

**NATIONAL ENVIRONMENTAL MANAGEMENT
ACT, 1998 (ACT 107 OF 1998) SECTION 24G
RECTIFICATION APPLICATION FOR THE
UNLAWFUL COMMENCEMENT AND
CONTINUATION OF LISTED ACTIVITIES - DE
BROUGH ESTATE ON PORTION 172,
PORTION 534, 535, 536 AND 537 OF THE
FARM WATERKLOOF 305 JQ, RUSTENBURG,
NORTH WEST PROVINCE
REF: REC 02/2013NW
OCTOBER 2013**



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LIST OF DEFINITIONS, ABBREVIATIONS AND ACRONYMS

AQM	Air Quality Management
AQMP	Air Quality Management Plan
BID	Background Information Document
BPDM	Bojanala Platinum District Municipality
CARA	Conservation of Agricultural Resources Act, 1983 (Act 43 of 1983)
CBA	Critical Biodiversity Area
CBD	Central Business District
CFC	Chloro Fluoro Carbons
DAFF	Department of Agriculture, Forestry & Fisheries
DEA	Department of Environmental Affairs
DPWRT	Department of Public Works, Roads & Transport
DWA	Department of Water Affairs
EAP	Environmental Assessment Practitioner
ECA	Environment Conservation Act, 1989 (Act 73 of 1989)
EIA	Environmental Impact Assessment
EMF	Environmental Management Framework
EMP	Environmental Management Programme
ESA	Ecological Support Areas
GDP	Gross Domestic Product
GNR	Government Notice Regulation
GPS	Global Positioning System
GVA	Gross Value Added
I&AP	Interested and Affected Party
LUMS	Rustenburg Land Use Management Scheme
mamsl	metres above mean sea level
MAE	Mean Annual Evaporation
MAP	Mean Annual Precipitation
MAR	Mean Annual Runoff
MEC	Member of the Executive Council
Mg	Magnesium
MPA	Magaliesberg Protection Association
MPE	Magaliesberg Protected Environment (same as MPNE)
NEMA	National Environmental Management Act, 1998 (Act 107 of 1998) as amended
NEMBA	National Environmental Management: Biodiversity Act, 2004 (Act 10, 2004)
NEMWA	National Environmental Management Waste Act, 2008 (Act 59 of 2008)
NHBRC	National Home Builder Registration Council
NO ₃	Nitrate
NWA	National Water Act, 1998 (Act 36 of 1998)
NW	North West
NW DEDECT	North West Department of Economic Development, Environment, Conservation and Tourism
ONA	Other Natural Areas
PE	Protected Environment (as declared under NEMPA)
PPP	Public Participation Process
RLM	Rustenburg Local Municipality
ROCLA	Rustenburg-Olifantsnek Corridor Landowners Association
SAHRA	South African Heritage Resources Agency

SANBI.....	South African National Biodiversity Institute
SDF	Spatial Development Framework
SEA	Strategic Environmental Assessment
SG	Surveyor General
VOC.....	Volatile Organic Carbons
WMA.....	Water Management Area
WML	Waste Management Licence

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1 INTRODUCTION

1.1 Background

HydroScience cc, an independent Environmental Assessment Practitioner (EAP), has been appointed by Mr Alec Brough, representing Brough Family Trust, to submit a Section 24G application for the rectification of the unlawful commencement and continuation of activities listed in terms of Government Notice Regulation (GNR) (GNR 544 Activity 9, 22, 23; GNR 545 Activity 5; GNR 546 Activities 4 (c) (i) (gg)) of the National Environmental Management Act (NEMA), 1998 (Act 107 of 1998), as amended and the Environmental Impact Assessment (EIA) Regulations of 2010. The project relates to the township establishment on remaining extent of Portion 172, Portion 534, 535, 536 and 537 of the farm Waterkloof 305 JQ located in Rustenburg in the North West Province.

As part of the process (Figure 1-1), a Section 24G application, in terms of the NEMA, and associated Regulations of 2010, has been submitted to the North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT). On the 13th of August 2013, an acknowledgement of receipt (including reference number) was received from NW DEDECT and the Public Participation Process (PPP) subsequently commenced.

This report contains the relevant and applicable information required for a comprehensive understanding of the project and nature of issues identified.

A Waste Management Licence (WML) application in terms of the National Environmental Management Waste Act (NEMWA), 2008 (Act 59 of 2008) will also be lodged with Department of Environmental Affairs (DEA) regarding sewage treatment works as well as a Water Use Licence application in terms of the National Water Act (NWA), 1998 (Act 36 of 1998) with Department of Water Affairs (DWA) for groundwater use and sewage treatment works.

1.2 Details of EAP

Company:	HydroScience cc
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The EAPs who compiled this report include Ms Paulette Jacobs (Director, HydroScience) and Ms Louise van Wyk (Senior Environmental Scientist and Specialist Ecologist, HydroScience) both of who have undertaken many EIA as well as Section 24G rectification applications for similar activities, projects and developments. The Curriculum Vitae of the aforementioned professionals, as well as a project list and company profile indicating previous experience in similar projects are included in Appendix A.

1.3 Details of applicant

Person: Mr Thomas Alexander (Alec) Brough
Identity no: 551228 5081 08 8
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E-mail: alecbrough@gmail.com

1.4 Details of property

Province: North West Province
District municipality: Bojanala Platinum District Municipality (BPDM)
Local municipality: Rustenburg Local Municipality (RLM)
Farm: Waterkloof 305JQ
Farm portions: Remaining Extent of Portion 172, Portion 534, 535, 536 and 537 (a Portion of Portion 172) (Appendix B)
Surveyor General (SG) code: T0JQ00000000033000172 (9.8010ha)
T0JQ00000000033000534 (0.9950ha)
T0JQ00000000033000535 (0.9992ha)
T0JQ00000000033000536 (1.0001ha)
T0JQ00000000033000537 (1.0182ha)
Size: 13.8135 Ha in total
Owner: **172:** Alec en Ansie Gesins Trust (IT6186/99)
534: Danie Brough Gesins Trust (IT10610/2005)
535: Reyners Brough Gesins Trust (IT10613/2005)
536: Ansie Brough Gesins Trust (IT10612/2005)
537: Alecia Brough Gesins Trust (IT10611/2005)
All represented by Mr Alec Brough (father)
Access road: R24/R30 (P16-1) - west of the property boundary
Services: Municipal electricity
No other municipal services (outside urban edge)
Provide own services (waste collection, sewage treatment facility, groundwater supply)
Towns in proximity: Rustenburg – 10km north
Servitudes: Olifantsnek Irrigation canal
Borehole water supply to three (3) other properties

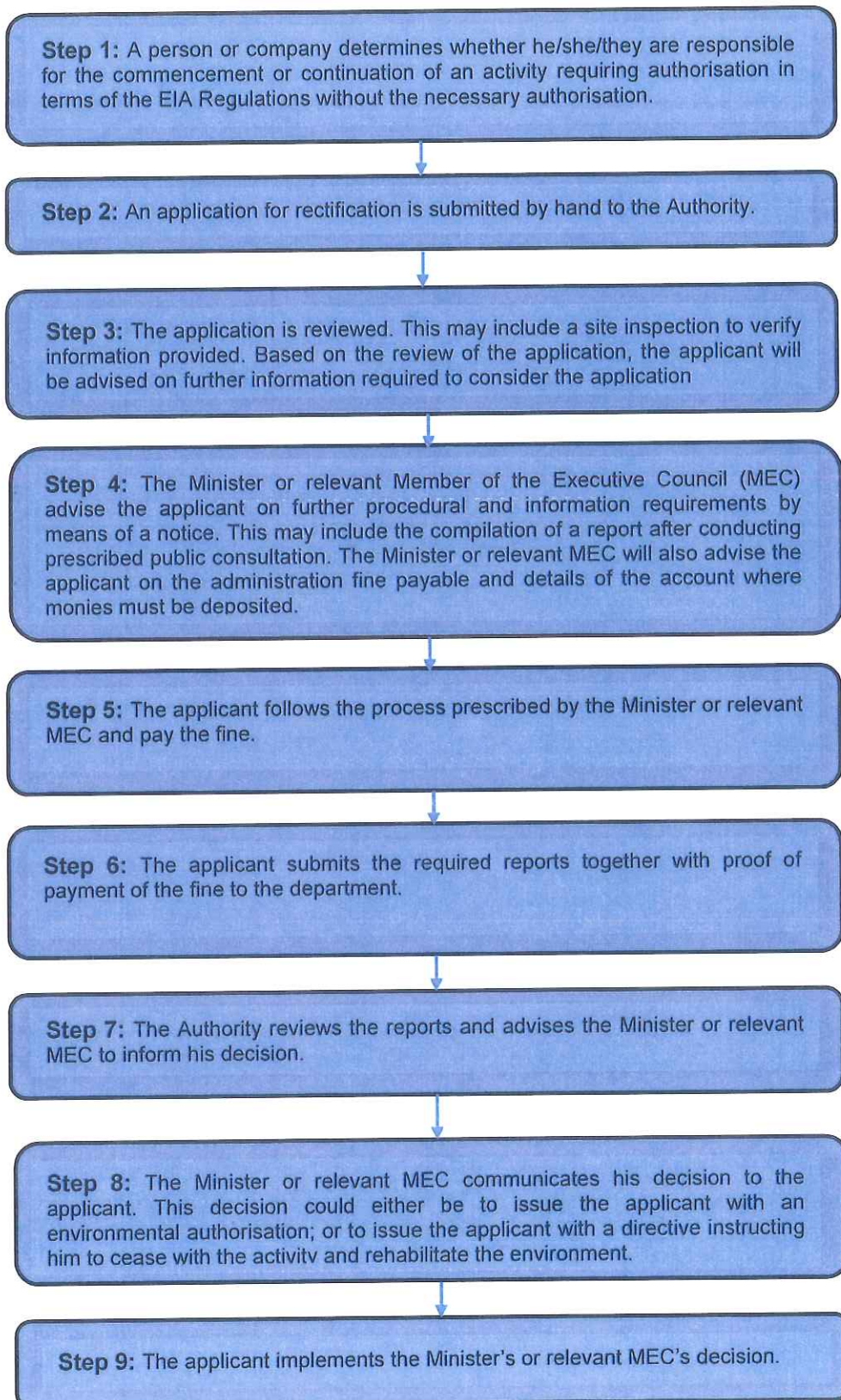


Figure 1-1: Simplified diagram explaining the 24G process

2 DESCRIPTION OF THE ACTIVITY

2.1 Nature

The properties cover 13.8135 Ha in total and the entire area has been disturbed due to the development. Approximately 6 Ha has already been built on and is occupied. Some buildings were demolished by the municipality. The facility can accommodate up to 200 families (600 people). The homes consist of different construction materials including brick, pre-cast walling and wood. There is a secure entrance (restricted access gates) from the R24/R30 (P16-1) in the southern and northern corners of the site. The entire site is bordered by a single layer brick wall and a gravel road network exists on site for internal travel. There is a private home (belonging to the Brough family) on site along with an office for assistance to residents. The development includes a community centre (also used as a church) for the residents. A section on the western boundary of the site serves as grazing facilities for cattle. No other agricultural activities exist on site. See Appendix C for the site layout and site photographs.



Plate 2-1: Entrance to property (left) and brick house (right)

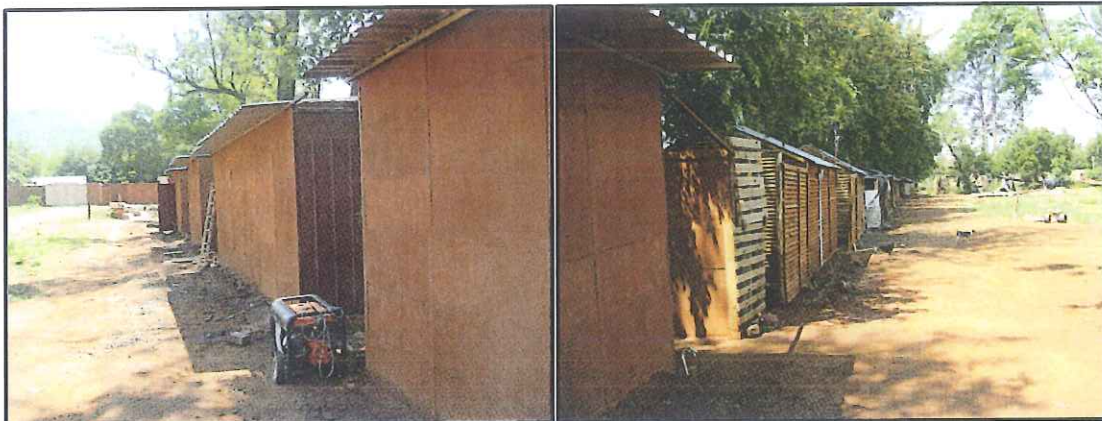


Plate 2-2: Smaller housing units (pre-cast left and wood right) and internal road

Water supply: Water is sourced from the groundwater resource via an equipped borehole, four (4) boreholes are located on the site. There is a servitude registered on the property to supply neighbouring properties with water from these boreholes and the irrigation canal from the Olifantsnek Irrigation Scheme runs on the northern boundary of the site. Mr Brough is a registered user with the Scheme (membership no. 013) and 8.565 m³ of water is allocated to him annually. Municipal water supply services do not extend to the property. A Section 21(a) water use licence application in terms of the National Water Act (NWA), 1998 (Act 36 of

1998) and/or registration as a water services provider in terms of the Water Services Act, 1997 (Act 108 of 1997) will probably be required for the use and supply of groundwater.

Sewage: A sewage treatment facility also exists on site since municipal sewage management infrastructure and services do not extend to the property. The sewage treatment facility will require a WML in terms of the National Environmental Management Waste Act, 2008 (Act 59 of 2008). The sewage treatment system includes both an aerobic and anaerobic process that has been self-engineered. The treated sewage water is recycled and utilised to water the De Brough Estate gardens.



Plate 2-3: Sewage treatment facility

Electricity: Municipal electricity exists on the site and generators have been installed for power outages. The water for ablution facilities is solar heated and gas geysers and stoves have been installed in the larger residential units.

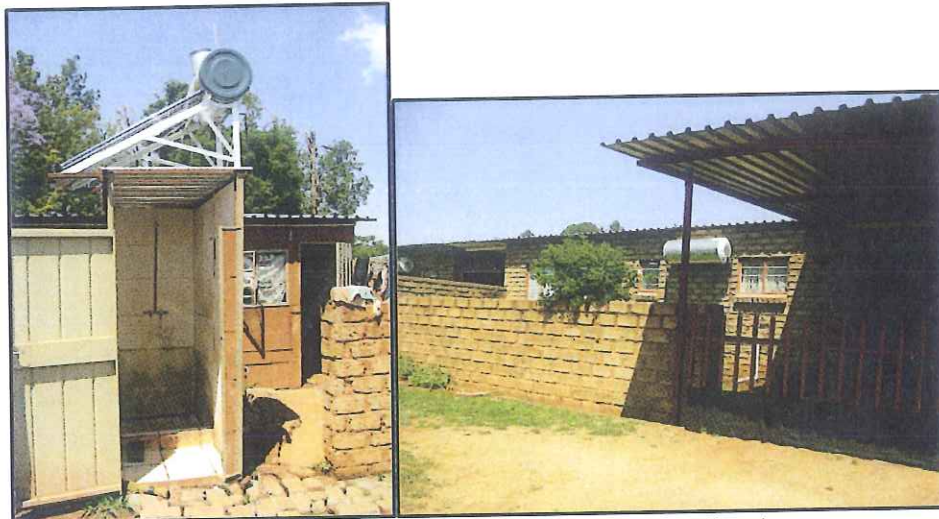


Plate 2-4: Solar energy used for heating of water

Waste: Waste is collected and stored on-site in wheelie bins, bags or drums. The waste is collected by a contractor for off-site disposal. Waste recycling is also practiced. Littering is evident across the site.



Plate 2-5: Waste management

2.2 Motivation

According to the Rustenburg Spatial Development Framework (SDF, 2010), the total population of Rustenburg has increased from 395 000 in 2001 to nearly 450 000 in 2007. This represents an increase of 13.6% over this period and thus implies an annual growth rate of approximately 2.3%. A notable feature is that the growth in the number of households (25.6%) was nearly double that of the population figures, translating into a household growth rate of 4.3% per annum. Approximately 84% of the Rustenburg Municipal Area population can be classified as urbanized, residing in either urban or rural settlements. Only 10% of the total population lives on farms. Furthermore, the agricultural sector only accounted for 3.4% of the employed population in 2007, this slightly decreased from 4.1% in 2001. A low percentage of the male population (2.6%) is involved in the agricultural sector.

The property has been sub-divided into five (5) portions and the sub-division was approved by the Department of Agriculture (approval 33504, dated 21 December 2000) in terms of article 4(2) of the Act on sub-division of agricultural land, 1970. The sizes of the individual properties (4 portions of around 1 ha and 1 portion of 9ha) does not allow for agricultural activities to be practiced in an economically feasible manner.

The Rustenburg Housing Sector Plan analysed the total overall municipal housing need, as well as the spatial disaggregation housing need per settlement cluster. According to these figures, the total backlog (which comprises of informal structures in informal settlements, informal structures in backyards, traditional houses constructed of traditional materials and other informal categories), is estimated to be approximately 58 600 units. This backlog is mostly concentrated in the Boitekong/Kanana Cluster ($\pm 14\ 000$), the Thekwane-Mfidikoe-Photsaneng Cluster ($\pm 12\ 000$) and the Rustenburg/Thlabane cluster ($\pm 6\ 000$) (SDF, 2010).

The property is located in the Rustenburg area along the R24/R30 (P16-1) approximately 10km south from the Rustenburg Central Business District (CBD).

