2nd DRAFT

ENVIRONMENTAL IMPACT ASSESSMENT REPORT

for the proposed

VLAKKELAND RESIDENTIAL DEVELOPMENT ON ERF 8359, RE/ERF 8370, ERF 8378, ERF 8399, ERF 8400, ERF 12628, ERF 12633 AND ERF 33027 IN PAARL, WESTERN CAPE

(21 Day PP Review Period)

(DEA&DP REF: 16/3/1/2/B3/28/1006/13)

Submitted to:
Department of Environmental Affairs and Development Planning
1 Dorp Street
Cape Town

Prepared for:
Drakenstein Municipality
Anthea Shortles
P.O. Box 1, Paarl

DRAKENSTEIN
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Date: September 2014

DETAILS OF THIS REPORT

Status of this Report	2nd **Draft** Environmental Impact Assessment report – **21 day Public Review**
Date Submitted	23 September 2014
Current Public Review Period	21 Days Review Period – 26 September 2014 – 17 October 2014
Report Title	**PROPOSED VLAKKELAND RESIDENTIAL DEVELOPMENT ON ERF 8359, RE/ERF 8370, ERF 8378, ERF 8399, ERF 8400, ERF 12628, ERF 12633 AND ERF 33027 IN PAARL, WESTERN CAPE.**
Applicant	**Drakenstein Municipality** **Ms Anthea Shortles** **P.O. Box 1** **Paarl**
Prepared by	Dané Vermeulen, Euonell Grundling & Guillaume Nel **Guillaume Nel Environmental Consultants** 45 Fabriek Street Paarl Tel: 021 870 1874 Fax: 021 870 1873 Cell: 072 1571 321
Reviewed by	Guillaume Nel **Guillaume Nel Environmental Consultants** 45 Fabriek Street Paarl Tel: 021 870 1874 Fax: 021 870 1873 Cell: 072 1571 321
Guillaume Nel environmental consultants	

PROJECT TEAM

The Vlakkeland Development Project Team consists of two groups of professionals. The first group (Technical group) works under the direction of Jubelie Project Managers (appointed by Department Housing on behalf of the Drakenstein Municipality) and Nu Plan Town and Regional Planners. The technical team is directly concerned with the motivation of the project. This team will further assist in preparing the development plan, will formulate the technical solutions and respond to issues.

The second group is called the Independent Assessment team. This team operates independently from the technical team and is involved with an independent environmental impact assessment. They are following the prescriptions of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) and will evaluate the proposal. Although this report focuses on the possible impacts of the proposed development, it will include input from both groups and has been derived from information supplied during the scoping process and subsequent technical documents. Members of the two groups are as follows:

Technical Team

Role	Responsible Person	Company
Project Manager	Gerhard Nel	Jubelie Project Managers
Engineers	Fred Laker	Lyners Consulting Engineers
Engineers	Bradley	BSP Consulting Engineers
Town Planning	Theo Steyn Danette Jones	NuPlan
Surveyor	Jimmy Brink	Joubert & Brink Surveys

Independent Environmental Team (& Specialists to be appointed)

Role	Responsible Person	Company
Environmental Consultant	Guillaume Nel Dané Vermeulen Euonell Grundling	Guillaume Nel Environmental Consultants (GNEC)
Botanist (Baseline)	Dave McDonald	Bergwind Botanical Surveys
Botanical Assessment	Dave McDonald	Bergwind Botanical Surveys
Wetland and Freshwater	Bill Harding	DHEC Environmental Consultants
Archaeological Assessment	Jayson Orton	ACO
Visual Impact Assessment	Albert vd Stock	Albert van der Stock
Heritage Impact Assessment	Cindy Postlethwayt	Cindy Postlethwayt

RESPONSIBLE PARTIES FOR COMPILING THIS REPORT

Compiled by:	Dané Vermeulen Euonell Grundling Guillaume Nel	Guillaume Nel Environmental Consultants
Reviewed by:	Guillaume Nel	Guillaume Nel Environmental Consultants

BACKGROUND TO GNEC

Guillaume Nel Environmental Consultants (GNEC) information.

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8	**E-mail**	guillaume@gnec.co.za
9	**BEE Status**	Level 4 Contributor
10	**Professional Registration**	SAATCA Certified Environmental Auditor, No. (EMA 375) (2003)
11	**Professional Registration**	Active Member of IAIASA
Guillaume's (EAP) Qualifications		
Degrees		MSc Environmental Management (PUK)
		B(Hons) Environmental Management (US)
		B Geography (US)
Certificates (University & SABS)		Environmental Law (PUK)
		EIA (PUK)
		EMS 14000 (PUK)
		Air Quality Management (PUK)
		Environmental Auditing (SABS)
		Geohydrological Principles
Experience as an EAP		Guillaume Nel has twelve years relevant experience as an environmental Assessment Practitioner

SECTION A: EXECUTIVE SUMMARY

INTRODUCTION

Please note that all changes to the 1st Draft EIR was made in Blue for ease of Reference and to assist with the review process of this EIR

Guillaume Nel Environmental Consultants (GNEC), as independent environmental consultants and impact assessors, has been appointed by the Western Cape Department of Housing, on behalf of Drakenstein Municipality, to facilitate the Integrated Environmental Management (IEM) procedure for the proposed residential development on Erf 8359, Re/Erf 8370, Erf 8378, Erf 8399, Erf 8400, Erf 12628, Erf 12633 and Erf 33027 (known as Vlakkeland) in Paarl, Western Cape.

The region of Paarl and Wellington suffers from a shortage of houses for the local community. Developable land in Paarl/Wellington area is scarce due to the sensitive nature of the natural environment in general, the heritage and visual sensitivity of most of the area as well as the good quality of most of the agricultural land in the area. Over population is therefore a major concern and this proposed development will provide the needed housing for the local community.

The proposed site is situated in the Paarl Valley between Paarl and Wellington in the Western Cape. The 105ha site is located south of Newton residential development and east of Mbekweni residential area. The western boundary of the site is bounded by Jan van Riebeeck Drive, Bo-Dal Road serves as the site's eastern boundary. Agricultural farm lands are situated east of Bo Dal Road and a heritage conservation site is situated to the south. The proposed site is zoned for agricultural use but it is currently standing mostly vacant and is an area prone to attract trouble makers. A group of informal farmers (mostly pigs and goats) have settled close to the western site boundary.

The municipality proposes to develop a residential development with approximately 3 260 units, consisting of a combination of subsidy housing, subsidy double storey housing an activity spine, GAP housing and GAP and rental apartments on the above mentioned property. It is proposed to allocate four erven for Primary Schools and two erven for Secondary Schools. Specific locations will be set out to accommodate Places of Worship, Creches, Pre-Primary Schools, Sport Fields and taxi bays. A conceptual open space network will run throughout the development. A Civic and Business Node will be created in the centre of the development, providing a location for retail, offices, a Library, a Post Office and a Community Centre. A primary storm water drainage system with a large storm water retention facility will be constructed in the south eastern corner and alongside the southern border. This area will also serve as a sport facility, providing sport fields for the local community.

Access to the site will be taken from Jan van Riebeeck Drive (770m south of Mbekweni intersection west of the site)

ENVIRONMENTAL IMPACT ASSESSMENT REQUIREMENTS

The proposed development involves 'listed activities', as defined by the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and the Environmental Impact Assessment (EIA) Regulations. Listed activities are activities, which may have potentially detrimental impacts on the environment and therefore require environmental authorisation from the relevant authorising body. The proposed development occurs in the Western Cape and thus the Department of Environmental Affairs and Development Planning (DEA&DP) is the responsible regulatory and competent authority.

On 18 June 2010 the Minister of Water and Environmental Affairs promulgated the new Environmental Impact Assessment Regulations (GN R. No. 543, GN R. No 544, GN R. No 545, GN R. No 546 and GN R. No 547) under Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) in Government Gazette No. 33306. These Regulations came into effect (GN No's R. 660, R. 661, R. 662, R. 663, R. 664 and R. 665 in Government Gazette No. 33411 of 2 August 2010) and therefore replaced the previous regulations (GN R. No. 385, GN R. No. 386 and GN R. No. 387 [21 April 2006]) on the 2nd of August 2010.

In terms of the Environmental Impact Assessment Regulations (GN R. No. 543, GN R. No 544, GN R. No 545, GN R. No 546 and GN R. No 547) the following activities are triggered.

GN R. No 544 (Listing Notice 1) {Activities 9, 11, 18, 21, 22 and 23}

GN R. No 545 (Listing Notice 2) {Activity 15}

GN R. No 546 (Listing Notice 3) {Activities 4, 12 and 16}

PROJECT DESCRIPTION

The Drakenstein Municipality proposes the construction and establishment of a GAP and Low Cost residential development of approximately 3 260 units between Paarl and Wellington. The development will cover an area of approximately 105 ha comprising Erf 8359, Re/Erf 8370, Erf 8378, Erf 8399, Erf 8400, Erf 12628, Erf 12633 and Erf 33027. The site is situated to the east of Jan van Riebeeck Drive and to the west of Bo-Dal Road.

After the scoping phase of the EIA it was concluded that Erf 33027 would be excluded from the development due to the site being botanically sensitive. This property has been set aside for conservation purposes due to the presence of rare botanical species on this site. Erf 33027 will therefore serve as a public open space and will be rehabilitated to reserve any critical biodiversity species that might be present on the site. It will further act as a buffer between the proposed new development and existing residential developments and the farming community to the north east and east of the site.

The municipality proposes to develop a combination of subsidy housing, subsidy double storey housing, an activity spine, GAP housing and GAP and rental apartments on the above mentioned property. It is proposed to allocate four erven for Primary Schools and two erven for Secondary Schools. Specific locations will be set out to accommodate Places of Worship, Creches, Pre-Primary Schools, Sport Fields and taxi bays. A conceptual open space network will run throughout the development. A Civic and Business Node will be created in the centre of the development, providing a location for retail, offices, a Library, a Post Office and a Community Centre. A primary storm water drainage system with a large storm water retention facility will be constructed in the south eastern corner and alongside the southern boundary. This area will also serve as a sport facility, providing sport fields for the local community.

Access to the site will be taken from Jan van Riebeeck Drive (770m south of Mbekweni intersection) west of the site

Three storm water drainage systems are present west of Jan van Riebeeck Drive (on and near the Vlakkeland site), gathering and channelling water to the Berg River farther west. The main drainage line is situated 400m north of the south western corner of the proposed site and a smaller drainage line is situated another 350m north. The Kleinbosch and Mbekweni River resides over most of the western side of the site.

It is proposed to realign and divert these watercourses into a primary storm water drainage system. The realignment will take the Kleinbosch River back to its original alignment. This storm water drainage system (gabion structure) will be constructed along the southern boundary of the site directing the storm water to the storm water retention facility in the south west corner of the site. It will then connect to the existing storm water drainage system west of Jan van Riebeeck drive and discharge the water into the Berg River. This

realignment (Kleinbosch back to original alignment) is required to divert water to the side of the development in order to enhance water quality and in order to open up more needed developable land. The diversion will also assist in water quality management and may be safer than taking the river through the proposed development. The storm water retention dam which will be located on site, will be large enough to cater for the development's stormwater as well as the Kleinbosch River water.

