- Impacts should be described both before and after the proposed mitigation and management measures have been implemented;
- All impacts should be evaluated for the full life cycle of the proposed development including construction and operational phases;
- The impact evaluation should take into account the cumulative effects of other activities which have occurred or are in the process of occurring within the study area; and
- Legal requirements (a list of the specific legal and permit requirements that could be relevant to the proposed project should be identified).

#### **13.2.2. Mitigation and monitoring**

Where negative impacts are identified, mitigation measures (ways of reducing impacts) should be set and where positive impacts are identified, ways of enhancing these impacts should also be mentioned. Where no mitigation is feasible, this should be stated and the reasons given. Quantifiable standards against which the effectiveness of the mitigation can be measured should be set. This may include input into monitoring and management programmes.

### **14. ISSUES AND IMPACT ASSESSMENT**

This chapter provides an assessment of the impacts (including cumulative) associated with each issue and further includes mitigation measures to be implemented to reduce the significance of negative impacts.

#### **14.1. ISSUE: SOIL LOSS AND EROSION**

##### **14.1.1. Issue**

During construction, the clearing and removal of vegetation, the digging of structure foundations, and earthworks may expose soils to wind and rain and could result in localised erosion. Furthermore, soils will be stockpiled during construction and could become vulnerable to erosion. The channelling of storm water may lead to the formation

of gullies. The engineering report identified steep slopes along the streams, varying from a 3% to 8% gradient. These slopes are to be regarded as areas sensitive to erosion.

**Table 3. Impacts surrounding soil loss and erosion**

<b>ISSUE:</b>	<b>SOIL LOSS AND EROSION</b>	
Project Phase	Construction and Operation	
Impact	Erosion	Siltation of Drainage Channels
Probability	Likely	Likely
Degree to which impact cannot be reversed	Low	Medium
Degree to which Impact may cause irreplaceable loss of resources	Low	High
Confidence level	High	Medium
Significance Pre Mitigation	Medium (-ve)	Medium (-ve)
Significance Post Mitigation	Low (-ve)	
Degree of Mitigation		
Nature	Negative (direct)	Negative (direct and indirect)
Extent	Site	Study area
Duration	Short Term	Medium Term

### 14.1.2. Recommended Mitigation

#### (a) Construction

- Removal of vegetation to take place only within demarcated construction site. Non-essential removal of vegetation to be avoided;
- No work is to be conducted within 30 metres of all drainage lines;
- Formal runoff prevention to be implemented on steep slopes. These could be in the form of beams, netting, barriers constructed out of topsoil or flatter road surfaces; and
- No development on slopes with a gradient > 16%





**Table 4. Impacts surrounding ground and surface water quality**

<b>ISSUE:</b>	<b>GROUND AND SURFACE WATER QUALITY</b>	
Project Phase	Construction and Operation	
Impact	Pollution of Surface and Ground Water systems	Health Impacts
Probability	Likely	Unlikely
Degree to which impact cannot be reversed	Low	Medium
Degree to which Impact may cause irreplaceable loss of resources	Low	Low
Confidence level	High	Medium
Significance Pre Mitigation	Low (-ve)	Low (-ve)
Significance Post Mitigation	Low (-ve)	Low (-ve)
Degree of Mitigation	Easily Mitigated	Moderately Mitigated
Nature	Negative (direct)	Negative (indirect)
Extent	Local	Local
Duration	Short Term	Medium Term

#### **14.2.2. Recommended Mitigation**

The following measures should be adhered to in order to limit the impact of the construction phase on the quality of water in the area:

##### **(a) Construction**

- No construction camps within 50 m of drainage line and standing water source;
- No water abstraction for construction from streams;
- No mixing of concrete to occur within 50 m of water course;
- Appropriate containment structures to be provided;
- No construction activities to occur in any wetlands;

- No concrete batching to occur directly on the ground;
- All fuel storage to be appropriately bunded;
- Plant to have drip trays to contain any potential leakages of fuels and oils; and
- Ablutions for construction workers.