The potential future growth of the municipality, resulting from both natural growth, as well as immigration to the area due to its high economic growth rate, will result in an additional demand for housing up to 2015. The total additional demand over this period is estimated to be approximately 57 000 units. This figure includes both affordable housing units to be provided through the public sector, as well as bonded houses to be provided through the private sector (SDF, 2010).

Based on other projects in the Rustenburg area, HydroScience has found that there is a need for inexpensive housing/accommodation. The RLM is also planning to address such a

need by establishing a township 1.2km south of this property. This project has been approved but appears to be delayed resulting in squatting which further emphasises the need.

This site (De Brough Estate) currently provides housing to an estimated 600 people (200 families) and can accommodate up to 400 families if expanded (based on surface area available). Should this development be demolished or closed, 200 families will have to find alternative accommodation and it is not known whether such accommodation is available elsewhere or provided by the RLM.

The main objective of the project is to establish a formal township providing affordable accommodation facilities for rental to the general public. These facilities have lower rates than surrounding accommodation in Rustenburg and therefore provide assistance to the disadvantaged community who cannot afford to buy property and has limited funds to rent.

3 LEGAL REQUIREMENTS AND GUIDELINES

All of the legislation below is applicable due to the extent of the development which requires Environmental Authorisation as well as the location (outside the urban edge in an agricultural area) and provision of services (water and sewage) that also requires authorisation/licences.

3.1 Constitution of South Africa, 1996 (Act 108 of 1996)

The Constitution of South Africa, 1996 (Act 108 of 1996) places a duty on the State to protect the environment. Section 24 states that:

“Everyone has the right

- a. to an environment that is not harmful to their health or well-being; and
- b. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that
 - i. prevent pollution and ecological degradation;
 - ii. promote conservation; and
 - iii. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.”

The Constitution of South Africa, 1996 (Act 108 of 1996) in Section 26 states the following in terms of housing:

1. Everyone has the right to have access to adequate housing.
2. The state must take reasonable legislative and other measures, within its available resources, to achieve the progressive realisation of this right.
3. No one may be evicted from their home, or have their home demolished, without an order of court made after considering all the relevant circumstances. No legislation may permit arbitrary evictions.

The applicant should therefore consider the protection of the environment and prevent pollution. The applicant provides housing. Nobody's constitutional rights may be infringed and therefore homes may not be demolished without a court order.

3.2 National Environmental Management Act (NEMA), 1998 (Act 107 of 1998) as amended, and associated Regulations of 2010

The principles underpinning environmental management as contained in the NEMA, must be taken into account by any organ of state in the exercise of any power that may impact on the environment. Section 2 (4a) states that sustainable development requires the consideration of all relevant factors including the following:

- That the disturbance of ecosystems and loss of biological diversity are avoided, or where they cannot be altogether avoided, are minimised and remedied;
- That pollution and degradation of the environment are avoided, or, where they cannot be altogether avoided, are minimised and remedied;
- That the development, use and exploitation of renewable resources and the ecosystems of which they are a part do not exceed the level beyond which their integrity is jeopardised;
- That negative impacts on the environment and on people's environmental rights be anticipated and prevented, and where they cannot be altogether prevented, are minimised and remedied.

The development does disturb an ecosystem and therefore the loss of biological diversity cannot be altogether avoided but can be minimised (based on size) and further managed. The ecosystem was historically disturbed through agricultural activities.

A NEMA Section 24G rectification application has been submitted to the NW DEDECT (Reference number REC 02/2013NW).

The following listed activities, which require rectification due to unlawful commencement and continuation were identified in terms of the relevant legislation:

NEMA: GNR 544 (18 June 2010):

9 - The construction of facilities or infrastructure exceeding 1 000metres in length for the bulk transportation of water, sewage or storm water

(i) with an internal diameter of 0,36 metres or more; or

(ii) with a peak throughput of 120 litres per second or more, excluding where:

a. such facilities or infrastructure are for bulk transportation of water, sewage or storm water or storm water drainage inside a road reserve; or

b. where such construction will occur within urban areas but further than 32 metres from a watercourse, measured from the edge of the watercourse.

Bulk transportation infrastructure (such as pipes) may exceed the limit of 1km long, 0.36 meter diameter and 120 l/s throughput and is not within a current road reserve or urban area.

22 - The construction of a road, outside urban areas,

(ii) where no reserve exists where the road is wider than 8 metres

The project site is outside an urban area and roads are wider than 8 metres in certain areas.

23 - The transformation of undeveloped, vacant or derelict land to-

(ii) residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger than 1 hectare but less than 20 hectares; except where such transformation takes place for linear activities.

The project site is outside an urban area and the size of the total area transformed/impacted/disturbed is between 6 and 13.8 hectares. Two (2) of the individual portions are below 1ha and therefore did not require authorisation for transformation.

NEMA: GNR 545 (18 June 2010):

5 - The construction of facilities or infrastructure for any process or activity which requires a permit or license in terms of national or provincial legislation governing the generation or release of emissions, pollution or effluent and which is not identified in Notice No. 544 of 2010 or included in the list of waste management activities published in terms of section 19 of the National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008) in which case that Act will apply.

The development includes a sewage treatment facility, groundwater abstraction and irrigation with treated sewage for which a WUL application will be lodged with DWA in terms of the NWA.

NEMA: GNR 546 (18 June 2010):

4 (c)(i)(gg) – The construction of a road wider than 4 metres with a reserve less than 13,5 metres.

(c) In North West:

i. Outside urban areas, in:

(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres from any other protected area identified in terms of NEMPAA or from a biosphere reserve.

The project site is within 5km from the Magaliesberg Protected Environment (MPE) and currently the road is more than 4m wide.

3.3 National Environmental Management Waste Act (NEMWA), 2008 (Act 59 of 2008)

The NEMWA has introduced an improved system for licensing of waste management activities, in order to control these activities and to ensure that they do not impact on human health and the environment. Waste management is one of the critical elements of sustainable development primarily because sound waste management practices contribute to sustainability. The objectives of the NEMWA include:

- Minimising the utilisation of natural resources;
- Preventing and minimising the generation of waste;
- Reducing, re-using, recycling and recovering waste;
- Treating and safely disposing of waste as a last resort;
- Preventing pollution and environmental degradation;
- Protecting the environment while promoting justifiable economic and social development;
- Promoting and ensuring effective delivery of waste services;
- Achieving integrated waste management reporting and planning;
- Generally, to give effect to section 24 of the Constitution in order to secure an environment that is not harmful to health and well-being.

A person who wishes to commence, undertake or conduct an activity listed under Category B of GNR 718 (3 July 2009), must conduct an EIA process, as stipulated in the EIA regulations made under section 24(5) of the NEMA as part of a waste management licence application. The following activities are relevant:

NEMWA: Category B (GNR 718, 3 July 2009):

2 - The reuse and recycling of hazardous waste.

Treated sewage water is used for irrigation of gardens. Sewage is generally classified as hazardous unless otherwise proven.

7 - The treatment of effluent, wastewater or sewage with annual throughput capacity of 15 000 cubic metres or more. The sewage treatment facility has a capacity of 35 000 cubic metres/annum.

It must be noted that due to the fact that the process is a Section 24G rectification process, this report replaces the Environmental Impact Report (EIR). However, the Section 24G Report (this report) contains all required information as per the EIA process.

3.4 National Water Act (NWA), 1998 (Act 36 of 1998)

The NWA states in Section 22 (1) that a person may only use water

- a) without a licence –
 - (i) if that water use is permissible under Schedule 1;
 - (ii) if that water use is permissible as a continuation of an existing lawful use; or
 - (iii) if that water use is permissible in terms of a general authorisation issued under section 39;
- b) if the water use is authorised by a licence under this Act; or
- c) if the responsible authority has dispensed with a licence requirement under subsection (3).

Water use is defined in Section 21 of the NWA. For the purposes of this Act, water use includes:

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

The development is taking water from a groundwater resource (Section 21(a)) for human consumption, is engaging in a controlled activity in terms of irrigation with treated sewage water (Section 21(e)) and is disposing of sewage in a sewage treatment plant (Section 21(g)).

3.5 Water Services Act, 1997 (Act 108 of 1997)

The main objectives of the Act are to provide for:

- a) the right of access to basic water supply and the right to basic sanitation necessary to secure sufficient water and an environment not harmful to human health or well-being;
- b) the setting of national standards and norms and standards for tariffs in respect of water services;
- c) the preparation and adoption of water services development plans by water services authorities;
- d) a regulatory framework for water services institutions and water services intermediaries;
- e) the establishment and disestablishment of water boards and water services committees and their duties and powers;
- f) the monitoring of water services and intervention by the Minister or by the relevant Province;
- g) financial assistance to water services institutions;
- h) the gathering of information in a national information system and the distribution of that information;
- i) the accountability of water services providers: and the promotion of effective water resource management and conservation.

Section 3 of the Act states:

- 1) Everyone has a right of access to basic water supply and basic sanitation.
- 2) Every water services institution must take reasonable measures to realise these rights.
- 3) Every water services authority must, in its water services development plan provide for measures to realise these rights.
- 4) The rights mentioned in this section are subject to the limitations contained in this Act.

Section 6 of the Act states that no person may use water services from a source other than a water services provider nominated by the water services authority having jurisdiction in the area in question, without the approval of that water services authority. A person who at the commencement of this Act was using water services from a source other than one

nominated by the relevant water services authority may continue to do so for a period of 60 days after the relevant water services authority has requested the person to apply for approval; and if the person complies with a request within the 60 day period until the application for approval is granted after which the conditions of the approval will apply or the expiry of a reasonable period determined by the water services authority if the application for approval is refused.

Section 22 of the Act states:

- 1) No person may operate as a water services provider without the approval of the water services authority having jurisdiction in the area in question.
- 2) Any approval in terms of subsection 1:
 - i. must be for a limited period; and
 - ii. may be granted subject to conditions,
- 3) Any person who at the commencement of this Act, was acting as a water services provider without approval from the water services authority having jurisdiction in the area in question, may continue to do so until the expiry of reasonable notice, which notice must not be longer than one year given by that water services authority—
 - i. that it requires the provider to enter into a contract; or
 - ii. that the continuation will be subject to approval as contemplated in subsection (1).

The applicant is currently not registered as a water services provider though he represents one. The RLM (through RandWater) is the water services authority having jurisdiction in the area.

3.6 Conservation of Agricultural Resources Act (CARA), 1983 (Act 43 of 1983)

In 1984, regulations were passed in terms of the CARA, regulations declaring about 50 species "weeds" or "invader plants". On 30 March 2001, the Minister of Agriculture promulgated an amendment to these regulations. This amendment now contains a comprehensive list of species that are declared weeds and invader plants dividing them into three categories. These categories are as follows:

- Category 1: Declared weeds that are prohibited on any land or water surface in South Africa. These species must be controlled, or eradicated where possible.
- Category 2: Declared invader species that are only allowed in demarcated areas under controlled conditions and prohibited within 30m of the 1:50 year floodline of any watercourse or wetland.
- Category 3: Declared invader species that may remain, but must be prevented from spreading. No further planting of these species are allowed.

In terms of the amendments to the regulations under the CARA, landowners are legally responsible for the control of alien species on their properties.

The control of weeds and invader species is relevant in this regard as many exotic species were identified during the site visit. The Department of Agriculture approved the sub-division of the property (33504, dated 21 December 2000) thereby rendering it unusable for economically sustainable agricultural activities.

3.7 National Forest Act, 1998 (Act 84 of 1998)

The formal protection of the pockets of Northern Afrotemperate Forest that occurs along some of the northern kloofs of the Magaliesberg could possibly be achieved through certain provisions of the National Forest Act, 1998 (Act 84 of 1998). The Act provides for three types of specially protected areas in the forestry context. These are a forest nature reserve, a forest wilderness area and any other protected area recognized in international law and

practice. The Act prescribes procedures for declaring protected areas and sets out the effect of such declaration. This includes for example the prohibition on cutting, disturbing, destroying, or removing forest produce from such a protected area. The responsibility for the implementation of the Act lies with Department of Agriculture, Forestry and Fisheries (DAFF). Furthermore, specific tree species “forest species” are declared protected under this Act.

Any tree species that occur on site and fall under this protected tree species list must not be harmed or affected in any way. Prior to this development, protected species may have been affected; however this cannot be confirmed at this point in time.

3.8 Other documents

Other documents considered during the process include:

- Rustenburg Spatial Development Framework (SDF), Urban Dynamics, North West, 2005 as well as the 2010 review/update by K2M Technologies, published in 2011.
- Rustenburg Strategic Environmental Assessment (SEA), 2003. Eco Assessments ecological and environmental consultants in association with African EPA, Motso planning and development consultants, MetroGIS. September 2003.
- Rustenburg Land Use Management Scheme (LUMS), 2005.
- Magaliesberg Protected Environment (MPE) Environmental Management Framework (EMF) and Plan. October 2007.

4 ENVIRONMENTAL SETTING

4.1 Site Description

The development is located on remaining extent of Portion 172, Portions 534, 535, 536 and 537 of the farm Waterkloof 305 JQ located in Rustenburg, North West Province. All portions belong to the Brough Family. The land was subdivided (Authorisation 33504 from Department of Agriculture) and registered to each of the four (4) Brough children and one portion remaining the property of the parents. The development is located approximately 10 km south from the Rustenburg CBD. This project area can be accessed via the R24 (P16-1) on the western boundary of the site. Global Positioning System (GPS) coordinates are 25° 45' 47.48" South and 27° 16' 23.70" East (refer to the Topographical map – Figure 4-1 and the Locality map – Figure 4-2). The project area is bordered by agricultural land and associated homesteads, guesthouses as well as commercial and sales facilities, such as Jabes filling station and Orange Grove Garden and Home Centre (Figure 4-3). As per Title Deed, servitude exists on Portion 172 for the provision of borehole water to Portion 247, Portion 150 and Portion 366 of the farm Waterkloof 305 JQ.

4.2 Magaliesberg Protected Environment (MPE) and Critical Biodiversity Area (CBA)

The property is not located in any protected area that is of concern specifically to the conservation of biodiversity. As can be seen in Figure 4-4, the site falls outside of the MPE, it is not a threatened ecosystem and does not fall within CBA 1. It does fall within the MPE buffer, however is not regarded as sensitive due to the fact that prior to the project, agricultural practices were applied and natural vegetation was limited.

The purpose of the CBA map and guidelines is to mainstream biodiversity into land-use planning and decision-making by classifying those sites critical for biodiversity persistence. The overall aim is to avoid loss and degradation of natural habitat in CBA's, whilst managing sustainable development in other natural areas outstanding. The CBA map and guidelines provide a common reference point for all decision-makers within the land-use sector, including all stakeholders involved in land-use planning and decision-making processes. Although the CBA maps constitute the best available biodiversity information, they can never substitute a site-assessment and are always to be viewed as the biodiversity informant of sustainable development, i.e. social, economic and natural environments." (NW BCA, 2009).

CBA's are terrestrial and aquatic features in the landscape that are critical for retaining biodiversity and supporting continued ecosystem functioning and services. The direct definition of a CBA can be explained as areas of the landscape that need to be maintained in a natural or near-natural state in order to safeguard the continued existence and functioning of species and ecosystems and the delivery of ecosystem services. In other words, if these areas are not conserved in a natural or near-natural state, then biodiversity conservation targets cannot be met. The foundations of the CBA classification and land-use guidelines are the biodiversity sector's understanding and quantification of the desired ecological state or biodiversity land management objectives for a given component of biodiversity. These objectives are based on the fundamental ecological and conservation planning principles of:

- Representation - The biodiversity present at the site;
- Complementarity - The spatial relationship between the biodiversity present at the site and neighbouring areas; and
- Ecological Processes - The ecological composition of the landscapes including structure and functioning requirements for persistence interpreted in the form of the biodiversity conservation targets or land management objective thresholds, that determine the

minimum spatial requirements for biodiversity patterns, ecological processes and ecosystem services to be adequately represented and to persist (NW BCA, 2009).

Information on the likelihood of this biodiversity being lost, or threats to biodiversity, is not contained in the CBA map (Figure 4-4). This information, however, can be incorporated into the criteria used to classify biodiversity features into different CBA categories (Table 4-1).

Table 4-1: A framework for linking spatial planning categories (CBAs) to land-use planning and decision-making guidelines (NW BCA, 2009)

CBA category	Land Management Objective
PA and CBA 1	Natural landscapes: <ul style="list-style-type: none"> • Ecosystems and species fully intact and undisturbed. • These are areas with high irreplaceability or low flexibility in terms of meeting biodiversity pattern targets. If the biodiversity features targeted in these areas are lost then targets will not be met. • These are landscapes that are at or past their limits of acceptable change.
CBA 2	Near-natural landscapes: <ul style="list-style-type: none"> • Ecosystems and species largely intact and undisturbed. • Areas with intermediate irreplaceability or some flexibility in terms of area required to meet biodiversity targets. There are options for loss of some components of biodiversity in these landscapes without compromising our ability to achieve targets. • These are landscapes that are approaching but have not passed their limits of acceptable change.
Ecological Support Areas (ESA)	Functional landscapes: <ul style="list-style-type: none"> • Ecosystems moderately to significantly disturbed but still able to maintain basic functionality. • Individual species or other biodiversity indicators may be severely disturbed or reduced. • These are areas with low irreplaceability with respect to biodiversity pattern targets only.
Other Natural Areas (ONA) and Transformed	Production landscapes: manage land to optimize sustainable utilization of natural resources.