An alternative to the above mentioned realignment was proposed by Dr. Harding in his Aquatics Assessment. It was proposed to realign the Kleinbosch River back to it's original position and in doing so recreate the original wetland which was found on the neighbouring SAHRA property to the South. From there the Kleinbosch River will Flow into the Dal River, which in turn flows through the culvert under the Jan van Riebeeck Drive and into the existing Mbekweni River. Sufficient capacity in the design of the culvert and retention dam has been made for the additional flow and for the anticipated 14% increase in storm water runoff due to climate change. The realignment (Kleinbosch River back to its original alignment) is required to divert water to the Southern side of the development in order to enhance water quality and in order to open up more needed developable land. This realignment will furthermore rehabilitate the original wetland on the neighbouring SAHRA property, creating an aesthetically pleasing natural feature by planting only indigenous wetland specific vegetation. The diversion will also assist in water quality management and may be safer than taking the river through the proposed development where it is subject to possible pollution. This is however, not the preferred alternative included in Layout 5 (Preffered alternative) and the initial design for the Kleinbosch River described above was decided upon.

Bulk earthworks will be undertaken during the construction phase of the proposed development. The proposed site slopes in a general east to west direction and as a result of this, the western area is very low and needs to be filled to allow for drainage away from the residential units. A slope of 0.75% was therefore decided upon for bulk earthworks.

Bulk Water Supply

According to the preliminary engineering services report (September 2014), there are currently no dedicated water supply for the proposed development. However according to GLS Consulting's Capacity Analysis (August 2014, Please refer to Addendum F-8), the development is situated within the water priority area and can be accommodated in the existing Van Blerk/Newton reservoir zone. The water will be supplied from the van Blerk/Con Marine and Newton reservoirs in the Wellington water system. Water in Wellington is mainly supplied via two bulk water pipelines ie the Leliefontein pipeline (bulk gravity pipeline between the Leliefontein reservoir in Paarl and the Newton and Con Marine reservoirs in Wellington) as well as the "strawberry King" pipeline, which is a bulk gravity line from the Courtrai suburb un Paarl to the Newton suburb in Wellington. During Summer months, the Strawberry King line is frequently out of service due to it's current bad state of

repair and has therefore incufficient capacity to accommodate any additional developments. It is therefore proposed that no construction can commence before the upgrading of this bulk water supply pipeline have been completed. This upgrade is currently in its planning phase and can only be constructed during Winter when the capacity of the line is not required.

According to GLS Consulting, the total capacity required in the existing Wellington water system is calculated at 23 367kl/d (271 l/s) and the capacity of the existing bulk system (including the upgraded Strawberry King line) is calculated at 21 945 kl/d (254 l/s). The existing bulk water supply capacity is therefore insufficient to accommodate the total developmet. Phases 1&2 can however, be accommodated.

Bulk Sewerage Services

Accodring to Lyners's Service Investigation (September 2014), there are currently no bulk sewerage services available in the vicinity of the proposed development to accommodate the flows from Vlakkeland. The Paarl sewer network however, runs adjacent to the proposed site and GLS investiged the the impact of the proposed development on the existing sewer network in their report "Vlakkeland Affordable Housing Development, Wellington: Capacity Analysis of the Bulk Water & Sewer Services" (dated 26 August 2014). It became apparent that the topography of the site allowed for the proposed development's sewerage to be accommodated by the Mbekweni pumpting station to the west of the site. Upgrades to the sewerage infrastructure are necessary and these include a new bulk sewer line from Jan van Riebeeck Drive to the existing Mbekweni pump station, the upgrading of the pump station to accommodate the increased flow as well as a new rising main to the Paarl WWTW. Please refer to the Lyners Service Investigation in Addendum F-8.

Stowmwater Infrastructure

Internal stormwater for the proposed development will be accommodated in a major and minor system. The minor system, which will be constructed for the convenience of the public, requires that the run-off the removed swiftly from residential areas through catchpits and manholes with spacing not more than 80meters between structures. This will be supported by an underground network of pipes and culverts. The major stormwater system will be constructed in accordance with measures to accommodate the occurance of storms at a higher interval than can be accommodated by the minor system. Infrastructure include natural watercourses, large conduits, roads, stormwater retention facilities (to the west of the proposed development) and floodplains. These systems can be characterised as being open and above ground level and can accommodate run-off from the minor stormwater systems. The effects of Climate Change, which is a predicted increase of 15% in rainfall and therefore stormwater runoff, have been included in all stormwater infrastructure to be constructed on site. Please refer to Annexure J in Lyner's Service Inestigation (Addendum

F-8) for Graeme McGill Consulting's Addendum to the Stormwater Plan Prepared by Lyners Consulting Engineers and Project Managers.

Electricity Services

According to Eimac (Pty) Ltd, the preliminary supply of electricity shall be at the existing Dalwiding S/S, which should be upgraded to make provision for this development. The existing 185mm^2 u/g cable which runs in a North-easterly direction past the proposed development and feeding existing development, can be used for the initial small phases of the development, but new bulk 185mm^2 u/g transmission cables feeding from Dalweiding S/S shall be required to service the rest of the development. Eimac (Pty) Ltd have confirmed that adequate capacity shall then be available at the main feeder Dalweiding S/S to service this development. Please refer to Annexure K for Eimac (Pty) Ltd's Electrical Services analysis.

APPROACH TO THE PROJECT

Under the National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998) as amended and the Environmental Impact Assessment Regulations, 2010, the project will go through a Scoping and EIA Process. The listed activities pertinent to the project will be discussed in more detail in Section B-1.

A Scoping Report was compiled, which represents the initial identification of key issues or concerns as highlighted by the relevant authorities, Interested and/or Affected Parties (I&AP) and professional judgement by the Environmental Assessment Practitioner (EAP). Scoping allows for the identification of the anticipated impacts, particularly those, which require specialist investigations.

The first Draft EIR was made available for Public Comment from 17 February 2014 to 31 March 2014. Issues and/or concerns were incorporated and addressed in the 2nd Draft EIR to be submitted for a 21 day review period.

This 1st Draft Environmental Impact Assessment report combined the results of the specialist studies, a full assessment of the impacts (including cumulative) and proposed alternatives. An Environmental Management Plan (EMP), environmental impact statement and an authorisation opinion concluded the 1st Draft EIR.

This 2nd Draft EIA report further combines the input from the professional team, NGO's and State Departments. Consideration were also be given to the input from the Registered I&AP during the review of the 2nd Draft EIR. The necessary changes were made to the 1st Draft EIR. The 2nd Draft EIR is again made available to all registered interested and affected parties for comment 21 day comment from the 26th of September 2014 till the 17th of October 2014.

An additional Wetland Assessment, Hydrological Assessment and Soils Assessment was

undertaken after the 1st Draft EIR in order to address issues and/or comments I&AP's had. These issues were resolved and are discussed in this EIR.

The Final Report, to be submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) will include responses received from NGO's, State Departments and other I&AP's during both the 1st Draft and 2nd Draft EIR Review periods.

Please refer to the proposed EIA process to be flowed below:

PUBLIC PARTICIPATION

1ST DRAFT SCOPING REVIEW (40 DAY REVIEW)

The required public participation processes during the review of the **1st Draft Scoping Report** was conducted from **09 May 2013 – 24 June 2013** (total of 46 days). This process included the following:

- Distribution of Background Information Documents (via hand) on the 09th of May 2013 to land owners within 100m from the boundary of the proposed development (these residents already received notifications via post)
- Erection of 7 site notices on and around the site at strategic locations;
- The placement of an advertisement in the Paarl Post on Thursday 09 May 2013;
- Registered letters to the following:
  - Adjacent land owners (they were also notified by Knock and Drop Letters)
  - Cape Nature
  - Department of Water Affairs
  - Department of Agriculture
  - Department of Transport and Public Works
  - Drakenstein Municipality
  - Ward Councillor
  - Department of Human Settlements

Comments on the 1st Draft Scoping report were incorporated in the 2nd Draft Scoping report.

2ND DRAFT SCOPING REPORT REVIEW (21 DAY REVIEW)

The required public participation processes during the review of the **2nd Draft Scoping** Report was conducted from **25 July 2013 – 19 August 2013** (Total of 24 days). This process consisted of the following:

Due to the fact that only a few responses from I&Aps residing in the surrounding area were received during the initial (40 day) PP process, it was the decision of the Independent Environmental Team to redo some of the actions which was already completed in the initial PP round. This included:

- Distribution of an additional 48 Background Information Documents (BIDs) (via hand) on the 25th of July 2013 to land owners within 100m from the boundary of the proposed development (these residents already received notifications via post and/or knock and drops during the first round);
- Erection of an additional 3 site notices on and around the site at strategic locations;
- Registered letters to the following:
  - All registered I&Aps
  - Cape Nature
  - Department of Water Affairs
  - Department of Agriculture
  - Department of Transport and Public Works

- Department of Human Settlement
- Drakenstein Municipality
- Ward Councillor
- Heritage Western Cape
- Drakenstein Heritage Foundation
- Paarl 300 Foundation
- ASKO

FINAL SCOPING REPORT

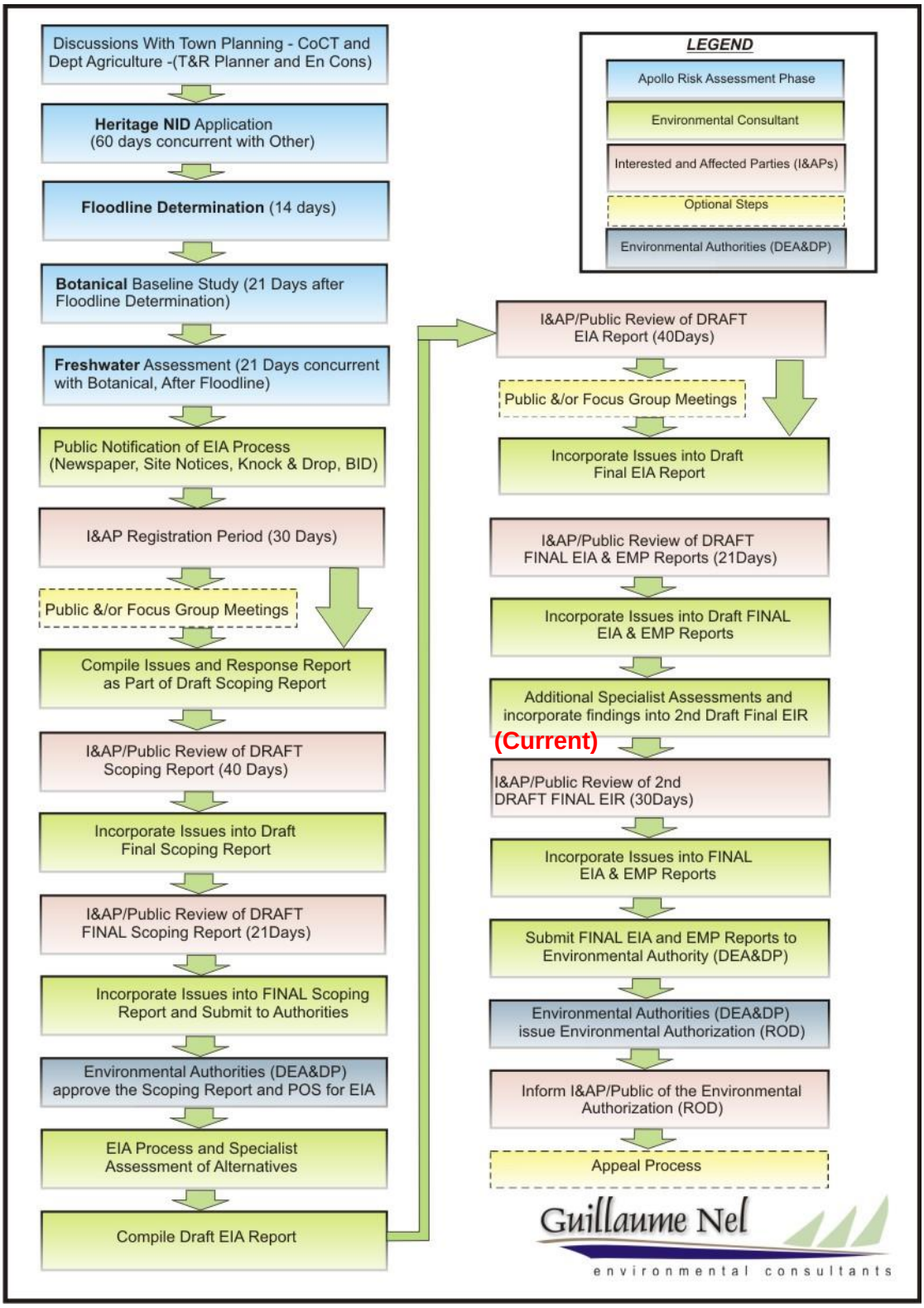
Comments on the 1st Draft Scoping and the 2nd Draft Scoping report were incorporated in the Final Scoping report and submitted to DEA&DP on 05 November 2013. The Scoping Report was approved by DEA&DP on 19 December 2013.