### **(b) Operation**

- All sewerage to be transported within the municipal sewer systems; and
- Pump stations to have backup facilities and 24 hour emergency storage.

## **14.3. Issue: Potential Flooding**

### **14.3.1. Issue**

If managed correctly the construction activities onsite are unlikely to increase the potential for flooding in the area. However, the impact on lower lying areas should be verified. Once complete, the development will cause an increase in hard standing areas, such as roads, houses, roofs, etc. This will result in an increase in the volumes of storm water, which may lead to localised flooding. It is planned that the proposed development will direct storm water off-site thereby minimising the potential for flooding. However this is based on the assumption that storm water management is adequately addressed in the design.

**Table 5. Indicates the issue of the flood potential**

<b>ISSUE:</b>	<b>FLOOD POTENTIAL</b>	
Project Phase	Operation	
Impact	Loss of Property	Public Safety
Probability	Unlikely	Unlikely
Degree to which impact cannot be reversed	High	High
Degree to which Impact may cause irreplaceable loss of resources	Low	Low
Confidence level	Medium	Medium
Significance Pre Mitigation	Medium (-ve)	Medium (-ve)
Significance Post Mitigation	Low (-ve)	Low (-ve)
Degree of Mitigation	Easily Mitigated	Moderately Mitigated
Nature	Negative (direct)	Negative (direct)
Extent	Catchment	Catchment

Duration	Long Term	Long Term
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### 14.3.2. Recommended Mitigation

On-site measures to attenuate peak flood discharge. This could be achieved through on-site water detention, grass-line swales, storm water infiltration systems, landscaping or a combination of the aforementioned; No development within 100 year flood line boundary;

## 14.4. Issue: Air Quality

### 14.4.1. Issue

The clearing of vegetation in preparation for construction exposes the soil to dust which increases the Particulate Matter concentration in the atmosphere. PM is documented as contributing to respiratory tract infections, especially in rural areas much like the proposed site. Furthermore, heavy construction vehicles will be required during construction of the development. This could impact on air quality by pollution through exhaust emissions, as well as dust created by vehicles and the construction plant.

**Table 6.** Impacts surrounding the quality of air

<b>ISSUE:</b>	<b>AIR QUALITY</b>	
Project Phase	Construction	
Impact	Atmospheric pollution	Public Health
Probability	Likely	Likely
Degree to which impact cannot be reversed	High	High
Degree to which Impact may cause irreplaceable loss of resources	Low	Low
Confidence level	Low	Medium
Significance Pre Mitigation	Low (-ve)	Medium (-ve)
Significance Post Mitigation	Low (-ve)	Low (-ve)
Degree of Mitigation	Easily Mitigated	Easily Mitigated
Nature	Negative (direct)	Negative (direct)
Extent	Regional	Local
Duration	Long Term	Short Term

#### 14.4.2. Recommended Mitigation

- Vegetated areas should not be cleared prematurely and exposed soil surfaces should be monitored, so not to further contribute to dust levels;
- Unnecessary clearing of vegetation to be avoided at all times;
- Dust suppression strategies should be implemented; and
- All plant to be of good condition with acceptable smoke emissions.

#### 14.5. Issue: Biodiversity

##### 14.5.1. Issue

The biodiversity studies found that there is no wetland on the study site and the Grassland Biome and the Savanna Biome was deemed natural grassland that are considered less sensitive and should not be excluded from development as far as possible. The site has already undergone transformation from its perceived natural state. With regards to flora, there are no known red data species or significant indigenous vegetation on-site or within the project area, however upon when clearing commences these may be revealed. There will be limited habitat destruction, however it is believed that few mammals and reptiles may be impacted, particularly those that are nesting at the time. The site is currently used for grazing and is regularly burnt which has impacted on biodiversity. Habitat fragmentation is likely, but the impact should not be as severe due to the degraded nature of the site.