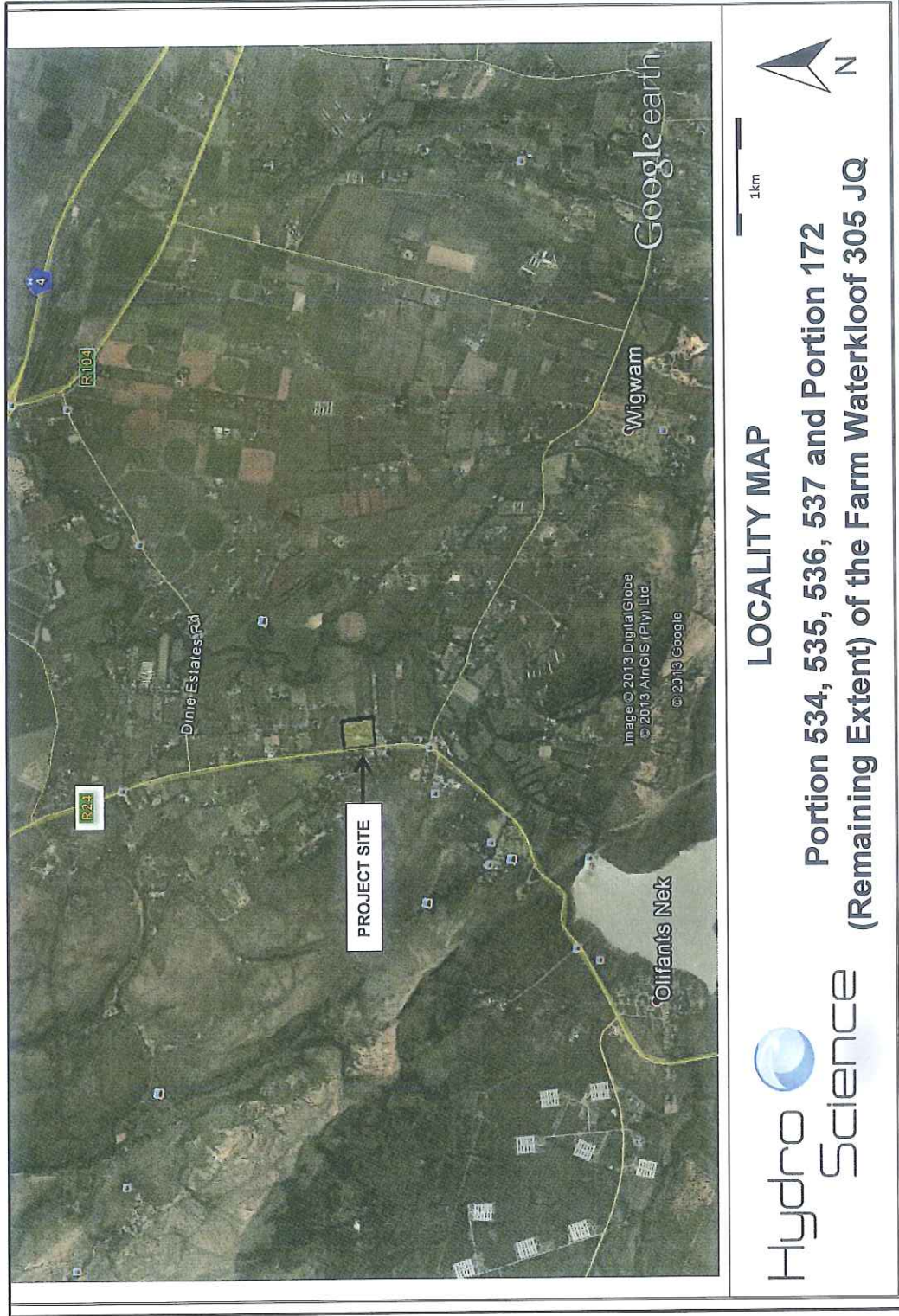


Figure 4-2: Google™ locality map

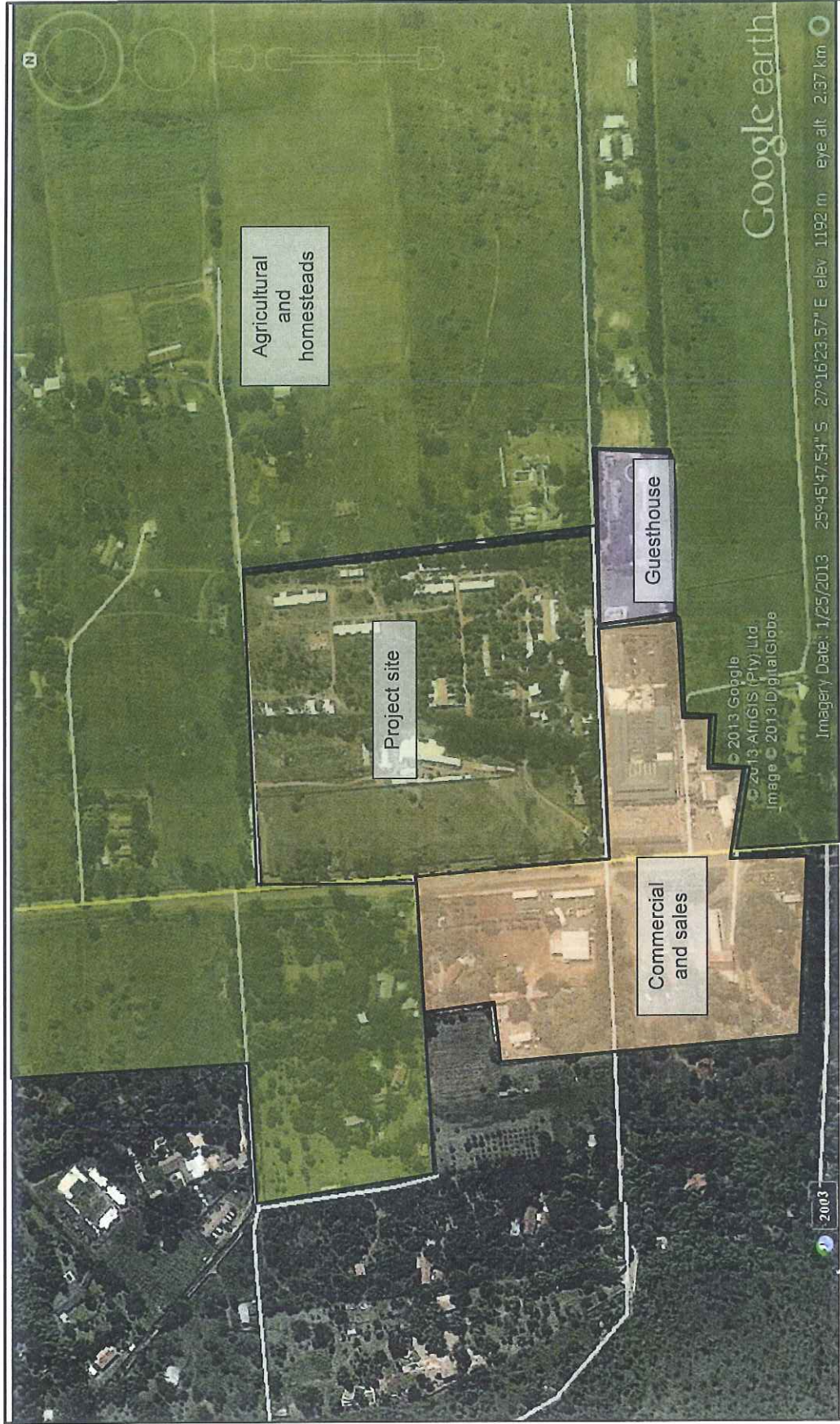


Figure 4-3: Surrounding land use of the project area

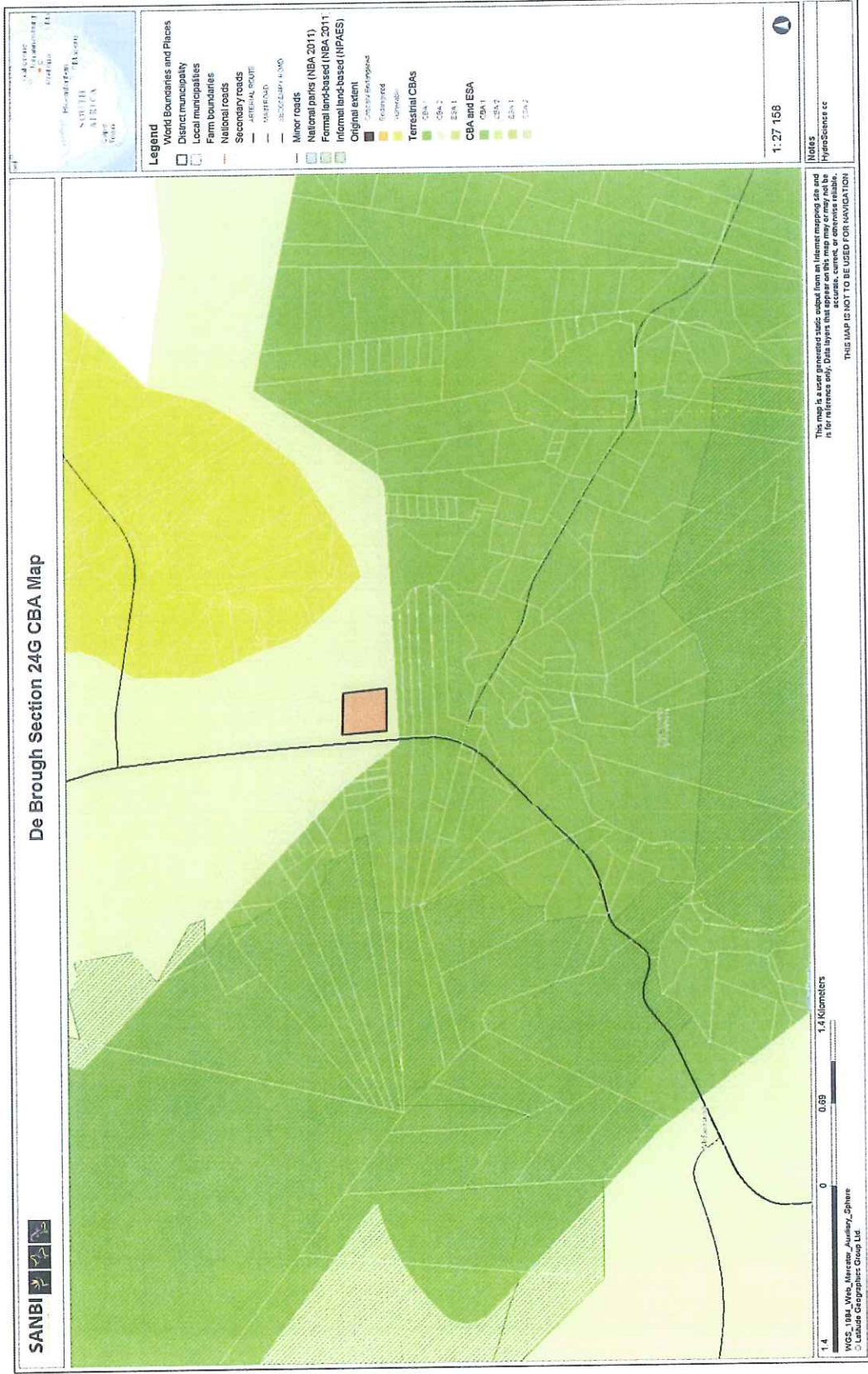


Figure 4-4: Sensitive area map including MPE and CBA

4.3 Physical Environment

The physical environment includes biotic factors such as fauna and flora as well as abiotic factors such as temperature, wind, precipitation (rainfall), evaporation, air quality, topography, geology and the soil type that is characteristic of this site/area. The information in this section (Section 4.3 and 4.4) was pre-dominantly adapted from the Rustenburg SEA (2003), Rustenburg SDF (2010), DEA Draft Macroscale Siting Report (2012), MPE EMF (2007) where applicable and the SANBI (South African National Biodiversity Institute) BGIS system.

4.3.1 Climate

Rustenburg falls within the Summer Rainfall Climatic Zone. The area is characteristically warm to hot with rainfall that is erratic and extremely variable, ranging from 450 to 750mm per year.

The mean circulation of the atmosphere is predominantly anti-cyclonic throughout the year, except near the surface where meso-scale circulations prevail (Matrix Environmental Consultants, 2001). Fine conditions with little or no rainfall, and light variable winds with a northerly component occur over the region. Elevated inversions, which occur as a result of the anticyclonic subsidence, suppress the diffusion and vertical dispersion of pollutants by reducing the depth of the mixing layer.

Seasonal variations in the position and the intensity of the high pressure cells determine the extent to which the tropical easterly circulation and the circumpolar westerlies are able to impact on the atmosphere over the region. The tropical easterlies, and the occurrence of easterly waves and flows, affect the region throughout the year resulting in airflow with a north-easterly to north-westerly component, but their influence is generally weaker during the winter months.

The winter weather is dominated by perturbations in the westerly circulation as a result of the succession of cold fronts moving over the region. The passage of a cold front is characterised by pronounced variations in wind direction, wind speed, temperature, humidity and surface pressure. Airflow ahead of the cold front has a distinct north-north-westerly to north-easterly component. Following the cold front, the northerly wind is replaced by winds with a distinct southerly component.

During the summer months, the anti-cyclonic belt weakens and shifts southwards, allowing the tropical easterly flow to resume its influence over the region.

Temperature

Temperatures typically range between 16°C and 31°C during the summer months, with daily averages in the order of 26.5°C. During the winter months, the temperature typically ranges between 3°C and 24°C, with an average temperature of 10.9°C. The average annual temperature for Rustenburg is 18.7°C (refer to Table 4-2). Extreme upper and lower ends of the temperature scale have been recorded at 39.1°C and 2.8°C, respectively (Rustenburg SEA, 2003).

Table 4-2: Average monthly temperatures recorded over a 29 year period (Rustenburg weather station no. 05115234)

Month	Average of Daily Temperature (°C)		
	Maximum	Minimum	Mean
January	30.3	17.2	23.8
February	29.4	16.8	23.1
March	28.3	15.0	21.7
April	25.5	11.2	18.3
May	23.3	6.5	14.9
June	20.4	3.2	11.8
July	20.9	2.8	11.8
August	23.7	5.1	14.4
September	27.3	9.6	18.5
October	28.7	12.9	20.8
November	29.4	14.9	22.1
December	30.1	16.1	23.1
Year	26.5	10.9	18.7

Precipitation and Evaporation

The mean annual precipitation (MAP) for Rustenburg (as recorded at Weather Station No. 05115234 at a height of 1 157 metres above mean sea level (mamsl) is given as 650mm. January commonly has the highest precipitation (mean of 134 mm) whereas the month of July has the lowest precipitation (mean of 2 mm). The distribution of rainfall through the remainder of the year is illustrated in Figure 4-5. More than 70% of the annual rainfall occurs between the months of October to February.

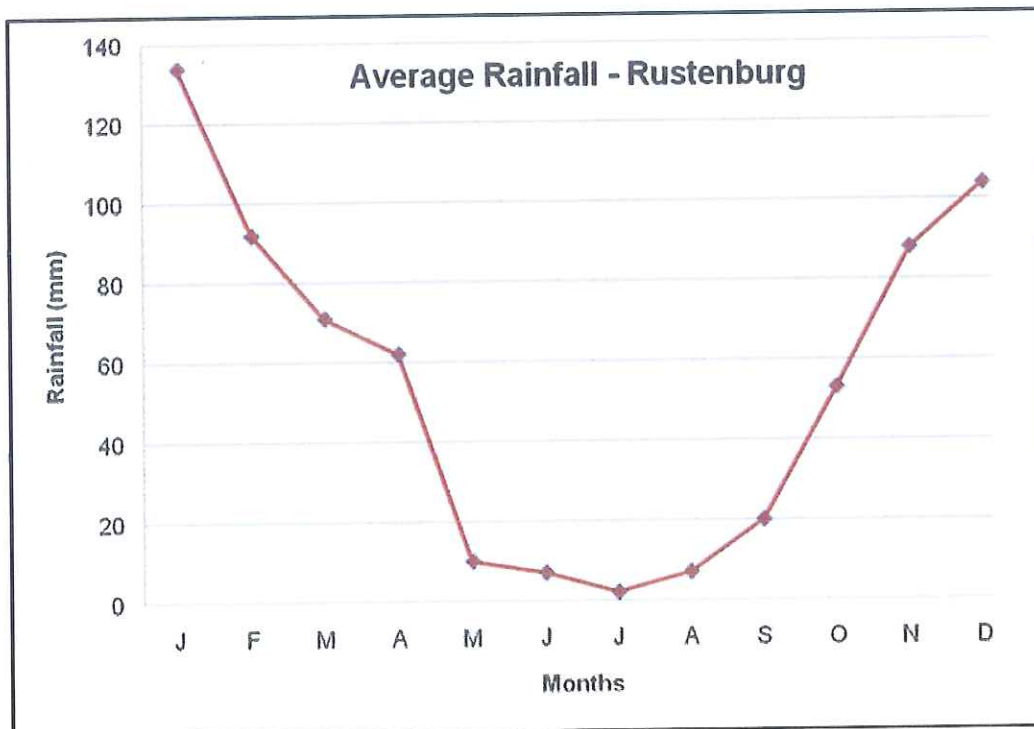


Figure 4-5: Graph indicating the mean monthly rainfall for Rustenburg over a 29 year period

Wind

Winds are heavily influenced by the underlying topography of the region. Rustenburg town is to the south of the Pilanesberg and experiences moderate northerly winds; another station in Rustenburg experiences frequent south-westerly winds, and strong north-easterly winds. This station is influenced by the Magaliesberg mountain range. A spatial and temporal variability exists in the wind field of the Rustenburg region between day and night.

A clear distinction can be made between the day and night-time wind conditions. Night-times are characterised by an increase in the number of calms as is typical of the night-time flow regime in most regions, and by the predominance of low velocity wind (generally below 3 m/s) from the south-westerly, southern and south-easterly sectors. Calm wind conditions occur nearly twice as much during the night than daytime hours. Furthermore, the winds during the day are mainly from the north-western, northern and north-eastern sectors.