1ST DRAFT EIA REPORT

The 1st Draft EIA report (EIR) was made available for public review from 17 February 2014 to 31 March 2014. All registered I&AP's were informed and a copy of the 1st Draft EIA report was submitted to the DEA&DP.

2nd DRAFT EIA REPORT

The 2nd Draft EIA Report (EIR) will be made available for public review form 26th of September 2014 to 17th of October 2014. All registered I&AP's will be informed and a copy of the 2nd Draft EIA report will be submitted to the DEA&DP.



Proposed EIA Process and current location in the process

IDENTIFICATION OF KEY ENVIRONMENTAL ISSUES

A baseline description of the environment was gathered through visual inspections of the site and its surroundings, desktop studies as well as preliminary specialist recommendations. This information was used to assess the potential areas of study, as a result of the proposed development.

The possible key issues identified include:

- Possible Visual impacts;
- Possible Traffic impact;
- Possible Heritage Impacts;
- Possible Botanical Impacts;
- Possible impact on Archaeological resources; and
- Possible Freshwater/wetland impacts.

As a result of the above-mentioned anticipated impacts, specialist studies as listed below, were undertaken during the EIA phase of the process. The specialist studies assist with the development of an understanding of the system processes and the potential positive and negative impacts of the proposed development on both the social and biophysical environments:

- Visual Impact Assessment;
- Archaeological Impact assessment;
- Botanical Assessment
- Traffic Impact Assessment;
- Heritage Impact Assessment;
- Freshwater/wetland Assessment

NEED & DESIRABILITY

In terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and the 2010 EIA Regulations, the Scoping/EIA report must indicate the need and desirability of the proposed activity (as per the March 2013 EIA Guideline and Information Document Series – Guideline on Need and Desirability). The consideration of a proposed project's Need and Desirability in the EIA process, involves the consideration of the strategic context of the development proposal, along with the broader societal needs and the public interest.

The site is situated within the approved Drakenstein Municipality urban edge.
The proposed development and densities are also consistent with relevant planning policy and framework for the area.

Additional aspects with regards to need and desirability of the proposed development on this site include the following.

Need and Desirability	Explanation
Ecological Impacts	Critical Biodiversity has been identified along the eastern boundary of the site. A large green buffer will be implemented along the eastern border to prevent the disturbance of critically endangered species and to serve as a visual barrier to the farms situated to the east of the site. No natural wetlands are present on the site and the rivers located on the site will be realigned to their original alignment.
Location and Accessibility	The site has a very accessible location situated next to Jan Van Riebeeck Drive west of the site. The site lies on the edge of the Drakenstein Municipality Urban Edge and is therefore ideally located. The site is also surrounded by similar developments on the north and west side. The development will make use of available services, resources and bulk infrastructure.
Employment Opportunities	The site is in close proximity to the Dal Josafat industrial area. The site is also situated between Wellington and Paarl which opens the possibility for short travelling distances to either Paarl or Wellington and the opportunity to occupy employment in either of the towns. During construction of this development multiple jobs will be created to the surrounding community. The possible job opportunities created in this area are therefore regarded as very important and positive
Densification	The proposed development will result in the densification/infill of the existing urban area resulting in the optimisation and utilization of available land and services.

The proposed development will help with the conservation of several Renosterveld & Fynbos plant species and even though these protected areas will not significantly help reach regional conservation targets for these vegetation types, as the patches are small, it may help achieve some representivity targets for certain rare species. Most of the site (>90%) has been extensively disturbed by decades of intensive agriculture, heavy cattle grazing and informal pig farming and does not currently support indigenous plant species. In rehabilitating these small identified areas and preventing any other disturbance in the future, vulnerable species will be protected and reserved and populations will have the possibility to increase. At the moment the site is under no such protection and it threatened by farther habitat loss due to increases in alien vegetation and the dumping of rubble.

The proposed buffer to the east and north east of the site will further provide larger habitat

areas for further botanical restoration/rehabilitation. This area will be regarded as no-go areas during construction and operational phases of the development. This green area will also buffer the existing farming (some historical) area from the proposed new residential development.

The proposed development will provide *inter alia* the following benefits:

- Increase the indigenous plant vegetation on the proposed site possible large areas will be kept for public open space (conservation area);
- An increase in the density on the urban periphery;
- Buffers will be created between new residential areas and existing farming land and heritage sensitive areas;
- Access to public transport, residence, recreation, shopping and employment within a walking distance of residential dwellings;
- Assist with unemployment during both the construction and operational phase of the development;
- The rivers present on the site will be aligned to its original flow;
- All other stormwater runoff from the area will be managed in a sensitively designed stormwater system that will ensure continued flood management and eventual discharge to the stream.

CONCLUSION

The EIA report will assess the impacts of each of the individual activities as well as ascertain the cumulative impacts of the development in its entirety. The EIA report will outline the necessary mitigation measures and delineate sensitive areas and facets worthy of conservation. Lastly, potential alternatives and mitigation measures will be devised in order to minimise negative impacts and optimise positive impacts.

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LIST OF ABBREVIATIONS

DEA&DP		Department of Environmental Affairs and Development Planning (Western Cape)
DWA	-	Department of Water Affairs
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EAP	-	Environmental Assessment Practitioner
ECO	-	Environmental Control Officer
EMP	-	Environmental Management Plan
HIA	-	Heritage Impact Assessment
I&APs	-	Interested and Affected Parties
IEM	-	Integrated Environmental Management
IDP	-	Integrated Development Plan
NEMA	-	National Environmental Management Act, 1998 (Act No. 107 of 1998)
NGOs	-	Non-Governmental Organisations
NSBA	-	National Spatial Biodiversity Assessment
PP	-	Public Participation
PoS	-	Plan of Study
SAHRA	-	South African Heritage Resources Agency
SACLAP	-	South African Council for Landscape Architecture Profession
SANAS	-	South African National Accreditation System
GNEC	-	Guillaume Nel Environmental Consultants
VIA	-	Visual Impact Assessment
WULA	-	Water Use License Application

GLOSSARY OF TERMS

Alien species: A plant or animal species introduced from elsewhere: neither endemic nor indigenous.

Anthropogenic: change induced by human intervention.

Applicant: Any person who applies for an authorisation to undertake an activity or to cause such activity to be undertaken as contemplated in Section 22(1) of the Environment Conservation Act, 1989 (Act No. 73 of 1989).

Arable potential: Land with soil, slope and climate components where the production of cultivated crops is economical and practical.

Critically endangered: A taxon is regarded as 'Critically Endangered' when it is facing an extremely high risk of extinction in the wild. The risk of extinction is foreseen within the immediate future.

Ecology: The study of the inter relationships between organisms and their environments.

Environment: All physical, chemical and biological factors and conditions that influence an object and/or organism.

Environmental Control Officer: independent officer employed by the contractor to ensure the implementation of the EMP and manage any further environmental issues that crop up.

Environmental Impact Assessment: Assessment of the effects of a development on the environment.

Environmental Management Plan: A legally binding working document, which stipulates environmental and socio-economic mitigation measures. The mitigation measures must be implemented by several responsible parties throughout the duration of the proposed project.

Local relief: The difference between the highest and lowest points in a landscape. For the purposes of this study, the local relief is based on a scale of 1:50 000.

Soil compaction: Mechanically increasing the density of the soil, vehicle passage or any other type of loading. Wet soils compact easier than moist or dry soils.

Study area: Refers to the entire study area encompassing the total area of the six (6) contiguous farms as indicated on the study area map.

Succession: The natural restoration process of an ecosystem.

Sustainable: Able to be continued indefinitely without a significant negative impact on the environment or its inhabitants.

Vulnerable: A taxon is 'Vulnerable' when it is not 'Critically Endangered' or 'Endangered' but is facing a high risk of extinction in the wild in the medium-term future.

SECTION B: INTRODUCTION

B-1 ENVIRONMENTAL ASSESSMENT PRACTITIONER

Guillaume Nel Environmental Consultants (GNEC), as independent environmental consultants and impact assessors, have been appointed by the Department of Housing on behalf of the Drakenstein Municipality to facilitate the Integrated Environmental Management (IEM) procedure for the establishment of the proposed Vlakkeland Housing Development.

As per the requirements of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations (GN R. No. 543, GN R. No 544, GN R. No 545, GN R. No 546 and GN R. No 547) under Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) the following information is pertinent with regards to the Environmental Assessment Practitioner (EAP) that has conducted the Scoping procedures for the proposed development:

B-1.1 Responsible Parties for Compiling this Report

Compiled by:	Euonell Grundling & Guillaume Nel	Guillaume Nel Environmental Consultants
Reviewed by:	Guillaume Nel	Guillaume Nel Environmental Consultants

B-1.2 Background to GNEC

Guillaume Nel Environmental Consultants (GNEC) information.

1	**Company Registration Number**	2007/189057/23
2	**Physical Address**	45 Fabriek Street, Paarl, 7646
3	**Postal Address**	P.O. Box 2632, Paarl, 7620
4	**VAT Registration Number**	4570241465
5	**Telephone Number**	(021) 870 1874
6	**Fax Number**	(021) 870 1873
7	**Cell Phone Number**	072 1571 321
8	**E-mail**	guillaume@gnec.co.za
9	**BEE Status**	Level 4 Contributor
10	**Professional Registration**	SAATCA Certified Environmental Auditor, No. (EMA 375) (2003)
11	**Professional Registration**	Active Member of IAIASA

Guillaume's (EAP) Qualifications	
Degrees	MSc Environmental Management (PUK)
	B(Hons) Environmental Management (US)
	B Geography (US)
Certificates (University & SABS)	Environmental Law (PUK)
	EIA (PUK)
	EMS 14000 (PUK)
	Air Quality Management (PUK)
	Environmental Auditing (SABS)
	Geohydrological Principles
Experience as an EAP	Guillaume Nel has twelve years relevant experience as an environmental Assessment Practitioner

Guillaume Nel has twelve years relevant experience as an environmental Assessment Practitioner

Guillaume Nel Environmental Consultants (GNEC) is a privately owned SMME that was established in 2007 with a combined professional experience of 65 years. Our Team Includes: Guillaume Nel; Renier Kapp; Alizna Jacobs; Christoff Dippenaar; Jo-Anne Nel, Dietmar De Klerk, , Theo Doms, Johann Kilian, Euonell Grundling and Hein Grobbelaar and Mvuyisi Qotyiwe. We also have a team of well experienced landscapers. Our office is situated at 45 Fabriek Street in Paarl, in the Western Cape.