**Table 7. Impacts on Biodiversity**

<b>ISSUE:</b>	<b>BIODIVERSITY</b>	
Project Phase	Construction and Operation	
Impact	Impacts to Vegetation Types of Conservation Importance	Vegetation Impacts
Probability	Likely	Definite
Degree to which impact cannot be reversed	Medium	Medium
Degree to which Impact may cause irreplaceable loss of resources	Not Replaceable	Moderately Replaceable
Confidence level	High	High
Significance Pre Mitigation	Low (-ve)	Medium (-ve)
Significance Post Mitigation	Low (-ve)	Low (-ve)

Degree of Mitigation	Easily Mitigated	Easily Mitigated
Nature	Negative (direct and indirect)	Negative (direct)
Extent	Site	Site
Duration	Long Term	Long Term

**Table 8. Impacts on Biodiversity (continued)**

<b>ISSUE:</b>	<b>BIODIVERSITY</b>	
Project Phase	Construction and Operation	
Impact	Disturbance to Resident Fauna	Habitat Fragmentation
Probability	Likely	Likely
Degree to which impact cannot be reversed	Medium	Medium
Degree to which Impact may cause irreplaceable loss of resources	Not reversible	Not reversible
Confidence level	Medium	High
Significance Pre Mitigation	Low (-ve)	Medium (-ve)
Significance Post Mitigation	Low (-ve)	Low (-ve)
Degree of Mitigation	Moderately Mitigated	Not Easily Mitigated
Nature	Negative (direct)	Negative (direct)
Extent	Site	Site
Duration	Medium Term	Medium Term

#### **14.5.2. Recommended Mitigation**

Care be taken to conserve the natural grassland in this proposed area through a management plan and through the implementation of the mitigation measures proposed in this specialist report.

#### **14.6. Issue: Employment**

##### **14.6.1. Issue**

The construction of the proposed development is likely to provide short term employment for casual labourers in the surrounding informational residential settlement.

This may lead to increased skills development through contractor training. This is a positive impact of the project on employment in the surrounding area.

#### 14.6.2. Recommended Mitigation

- Contractors should be encouraged to source labour from surrounding areas; and
- External construction workers should be housed in secure camp and are to abide by rules of the EMP to prevent public disruption (i.e. Spread of HIV/AIDS, crime, public disturbance).

**Table 9. Issue of Employment.**

<b>ISSUE:</b>	<b>EMPLOYMENT</b>	
Project Phase	Construction	
Impact	Job Creation	Construction Workers
Probability	Highly Probable	Probable
Degree to which impact cannot be reversed	Low	Low
Degree to which Impact may cause irreplaceable loss of resources	Low	Low
Confidence level	Medium	Medium
Significance Pre Mitigation	Low (+ve)	Medium (-ve)
Significance Post Mitigation	Medium (+ve)	Low (-ve)
Degree of Mitigation	Easily Mitigated	Easily Mitigated
Nature	Positive (direct and indirect)	Negative (direct)
Extent	Regional	Local
Duration	Short Term	Short Term

### 14.7. Issue: Land Use

#### 14.7.1. Issue

The proposed development will result in a change in land use, with some loss vegetation. However, it will impact positively on the current housing shortage within the MLM area because it will aim to address the number of informal settlements as well as providing housing to previously disadvantaged individuals who cannot afford houses.

**Table 10. Impacts surrounding the establishment of Housing**

<b>ISSUE:</b>	<b>LAND USE</b>	
Project Phase	Operation	
Impact	Provision of Housing	Community Upliftment
Probability	Definite	Probable
Degree to which impact cannot be reversed	Low	Low
Degree to which Impact may cause irreplaceable loss of resources	Low	Low
Confidence level	High	Medium
Significance Pre Mitigation	Medium (+ve)	Low (-ve)
Significance Post Mitigation	High (+ve)	Medium (-ve)
Degree of Mitigation	NA	NA
Nature	Positive (direct)	Positive (direct and indirect)
Extent	Local	Local
Duration	Long Term	Long Term

#### **14.8. Issue: Visual and Noise**

The proposed development will impact on the environment both visually and through limited noise pollution. The project site is currently adjacent to a residential and industrial area and therefore the construction of the development will disturb the landscape to a limited extent. Noise levels are expected to rise during the construction phase of the development. Construction activities that cause noise include vehicle trafficking, generator noise, pressure hammers and construction worker's voices, etc. These noise levels are not assessed to be a nuisance to adjacent residents and communities.