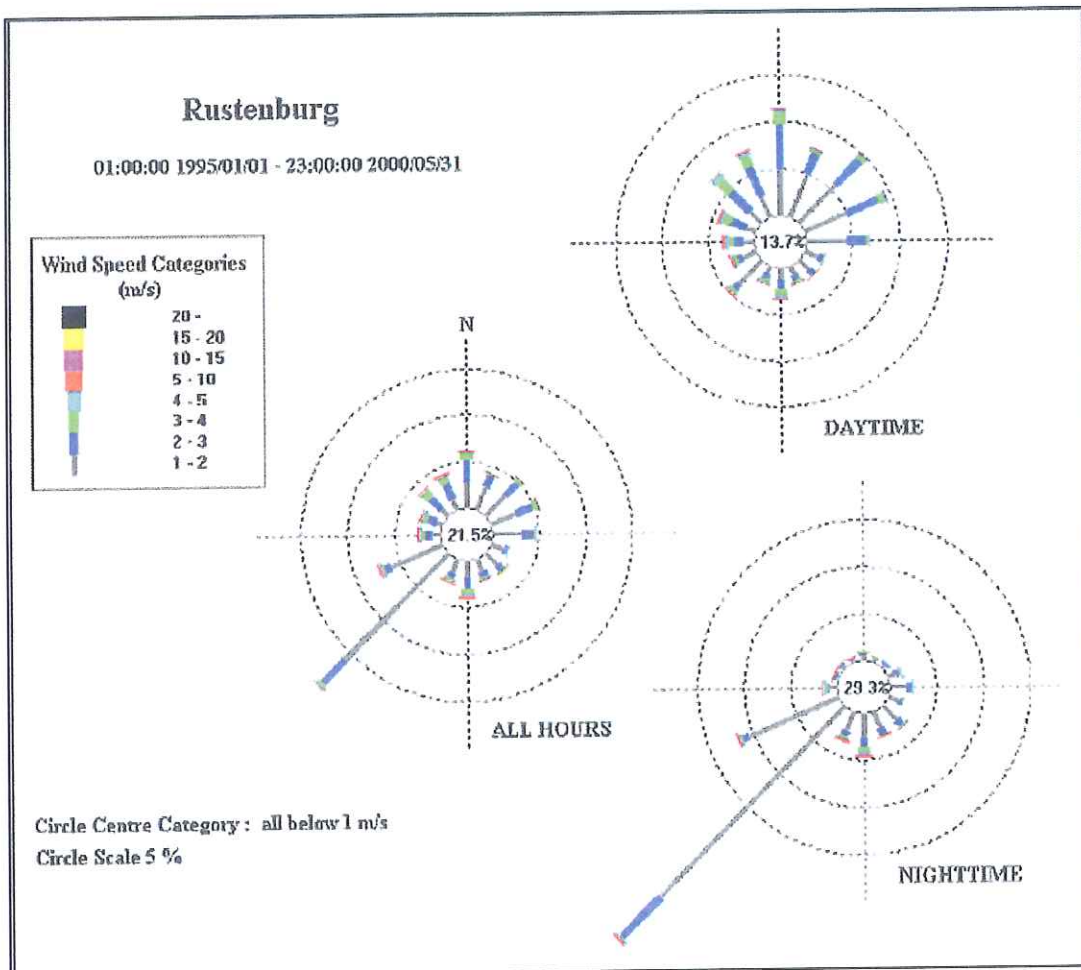


Figure 4-6: Wind patterns recorded at the Rustenburg weather station

4.3.2 Air Quality

The prominent economic activities within the BPDM are mining and tourism. Large Platinum mines are located in the District, predominantly in the Rustenburg area. The mines are located in a band along the Merensky Reef which stretches west from the Pilansberg towards Marikana and Brits in the east. Although the area is currently not regarded as an air

pollution 'hot spot,' it has been declared a priority area anticipating the future developments in the area, which could result in the area experiencing severe air pollution problems as are seen in the Vaal and Highveld priority areas.

In the BPDM, the area around Rustenburg has the largest potential for future mining activities due to the position of the Merensky Reef (BPDM AQMP, 2010). The National Framework for Air Quality Management in South Africa has identified the Bojanala Platinum District as having poor air quality due to emissions from mining (National Framework for AQM, 2007). Mining, particularly opencast mining, generates dust emissions as a result of quarrying, mining, materials handling, vehicle entrainment from haul roads, wind erosion from open areas, drilling and blasting.

Domestic fuel burning is also a concern in BPDM, with many households not electrified. Domestic fuel burning is of particular significance during winter when more fuel is burnt for warmth and the high pressure system over the region prevents the dissipation of pollution. Transportation is also a source of emissions in the BPDM, with private and commercial vehicle emissions as an overall contributor. Agriculture, biomass burning and waste management are all lesser contributors to overall atmospheric emissions.

An emissions inventory for BPDM was compiled as part of the Air Quality Management Plan for the District. The main sources of air pollution were identified as:

- Industrial operations,
- Mining activities,
- Agricultural activities,
- Biomass burning (veld fires),
- Domestic fuel burning (particularly, coal),
- Vehicle tailpipe emissions,
- Waste treatment and disposal (landfills and incineration),
- Vehicle entrainment of dust from paved and unpaved roads,
- Other fugitive dust sources such as wind erosion of exposed areas.

Pollutants that are of particular concern for BPDM are SO₂, NO₂ and PM₁₀. Rustenburg and Madibeng Local Municipalities also have the highest contribution of industrial emissions.

4.3.3 Topography

The Rustenburg area is typically a combination of slightly undulating plains where more than 80% of the area has slopes of less than 5%, and lowlands, hills and mountains with moderate to high relief (i.e. 50 – 80% of the area has a slope less than 5%).

The project site is located on a gently undulating piece of land that naturally slopes from west to east (1 197 to 1 188 mamsl) over 300m (1:75 – relatively flat). This is expected as the surrounding landmass includes the Magaliesberg Mountain Range 400m to the west of the site from which the site is located on the outer reaches of the mountain slope.

4.3.4 Geology and Geohydrology

The 1:250 000 Geological Series map no 2526 Rustenburg indicates that the area of interest lies on Kolobeng Norite, which is part of the Rustenburg Layered Suite. The Kolobeng norite lies on top of the Magaliesberg quartzite which is part of the Pretoria Group and the Transvaal Sequence. The Teelaagte Bronzite lies on top of the Lolobeng Norite and is also part of the Rustenburg Layered Suite. On the site the Kolobeng Norite is not visible. The Magaliesberg quartzite weathers away slowly and normally forms the mountain ranges. The Magalies Mountains to be found in the area is typically representative of the Magaliesberg

quartzite. The quartzite rock weathers to fine grained sand which normally migrates down towards the valleys. The site is covered by red fine grained sand that originated from the mountains from the Magaliesberg quartzite which was transported by water towards the site. The thickness of the sand on site may be 10 to 15 metres in depth. Below the sand the Kolobeng Norite is to be found. Kolobeng

<u>Sequence</u>	<u>Group</u>	<u>Formation</u>	<u>Lithology</u>	<u>Color</u>
Rustenburg Layered Suite	Pretoria	Magaliesberg	Tweelaagte Bronzite	Vi
			Kolobeng norite	Vn
Transvaal Sequence			Quartzite	Vm

Figure 4-7: A summary of the lithology of the project area

Contamination risk:

Norite is intrusive rocks that is normally blue in colour and weathers to a coarse grained medium yielding aquifer which has a low susceptibility. Groundwater quality management indicates a low level of protection is needed (GQM index 2). The vulnerability of groundwater resources in the area is rated as low to medium as the groundwater aquifer lies approximately 17 to 21m below the surface. The groundwater flow velocity is slow at 30.6m/a, which also results in the slow spreading of groundwater contamination to the east. With borehole water abstraction, this rate will increase.

Water availability:

The groundwater recharge for the property is 43.8mm/a. Over an area of 13.8ha, this translates to 16.59m³/day which is 5.8% of MAP. With natural recharge at 16.59m³/day and 0.67m³/day induced from irrigation activities, it implies that 17.25m³/day of groundwater is available to the site (Geo-logic, 2013).

De Brough Estate requires and uses an estimated 60m³/day of groundwater, currently. Based on the 17.25m³/day recharge for the property, it is therefore evident that there is not sufficient groundwater to sustain this development.

Water quality:

Groundwater in five (5) of the six (6) boreholes sampled and analysed during the geohydrology study (Geo-logic, 2013) was found to be contaminated in terms of Mg (Magnesium), NO₃ (Nitrate) or E-coli (Table 4-3).

Magnesium (Mg): Magnesium is an alkaline earth metal which reacts with oxygen and water to form magnesium oxide and magnesium hydroxide, respectively. Magnesium is a common constituent of water. The solubility of magnesium in water is governed by pH. Magnesium bicarbonate, chloride, nitrate and sulphate are very soluble in water. When water with elevated magnesium is heated, scaling problems may result. Magnesium has a bitter taste.

Table 4-3: Water quality (Geo-logic, 2013)

Parameter: (mg/l unless otherwise indicated)	SABS 241 (South African Bureau of Standards)		Baseline (BH23 on Plot 2 – Ferreira)	BH19 (Plot 1 - Makgoba)	BH5 (Plot 3 – Roselt)	De Brough Estate		
	Class I (acceptable)	Class II (Max allowable)				4	1	2
pH	5 – 9.5	4 – 10	8.02	7.84	8.00	8.24	8.11	8.76
TDS	1 000	2 400	291	481	141	347	288	430
Cl	200	600	21.7	43	1.08	42.4	17.1	49.8
SO ₄	400	600	36.1	51.3	12.3	24.1	18.9	24.4
NO ₃ as N	10	20	6.2	11.2	1.58	10.6	7.17	13.5
NH ₃ as N	1	2	0.12	0.15	0.097	0.093	0.091	< 0.005
o-PO ₄			0.021	0.021	0.023	0.019	0.020	0.017
F	1	1.5	0.136	0.167	0.174	0.108	0.169	0.143
Ca	150	300	18.7	28.7	8.99	15.4	18.9	28.5
Mg	70	100	65.2	105	31.6	85.9	66.1	105
Na	200	400	0.592	1.51	0.522	0.539	0.526	< 0.013
K	50	100	0.462	1.77	0.192	2.62	1.54	1.82
Coliforms	10	100	< 1	8	47	< 1	3	16
E-coli (CFU/100ml)	0	0	< 1	< 1	4	< 1	3	< 1

Nitrate: Nitrate results from the oxidation of vegetable and animal debris and of animal and human excrement. Treated sewage wastes also contain elevated concentrations of nitrate. Nitrate tends to increase in shallow groundwater sources in association with agricultural and urban runoff. Nitrate with phosphate stimulate plant growth. Nitrate in drinking water is a health concern in that it can be converted (bacterial reduction) to nitrite in the gastrointestinal tract which limits the oxygen-carrying capacity of blood.

E-coli: E-coli is a bacterial indicator for faecal pollution from warm-blooded animals such as humans.

A full geohydrological report can be seen in Appendix D.

4.3.5 Soil

In the Rustenburg area, the Mispah-forms of soil are the most dominant, covering the central parts of the area with some miscellaneous bands radiating from the eastern parts. Soils in the Mispah forms can generally be described as lithosols of arenaceous sediments. These soils may be “brown to reddish brown ferrigenous lateritic soils” (SEA, 2003).

One general soil type is identified to occur within the project area (Figure 4-8).

The entire site, as can be seen in Figure 4-8, is identified to have red, yellow or greyish soils with a high base status. The soil class associated and identified within this region include freely drained, structureless soils. These soils, which are favourable for physical development such as this project, may have a restricted soil depth, excessive drainage, high erodibility and low natural fertility.

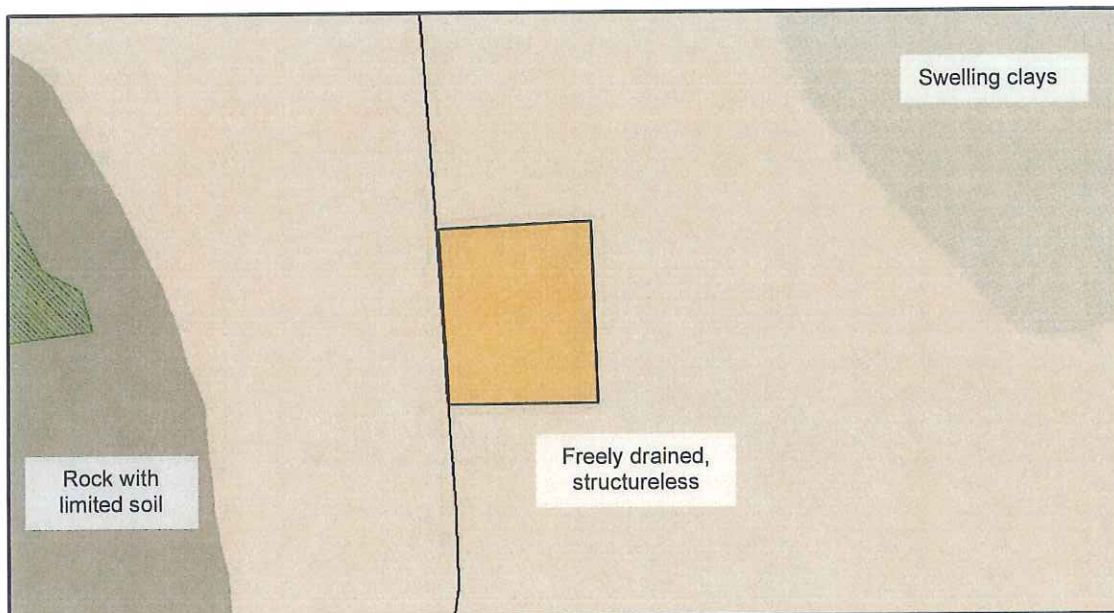


Figure 4-8: Soil classes identified for the project area

Prevention of contamination: Silty fine grained soil acts as a filtration system and/or barrier for contaminants. Contaminants therefore may be prevented from leaching into groundwater. There is a low infiltration rate of sub-surface soils and the soil restricts groundwater flow which further reduces contamination spreading.

4.3.6 Surface Water

The study area falls within the Crocodile (West) Marico Water Management Area (WMA) and within the A22H quaternary catchment. The surface water information available is as follows:

Water Management Area (WMA):	Crocodile (West) Marico
Catchment Area:	4.26028 km ²
Mean Annual Runoff (MAR):	23.7 mm
Mean Annual Precipitation (MAP):	657.65 mm
Quaternary Catchment:	A22H
Closest water course:	Hex River: 700m east of the project area
Water authority:	DWA Hartbeespoort Regional Office

DWA monitoring: A2H075 Hex River at Olifantspoort

The property has water rights in terms of the irrigation canal that is supplied with water from the Olifantsnek Dam via the Olifantsnek Irrigation Scheme.

4.4 Biotic Environment

The BPDM falls within a high biodiversity area of the Province and some significant faunal and floral species may be present in and around the project area. Although the area predominantly consists of agricultural land, the occurrence of species of concern is not eliminated.

4.4.1 Fauna

Fauna species of concern identified to occur within the Rustenburg area can be seen in Tables 4-4 to 4-7. The probability of occurrence was estimated based on the current site conditions and habitat availability for species of concern.

Table 4-4: Red Data mammals that are likely to occur within the Rustenburg region

Scientific Name	Common Name	Status	Probability
<i>Atelerix frontalis</i>	Hedgehog	Rare	Low
<i>Civettictis civetta</i>	African Civet	Rare	Low
<i>Cleotis percivali</i>	Short-eared Trident Bat	Indeterminate	Low
<i>Crocidura maquassiensis</i>	Maquassi Musk Shrew	Indeterminate	Low
<i>Graphiurus ocellatus</i>	Spectacled Dormouse	Rare	Low
<i>Manis temminckii</i>	Pangolin	Vulnerable	Low
<i>Mellivora capensis</i>	Honey Badger	Vulnerable	Low
<i>Myodomys albicaudatus</i>	White-tailed Mouse	Vulnerable	Moderate
<i>Oryzomys afer</i>	Aardvark	Vulnerable	Low
<i>Pipistrellus kuhlii</i>	Kuhl's Bat	Indeterminate	Moderate
<i>Poecilogale a. albinucha</i>	African Striped Weasel	Rare	Low
<i>Proteles cristatus</i>	Aardwolf	Rare	Low
<i>Rhinolophus denti</i>	Dent's Horseshoe Bat	Indeterminate	Low
<i>Suncus infinitesimus</i>	Lesser Dwarf Shrew	Indeterminate	Moderate
<i>Suncus lixus</i>	Greater Dwarf Shrew	Indeterminate	Low
<i>Zelotomys woosnami</i>	Woosnam's Desert Rat	Rare	Low

Table 4-5: Red Data bird species that are likely to occur within the Rustenburg region

Scientific Name	Common Name	Status	Probability
<i>Anthus brachyurus</i>	Short-tailed Pipit	Rare	Low
<i>Apus bradfieldi</i>	Bradfield's Swift	Indeterminate	Low
<i>Ardeotis kori</i>	Kori Bustard	Vulnerable	Low
<i>Botaurus stellaris</i>	Bittern	Vulnerable	Low
<i>Falco peregrinus</i>	Peregrine Falcon	Rare	Low
<i>Glareola pratincola</i>	Red-winged Pratincole	Rare	Low
<i>Gypaetus barbatus</i>	Bearded Vulture	Rare	Low

Scientific Name	Common Name	Status	Probability
<i>Gypohierax angolensis</i>	Palmnut Vulture	Rare	Low
<i>Gyps coprotheres</i>	Cape Vulture	Vulnerable	Low
<i>Ixobrychus sturmii</i>	Dwarf Bittern	Indeterminate	Low
<i>Mirafrua chuana</i>	Short-clawed Lark	Indeterminate	Moderate
<i>Neophron percnopterus</i>	Egyptian Vulture	Endangered	Low
<i>Neotis ludwigii</i>	Ludwig's Bustard	Vulnerable	Low
<i>Polemaetus bellicosus</i>	Martial Eagle	Vulnerable	Low
<i>Porzana pusilla</i>	Baillon's Crake	Indeterminate	Low
<i>Pterocles gutturalis</i>	Yellow-throated Sandgrouse	Indeterminate	Moderate
<i>Terathopius ecaudatus</i>	Bateleur	Vulnerable	Low
<i>Torgos tracheliotus</i>	Lappet-faced Vulture	Vulnerable	Low
<i>Tyto capensis</i>	Grass Owl	Vulnerable	Moderate

Table 4-6: Red Data herpetofauna species likely to occur within the Rustenburg region

Scientific Name	Common Name	Status	Probability
<i>Dalophia pistillum</i>	Blunt-tailed Worm-lizard	Peripheral	Low
<i>Homoroselaps dorsalis</i>	Striped Harlequin Snake	Rare	Low
<i>Python sebae natalensis</i>	African Rock Python	Vulnerable	Low

Table 4-7: Red Data arthropod species likely to occur within the Rustenburg region

Scientific Name	Habitat	Status	Probability
<i>Acraea machequena</i>	Bushveld	Red Data	Low
<i>Andronymus neander neander</i>	Wetlands/forests	Red Data	Low
<i>Metisella meninx</i>	Wet areas/wetlands	Red Data	Low
<i>Neita neita</i>	Bushveld/Hillsides	Red Data	Low
<i>Spialia paula</i>	Bushveld	Red Data	Low

4.4.2 Flora

The project area falls within the Moot Plains vegetation type (Figure 4-9). The Moot Plains Bushveld forming the southern plains of the Magaliesberg consists of open to closed woodlands dominated by *Acacia caffra* and *Acacia karroo*. The threatened status of this vegetation type is Vulnerable and the conservation target is 19% (Mucina and Rutherford, 2006).