The multi-disciplinary structure of GNEC produces a steadfast and holistic approach to environmental management and landscaping, enabling GNEC to fully function in the multi-disciplinary structure of the environmental management field. In addition to the expertise offered by this team, GNEC has built up a relationship with well experienced and acknowledged specialists who forms part of our assessment teams as required. These specialists include, but are not limited to botanical, freshwater, soils/agricultural, visual, archaeological, heritage, social, stakeholder engagement; noise and fauna [and avi-fauna] specialists.

GNEC has vast expertise in EIA's, Basic Assessments, EMPs, Mining Applications, Waste Management Applications and EMP & Law Compliance Audits.

B-2 LEGAL REQUIREMENTS

The aim of this component of the report is to provide a brief overview of the pertinent policies as well as legal and administrative requirements applicable to the proposed development.

B-2.1 Environmental Impact Assessment Requirements

The proposed development involves 'listed activities', as defined by the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and the Environmental Impact Assessment (EIA) Regulations. Listed activities are activities, which may have potentially detrimental impacts on the environment and therefore require environmental authorisation from the relevant competent Authority (DEA&DP). The proposed development occurs in the Western Cape and thus the Department of Environmental Affairs and Development Planning (DEA&DP) is the responsible regulatory and competent authority.

On 18 June 2010 the Minister of Water and Environmental Affairs promulgated the Environmental Impact Assessment Regulations (GN R. No. 543, GN R. No 544, GN R. No 545, GN R. No 546 and GN R. No 547) under Chapter 5 of the National Environmental Management Act, 1998 (Act No. 107 of 1998) (NEMA) in Government Gazette No. 33306. These Regulations came into effect (GN No's R. 660, R. 661, R. 662, R. 663, R. 664 and R. 665 in Government Gazette No. 33411 of 2 August 2010) and therefore replaced the previous regulations (GN R. No. 385, GN R. No. 386 and GN R. No. 387 [21 April 2006]) on the 2nd of August 2010.

In terms of the new Environmental Impact Assessment Regulations (GN R. No. 543, GN R. No 544, GN R. No 545, GN R. No 546 and GN R. No 547) the following activities are triggered by the proposed Vlakkeland Residential Development.

Table 1: Listed Activities triggered by the proposed development (LN 1)

Government Notice 544 Listing 1		
No.	**Description of Activity**	**Reason for the Trigger**
9	The construction of facilities or-infrastructure exceeding' 1000metres in length for the bulk transportation of water, sewage or storm water. (i) with an internal diameter of 0,36 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.	The proposed development will include large number of pipelines. Although the site is situated within the urban edge, it is situated outside the urban area as defined by the NEMA
11	The construction of: • canals; • channels; • bridges; • dams; • weirs; • bulk storm water outlet structures; • marinas; • jetties exceeding 50 square meters in size; • slipway exceeding 50 square meters in size; • buildings exceeding 50 square meters in size; or • infrastructure or structures covering 50 square meters or more where such construction occurs within a watercourse or within 32 meters of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.	There are two watercourses on the site. These two watercourses will be realigned. Gabion structures will be constructed and new bridge structures will be constructed. The Kleinbosch River will be taken back to its original alignment (diverted back to its original alignment). Storm water retention structures will be constructed as well as storm water outflow structures.
18	The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock from (i)a watercourse; (ii) the sea; (iii) the seashore; (iv) the littoral active zone, an estuary or a distance of 100 metres inland of the high-water mark of the sea or an estuary, whichever distance is the greater~ But excluding where such infilling, depositing, dredging, excavation, removal or moving is for maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or occurs behind the development setback line.	There are two watercourses on the site. These two watercourses will be realigned (to its original alignment). Gabion structures will be constructed and new bridge structures will be constructed. The Kleinbosch River will be taken back to its original alignment (diverted back to its original alignment). Storm water retention structures will be constructed as well as storm water outflow structures.
22	The construction of a road, outside urban areas, with a reserve wider than 13.5 meters or, where no reserve exists where the road is wider the 8	New Roads with various widths will be constructed on the proposed development.

Government Notice 544 Listing 1		
No.	**Description of Activity**	**Reason for the Trigger**
	meters, or for which an environmental authorisation was obtained for the route determination in terms of activity 5 in Government Notice 387 of 2006 of activity 18 in Notice 545 of 2010.	
23	The transformation of undeveloped, vacant of derelict land to – residential, retail, commercial, recreational, industrial or institutional use, inside an urban area, and where the total area to be transformed is 5 hectares or more, but less than 20 hectares, or residential, retail, commercial, recreational, industrial or institutional use, outside an urban area and where the total area to be transformed is bigger that 1 hectare but less than 20 hectares; - except where such transformation takes place for linear activities.	The proposed development area is 108 ha in size.

Table 2: Listed Activities triggered by the proposed development (LN 3)

Government Notice 546 Listing 3 – Basic Assessment		
No.	**Description of Activity**	**Reason for the Trigger**
4	The construction of a road wider than 4 meters with a reserve less than 13.5 meters. • In an estuary; • All areas outside urban areas; • In urban areas: • Areas zoned for use as public open space within urban areas; and • Areas designated for conservation use in Spatial Development Frameworks adopted by the competent authority, or zoned for a conservation purpose.	New Roads with various widths will be constructed on the proposed development.
12	The clearance of an area of 300 square metres or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation.	There is a possibility that an area of more than 300m^2 may be cleared from sensitive botanical species with the construction of a connection road to the east. The remainder of the buffer will however be conserved and protected. This will however be avoided as far as possible.
16	The construction of: • Jetties exceeding 10 square metres in size; • Slipways exceeding 10 square metres in size; • Buildings with a footprint exceeding 10 square metres in size; or • Infrastructure covering 10 square metres or more Where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of the watercourse, excluding where such construction will occur behind the development setback line.	There are two watercourses on the site. These two watercourses will be realigned. Gabion structures will be constructed and new bridge structures will be constructed. The Kleinbosch River will be taken back to its original alignment (diverted back to its original alignment). Storm water retention structures will be constructed as well as storm water outflow structures.

Table 3: Listed Activities triggered by the proposed development (LN 2)

Government Notice 545 Listing 2 – Scoping/EIA		
No.	**Activity Number**	**Description of Activity**
15	Physical alteration of undeveloped, vacant or derelict land for residential, retail, commercial, recreational, industrial or institutional use where total area to be 18transformed is 20 hectares or more; Excluding where such physical alteration takes place for: • linear development activities; or • agricultural tree, timber or wood production of 100 hectares or more.	The total size of the proposed development area is 108 ha.

B-2.2 EIA Regulations Conclusion

Due to the fact that activities in terms of Regulation 545 are triggered, the entire project will undergo a full Scoping and EIA process. The proposed process is indicated in the figure below.

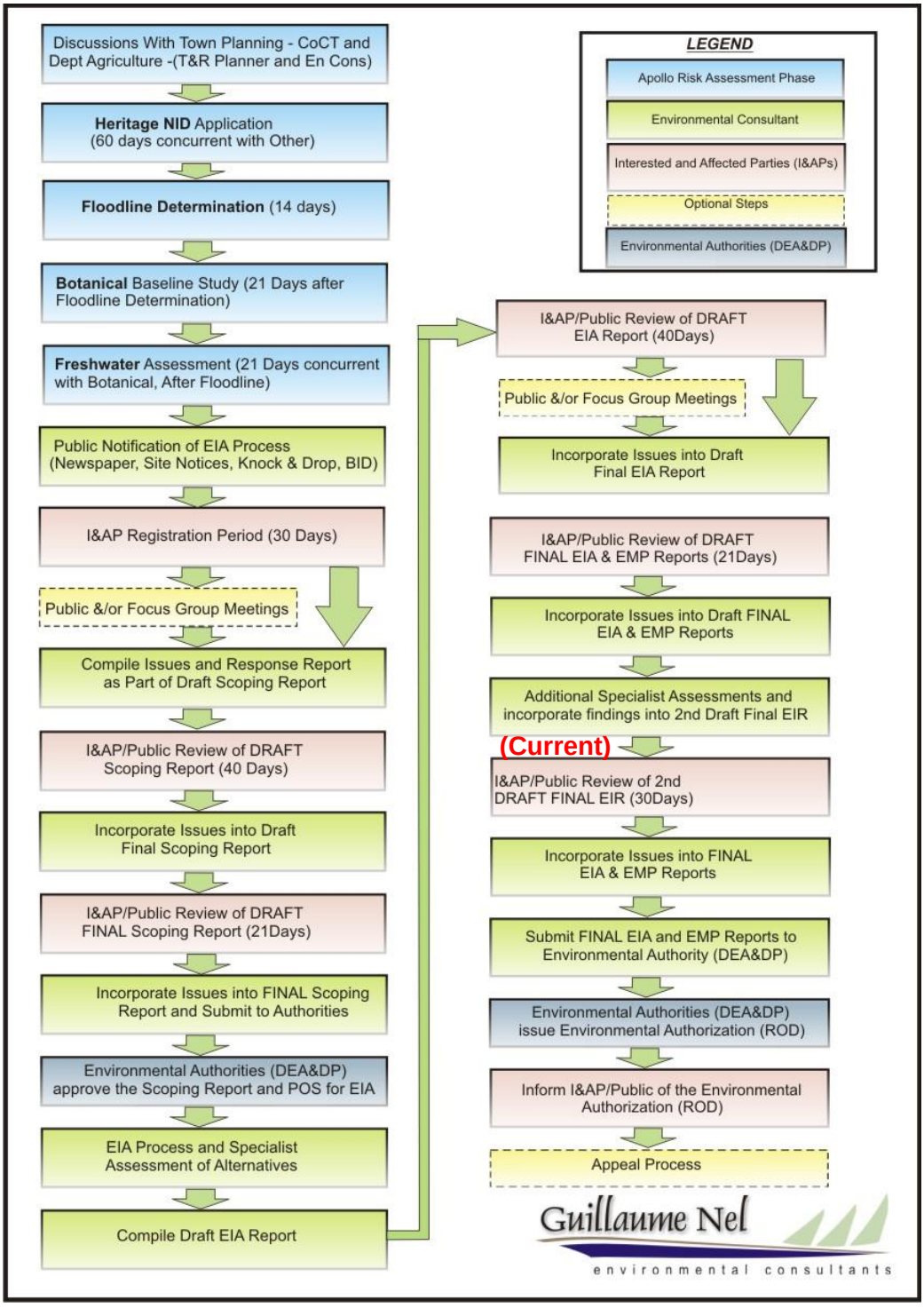

Figure 1: EIA Process Flow Diagram

B-2.3 Other Legal Requirements

The following list of legislation applicable to biodiversity may or may not be applicable to the proposed development. Its relevance may become clear when the biodiversity is assessed and the impacts are determined during the EIA phase.

National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004)
The purpose of the Biodiversity Act is to provide for the management and conservation of South Africa's biodiversity within the framework of the NEMA and the protection of species and ecosystems that warrant national protection. As part of its implementation strategy, the National Spatial Biodiversity Assessment was developed.

Some endangered vegetation is present on this site. The areas identified as sensitive will be protected as regarded as No-Go areas on the proposed site. Buffer areas will also be provided for sensitive areas. The buffer area to the East of the property will be protected from vandalism and pollution by the construction of fences bordering the buffer area.