**Table 11. Noise and Visual Impacts**

<b>ISSUE:</b>	<b>NOISE AND VISUAL</b>	
Project Phase	Construction	Construction and Operation
Impact	Noise	Visual Impacts
Probability	Highly Probable	Highly Probable
Degree to which impact cannot be reversed	Medium	Medium
Degree to which Impact may cause irreplaceable loss of resources	Medium	Medium
Confidence level	Medium	Medium
Significance Pre Mitigation	Low (-ve)	Medium (-ve)
Significance Post Mitigation	Low (-ve)	Low (-ve)
Degree of Mitigation	Easily Mitigated	Moderately Mitigated
Nature	Negative (direct)	Negative (direct)
Extent	Local	Site
Duration	Short Term	Long Term

## 14.9. Recommended Mitigation

### 14.9.1. Noise

- Designated working hours;
- Silencers on plant, construction vehicles and equipment; and
- Location of construction workers camp.

### 14.9.2. Visual

- Ensure site is maintained in a cleanly fashion;
- Construction completed on time;

- Site vegetation correctly according to rehabilitation guidelines stated in the EMP; and
- Construction waste is not to enter the biophysical or socio-economic environment. Contractors to produce waste management plans to mitigate potential impacts.

## 14.10. Issue: Health and Safety

### 14.10.1. Issue

The proposed development has minimal potential to create a health and safety risk for neighbouring residents from the community. The construction of the development does pose a health and safety risk to construction workers. This can be mitigated with the correct implementation of a health and safety plan to be developed by the contractor.

**Table 12. Issue of Health and Safety**

<b>ISSUE:</b>	<b>SAFETY</b>	
Project Phase	Construction	
Impact	Construction Workers	Public
Probability	Highly Probable	Probable
Degree to which impact cannot be reversed	Low	Low
Degree to which Impact may cause irreplaceable loss of resources	Low	Low
Confidence level	Medium	Medium
Significance Pre Mitigation	Medium (-ve)	Low (-ve)
Significance Post Mitigation	Low (-ve)	Low (-ve)
Degree of Mitigation	Easily Mitigated	Easily Mitigated
Nature	Negative (direct)	Negative (direct and indirect)
Extent	Site	Local
Duration	Short Term	Short Term

## **14.10.2. Recommended Mitigation**

### **Public**

- Site demarcated and access to public is to be prohibited;
- Safety and informative signage to be erected;
- Off-site movement of construction vehicles to adhere to rules of the road; and
- Pedestrians have the right of way.

### **Construction Workers**

- To adhere to on-site Health and Safety guidelines; and
- A health and safety plan is to be developed and implemented as soon as land clearing commences.

## **14.11. Issue: Solid Waste Pollution**

### **14.11.1. Issue**

The construction phase of the development is likely to generate waste from clearing of vegetation, builder's rubble, general construction refuse and minor hazardous waste including paint tins, cleaning acids, asphalt's and oils. The development could therefore impact on the environment by generating solid waste pollution. The contractor and developer should ensure that all the waste generated by the development is appropriately disposed of at the recommended waste disposal sites close to the area. During the operations phase, Municipal waste management will service the proposed residential area. The licensed Waste Disposal Site is nearby the proposed development and has sufficient capacity to deal with waste produced on the proposed township development

**Table 13. Impacts surrounding Solid Waste**

ISSUE:	SOLID WASTE POLLUTION	
Project Phase	Construction	Operation
Impact	Construction Waste	General Waste
Probability	Highly Probable	Highly Probable
Degree to which impact cannot be reversed	Medium	Medium
Degree to which Impact may cause irreplaceable loss of resources	Low	Low
Confidence level	Medium	Medium
Significance Pre Mitigation	Medium (-ve)	Medium (-ve)
Significance Post Mitigation	Low (-ve)	Low (-ve)
Degree of Mitigation	Easily Mitigated	Easily Mitigated
Nature	Negative (direct)	Negative (direct and indirect)
Extent	Regional	Regional
Duration	Short Term	Long Term

### **14.11.2. Recommended Mitigation**

#### **Construction Waste**

- To be removed from site promptly and deposited at permitted landfill site;
- No construction waste should enter the surrounding environment; and
- No cleared vegetation to be burnt on-site.