Although this vegetation type is identified to be of conservation value, the vegetation on the site was found to be completely transformed due to agricultural activities and the current development. Very little traces are found of the original bushveld vegetation type, the trees mostly consist of exotic species, *Pinus sp.* (Pine tree), *Grevillea robusta* (Silky oak) etc. The Silky oak is commonly found and planted at orchards/citrus plantations as a windbreak.

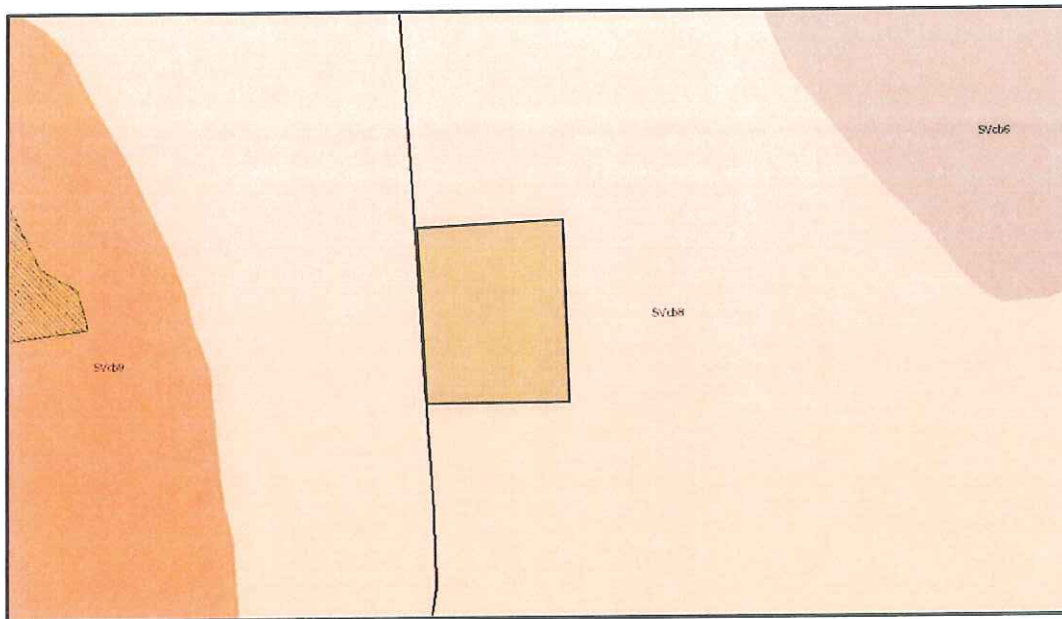


Figure 4-9: Vegetation type, Moot Plains, identified for the project site (Mucina and Rutherford, 2006)

Red Data species that might occur within the project grid square 2527CD as listed by the South African National Biodiversity Institute (SANBI) can be seen in Table 4-8. However, due to the extent of disturbance on site and since no natural vegetation occurs on the site anymore, the occurrence of species of concern is highly unlikely.

Table 4-8: Red data plant species that might occur within the project area (SANBI, 2012)

Family	Species Name	Common Name
AQUIFOLIACEAE	<i>Ilex mitis</i>	Declining
ASPHODELACEAE	<i>Aloe peglerae</i>	Endangered
CRASSULACEAE	<i>Adromischus umbraticola</i>	Near Threatened
HYACINTHACEAE	<i>Ledebouria atrobrunnea</i>	Vulnerable
MESEMBRYANTHEMACEAE	<i>Frithia pulchra</i>	Rare
MYROTHAMNACEAE	<i>Myrothamnus flabellifolius</i>	Data Deficient

Endemic species, meaning species that only occur within South Africa or specific regions of South Africa were also taken into account. Endemic species listed by SANBI to possibly occur within the project area can be seen in Table 4-9 but as with the occurrence of Red Data species, it is highly unlikely that these species occur.

Table 4-9: Endemic plant species that might occur within the project area (SANBI, 2012)

Family	Species Name
ANACARDIACEAE	<i>Searsia rigida</i>
APOCYNACEAE	<i>Aspidoglossum glabrescens</i>
APOCYNACEAE	<i>Huernia transvaalensis</i>
ARALIACEAE	<i>Cussonia transvaalensis</i>

Family	Species Name
ASTERACEAE	<i>Vernonia staehelinoides</i>
ASTERACEAE	<i>Berkheya carlinopsis</i> subsp. <i>magalismontana</i>
ASTERACEAE	<i>Berkheya seminivea</i>
ASTERACEAE	<i>Vernonia staehelinoides</i>
CAMPANULACEAE	<i>Wahlenbergia magaliesbergensis</i>
CELASTRACEAE	<i>Gymnosporia polyacanthus</i> subsp. <i>vaccinifolia</i>
CELASTRACEAE	<i>Gymnosporia polyacanthus</i> subsp. <i>vaccinifolia</i>
CRASSULACEAE	<i>Adromischus umbraticola</i>
EUPHORBIACEAE	<i>Euphorbia clavarioides</i> var. <i>truncata</i>
FABACEAE	<i>Indigastrum burkeanum</i>
MALPIGHIACEAE	<i>Triaspis glaucophylla</i>
MALVACEAE	<i>Hermannia grisea</i>
MALVACEAE	<i>Hibiscus marlothianus</i>
MALVACEAE	<i>Hermannia lancifolia</i>
MALVACEAE	<i>Triumfetta sonderi</i>
POACEAE	<i>Sporobolus pectinatus</i>
PORTULACACEAE	<i>Portulaca grandiflora</i>
RHAMNACEAE	<i>Phylica paniculata</i>
SCROPHULARIACEAE	<i>Craterostigma wilmsii</i>
VITACEAE	<i>Cyphostemma sulcatum</i>

4.5 Socio-Economic Environment

The dominance of the mining sector in the local economy of the RLM is depicted in that more than 50% of the employed economically active population were involved in the mining sector by 2007. The total number of people employed in this sector has also increased from 57212 in 2001 to 64861 by 2007. This has reduced somewhat, due to the retrenchment of mineworkers in 2012. The most notable other sectors is the wholesale and retail trade sector which by 2007 accounted for 10.8% of the employed population (13962 people) and the community, social and personal services sector representing 12% of the employed population (15490 people). The proportional contribution of the various economic sectors to employment has not dramatically changed between 2001 and 2007. A further important aspect to note is that, despite the large rural areas in the RLM, the agricultural sector only accounted for 3.4% of the employed population by 2007. It also slightly decreased from 4.1% in 2001 (SDF, 2010).

Housing Demand: The potential future growth of the municipality, resulting from both natural growth, as well as immigration to the area due to its high economic growth rate, will result in an additional demand for housing up to 2015. The total additional demand over this period is estimated to be approximately 57 000 units. This figure includes both affordable housing units to be provided through the public sector, as well as bonded houses to be provided through the private sector (SDF, 2010). This project specifically aims to address a socio-economic need for affordable accommodation.

Need for Services: In and around the project area, the local community have no direct access to municipal water and is not linked to the municipal sewage management system. Groundwater is used, via boreholes, as water supply source. Municipal power lines are located adjacent to the site and the property therefore has access to municipal electricity. Since the property is not linked to the municipal sewage management system, the applicant

has self-engineered a small sewage treatment system where after the treated effluent is used for irrigation of gardens. General waste is sorted and recycled and then collected by a contractor for removal for off-site disposal.

4.5.1 Heritage/Archaeology

No sites of cultural importance were identified to occur on site currently, however the entire site is already disturbed and the EAP cannot determine whether any sites of heritage importance existed prior to project activities. The farm house that exists on site has not been affected by project activities, but has been renovated and completely modified. It does not resemble the typical farm house of heritage importance.

5 PROJECT ALTERNATIVES

5.1 Site Alternatives

Location alternatives have not been considered as the applicant owns the farm on which the development exists. Activities on the project area already commenced in 1999 as part of accommodation facilities for farm workers, but were then expanded further over time. Therefore finding or considering an alternative site is not feasible for the applicant.

5.2 Activity Alternatives

Alternative 1 for use: Preferred option - Residential township establishment: The current zoning of the property is agricultural. An application has been submitted to RLM (Towncomp, August 2013) for a change of land use from agricultural use to residential use for the purpose of a township establishment. The residential township establishment will provide housing for individuals/families seeking low cost rental accommodation within the Rustenburg area.

Alternative 2 for use: Agriculture: The current zoning of the property is agricultural. As per Title Deed (T136987/99; T115861/06; T115860/06; T141078/07; T141079/07) the said portion of land must be used for the cultivation of orchard trees. The trees and surrounding environment must remain in a good and healthy condition. The orchards have been completely eliminated by the project. An application has been lodged to uplift these title deed conditions. The land was sub-divided under approval of Department of Agriculture and each of the five (5) properties now has its own title deed (T136987/99; T115861/06; T115860/06; T141078/07; T141079/07). Four (4) of the properties cannot be farmed economically due to its small size (~1ha). The fifth portion is 9.8ha.

Alternatives in terms of water supply:

- **Groundwater:** The preferred option that is currently available to the applicant is groundwater from four (4) existing boreholes on the site. However, according to the geohydrological specialist study, the groundwater in the area and available to the property, is insufficient to supply water to the amount of residents currently on De Brough Estate. Continual abstraction of groundwater at current volumes will affect the supply available to surrounding residents (other water users). Therefore this supply will need to be supplemented by another option.
- **Rand Water:** Water supply from Rand Water pipeline on the R24 adjacent to the site. However, this is some distance from the site and does not seem a viable option as it would prove too costly.
- **RLM:** Municipal water supply – municipal water supply and sewage management systems do not currently exist on this site or extend to this area. There are also not immediate plans by RLM to extend water supply infrastructure this far from the CBD and therefore this is not regarded as a viable option.
- **Olifantsnek Irrigation Scheme:** Water can possibly be bought from the Olifantsnek Irrigation Scheme and be transported to site via the existing canal. Mr Brough is a registered user with the Scheme (membership no. 013) and 8.565 m³ of water is allocated to him annually. However, if permission is given for the water use, the water will need to be treated (water treatment plant) to ensure it is of acceptable quality for human consumption. The Olifantsnek Irrigation Scheme has been contacted in this regard and an application has been lodged.

Alternatives in terms of sewage management:

- **RLM:** Link with municipal sewage management system. Municipal sewage management system/infrastructure does not currently exist on this site or extend to this area and RLM

has no immediate plans to extend this far from the CBD. Therefore, this is not regarded as a viable option.

- On-site dry system: SPUD (Solar-powered dehydration) system considers the scarcity of water resources (aerobic dry system, 100% waterless), the lack of bulk infrastructure in most municipal areas (municipal backlogs), the cost of establishing wastewater treatment works and environmental impact (solar powered, ventilation powered through a wind driven extractor, no need for off-site removal and disposal – self-contained, 100% chemical free). This is the preferred option, if an upgraded Sewage Treatment Plant is not possible.
- Self-engineered treatment facility: According to Water and Sanitation Africa, September/October 2012, “Africa will break away from the centralised model of sewage treatment and adopt a decentralised approach that can be deployed rapidly, independent of access to capital, and with low operating and maintenance cost” (Loyiso Jiya, Bannow Africa). A number of different package plant options exist - Blivet package plant (rotating biological contractor); Green Sanitation (Anaerobic bacteria generator and nano filter) etc. The current sewage treatment facility at De Brough Estate was self-engineered and is inadequate for the treatment of the current wastewater volume produced (it overflows). The treatment facility will need to be upgraded to a more efficient system and must be approved by the Department of Water Affairs. The establishment of an upgraded sewage treatment plant will require a WML in terms of the NEMWA.

5.3 No-go Alternative

If the NEMA Section 24G rectification application is not authorised, the entire site will have to be rehabilitated and restored to its original condition. This will include the re-establishment of indigenous bushveld species (trees, shrubs, grasses) and the removal of any exotic/invasive species. It must be noted that prior to the site clearance, there were existing disturbances on site (agricultural practices - orchards). If the land is rehabilitated to be utilised for agricultural activities (orchards) again instead of natural vegetation, it would prove sufficient.

If the NEMA Section 24G rectification application is not authorised, a major socio-economic impact will be exerted as many of the occupants/residents of De Brough Estate are elderly or disadvantage individuals with young children. There are apparently no other affordable accommodation facilities that exist where they can move to if the project should be decommissioned (personal communication with community members).

6 PUBLIC PARTICIPATION

6.1 Introduction

The PPP forms an integral part of any authorisation process and it is one of the important aspects of the process. Its aim is to provide all interested and affected parties (I&APs) with clear, accurate and comprehensible information about the project, its alternatives, the possible environmental impacts and the management thereof. In addition, the process seeks to provide I&APs with the opportunity to indicate their viewpoints on issues and concerns regarding the project/development, alternatives and/or decisions.

This process therefore enhances transparency and accountability in decision-making as it allows all I&APs to suggest ways of avoiding, reducing or mitigating negative impacts of the project and enhance positive impacts. All inputs from the I&APs are considered in the project and consequently clear recording of all issues and concerns raised was maintained in a comments and response register. This register is updated when new issues or concerns are raised.

This section of the report provides a methodical description of the PPP followed. It also contains a complete record of any public notices, details of all registered I&APs and all communications to and from I&APs pertaining to the application.

6.2 Approach

The aim of the PPP is not only to adhere to the legislation, but also to give as many stakeholders and I&APs as possible an opportunity to be actively involved in this process.

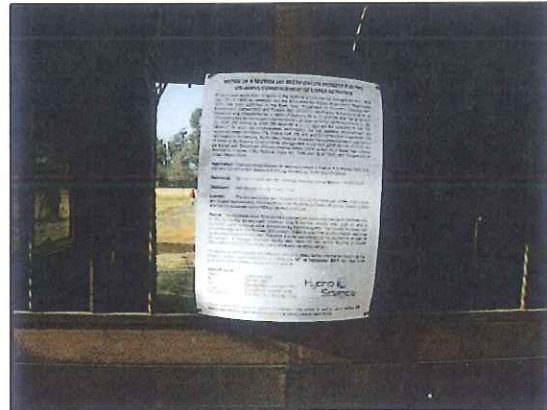
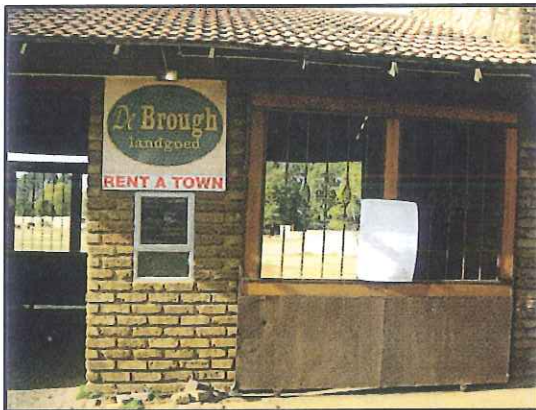
The PPP has been carried out in accordance with Chapter 6 of the NEMA as amended and in support of the EIA Regulations, 2010. Based on these Regulations published in terms of Sections 54 to 57 of GNR 543 of NEMA, the following steps were undertaken:

- Potential I&APs were identified through conducting a site visit, previous work in the area and having discussions with the local community, through notices placed on site (Figure 6-1 and Plate 6-1) and through placing a notice in a local newspaper, the Rustenburg Herald (23 August 2013, page 14, see Appendix E);
- Further notice of the application for rectification was given to the identified I&APs (see Table 6-1) through the distribution of written notices, in the form of Background Information Documents (BIDs), via e-mail, fax, post and hand delivery (Appendix E);
- A stakeholder register of I&APs was compiled in terms of Regulation 57 and includes national, provincial and local authorities, government departments, community members and representatives, organisations and neighbours that may have an interest in the project. BIDs were distributed to all these stakeholders (Table 6-1);
- I&APs were given 40 days (22 August – 30 September 2013) to comment on the application or register as I&APs. Any concerns that have been raised by I&APs were acknowledged, noted and addressed (Table 6-2) by the EAP;
- Furthermore, all registered I&APs were given 40 days (31 October – 10 December 2013) to comment, in writing, on the Report - prior to its submission to the competent authority, the NW DEDECT in December 2013/January 2014; and
- A recorded summary of concerns raised by I&APs, as well as the responses from the EAP, will be kept throughout the entire process.