National Water Act, 1998 (Act No. 36 of 1998)
The National Water Act guides the management of water in South Africa as a common resource. The Act aims to regulate the use of water and activities, which may impact on water resources through the categorisation of 'listed water uses' encompassing water extraction, flow attenuation within catchments as well as the potential contamination of water resources, where DWAF is the administering body in this regard. The Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed and controlled in ways which take into account amongst other factors:

(a) Meeting the basic needs of present and future generations
(b) Promoting equitable access to water
(c) Facilitating social and economic development
(f) Providing for the growing demand of water use;
(g) Protecting aquatic and associated ecosystems and their biological diversity
(h) Reducing and preventing the pollution and degradation of water resources
(i) Promoting dam safety; and
(j) Managing floods and droughts.
(k) Application will be made to obtain the necessary WULA.

A Water Use Licence in terms of the NWA is required. The Water Use Licence Application is in the process of being completed (Refer to Addendum C-4 for proof of submitting report).
Section 22(3) of the National Water Act 36 of 1998, ("the Water Act") provides that "[a] responsible authority may dispense with the requirement for a licence for water use if it is satisfied that the purpose of this Act will be met by the grant of a licence, permit or other

authorisation under any other law".

Due to the fact that the Applicant is in the process of undertaking an EIA process in terms of the National Environmental Management Act 107 of 1998, ("NEMA") in respect of which the draft Environmental Impact Report was submitted to the Department of Environmental Affairs & Development Planning, it was requested that the Department of Water Affairs dispense with the requirement for a water use licence in terms of section 22(3) of the Water Act. This request was made due to the fact that the environmental authorisation could satisfy the purposes of the Water Act. DWA was requested to provide inputs to the proposed development to the Environmental Assessment Practitioners and DEA&DP. DWA was furthermore requested to indicate what conditions DWA would like DEA&DP to consider including in the environmental authorisation. This would also be in line with the provisions of the Constitution regarding cooperative governance, as well as the principle in section 2 of NEMA which states that "there must be intergovernmental coordination and harmonisation of actions relating to the environment[1]".
This decision is pending.

Protected species – Provincial Ordinances

Provincial ordinances were developed to protect particular plant species within specific provinces. The protection of these species is enforced through permitting requirements associated with provincial lists of protected species. Permits are administered by the Provincial Departments of Environmental Affairs.

National Heritage Resources Act, 1999 (Act No. 25 of 1999)

The National Heritage Resources Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 ha. The Act makes provision for the potential destruction to existing sites, pending the archaeologist's recommendations through permitting procedures. Permits are administered by the South African Heritage Resources Agency (SAHRA).
In terms of Section 38 (1) of the NHRA (1999), the following activities will be triggered by the proposed development.

[1] *From Letter of C. Molteno, 2014*

Table 4: Listed Activities according to the NHRA

CATEGORY OF DEVELOPMENT (Section 38 (1))	Triggered
1. Construction of a road, wall, power line, pipeline, canal or other similar form of linear development or barrier over 300m in length	**Yes**
2. Construction of a bridge or similar structure exceeding 50 m in length	**No**
3. Any development or activity that will change the character of a site–	
a) exceeding 5 000 m^2 in extent	**Yes**
b) involving three or more existing erven or subdivisions thereof	**No**
c) involving three or more erven or divisions thereof which have been consolidated within the past five years	**No**
4. Rezoning of a site exceeding 10 000 m^2	**Yes**

An Archaeological Assessment was undertaken.

A Heritage Impact Assessment was also undertaken and reviewed by the IAComm on the 13th of August 2014. The Final Decision from HWC was communicated tothe project team on the 20th of August 2014. According the final comment, the committee supports the proposal and development is granted.

National Environmental Management: Protected Areas Act, 2003 (Act No. 57 of 2003)

The purpose of this Act is to provide for the protection, conservation and management of ecologically viable areas representative of South Africa's biological diversity and its natural landscapes.

This act is not relevant to the proposed development.

National Environmental Management: Waste Act, 2008 (Act No. 59 of 2008)

Based on the proposed development, a Waste Management Licence in terms of the NEM:WA will not be required.

B-2.4 Development Strategy/Guidelines

The Proposed Vlakkeland Housing development may deviate from current development patterns. A process of environmental analysis, design conceptualization and impact assessment has been initiated. This includes engagement with stakeholders. One of the most significant stakeholders is the Drakenstein Municipality. It is recognized that the city has prepared a Draft Spatial Development Framework and Various policies. Depending on how these policies are interpreted, the Vlakkeland Housing Development may be in compliance.B-2.4.1 The Development Facilitation Act No 67 of 1995 (DFA)

The act was approved in 1995 in order to facilitate land use planning within South Africa and to establish processes for speedy land delivery. Although for historical reasons the DFA is not implemented in the Western Cape, the principles proposed in Chapter 1 of the Act are applicable to all land development. The following principles are of particular relevance:

- Provide for urban and rural land development and facilitate development of formal and informal, existing and new settlements;
- Promote efficient and integrated land development by:
  - Integration of social, economic, institutional and physical aspects of land development;
  - Integrated land development in rural and urban areas;
  - Promote availability of residential and employment opportunities in close proximity to each other;
  - Optimise the use of existing resources;
  - Promote a diverse combination of land uses;
  - Encourage environmentally sustainable land development.
- Assist communities to actively participate in the process of land development;
  - Promote sustainable land development at the required scale:
  - Promote land development within the Republic;
  - Establishment of viable communities;
  - Sustained protection of the environment;
  - Meet the basic needs of all citizens in an affordable way; and,
  - Safe utilisation of land.
- Security of tenure, provide possible range of tenure alternatives.

How does the development affect/incorporate the abovementioned?

The proposed Vlakkeland Housing development addresses the principles as stipulated in the DFA.

B-2.4.2 Provincial Spatial Development Framework (PSDF)

This policy is established to guide municipal (district, local & metropolitan) Integrated Development Plans and Spatial Development Frameworks (SDF's) and provincial and municipal Spatial Development Plans (SDP's). It also helps to prioritise and align investment and infrastructure plans and provides clear signals to the private sector about desired development directions.

The Western Cape Provincial Spatial Development Framework (PSDF) has recently been approved as a statutory 4(6) structure plan. The stated purpose of the PSDF is to redress the spatial legacy of apartheid and to spatially express the provincial growth and development strategy of the Western Cape. It provides guidance to municipalities for their own integrated development frameworks, and aligns investment and infrastructure plans. It also aims to give guidance to the private sector about desired development directions and establishes 'no-go', 'conditional' and 'go' areas for development.

The PSDF endorses bio-regional planning as a land-use planning method which promotes sustainable development through five subcomponents. These are 'sense of place', 'sense of history', sense of craft', 'sense of nature' and sense of limits'. The bio-regional planning method involves four main spatial planning categories, which are 'core', 'buffer', 'intensive', 'agriculture' and 'urban'.

The PSDF contains a number of objectives, strategies and policies which are intended to guide development in the Province. These are listed under three broad categories relating to economic, social and ecological principles.

In specific regard to Vlakkeland the Drakenstein SDF development proposals map proposes that this area be utilized for "new Urban Development", however cognizance must be taken of the fact that an "ecological corridor" as well as 1:100 year flood line are indicated on the southwestern portion of the site and that certain areas are identifies as "Critical Biodiversity Areas. The development of portions of the Vlakkeland area would therefore be subject to informant/specialist studies as id indicated by the Drakenstein SDF.

The Drakenstein SDF also indicates Jan van Riebeeck Drive as an "existing strip of linear economic development to be reinforced" and "mixed use development (commercial/residential/social)" must be promoted along this road.

The development proposals of the Drakenstein SDF also states: "Containing the tendency for residential development to the east of Jan van Riebeeck Drive and fixing a clear eastern urban edge to protect high potential agricultural land, nature areas, areas of cultural and historic

significance and areas of high visual quality." Any proposed development must therefore be guided by this principle.

Furthermore: "The promotion of land uses to create clusters of community facilities and economic development and job creation opportunities along Jan van Riebeeck Drive and the thereby improve access to such facilities/opportunities by communities residing along its length."; and "Particular attention should be given to "live/work" opportunities and high density residential development on land fronting onto the Jan van Riebeeck Road and Van der Stel Street. To this end the wide road reserves allocated to these two roadways must be reconsidered to allow for increased social-economic activity along these channels."

B-2.4.3 Western Cape Draft Strategic Plan 2010 (WCDSP)

[2]The 11 Strategic Objectives embodied in the WCDSP embody the key overarching objectives identified by the incumbent Provincial government for its term in office (i.e. until 2014). The 11 Objectives are broadly aligned with the 12 National Lekgotla Outcomes, but focuses specifically on the Western Cape development context.

Of the 11 Outcomes the following are broadly applicable to aspects of the Vlakkeland proposal:

- Increasing opportunities for growth and jobs;
- Developing integrated and sustainable human settlements;
- Mainstreaming sustainability and optimizing resource use and efficiency;
- Reducing and alleviating poverty;

Proposed socio-economic interventions are underpinned by the Administration's beliefs that "economic growth constitutes the foundation of all successful development; that growth is driven primarily by private sector business operating in a market environment; and that the role of the state is (a) to create and maintain an enabling environment for business and (b) to provide demand-led, private sector-driven support for growth sectors, industries and business".

B-2.4.4 Drakenstein IDP 2012 - 2017

In the Drakenstein Municipal IDP (2012 – 2017) as approved on 30 May 2012, Key Performance Area KPA 6: Social and Community Development, is applicable to the Vlakkeland development. In terms of this KPA, IDP ref KP 1052 and 1053 is relevant, being "Implementation of Integrated Human Settlement Strategy Plan through addressing housing backlogs and reduce the housing demand"

B-2.4.5 Drakenstein Spatial Development Framework 2012

The Drakenstein Municipality Housing Department has identified a number of current and future housing projects to address the need for housing in the municipal area. These projects are indicated spatially in the figure below.