#### **General Waste**

- Waste to be collected regularly by municipality and deposited at permitted landfill site;

- MLM to develop a formal waste collection strategy;
- Roads design to cater for refuse collection trucks; and
- No waste should enter the surrounding environment.

## 14.12. Issue: Heritage Resources

### 14.12.1. Issue

No features of cultural, historical or heritage significance or buildings/structures/graves greater than 60 years old were identified at the project site during the site visit. Therefore the proposed development should not impact on the heritage resources of the area.

**Table 14.** Issue of Heritage Resources

<b>ISSUE:</b>	<b>HERITAGE</b>
Project Phase	Construction and Operation
Impact	Heritage Resources
Probability	Unlikely
Degree to which impact cannot be reversed	N/A
Degree to which Impact may cause irreplaceable loss of resources	N/A
Confidence level	Medium
Significance Pre Mitigation	N/A
Significance Post Mitigation	N/A
Degree of Mitigation	Easily Mitigated
Nature	Neutral
Extent	Site
Duration	Short Term

#### 14.12.2. Recommended Mitigation

No heritage resources were identified on site and therefore no mitigation measures are required. Should any artefacts, graves or features that may be of heritage value be excavated during the construction phase, work must stop and the heritage agency is to be notified immediately. Work may only commence once approval is given from the heritage agency.

#### 14.13. Cumulative Impacts

The following cumulative impacts could be associated with a development of this nature.

##### 14.13.1. Social

A development of this nature will cumulatively impact on the number of informal settlements, address the current housing shortage and will also create jobs throughout the construction and operation phases. It is essential to weigh the negative versus the positive impacts to obtain an overall cumulative social impact.

**Table 15. Cumulative impacts on society**

Issue	Impact	Significance Post mitigation	Interaction Opportunity	Significance of cumulative impact
Social Issues	Provision of Jobs	Low (+ve)	It is highly likely that these impacts will interact during either the construction phase, the operational phase or both.	Due to the location of the site it is not anticipated that the cumulative impact will be significant. Rather it is expected that the significance of the impact will be Medium (+ve).
	Provision of Housing	High (+ve)		
	Community Upliftment	Low (+ve)		
	Noise	Low (-ve)		
	Construction Workers	Low (-ve)		

## **15. ASSUMPTIONS AND KNOWLEDGE GAPS**

The following assumptions and knowledge gaps have an influence on the assessment of the impacts in the EIA:

Site investigations and consultation with the community did not provide any evidence of sensitive heritage resources. It is therefore assumed that the site does not contain any resources of heritage value. However, there may be sensitive heritage resources subsurface which will only be discovered once excavations commence. Should this be the case the correct procedure would be to contact the responsible provincial and national heritage authorities; and

The heritage agency was notified at commencement of the EIA and no further feedback was obtained.

## **16. ENVIRONMENTAL IMPACT STATEMENT**

### **16.1. Need and Desirability**

In 2004, the Department of Housing declared the desire to eradicate informal settlements in South Africa by 2014 following the unprecedented housing backlog, proliferation of informal settlements, social exclusion and the inability of municipalities to provide basic infrastructure to the urban poor households.

Housing and service delivery is a key challenge facing the Masilonyana Local Municipality (MLM). According to the MLM's Integrated Development Plan (2014/15 – 12th edition) the MLM has a housing backlog of 47,442 units (15,752 units in informal areas and 30,202 backyard shacks) and has identified the provision of quality housing and the structured upgrading of informal settlements as one of their main objectives.