6.3 Public Awareness

6.3.1 Site Notices

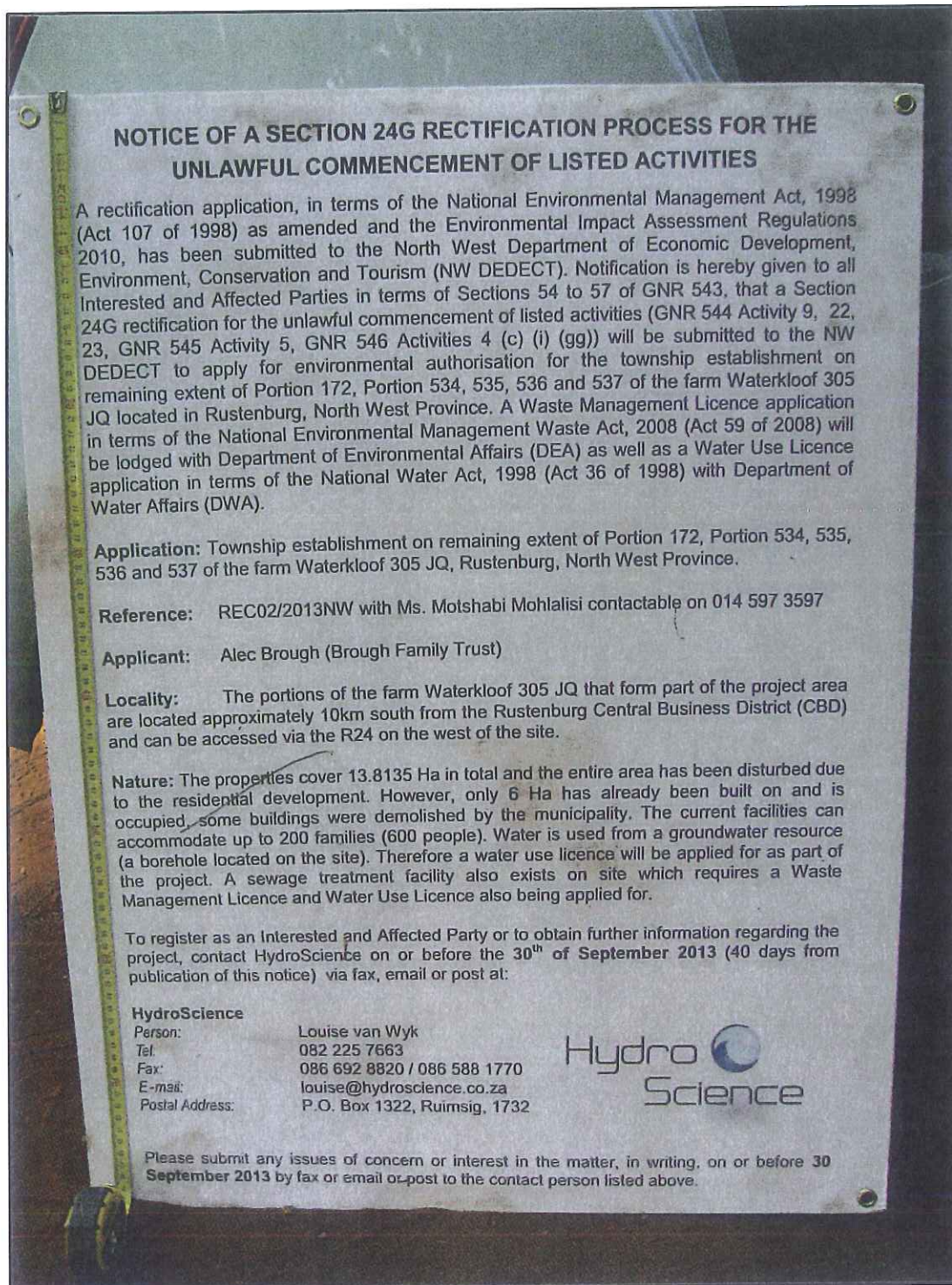
Two (2) notices (measuring 800mm x 600mm) were placed at the site on 22 August 2013 at locations where they would be visible to the public concerned. The first notice was placed on the entrance gate to De Brough Estate which is also visible from the road and to neighbouring business establishments (Orange Grove) to the south of the site. The second notice was placed at the northern entrance of the site, which is also on the R24 and visible to any passer-by. Each notice contained details regarding the applicant (Alec Brough representing the Brough Family), the nature of the activity (Township establishment), the locality of the project (Portions 172, 534, 535, 536 and 537 of the farm Waterkloof 305 JQ), reference number (REC 02/2013NW) and the contact details of the EAP (see Plate 6-1). The placement of the site notices were recorded by taking photographs of the placed notices on site as well as by recording the GPS coordinates of these positions (Plate 6-1). These notices will remain on the site for the duration of the process. Figure 6-1 indicates the locality of the notices placed on site from an aerial view.



Site notice 1 at the main entrance to the establishment south west of the site, which is located next to Orange Grove Nursery and the R24 (25° 43' 52.85" South; 27° 16' 19.37" East)



Site notice 2 at the north west entrance of the site also visible from the R24 and any passer by (25° 45' 42.47" South; 27° 16' 17.86" East)



Size and wording of the site notices

Plate 6-1: Notices placed on site as part of the Public Participation Process



Figure 6-1: Location of site notices - Google™

6.3.2 Newspaper Advertisement

One (1) newspaper advertisement (125mm X 95mm), regarding the project, was placed in the Rustenburg Herald, page 14 published on the 22/23 August 2013 (Appendix E). The aim of placing advertisements in the local newspaper (Rustenburg Herald) was to create a greater awareness of the project and to invite a broader spectrum of I&APs to register and be part of the process.

The Rustenburg Herald distributes newspapers throughout Rustenburg including Brits, Buffelspoort, Groot-Marico, Hartbeespoort, Koster, Kroondal, Lichtenburg, Marikana, Mooinooi, Sun City, Swartruggens and Zeerust. Around 32 000 copies are distributed weekly.

6.3.3 Background Information Document

BIDs, containing information regarding the project, were distributed to adjacent land owners (Figure 6-2) as well as all other I&APs (Table 6-1) via e-mail, fax, post or hand-delivery as part of the notification process. Furthermore, BIDs were also distributed to local, provincial as well as national authorities, applicable government departments (such as the DAFF), and the Ward Councillor for the area. The BIDs were distributed between 22 and 29 August 2013 and it included a locality map, as well as the registration/response form. After distribution of the BIDs, I&APs were given 40 days (22 August – 30 September 2013) to register as an I&AP and to be included in future communication and the process for the project. More than twenty (20) members of the public registered. The responses/comments received thus far can be seen in Table 6-2.

6.3.4 Site meetings

During a site visit and placement of site notices (22 August 2013), many of the surrounding landowners (amongst others Mr and Mrs Ferreira, Mr Moseki) approached HydroScience

(Mrs Louise van Wyk). Elaborate discussions were engaged in regarding neighbours' concerns. The EAP requested that they put all these concerns in writing in order for it to be correctly recorded and included in documents provided to the competent authority for decision (Table 6-2).

Site visits were further conducted with Mr Nevhufumba Lufuno from DAFF on 20 September 2013 and Mrs Kelebogile Mekgoe from RLM on 10 October 2013.

6.4 Comments and Response Register

Any concerns or issues that were raised by I&APs during the process so far, were acknowledged, recorded and addressed by the EAP where possible (see Table 6.2). All proof of communication can be seen in Appendix E.

Furthermore, all registered I&APs were given an opportunity to comment (31 October – 10 December 2013), in writing, on the Report before its submission to the competent authority, NW DEDECT.



1.	Portion 151 of Waterkloof 305 JQ	JAVAL INV CC	9.	Portion 189 of Waterkloof 305 JQ	Renier Theron
2.	Portion 124 of Waterkloof 305 JQ	JAVAL INV CC	10.	Portion 00 of Boschfontein 330 JQ	Mr H.W.A Minnaar JABEZ FILLING STATION
3.	Portion 123 of Waterkloof 305 JQ	Charles Gerald Holding	11.	Portion 125 of Waterkloof 305 JQ	Frederick Clive Bannister
4.	Portion 192 of Waterkloof 305 JQ	Ivor E. Davis	12.	Plot 3 of Waterkloof 127 JQ	J.J.F Brits
5.	Portion 247 of Waterkloof 305 JQ	Johannes van Dyk (previously Munro)	13.	Plot 2 of Waterkloof 127 JQ	D.J.J. Ferreira
6.	Portion 130 of Waterkloof 305 JQ	Johannes van Dyk ROBFAIR INV	14.	Plot 1 of Waterkloof 127 JQ	Thabo Moseki
7.	Portion 150 of Waterkloof 305 JQ	Renier Theron	15.	Portion 35 of Boschfontein 330 JQ	Adriaan Roux
8.	Portion 366 of Waterkloof 305 JQ	Kenneth Roseit	16.	Portion 36 of Boschfontein 330 JQ	Orange Grove Garden and Home Centre

Figure 6-2: Surrounding landowners within a 100m of the project area

**Table 6-1: Registered I&APs for the proposed project
NEIGHBOURING LAND OWNERS, RESIDENTS AND BUSINESSES**

Name & surname	Company/ Department/ Organisation	Tel	Email	Cell	Address	Interaction
Charles Gerald Holding	Portion 123 Waterkloof 305JQ	014 537 2482	pure-game@vox.co.za	082 806 3801	P O BOX 2715 RUSTENBURG 0300	Emailed BID: 2013-08-22
Arlene Holding	Portion 123 Waterkloof 305JQ	014 537 2482	principal@fieldscollege.com		P O BOX 2715 RUSTENBURG 0300	Registered: 2013-09-13
Frederick Clive Bannister	Portion 125 Waterkloof 305JQ	014 537 2480				Contacted via Mr. Brits Plot 3 as Mr. Bannister does not occupy his home
Johannes van Dyk ROBFAIR INV	Portion 130 and 247 Waterkloof 305JQ	014 537 2812	tjvandyk@iafrica.com	082 926 0024	P O BOX 21438, PROTEAPARK, 0305	Emailed BID: 2013-08-22
Renier Theron	Portion 150 & 189 Waterkloof 305JQ		rancor@frognet.co.za	082 829 4864		Emailed BID: 2013-08-23
Adriaan Roux	Portion 35 Boschfontein 330JQ	014 597 4829		082 908 2926	P O BOX 21913, RUSTENBURG, 0300	By Registered mail: RD654806391 2013-08-22 Registered: 2013-09-19
H.W.A Minnaar JABEZ FILLING STATION	Portion 0 Boschfontein 330JQ		q-mc@mweb.co.za a-mc@mweb.co.za	082 892 0602		Emailed BID: 2013-08-22
I. G. Bronkhorst ORANGE GROVE GARDEN AND HOME CENTRE	Portion 36 Boschfontein 330JQ	014 537 2520	campwondrtrb@telkomsa.net	082 444 2195		Hand delivered BID: 2013-08-22
Vanessa and George Crafford		086 677 2408 (fax)		082 508 2802	P O BOX 1954 RUSTENBURG, 0300	Registered: 2013-10-01
Chris Clemente DU PLESSIS & VD WESTHUIZEN INC	Legal representation of D.J.J Ferreira, W. Vos and A. Roux	014 592 9241	chris@dupwest.co.za	072 149 4231	P O BOX 254 RUSTENBURG, 0300	Registered: 2013-10-01
Alec and Ansie Brough (APPLICANT)	Portion 172		ansiebrough@gmail.com; alecbrough@gmail.com			Emailed BID: 2013-08-22

Name & surname	Company / Department / Organisation	Tel	Email	Cell	Address	Interaction
Ivor E. Davis	Portion 192 Waterkloof 305JQ		ied@telkomsa.net			Received BID from neighbour Registered: 2013-09-04
Shirley Munro (legal representation for Mr/Mrs. Munro and Mrs. E. Roselt)	Previously owner of Portion 247 Waterkloof 305JQ		smmunro@icon.co.za	082 452 4297 072 781 5976	P O BOX 2515, NORTHRIDING 2162	Received BID from neighbour Registered: 2013-09-17
E. Roselt	Portion 366/181 Waterkloof 305JQ	014 537 2521	eroselt@telkomsa.net	082 299 7164	POSTNET SUITE 23 PRIVATE BAG X82245 RUSTENBURG 0300	Received BID from neighbour Registered: 2013-09-17
W.J Vos	Plot 4 Waterval Rustenburg		willemvos@mweb.co.za	082 777 0240		Registered: 2013-09-30
J.J.F Brits	Plot 3 Waterval Rustenburg		pierredeவில்லியர்@xsinet.co.za	073 150 7824		Hand delivered BID: 2013-08-22
D.J.J and Elsa Ferreira	Plot 2 Waterval Rustenburg		elsa@mtinloaded.co.za	083 310 2843	P O BOX 1954 RUSTENBURG 0300	Emailed BID: 2013-08-23 Registered: 2013-09-15
Thabo Moseki	Plot 1 Waterval Rustenburg Portion 137 Waterkloof 305JQ		tmoseki@morusuholdings.co.za	083 648 6386		Hand delivered BID: 2013-08-22
Dr Makgoba	Portion 1 Waterkloof 305 JQ			083 627 2851		
Mr C Venter	Portion 201 Waterkloof 305 JQ			082 920 5348		
Mr H Muller	Portion 139 Boschfontein 330 JQ			083 234 8941		Contacted during geohydrology study

Name & surname	Company / Department / Organisation	Tel	Email	Cell	Address	Interaction
Cas Venter IES CONSULTING (representing seven other neighbors and concerned parties)		014 597 4182	cas.venter@iesconsulting.co.za rustenburg.scm.proc@sapa.org.za adrian.claassen@angloamerican.com peet.swanepoel@angloamerican.com om ruurd@ruurdvdwal.co.za carien.venter@webmail.co.za Christo.Wallis@lonmin.com tienie.nieuwenhuizen@yahoo.com	082 920 5348	P O BOX 6861 RUSTENBURG 0300	Registered through observation of site notice 2013-09-02
Hendrik Hart			hendrik.hart@angloamerican.com			Registered through observation of site notice 2013-09-02
Pierre G. De Villiers		014 597 0270	pierredvilliers@xsinet.co.za	083 639 7097	P O BOX 70041 RIDDERPARK RUSTENBURG 0300	Registered: 2013-09-30
Johannes Brits		014 597 0270		073 150 7824	P O BOX 70041 RIDDERPARK RUSTENBURG 0300	Registered: 2013-09-30
Allen Percy	Plot 3 Waterglen Palmsprings	014 597 0270		072 327 1047		Registered: 2013-09-30
Pieter de Jager (TOWN PLANNER FOR PROJECT)	Towncomp		towncomp@mweb.co.za			Emailed BID: 2013-08-22
Paul Fatti	Magaliesberg Protection Association		pauifatti@gmail.com			Emailed BID: 2013-08-22
Chris de Bruyn	North West Environmental Forum (NWEF)	014 537 3400	tt131424@mweb.co.za	082 823 3815		Emailed BID: 2013-08-22
Jemile Boit	Rustenburg Olifantsnek Corridor Landowners Association (ROCLA)	014 537 2244	sylviabait@telkomsa.net	079 967 4248		Emailed BID: 2013-08-22

Name & surname	Company / Department / Organisation	Tel	Email	Cell	Address	Interaction
William Sheehan Grant	ROCLA	014 597 2543	shalom@mweb.co.za	082 652 1890	PO BOX 1318 RUSTENBURG 0300	Emailed BID: 2013-08-22 Registered: 2013-08-23
Mark Muhl	Olifantsnek Irrigation Board		markmuh@vodamail.co.za	082 921 5381		Emailed BID: 2013-08-29 Registered: 2013-09-03
Dieter Wenhold	Olifantsnek Irrigation Board		dieter.wenhold@wrmw.co.za			Emailed BID: 2013-08-29

AUTHORITIES						
Local Municipality: Rustenburg Local Municipality (RLM)						
Name	Company / Department	Tel	Fax	Cell	E-mail	Interaction
Mr Thato Molwantwa	RLM: Town planning				tmolwantwa@rustenburg.gov.za	Emailed BID: 2013-08-22
Ms Tsibi Ruele	RLM: Town planning (assistant to Mr Molwantwa)				truele@rustenburg.gov.za	Emailed BID: 2013-08-22
Ms R: nette Barnard	RLM: Town planning				rbarnard@rustenburg.gov.za;	Emailed BID: 2013-08-22
Ms Mpho Haoli	RLM: Town planning				mhaoli@rustenburg.gov.za	Emailed BID: 2013-08-22
Mr Walter Senne	RLM: Waste management	014 590 3101			wsenne@rustenburg.gov.za	Emailed BID: 2013-08-22
Ms Kelebogile Mekgoe	RLM: Environmental management	014 590 3075	014 590 3070	072 585 9460	kmekegoe@rustenburg.gov.za P.O. Box 16, Rustenburg, 0300	Emailed BID: 2013-08-22
Mr Tshepo Lenake		014 590 3085		083 961 0591	lenake@rustenburg.gov.za	Emailed BID: 2013-08-22
Ms Ziyanda Mateta	RLM: Water & sanitation	014 590 3530		082 813 3358	zmateta@rustenburg.gov.za	Emailed BID: 2013-08-22
Office of the Speaker	RLM: Ward councillor				speaker@rustenburg.gov.za	Emailed BID: 2013-08-22
Ms Ala Malan	Ward Councillor		086 212 5022		alamalan@telkomsa.net	Emailed BID: 2013-08-22 Registered 2013-08-22
District Municipality: Bojanala Platinum District Municipality (BPD)						
Name	Company / Department	Tel	Fax	Cell	E-mail	Interaction
Mrs Lynette	Bojanala Platinum District Municipality: Environmental	014 594 2332			lynnettel@bojanala.gov.za	Emailed BID: 2013-08-22
Provincial Government: North West Department of Economic Development, Environment, Conservation and Tourism (NW DEDECT)						
Name	Company / Department	Tel	Fax	Cell	E-mail	Interaction
Ms Motshabi Mohlasi	NW DEDECT Rustenburg: EIA Manager and Officer of Project	014 597 3597	014 597 3553		mmohlaisi@nwpg.gov.za	Emailed BID: 2013-08-22
Mr Steven Mukhola	NW DEDECT Mahikeng Head Office	018 389 5959			smukhola@nwpg.gov.za	Emailed BID: 2013-08-22
Mr Mashudu Nemutandani	Conservation	014 597 3597			mnmnutandani@nwpg.gov.za	Emailed BID: 2013-08-22