[2] *Nuplan Africa Town and Regional Planners*

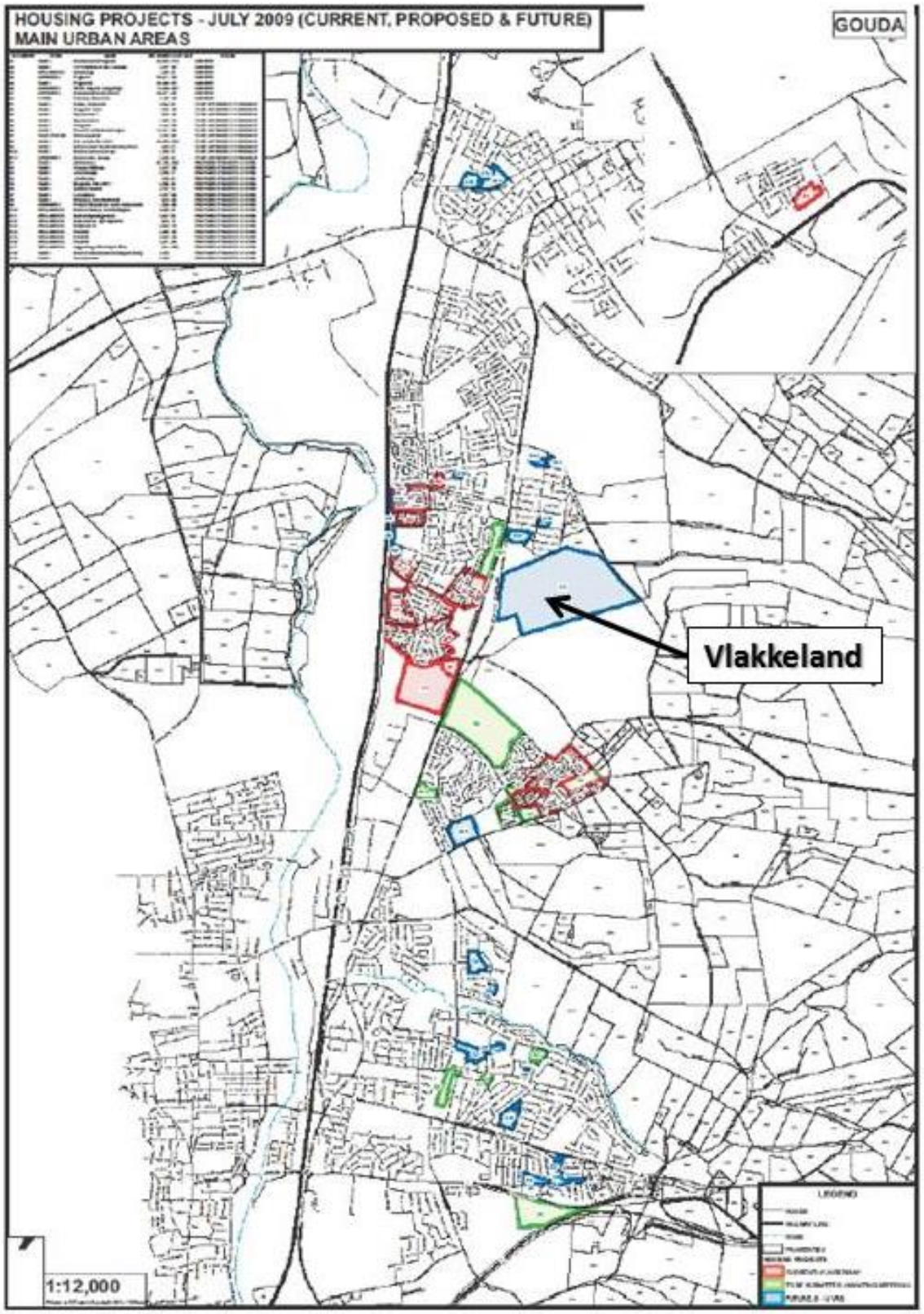

Figure 2: Current and Proposed Housing Projects – Drakenstein SDF

Following on this the ISHSP for the Drakenstein Municipality, the following projects were identified as potential pilot housing projects to be implemented in the Drakenstein Municipality (Table below).

Table 5: Drakenstein ISHSP Pilot Projects

PILOT PROJECT	LOCATION	ISHSP STRATEGY
Paarl Station	Paarl South	Infill, densification and redevelopment within established areas
Die Kraal	Paarl East	Infill, densification and redevelopment within established areas
Mbekeni South (current)	Mbekweni	Integration zone
Vlakkeland	**Paarl North**	**Integration zone**
Mbekweni Station	Mbekweni	Township upgrade
R301/R302 "Buffer Strip"	Mbekweni	Township upgrade/integration zone
Pentz Street	Wellington	Infill, densification and redevelopment within established areas

In terms of Social facilities the SDF states the following: "The provision of social facilities must be seen in their broader context as contributing to the creation of community cohesion and a sense of place. Existing facilities are more often than not embedded within local areas making them relatively inaccessible to everyone accept those in their immediate vicinity.

Constraints such as the availability of suitable land, public resources and building costs dictate a move away from local area orientated facilities towards shared facilities. To facilitate sharing, such facilities should, however, be located in a manner that is accessible to the greatest possible amount of users. Locations along important public transportation routes and at areas promoting clustering of similar facilities, present ideal opportunities for maximum exposure of facilities of this nature".

The movement and access proposals contained in this Spatial Development Framework is aimed at complementing the strong north-south linkages in the Paarl-Mbekweni-Wellington urban centre with east-west "integrators" providing improved linkages between historically segregated communities to the east and west of the Berg River (refer to figure 3 below). These include:

- a shift in function for Jan van Riebeeck Road from being only a mobility route providing a fast connection between Wellington and the N1 to a more multi-functional road that will also provide increased access to existing and proposed future developments located to the east and west along its length. The extension of the Berg River Boulevard in a south- as well as northward direction should be considered as an alternative mobility route to Jan van Riebeeck Road. Current land use approvals and proposals along Jan van Riebeeck Road and social development opportunities for communities located along this route can only be positively affected by activity corridor type development along this route.

The following spatial proposals for the Mbekweni area have relevance to the proposed Vlakkeland development:

- The potential for infill housing on sites identified through the urban audit of vacant and under-utilized land must be prioritised to promote the creation of a more compact urban form;
- Strengthening of east-west road linkages to aid integration of communities;
- The promotion of land uses to create clusters of community facilities, economic development and job opportunities along Jan van Riebeeck Road to improve access to facilities/opportunities for communities residing along its length;
- Attention should be given to "live/work" opportunities and high density residential development on land fronting onto Jan van Riebeeck Road and Van der Stel Street.

B-2.5 Other Applicable Guidelines

B-2.5.1 Guideline for involving Visual and Aesthetic Specialists in the EIA processes (2005)

The guideline looks at the following:

- Triggers and Key issues potentially requiring visual specialist's input in the EIA process;
- The choice of the appropriate specialist and the negotiation process leading to sound terms of reference for that specialist;
- Specialist Input to Impact Assessment and recommendation of management actions.

B-2.5.2 Guideline for involving Biodiversity Specialists in the EIA processes (2010)

The guideline deals with the ecological specialist's input to the EIA process.

These guidelines will be incorporated during the use of numerous specialists in the EIA Phase of the development. As mentioned above, a list of specialists has been appointed to conduct specialist assessments to assist the developer in making an informed decision.

B-2.5.3 Guideline on Alternatives

This guideline provides an overview of how to consider alternatives in the EIA process. It is aimed at Government authorities, non-governmental organizations, environmental impact practitioners, project applicants and interested and affected parties. The guideline strives to create a common understanding amongst the different stakeholders of what is required in the identification and assessment of alternatives.

B-2.5.4 National Spatial Biodiversity Assessment

The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on its biophysical characteristics, which are ranked according to priority levels.

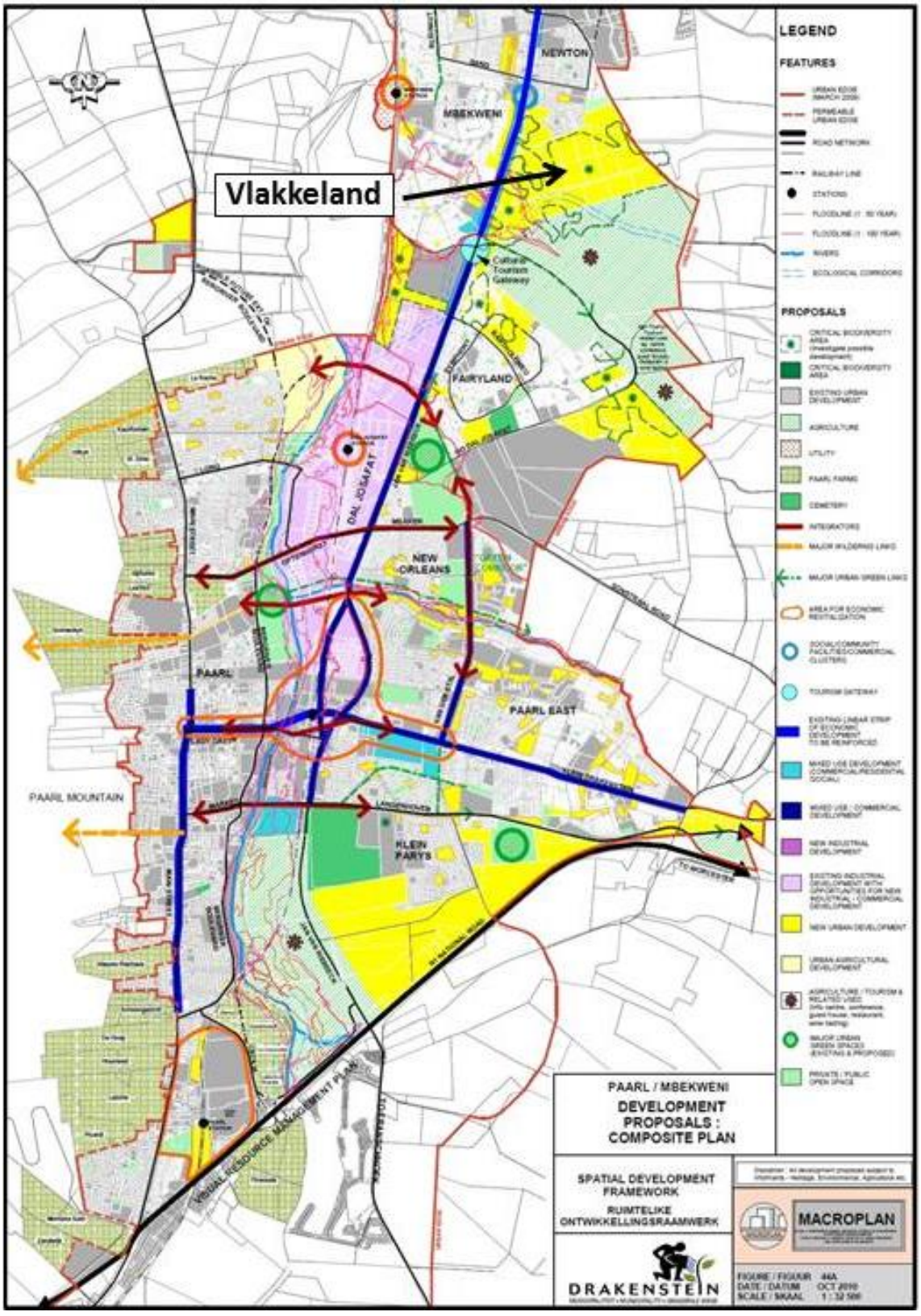

Figure 3: Drakenstein SDF Proposals

B-2.5.5 Sustainable Energy Strategy for the Western Cape

The recent energy crisis in the Western Cape has highlighted the need to develop a plan for sustainable, secure energy provision in the Western Cape. Although various national efforts are underway to increase energy provision to the Western Cape, the Provincial Government believes that additional efforts need to be made to address the other energy challenges facing the Province, including the challenges of:

- reducing the Province's carbon footprint;
- providing access to energy to all citizens in the province, and
- addressing the numerous health, social and environmental problems associated with our current energy use patterns.

These challenges need to be addressed in the context of supporting the Province's economic development and job creation.

B-2.5.6 Guidelines on Public Participation (2013)

This guideline provides an overview of how to conduct a Public Participation Process in the EIA process. It is aimed at Government authorities, non-governmental organizations, environmental impact practitioners, project applicants and interested and affected parties. These guidelines will be adhered to and strictly followed during all public participation processes.

B-2.5.7 Guidelines on Needs and Desirability (2013)

This guideline ensures that the implementation of social and economic policies takes cognizance of strategic concerns such as climate change, food security, as well as sustainability in supply of natural resources and status of our ecosystem services. It is designed to identify and focus on the needs and the desirability of the project or activities in question. It aims to achieve our Constitutional goal of a better quality of life for all now and in the future.

B-3 DETAILS OF THE APPLICANT

The details of the project applicant are indicated below.