In terms of the Municipal Systems Act 32 of 2000, all municipalities (i.e. metropolitan, district and local) have to undertake an Integrated Development Plan (IDP) process to produce IDPs. As the IDP is a legislative requirement it has a legal status and it supersedes all other plans that guide development at local government level. The provision of integrated and sustainable human settlements is listed as one of the strategic objectives of the Municipality's IDP (13th ed.), which means that housing must be accompanied by the provision of other services and amenities required to improve the socio-economic conditions of the residents of that area (i.e. access to community facilities such as educational, entertainment, cultural, health, sports and welfare services).

The area of Theunissen was identified in the 13th edition of the MLM IDP as a restructuring zone for social housing and Theunissen was identified as a precinct where residential expansion needs to take place.

## **16.2. Positive and Negative Impacts**

The Scoping and EIA phases of this project have not identified any fatal flaws which should prevent the project from proceeding.

Positive direct impacts include job creation and community upliftment. Furthermore, the development will address the shortage of formal housing in the Theunissen area.

Positive indirect impacts include utilising the 'undetermined' open area of land for the betterment of the community, instead of leaving it vacant and at the mercy of land invaders, therefore creating future problems for the Biophysical and Socio-economic environment. Post mitigation negative impacts discussed in this report are all rated as Low Significance.

## **16.3. Alternatives**

Portion 1 of the Farm Tevrede 210, R/E of the Farm Leeuwfonteins 51, Portion 14 and 17 of the Farm Louterbronnen 250, Farm Mooimeisjes Fontein 451 and R/E of the Farm Theunissens 610 is proposed by the Masilonyana Local Municipality (MLM) as a suitable location for the proposed housing development for several reasons. The Portions are in close proximity to the informal settlement where the residents who are to be relocated are currently living. The land is municipal property and will not require a lengthy/costly process of land acquisition. Service infrastructure will be connected onto existing bulk services and will not require extensive additional connections.

Due to the limited land availability for development in the area, no other site alternatives are proposed as part of this application. As most of the housing recipients work in the areas close to the site, relocation elsewhere in the MLM is not considered to be a suitable alternative for the residents given the socio-economic and logistical factors involved.

## **16.4. EAP's Opinion on Authorisation of Activity**

Given the low significance of the negative impacts of the project and the positive impacts associated with a development of this nature, it is the EAP's opinion that MLM be allowed to develop the land parcel according to the design considered in this EIA. Development should however be conducted in accordance with the recommendations given in this EIAR.



## **17.RECOMMENDATIONS**

The following Recommendations are deemed necessary by the EAP and should be included as conditions in an Environmental Authorisation for the the Portion 1 of the Farm Tevrede 210, R/E of the Farm Leeuwfonteins 51, Portion 14 and 17 of the Farm Louterbronnen 250, Farm Mooimeisjes Fontein 451 and R/E of the Farm Theunissens 610 housing development:

- In terms of design, surfaced roads should be enforced on flat slopes;
- No development to take place within 100 year flood line boundary
- Any sites of heritage significance discovered during the construction phase to be reported to the responsible heritage authority and all work in the vicinity of the find must stop. Work may only recommence on approval of the authority;
- No occupation of houses to take place until the required sewerage infrastructure and pump station is in place;
- The draft EMP for the construction phase must be completed with DESTEA's conditions and requirements and signed by MLM, and the relevant contractor as implementing agents; and
- The EMP should be audited by a suitably qualified EAP. Audits should be undertaken, at least, on a monthly basis for the period of the construction and three (3) months after the construction is complete.
- Environmental audit report should be submitted to the DESTEA on monthly basis.

## **18.CONCLUSIONS**

This report details the findings of the Final Environmental Impact Assessment Report (EIAR) undertaken as part of the legislated EIA process for the proposed housing development on Portion 1 of the Farm Tevrede 210, R/E of the Farm Leeuwfonteins 51, Portion 14 and 17 of the Farm Louterbronnen 250, Farm Mooimeisjes Fontein 451 and R/E of the Farm Theunissens 610.

This Final EIAR will be submitted to the DESTEA for review and approval. Registered I&AP's will be further notified upon DESTEA's decision which will be distributed to all registered I&AP's on receipt of the Environmental Authorisation, should one be granted.

## 19. REFERENCES

Masilonyana Local Municipality, 2014/15: Integrated Development Plan.

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