Department of Environmental Affairs (National)						
Name	Company/ Department	Tel	Fax	Cell	E-mail	Interaction
Mr Albi Modise	National Department of Environment	012 310 3132			amodise@environment.gov.za	Emailed BID: 2013-08-22
Mr Lucas Mahlangu	DEA: Authorisation and Waste Disposal Management	012 310 3536	012 310 3753		lmahlangu@environment.gov.za Private Bag X447, Pretoria, 0001	Emailed BID: 2013-08-22
Department of Agriculture, Forestry and Fisheries (DAFF)						
Name	Company/ Department	Tel	Fax	Cell	E-mail	Interaction
Mr. B. Msoni	DAFF				CDESRM@nda.agric.za CDESRM@daff.gov.za	Emailed BID: 2013-08-22
Mr Lufuno Nevhufumba	National Department of Agriculture	018 381 3423	086 580 1640	082 907 6118	Nevhufumba@nda.agric.za Private Bag X05, Mmabatho, 2735	Emailed BID: 2013-08-22
Mr Piet Theron					PietT@daff.gov.za	Emailed BID: 2013-08-22
Mr David Kleyn			012 319 7484			davidki@nda.agric.za
Department of Water Affairs (DWA)						
Name	Company/ Department	Tel	Fax	Cell	E-mail	Interaction
Ms Letabo Ramashala	DWA: Hartbeespoort regional office	012 253 1026	086 548 3057	082 885 9581	Ramashala@dwa.gov.za P/Bag X357, Hartbeespoort, 0216	Emailed BID: 2013-08-22
Ms C. Theunissen	DWA - Hartbeespoort Dam Office				TheunissenC@dwa.gov.za	Emailed BID: 2013-08-22
Department of Public Works, Roads and Transport (DPWRT)						
Name	Company/ Department	Tel	Fax	Cell	E-mail	Interaction
Mr Lobakeng	NW DPWRT				lobakengk@nwppg.gov.za	Emailed BID: 2013-08-22
Department of Housing (MEC Support; communication; development & planning)						
Name	Company/ Department	Tel	Fax	Cell	E-mail	Interaction
Mr Kelepile Thaganyane	NW Department of Housing	018 387 3689			kthaganyane@nwppg.gov.za	Emailed BID: 2013-08-22
Mr S. P. Ramagaga		018 387 5303			sramagaga@nwppg.gov.za	Emailed BID: 2013-08-22
Ms Kelebogile Tshenkeng		018 388 2391			ktshenkeng@nwppg.gov.za	Emailed BID: 2013-08-22

South African Heritage Resources Agency (SAHRA)						
Name	Company/ Department	Tel	Fax	Cell	E-mail	Interaction
Ms Colette Scheermeyer	SAHRA	021 462 4502			cscheermeyer@sahra.org.za	Emailed BID: 2013-08-22
ESKOM						
Name	Company/ Department	Tel	Fax	Cell	E-mail	Interaction
Mr Kobus Vorster	Eskom	014 565 1122	014 565 1191	083 255 2341	Vostek@eskom.co.za	Emailed BID: 2013-08-22

Table 6-2: Comments and Response Register

Comment received from:	Date received and date responded:	Comment / concern:	Response:
Shirley Munro-Flint (Legal representation for Mr & Mrs Munro & Ms E. Roselt)	2013-08-28 2013-08-29	<ul style="list-style-type: none"> • Confirms legal representation for Mr. & Mrs. Munro & Ms. E. Roselt. • Identifies issues pertaining to the registered servitude in clients', (Mr and Mrs Munro) favour and the dependency on the groundwater located on the portion(s) of land on which the envisaged township establishment is proposed. • Requested a copy of the BID 	<ul style="list-style-type: none"> • To register, form attached to BID document (sent in email) must be completed. • The Surveyor General diagram does indicate the servitude and the servitude is therefore legal and will therefore remain irrespective of any application, construction etc. The title deeds also refer to the servitude in favour of certain properties. • The EAP is aware of the issues with groundwater as a water supply source in the area as there is no municipal water supply to this area. A specialist geohydrology study will be conducted as part of this process – which will include a hydrosensus to establish all other groundwater users in the area as well as the pollution risk to groundwater quality from current sewage management practices.
Hendrik Hart	2013-09-02 2013-09-04 – initial response 2013-10-31 – detailed response in report	<ul style="list-style-type: none"> • Underground water will not be able to sustain this development. Since 2010, there has been a gradual decline in the water table levels. • Traffic infrastructure of this road can't handle this amount of traffic. • Residents in this region prefer to live outside town for the peace and tranquility. This development will bring the city to this region. This is cheap low cost housing which appeals to a certain segment of citizens. Citizens that can't afford to stay in town and with poverty come drugs, alcohol misuse, violence and crime. • Stop low cost housing by a few capitalists that want to make quick buck or two. If concerned about people that can't afford houses in town, collaboration with the Local Municipality to ensure that affordable accommodation is erected on municipal land, with Rand Water and Municipal sanitation connections must be pursued. 	<ul style="list-style-type: none"> • Mr Hart was registered and will be notified of the progress throughout the process. • The geohydrology study confirmed that groundwater will not be able to sustain this development. • The layout diagram shows the upgrade of roads planned by the roads and transport authority. This should improve traffic (which is not necessarily a result of this development). • The development does include affordable accommodation. • Affordable accommodation should preferably be provided by the municipality. • Affordable accommodation should have services.

Comment received from:	Date received and date responded:	Comment / concern:	Response:
Cas Venter	2013-09-02 2013-09-04 – initial response 2013-10-31 – detailed response in report	<ul style="list-style-type: none"> • Since 2010 there is gradually decline in the water table levels. Such a development will not be sustainable on borehole water in the area. • Inadequate services threaten the water quality such as siltation, contamination and sedimentation of both surface water and groundwater sources. • Two aquifer types occur in the area - Rustenburg layered Suite & Magaliesberg Formation. Ground water yield from these aquifers is generally poor (i.e. less than 2l/s) and the water quality is generally average to good. • The traffic infrastructure on the R24 cannot support an increase in traffic. • The Magaliesberg Mountain range is currently protected under ECA as a Protected Natural Environment. This area provides Rustenburg with a significant natural asset and this should continue to be protected against developments like these. • Services are insufficient. This gives rise to environmental impacts including pollution, contamination of water, dumping, and unhealthy living conditions. • Development pressures are exerting a number of impacts on the biophysical as well as socio-economic environment in the form of decreased air quality, reduced water quality, loss of natural land, loss of agricultural land, increased traffic and congestion, increase in the number of illegal activities, noise pollution, litter and illegal waste dumps, inadequate service supply and delivery, lack of enforcement and several other impacts. • We are in support of Mr Hart's comments • We hereby would like to lodge a formal and strong objection against the project. 	<ul style="list-style-type: none"> • The geohydrology study confirmed that groundwater will not be able to sustain this development. • The geohydrology study confirmed contamination of groundwater (nitrates, magnesium and Ecolli) in the area (not necessarily as a result of this project). • Refer to geohydrology report or geohydrology section (4.3.4) for details on aquifer yields and quality. • The layout diagram shows the upgrade of roads planned by the roads and transport authority. This should improve traffic (which is not necessarily a result of this development). • Agree on the MPE protection though it is now protected under the MPE EMF, NEMPAA and NEMBA. This was considered in the report, Refer to Section 4.1. • Any development should assure adequate services available. • The EAP acknowledges receipt of all concerns and objections in regard with the continuation of this project. This will be conveyed as such to the deciding authority. • All involved were registered (including attached email addresses), therefore, the progress of the application process will be conveyed to all registered.

Comment received from:	Date received and date responded:	Comment / concern:	Response:
Ivor Davis	2013-09-02 2013-09-04 – initial response 2013-10-31 – detailed response in report	<ul style="list-style-type: none"> • A complaint is lodged regarding yet another development that has commenced on the property adjacently situated. A contractor concerned with the project approached neighbours with a request to buy water from them as they do not have enough themselves. The area does not have strong water supply and all within this region are aware of it. Whilst there might be enough water for normal domestic use, on the basis of one residence per plot, the water supply in this area will not support further ever increasing developments of this nature. The water table has declined over the years and there is a real threat that the supply might fail. • Judging by the size of the area of the site of this new development, it has the potential to provide high density "flat-type accommodation which, whilst it will bring high profits to the individual owner of the property, will be detrimental to and at the expense of the other property owners in the area, specifically in respect of the following:- • All residents rely on boreholes for their domestic water needs. Water table has dropped substantially over the past few years - direct result of more and more pressure being brought to bear on available underground water resources owing to over exploitation of this scarce resource as a result of this type of injudicious and uncontrolled housing development. • No sewerage reticulation in area. Residents rely on septic tank type of sewerage disposal. Due to the risk of overexploitation of water reserves, the underground water supply might ultimately also be polluted to the point of the water being rendered unsuitable for domestic consumption. The implications of this could be far reaching in respect of not only the health hazard imposed on existing residents who have no alternative 	<ul style="list-style-type: none"> • This project is for the current existing development. • The geohydrology study confirmed that groundwater will not be able to sustain this development. • The use of guesthouses and B&B's for permanent accommodation highlights the need in the area. • The EAP acknowledged receipt of the registration form as well as the concerns raised. Similar concerns were also raised by other neighbouring property owners (see above) and definitely require the necessary attention. • I&AP will be informed as more information becomes available. • Concerns will be submitted to the competent authority, NW DEDECT to consider during their decision-making process. You are welcome to contact this authority directly, should you wish to do so in terms of other developments that are also of concern to you.

Comment received from:	Date received and date responded:	Comment / concern:	Response:
		<p>supply of potable water, but also begs the question, who will be held responsible in the event of the water supply of many residents either failing or becoming polluted.</p> <ul style="list-style-type: none"> • It is with great concern that for some years now developments of this nature that are being applied for, ostensibly for so-called "Bed and Breakfasts" and "Lodges" are often a smoke screen for various types of substantial and permanent accommodation and apparently continue to be approved in this area unabated, notwithstanding the lack of provision of either sewerage disposal or alternative water reticulation. • Other developments in this area development seems to be taking place and would be happy to point these out to you as I would like to know whether they have the approval of the powers that be and whether any thought has been given our water supply and pollution aspect being able to support these developments. • Is the lodging of these concerns with a higher authority on a regional or even National level possible, then please advise so that complaints and issues can be addressed to an appropriate authority to not only put a stop to these developments but to also investigate such developments already approved or not approved. Surely we cannot continue to sit back and do nothing whilst ever more developments are allowed to take place in an area that has limited resources of water and could ultimately be threatening to our health and our ability to actually continue to live on our properties. I am a pensioner and have nowhere else to go and, as water is life, without it I would be forced to abandon my home. 	

Comment received from:	Date received and date responded:	Comment / concern:	Response:
Jemil Bait	2013-09-05 2013-09-05 – initial response 2013-10-31 – detailed response in report	<ul style="list-style-type: none"> • Similar development was attempted recently at Olifants Nek Dam. The MEC from Mmabatho ruled that underground water cannot be used for any construction. Same applies here. • Contamination of underground water, an unhealthy sewage system which in effect is the pollution of underground water by 300 people. Neighbouring landowners are seriously affected. • Proof is required for the following: <ul style="list-style-type: none"> • A safe new sewage system; • Approved plans of existing housing; • Electrical certificate; • Approval from the Roads Department for access from and onto the R24 • Municipal approval and associated EIA outside of the spatial development area. • Requested to register wife as well 	<ul style="list-style-type: none"> • The geohydrology study confirmed contamination of groundwater (nitrates, magnesium and Ecol) in the area (not necessarily as a result of this project). • The EAP acknowledged receipt of registration and concerns. • I&AP will be updated. • Geohydrology study was conducted - address the groundwater and sewage concern which was raised by a number of people.
Gerald Holding	2013-09-13 2013-09-16	<ul style="list-style-type: none"> • Requested to register wife as well 	<ul style="list-style-type: none"> • Notified that wife has been registered.
T J van Dyk	2013-09-16 2013-09-16	<ul style="list-style-type: none"> • When will geohydrologist study boreholes (2) situated on plot 130 next to the De Brough Estate. 	<ul style="list-style-type: none"> • EAP provided details to the geohydrologist. • Mr. van Dyk was contacted directly by the geohydrologist. • Mr van Dyk's boreholes were included in the hydrocensus.
Shirley Munro-Flint (Legal representation for Mr & Mrs Munro & Ms E. Roselt)	2013-09-16 2013-09-16 – initial response 2013-10-31 – detailed response in report	<ul style="list-style-type: none"> • Notarial Deed of Servitude No. K5474/03S in favour of Ms Roselt. • Servitude is right which belongs to our clients and which entitles our clients to exercise those rights. It is protected by law and may not be encroached upon in any way whatsoever. • Property situated within the Magabiesberg Protected Natural Environment - subject to provisions NEMPAA. EMF and its relevant land use guidelines will thus also apply to the desired state that is the end use proposal. Compliance with legislation. 	<ul style="list-style-type: none"> • Comments are acknowledged. • Agreed on servitude. • Property is outside MPNE and outside Critical Biodiversity Area (CBA) 1. It however, does fall within the 2.5km buffer zone of the MPNE. EMF will be referred to in terms of land use applicable to the buffer zone. • Groundwater pollution risk as well as available groundwater volumes for abstraction was investigated by geohydrologist. A riparian delineation will not be conducted due to the

Comment received from:	Date received and date responded:	Comment / concern:	Response:
		<ul style="list-style-type: none"> • Property situated in Transition Zone of proposed Magaliesberg Biosphere. Necessary EIA of project to be conducted. • Increase in use of groundwater due to unlawful activities on property as well as pollution impact. The Hex River also abuts the property. A Riparian Delineation exercise needs to be conducted in line with DWA Protocol. • Clients' properties are solely dependent on borehole water for human and animal consumption and agricultural activities. Development is firstly inappropriate and secondly has the potential, (it is reasonable to assume that it already has) to have a devastating effect on water supply and water pollution. Accordingly a specialist hydrological survey must be undertaken. The scope of the hydrological survey cannot be restricted as this would compromise its validity. The water quality, contamination risks and bacteriological studies must be undertaken and the depth of the water table must be assessed. • It is further submitted to consider and include in alternative sewerage facilities and/or methods including municipal facilities. • Kindly provide the name and details of the groundwater specialist and contractor that has been appointed. In this regard we refer you to your email of 13 September 2013. • Sampling and testing of water must also be undertaken on our clients' property. We are furthermore of the view that you cannot determine the vicinity, (you have already determined the vicinity of properties within 100m of De Brough Estates) without a hydrocensus determination. • We point out at this time that we do not consider the Section 24G Application an appropriate vehicle in which 	<p>distance of the Hex River from the property in question.</p> <ul style="list-style-type: none"> • A specialist geohydrological investigation (groundwater) not hydrological (surface water) was undertaken. All surveys are restricted in scope. However, the aspects mentioned have covered. The study is in line with DWA requirements. • Consideration of alternatives form an important aspect of studies and alternative sewerage management facilities will definitely be considered. • Mr Henk Kruidenier is the groundwater specialist and you can contact him at geologic@jantic.net (please copy us in on your communication with him) or 082 872 5705 • The geohydrological specialist will determine, based on scientific principles, on which properties sampling and testing will be undertaken. The 100m vicinity you refer to has nothing to do with the geohydrology, this is in terms of the public participation process and indicated in guidelines and regulations. A hydrocensus forms part of the geohydrological study and this was done within a 1km radius. • Mrs Roself's borehole was included in the hydrocensus. • The Section 24G rectification application is currently the only vehicle available to address the rectification of transgressions in terms of NEMA. • The current project as per appointment does not include a compliance audit but it can be suggested to the client and if he is prepared to pay for it, it can be arranged. Thus far the following legislation is considered in this process: NWA, NEMA, NEMWA & Township Ordinance (handled by a townplanner).