Name of Applicant	Relevant Numbers
Drakenstein Municipality Anthea Shortles David Delaney	Tel:(021) 807 4835 E–mail: Anthea.shortles@drakenstein.gov.za E-mail: davidd@drakenstein.gov.za

B-4 THE SITE

B-4.1 Regional setting

The site is situated within the Local Authority District of Drakenstein Municipality. It is located between Paarl and Wellington, east of the Mbekweni and south of the Newton residential areas. The site falls within the Urban Edge suggested by die Drakenstein Municipality. The site is mostly surrounded by agricultural farm land to the east.

The area is mostly known for its Agricultural activities which mainly consist of grape farming and wine farms. The area is also known for the establishment of informal settlements and rural areas.

B-4.2 Site Locality

The site is located between Paarl and Wellington with the Mbekweni residential area situated to the west and the Newton residential area situated north of the site. Jan Van Riebeeck Drive runs along the western boundary of the site and Bo Dal Road runs along the eastern site boundary. The proposed development area includes erven 8359, RE 8370, 8378, 8399, 8400, 12628, 12633 and 33027 of Paarl, Western Cape.

After the scoping phase of the EIA it was concluded that Erf 33027 would be excluded from the development due to the site being botanically sensitive. This property has been set aside for conservation purposes due to the presence of rare botanical species on this site. Erf 33027 will therefore serve as a public open space and will be rehabilitated to reserve any critical biodiversity species that might be present on the site. It will further act as a buffer between the proposed new development and existing residential developments and the farming community to the north east and east of the site.

The Drakenstein Urban Edge runs along the eastern and southern boundaries of the site. Agricultural farm land and informal settlements mostly surrounds the site. The Berg River runs

through the valley in a northerly direction approximately 1.8km west of the site. Railway tracks are situated approximately 1km west of the site running parallel with the Berg River.

Table 6: Detail of affected Erven

NR	PROPERTY DESCRIPTION	TITLE DEED NUMBER	SIZE (HA)	Owners	Zoning
1	Rem erf 8378 Paarl	T23400/1967	88,1175ha	The Drakenstein Municipality	Undetermined
2	Erf 12633 Paarl	T16190/1991	4,1552ha	The Drakenstein Municipality	Agricultural purposes
3	Rem erf 8359 Paarl	T27764/1974	4,0184ha	The Regional Services Council	Reserved for Road purposes
4	Erf 8399 Paarl	T23399/1067	4,515ha	The Municipality of Paarl	Split Zoning: Agricultural and Road purposes
5	Erf 8400 Paarl	T16190/1991	1,0634ha	The Municipality of Paarl	Split Zoning: Agricultural and Road purposes
6	Erf 12628 Paarl	T16190/1991	3,8444ha	The Municipality of Paarl	Agricultural purposes
TOTAL SIZE			**105,7139ha**		