Comment received from:	Date received and date responded:	Comment / concern:	Response:
Harry Munro and Elizabeth Roselt	2013-09-17 – 2013-09-17 – initial response 2013-10-31 – detailed response in report	<p>to address transgressions of inter alia; the National Water Act, 1998, National Environmental Management Act, 1998 and the National Environmental Management Waste Act, 2008.</p> <ul style="list-style-type: none"> • We furthermore propose that you conduct a compliance audit on the property in order to determine whether other legislation has been contravened. • Our clients' rights are reserved to amend and /or supplement that which is contained herein at any time of the process. <p>H. Munro:</p> <ul style="list-style-type: none"> • Report did not mention servitude (T29448/1970) situated on Portion 172; exists for over 40 years - Deed of Transfer T11372/87. • Plot 247 is located on the west side of the R24 and is dependent on this water for agricultural use and human consumption. Plot 366 which has no borehole is also serviced from this servitude, as are other properties in the area which require water during drought periods. • Pollution impact is of vital importance. Riparian delineation in line with DWA protocol required and bacteriological studies on the quality of the water. • Also refer to Ms. Munro-Flintz's comments. <p>E. Roselt:</p> <ul style="list-style-type: none"> • Concern - some landowners have no understanding of their title deeds, respects for the authorities and consideration for water/environment. • Appears that Mr. Brough is a landowner that goes ahead with a development with no consideration of the law. Only after pressure from concerned landowners did he apply for permission. Letters of concern and complaints have been sent to the municipality and the MEC of DAFF since 2005. • Plot 366 is solely dependent on the servitude 	
		<p>EAP acknowledges receipt of registration (Mr Harry Munro & Mrs E Roselt) as I&APs. As mentioned previously, the title deed does make mention of the servitude and the servitude is therefore a right. This process does not include amendment or change to title deeds and rights/servitudes associated with title deeds.</p> <p>The "report" Mr Munro refers to is in no way a report, it was a short document (Background Information Document) compiled to make people aware of the project in the area. The report compiled as a result of the NEMA process that was started end of August will definitely</p> <ul style="list-style-type: none"> • make mention of the servitudes • include the title deed mentioning the servitude • address water availability – one user is not allowed to infringe on another user's existing rights • address water pollution risk. • The water pollution and water availability issues were raised by a large number of I&APs and based on previous work in the area we realise that it is a major concern. Therefore a groundwater study was initiated and results are included in this report. 	

Comment received from:	Date received and date responded:	Comment / concern:	Response:
		<p>(T66379/9) for its water. There are orchard trees, avo trees, mango trees and nut trees on this plot that require water.</p> <ul style="list-style-type: none"> • Agreement with the letter from Munro-flint Attorneys dated 13 Sep 2013. 	
Mark Muhl	2013-09-18 2013-09-18 (telephonic)	<ul style="list-style-type: none"> • Concern - irrigation canal from Olifantsnek Dam that borders the property. Irrigation canal has not been constructed to support weight on it including that of vehicles that drive over it. • Further concern is pollution of water in the canal. 	<ul style="list-style-type: none"> • Noted, addressed in Section 24G Report and associated EMP.
Adriaan Roux	2013-09-19 2013-09-19	<ul style="list-style-type: none"> • Raw sewage from De Brough Landgoed is running into public roads on a daily basis. This will affect water quality. 	<p>The EAP hereby acknowledges the receipt registration as well as concerns regarding the contamination risk from sewage. Sewage contamination risk assessment was conducted as part of geohydrology study.</p> <p>The registration period will be extended with one week, until 7 October 2013. After which the completion of the Section 24G Report will commence. The draft version of the report will then have a public review period of 40 days, during which further comments and concerns can be submitted.</p>
Cas Venter	2013-09-19 2013-09-19	<p>Asked for extension on the closing date to lodge objections to 31st October 2013.</p>	
W.J. Vos & D.J.J Ferreira	2013-09-30 2013-09-30	<ul style="list-style-type: none"> • Proposed town establishment will have a detrimental impact on the value of our property. • Crime in the area will rise tremendously owing to the increase in occupants. We have already noted an increase in crime in our area since the development of this "township". Criminal activities include theft and drug related offences. • Noise pollution will increase as will soil contamination through the waste disposed of by the "township". • Fire risk for the residents. Homes are built close to each other, if a fire breaks out in one home it could easily spread to others. At present no connections for the fire brigade should fire occur and the homes or occupants are not equipped with fire extinguisher. • Homes built under power lines, creates danger to 	<ul style="list-style-type: none"> • Project deals with existing development only. • Criminal activities should be reported to police and handled by them. • Noise and soil contamination addressed in EMP. • Fire risk addressed in EMP. • No houses allowed underneath power lines. • Certificate of compliance for electricity connections required from electrician – refer to EMP. • Building regulations to be adhered to by the applicant and building plans to be submitted to RLM for approval – refer to EMP. • Proper sewage conveyances and management as per EMP required to be implemented by applicant. • Waste management is addressed in EMP.

Comment received from:	Date received and date responded:	Comment / concern:	Response:
		<p>residents. Illegal to build directly under power lines.</p> <ul style="list-style-type: none"> • Current electrical connections to various homes are not compliant within necessary safety or legal requirements. • Homes are built on the boundary wall of the "township". I submit that this is both unsafe and illegal. • The boundary walls of the "township" are not of a proper standard and I do suspect that neither proper materials nor proper planning permission were obtained. Many of the walls are broken, falling apart and seem to be held up by mud. Since the houses are built on the boundary wall, they could at any time fall in or collapse on the occupants. • The "plumbing" of the homes are clearly visible and is situated on the exterior of the boundary wall of the "township" which borders a public road. My complaints here are the following: <ul style="list-style-type: none"> ○ These pipes should be on the inside of the "township" and not exposed. ○ These pipes are clearly visible for 100's of meters and are an eye sore. ○ These pipes are not maintained. ○ Many of the pipes are open or broken and the waste runs into the road. ○ Due to broken and open pipes the waste dams up. ○ This creates pollution to the ground, smells awful and is unsightly. • Wastewater disposed runs directly into our farming fields and has the following negative impact: <ul style="list-style-type: none"> ○ Contaminates or has the potential to contaminate underground water supply ○ Erodes fields. • Litter on the outside of the township is severe. It appears as though there is no or inadequate implementation of waste management, collection and 	<ul style="list-style-type: none"> • Road improvements are planned by the roads and transport authority – see layout plan.

Comment received from:	Date received and date responded:	Comment / concern:	Response:
		<p>removal. The litter is detrimental to the environment.</p> <ul style="list-style-type: none"> • Encroachment upon the Olifants Irrigation canal. • Boundary wall is built directly next to the canal and in some parts appears to be inside the canal. The problems here are the following: <ul style="list-style-type: none"> ○ The "township" should not be in or so near to the canal as this is not allowed. ○ The water from the canal is eroding the ground directly under the boundary wall and with time the wall will give way. This creates a risk for occupants and could result in the canal being damaged and closed for extended periods of time thus depriving us of our right to access the water. • Increased road traffic which will travel directly past our premises and create a potential risk to pedestrians and also increase noise in front of our premises. It may also impact our access to and from our premises. 	

7 ENVIRONMENTAL IMPACTS

This section explains the impacts (current & future) of the development on the project area for the different environmental attributes. Due to the fact that no records were kept/available (photographs etc.) or assessments made prior to site clearance, existing/current/historic impacts can only be speculated and can therefore not be considered as factual.

7.1 Land Use

The current zoning of the property is agricultural. Specific reference is made within all the Title Deeds of the subdivisions that the properties should remain as orchards. However, with the construction of accommodation facilities in 1999 and the further expansion thereof, agricultural practices were eliminated. The properties however, have not been rezoned from agricultural land use to residential. An application for township establishment (Towncomp, August 2013) has been submitted and this will need to be authorised to allow the development to continue. Loss of agricultural land has already spanned over 14 years (since the start of the project in 1999); the loss is not seen as significant to the agricultural produce. The Department of Agriculture approved the sub-division of the agricultural property into portions too small to practice farming on an economically feasible basis.

7.2 Visual Aspects

Currently, although predominantly zoned agricultural, the landscape in the area also consists of a fair amount of residential/farmsteads, business and retail establishments (neighbouring Orange Grove shopping facility) and tourism facilities (B&B, guesthouses). The entire property is walled and none of the accommodation facilities can be viewed from the road, therefore the visual impact is seen as minimal, except for waste and wastewater that may be due to inadequate waste management on site, be disposed of or discharged outside of the premises.

7.3 Flora and Fauna

Due to the fact that the property was previously impacted upon by agricultural activities (orchards), the natural vegetation prior to the development was probably limited. Exact impacts that occurred cannot be assessed, such as whether any Red Data/threatened or protected species were impacted by the development is unknown, however speculated to be unlikely. Currently, the site is of a low ecological integrity due to human interference, the level of pollution on site as well as the presence of many exotic species. Pollution will need to be removed as well as exotic/invasive species. Specifically, the Silky Oak (*Grevillea robusta*) has intrusive roots that can damage underground pipes and the tree is known to cause allergies (rashes to such an extent as poison ivy).

7.4 Noise and Air

Currently, noise increased in comparison to agricultural activities due to a local increase in the number of residents/people talking, shouting, children playing, dogs barking, music playing etc.

Currently, the sources of air pollution in and around the project site include vehicular exhaust emissions, emissions from fires used by the local community for heating and cooking purposes, dust from travel on gravel roads and unpleasant smells from the sewage treatment and overflows. The smell of sewage is prominent and is a major nuisance to neighbours and businesses. This in turn can negatively impact business income or the health of people.

7.5 Traffic

Traffic is a problem in the area especially entrances to and exits from the R24 (P16-1). The DPWRT is planning upgrades to the P16-1 road (widening) as well as entrances and exits (circles etc.). Refer to the layout plan of the site to see road changes and improvements planned for this area. Due to the fact that the residents of the De Brough Estate are mostly disadvantaged, very few have vehicles. However, there has been a slight increase in the use of the entrance road to De Brough Estate, and the gravel road to the south of the site that many of the other farmers and visitors to Orange Grove Nursery use. The impact from the development on traffic is not of major concern currently and its significance will further decrease due to road upgrades and improvements planned by the roads authority.

7.6 Surface water

There are no natural surface water resources on De Brough Estate. The closest surface water source, the Hex River, flows 700m east of the site. However, the Olifantsnek Irrigation Scheme canal runs on the northern boundary of the site. The impacts on this canal and the irrigation water contained in it is a concern, due to inadequate sewage management facilities (sewage overflows) and other waste material (debris & litter) that pollute this water and cause blockages which prevent irrigation water supply reaching farmers.

Impacts that will require mitigation are:

- Contamination of Olifantsnek Irrigation Scheme canal water through improper wastewater and waste handling;
- Contamination of surface water runoff through improper wastewater and waste handling;
- Inadequate storm water and sewage management;
- Interception of water from the Olifantsnek Irrigation Scheme canal, as claimed by neighbours, preventing these downstream neighbours from accessing their allocation.

Mitigation and management measures must be put in place for these impacts as part of a comprehensive EMP.

7.7 Groundwater

A major concern raised by many I&APs is the pollution and depletion of groundwater. Currently, the groundwater resource is over-exploited and water is abstracted unsustainably from the aquifer from at least nine (9) boreholes (different users) in the hydrocensus area. This may result in this aquifer eventually drying up. De Brough Estate currently utilises boreholes (4 boreholes exist on the site) as a potable water supply source and requires an estimated 60m³/day. Based on the findings of the geohydrology study (Geo-logic, 2013), the groundwater in the area is limited and based on the recharge to the property, this property only has access to an estimated 17m³/day which is insufficient to sustain the development from groundwater only. If more than the 17m³/day is abstracted this will negatively impact on surrounding water users.

Pollution of groundwater is also a concern due to untreated sewage overflows in the area. The contamination risk was evaluated and found to be of low to medium risk. Boreholes investigated as part of the geohydrology study (Geo-log, 2013) were found to be contaminated. The following constituents were found at elevated levels and are therefore of concern: NO₃, Mg and E-coli.

BH23 (on Mr Ferreira's property, Portion 2) represents baseline water quality. BH19 (on Dr Makgoba's property – Plot 1) shows elevated levels of nitrate (NO_3) and is at risk due to its proximity to the septic tank on the same property that sometimes overflows.

Table 7-1: Water quality constituents of concern

Parameter:	Range:	Boreholes affected:	Possible effect on humans
Magnesium (Mg)	86 – 105 mg/l	Plot 1 (BH19) De Brough Estate BH2 De Brough Estate BH4	Bitter taste Scaling problems Diarrhoea in sensitive users
Nitrate (NO_3) as N	10 – 14 mg/l		Methaemoglobinaemia (blood incapable of carrying oxygen) in infants (especially < 3 months)
E-coli	< 3 CFU/100ml	De Brough Estate BH1 Plot 3 (BH5)	Water-related infectious diseases

As indicated above in Table 7-1:

- Both BH2 and BH4 on De Brough Estate indicate nitrate contamination and are closely situated to the sewage treatment works.
- BH 1 on the De Brough Estate has a good chemical water quality but is contaminated with E-coli.
- Both BH1 and BH2 are currently not suitable for human consumption and require treatment.

Contamination from the De Brough Estate Sewage Treatment Plant and Plot 1's septic tank overflows appears to be a possible source of pollution. The septic tank on Plot 1 is close to its borehole (BH19) which poses a contamination risk.

Treatment options:

- **Magnesium:** Lime softening followed by recarbonation is most commonly used for treatment of domestic water supplies. Due to magnesium levels, household appliances will require regular descaling.
- **Nitrate:** Nitrate is not readily removed from domestic water supplies. A water treatment plant will be required as costly treatment such as ion exchange or reverse osmosis will have to be considered.
- **Bacterial contamination:** Viruses are inactivated by exposure to sunlight. Disinfection with chlorine (or other oxidising agents) is commonly used.



Figure 7-1: Location of boreholes within the area relative to sewage management units

7.8 Socio-Economic

The provision of housing and accommodation for the people in the area is a positive impact. It is, as mentioned previously, affordable accommodation used by the elderly, disadvantaged individuals with children and contract workers. However, the residential use of the property is not in line with surrounding land use, the surrounding community is concerned that this will affect their property values.

Further negative socio-economic impacts are listed below.

7.8.1 Health and safety of the residents

As indicated by the geohydrological study (Geo-loc, 2013), there is currently contamination of the water supply source (boreholes on the property) - NO_3 and E.coli possibly from sewage treatment facility overflows. E.coli contamination results from contact with the faeces, or stool, of humans or animals. Microbes in the water can cause short term effects, such as diarrhoea, cramps, nausea, headaches, or other symptoms. They may pose a significant health risk for infants, young children, and people with severely compromised immune systems. This should be addressed as a matter of urgency and may include the upgrade or replacement of the sewage treatment facility. In many areas, the grey water and stormwater drainage is blocked, which raises further health concerns.



Plate 7-1: Blockages in drainage

Electrical wiring is exposed and appears unsafe. This can cause electrocution, fires etc. among the residence. An electrician should check wiring, correct and issue a certificate of compliance.



Plate 7-2: Electrical wiring

Structures occupied by the residents of De Brough Estate probably do not comply with building regulations of the NHBRC. The walls consist of single brick layers and in some units the boundary wall forms the wall for the room/unit. The stability of walls as well as possible collapse is a concern. Some units lack windows.

7.8.2 Health and safety of the community

As with the residence, the spillage/overflow of sewage is also a health concern to the surrounding community. The upgrade/replacement of the sewage treatment facilities is a matter of urgency.

Based on road upgrade plans and visual observations, it appears as though the boundary wall has been constructed within the road reserve and across the Olifantsnek Irrigation Scheme canal. The boundary wall has to be demolished and moved as part of a road upgrade.

Community members have also raised safety and security risks as a concern, with regards to the site being accessible to criminals' including drug traffickers and prostitutes.

7.9 Cumulative Impacts

Cumulative impacts include the further contamination and depletion of groundwater resources, which affects residents and the surrounding community. Although water is currently still available, the cumulative effect will slowly result in the aquifer drying up.

If the project should not continue, a cumulative impact will be that as the population grows, the percentage of families without homes will also grow.

Any environmental impacts must be sufficiently and effectively mitigated in order to reduce the probability of unforeseen cumulative impacts that may occur as a result of the development.

7.10 Environmental Management Programme (EMP)

The EMP was compiled assuming authorisation will be granted. The purpose of the EMP is therefore to ensure that undue or reasonably avoidable adverse impacts on the environment, are prevented, that impacts which cannot be prevented are managed to reduce their significance and that the positive benefits are enhanced.

The EMP will therefore:

- Define the various measures to be taken during the life of the project (reconstruction and operation) in order to enhance positive and minimise/reduce adverse environmental impacts and meet the performance specifications;
- Define the actions needed to implement these measures;
- Describe how this will be achieved; and
- Allocate responsibilities.

An EMP is an important tool for ensuring that the management actions/measures are clearly defined and implemented through all phases of the project. The EMP can be seen as a separate report in Appendix F.

8 CONCLUSION

It should be noted that Mr Alec Brough did in 2001 apply for environmental authorisation (222/2001 NW). These documents were however misplaced or lost by the relevant authorities and no decision was ever issued.

In conclusion, the project area does not fall within a sensitive area but the development is not in line with surrounding land uses. Some impacts were found to be adverse.

The project cannot be decommissioned unless alternative affordable accommodation is provided for the residents of De Brough Estate. These people have constitutional rights and cannot be homeless. It is not certain whether the local authority is in a position to provide these people with other accommodation at the moment.

If the project is authorised, the following conditions should form part of such an authorisation:

- Strict adherence to EMP
- No homes located underneath power lines
- **Buildings:** Structures to comply with NHBRC and building regulations as well as building plans to be approved by RLM.
- **Electricity:** An electrician to check and correct electrical connections and issue an electrical certificate of compliance.
- **Fire:** Provision of fire extinguishers as per legislation. Insufficient water and no water connections available for fire fighting.
- **Town planning:** RLM to approve a township establishment on this property.
- **Waste:** Continue with waste recycling project. Ensure waste collection is handled by a contractor, occur at a regular frequency (weekly) and prevent littering on premises and surroundings by providing adequate waste storage facilities, having litter patrols and implementing fines within the De Brough Estate to punish people for littering.
- **Potable water:** An alternative and/or supplementary water supply source is required as groundwater from boreholes is inadequate to supply the development without adversely impacting other water users. Groundwater requires treatment and disinfection prior to human consumption.
- **Sewage:** Upgrade or replace sewage treatment facility.
- **Boundary wall:** Move boundary wall to not interfere with road reserve and Olifantsnek Irrigation Scheme canal.
- **Storm water:** Design and implement a proper storm water management plan for the site.

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