Source – Nuplan Africa, 2014

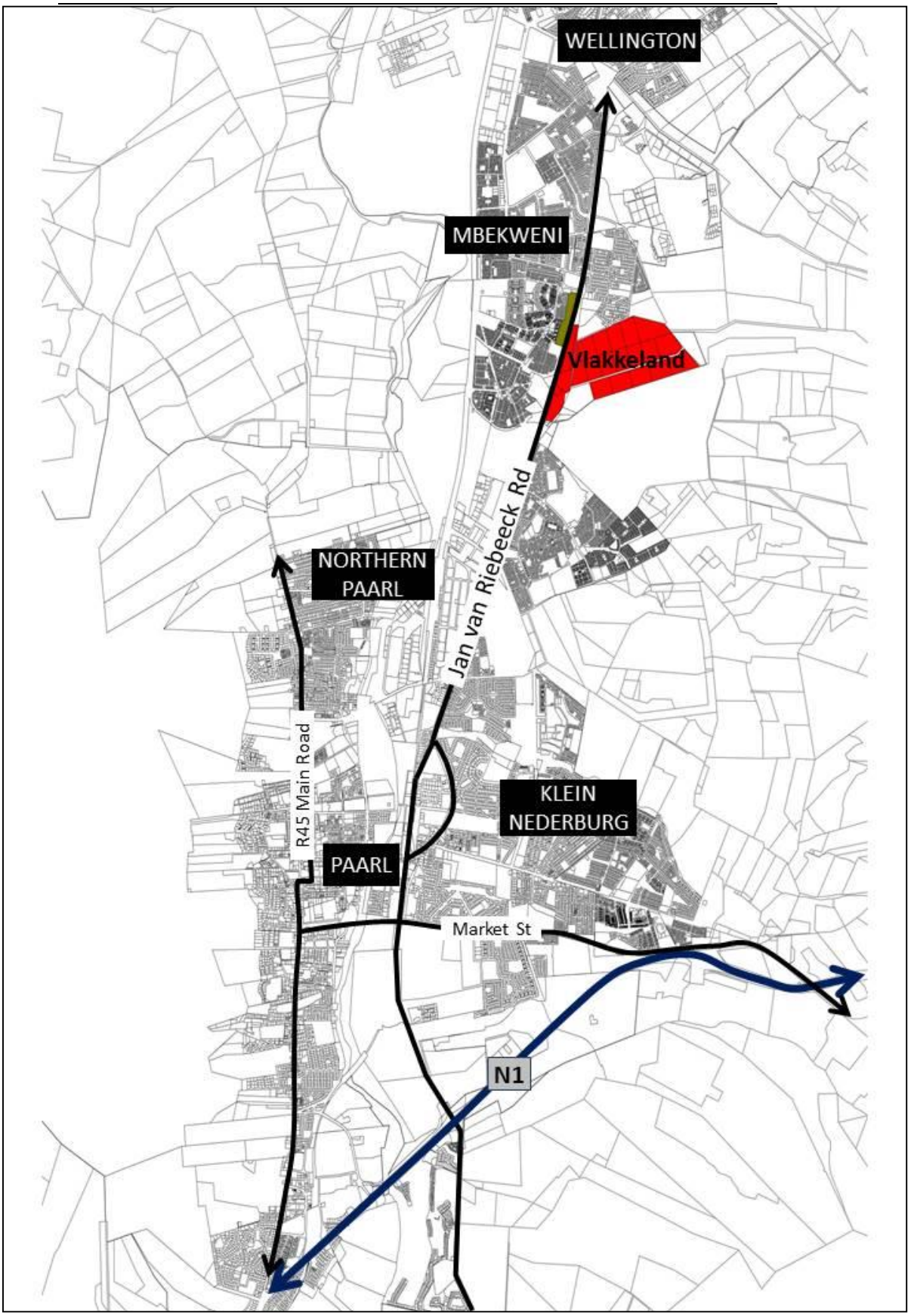

Figure 4: Regional Locality of Vlakkeland

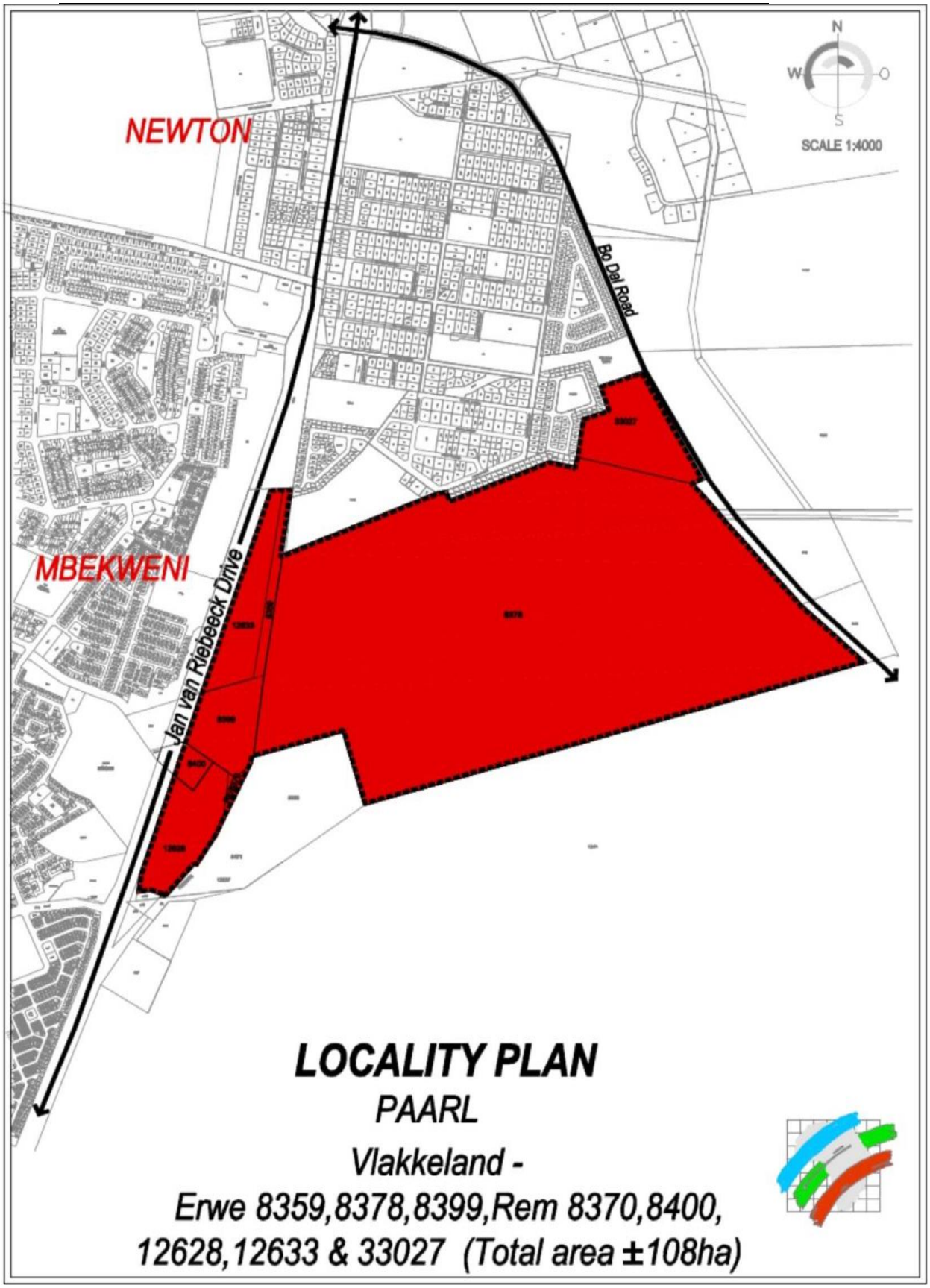

Figure 5: Locality Map

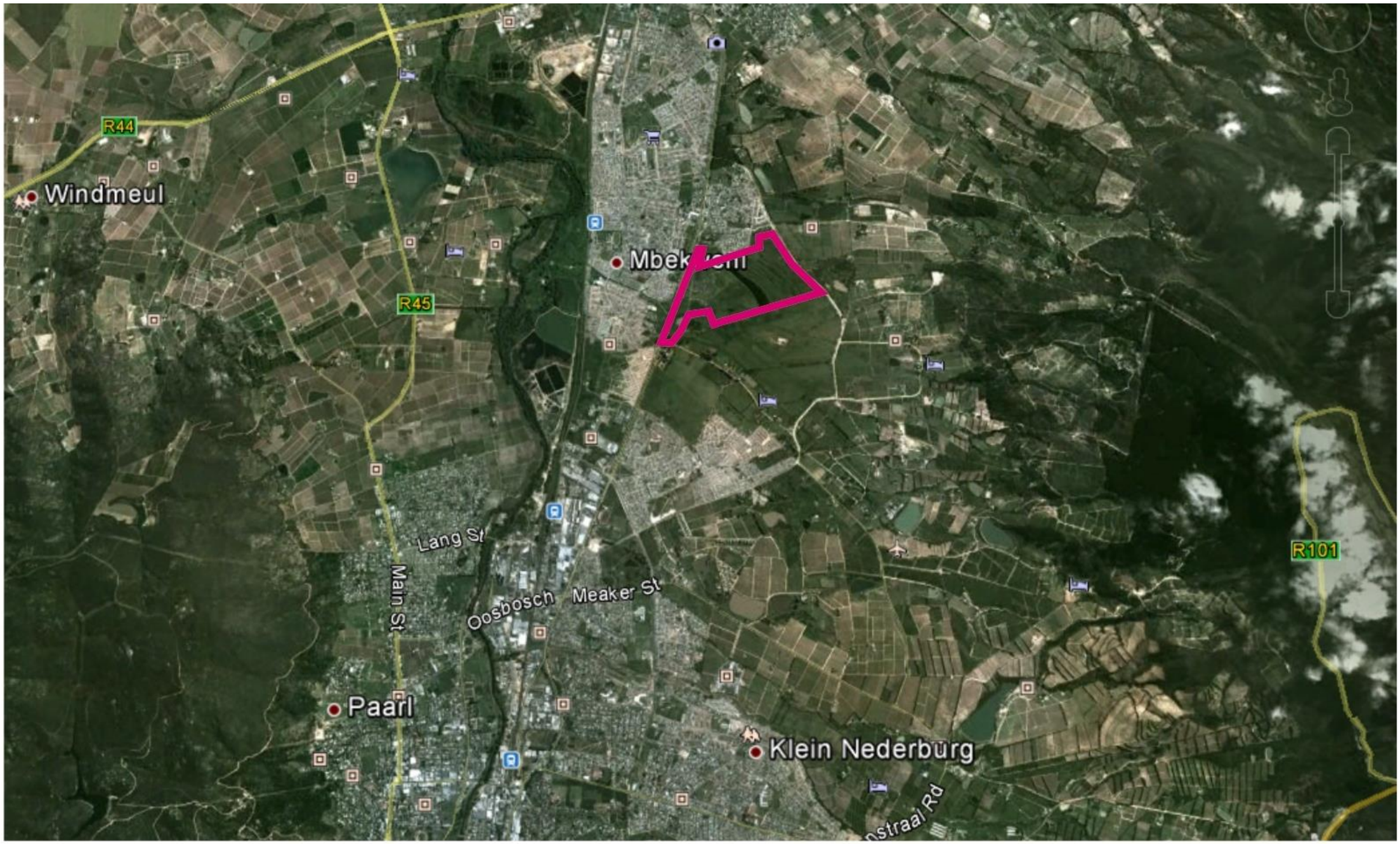

Figure 6: Google (Aerial Photo) Image of the site and its surroundings

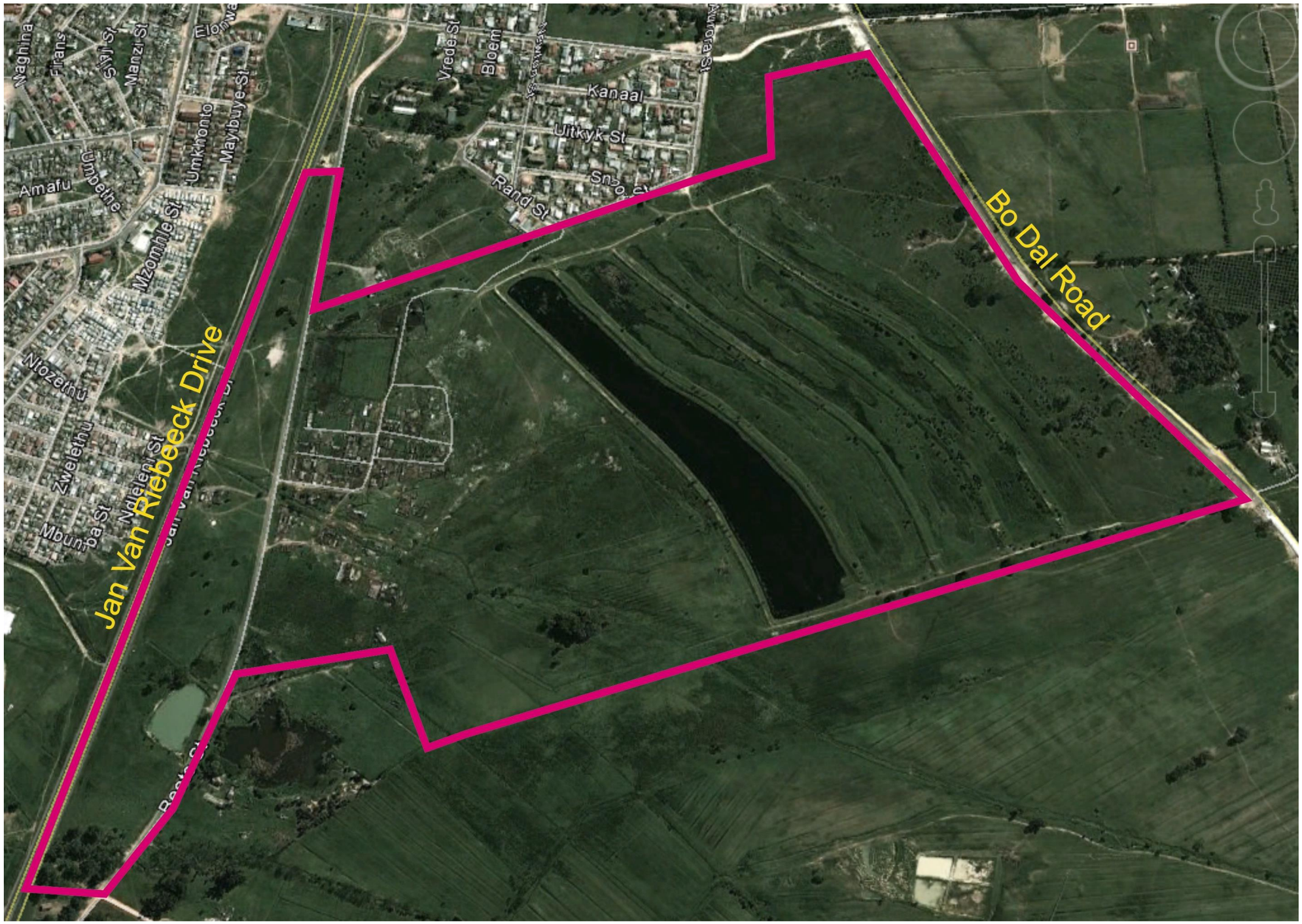

Figure 7: Aerial Image of the site

B-4.3 Brief Site Description

The proposed site is situated in Paarl Valley, east of Jan van Riebeeck Drive between Paarl and Wellington in the Western Cape.

The site is an irregular, polygonal shape and it is approximately 108 hectare in area. It is bounded by Jan van Riebeeck Drive and by vacant land to the west and existing housing to the north. Vacant land abuts the northern third of the eastern boundary, with a gravel road (Bo Dal Road) running along the southern two-thirds. Mainly vacant land lies to the south of the southern boundary, but the Mbekweni River, Kleinbosch River, Seven Springs River, Dal River and associated dams and dam-like structures occur near the extreme western end of the boundary.

The overall slope of the site is towards the southwest, with a typical gradient of approximately 1:75, but a strip along the northern boundary has a gradient of approximately 1:18.

Five, very large, abandoned evaporation ponds, which extend north-south almost across the entire width of the site, cover approximately 70% to 80% of the central and eastern parts of the site. Excavations for these ponds and the embankment walls themselves have changed the site profile. The bases of the ponds, which range up to 100m in width and up to 300m in length, are slightly dish-shaped and they have a very gentle fall to the east. Water is trapped in parts of these ponds in winter and reed vegetation occurs in the very gentle fall to the east. The embankment walls vary in size and length, but typically they are 3m to 4m high with slopes at 1:3, and crest widths between 3m and 4m. The upper parts of the embankments have been subjected to wave erosion, and near vertical slope occur, in places, just below the crest. The embankment walls have been deliberately breached in places to ensure free outflow of storm water.

The large diameter, cement pipes that previously formed the rising main and gravity pipelines from the sewage works to the west of Jan van Riebeeck Drive to the evaporation ponds apparently run in a north easterly direction through the centre of the site but only one was identified.

Most of the site has a grass cover, which was very sparse in places during the time of the site visits, but relatively thickly developed in a floodplain or wet area in the south western corner of the site. Large gum trees grow along the central parts of the eastern boundary, and large pine trees grow in most areas of the site, but notably in the pond area and in the central parts of the site to the west of the ponds. Wattle and other large trees grow next to the dams and the Dal

River in the extreme south western corner of the site.

An area which is approximately 0.8 ha in size, located in the central western part of the site, is currently occupied by the largely abandoned shacks and informal livestock pens and paddocks of emergent farmers. Most of the structures have been abandoned, but a few of the shacks are still occupied, and livestock is still housed, in places.
Gravel tracks crisscross many parts of the site, and there is still limited vehicular access along the tops of the embankment walls.

After a botanical survey was completed it was concluded that the site hold several endangered plant species along the eastern boundary of the site.
The remnants of old brick houses and structures occur near the south western corner of the property, and at least one of these are occupied. Paddocks also occur in this area.
Scattered rubble and rubbish has been dumped throughout the site, particularly in the south western corner and the extreme eastern parts and in some parts of the evaporation ponds.

B-4.4 Surrounding Developments

Two small new residential developments occur to the north and south of the subject property as depicted in the figure below. The development to the south (erf 16161), abutting Jan van Riebeeck Road, is currently being serviced while the proposed development abutting the east of Newton is approved, but no services have been installed to date.

The proposed erf 557 development is located directly to the east of Jan van Riebeeck Road and shares an access point onto Jan van Riebeeck Road with the proposed Vlakkeland development.

The area to the west and north of the subject property is fully developed for residential purposes forming the suburbs of Mbekweni and Newton respectively. To the east of the subject property agricultural activities occur with several historical wine producing farms. To the south of the subject property historical farms with heritage significance occur belonging to the South African Heritage Resources Agency (SAHRA).

Figure 8: Surrounding Developments

(Nuplan, 2013)

Figure 9: Photo Page of the site (1)

Figure 10: Photos Page of the site (2)

B-5 PROJECT DESCRIPTION

The Drakenstein Municipality proposes the construction and establishment of a GAP and Low Cost residential development of approximately 3260 units between Paarl and Wellington. The development will cover an area of approximately 108 ha comprising Erf 8359, Re/Erf 8370, Erf 8378, Erf 8399, Erf 8400, Erf 12628, Erf 12633 and Erf 33027. The site is situated to the east of Jan van Riebeeck Drive and to the west of Bo-Dal Road.

B-5.1 Housing Typologies

The municipality proposes to develop a combination of subsidy housing, subsidy double storey housing, an activity spine, GAP housing and GAP and rental apartments on the above mentioned property. A total of approximately 3 260 units will be constructed. The housing distribution is based on the principle of higher densities along the main movement and Public Transport routes and lower densities adjacent to existing residential areas. The layout design promotes walkable communities with all residential precincts within walking distance of community facilities and public transport routes. The residential distribution is thus as follows and illustrated in Figure 11

The single subsidy housing includes:

1. Freestanding 2 bedroom units on erf sizes ranging from 124m^2 to 164m^2 , depending on the design of the unit;
2. Single semi-detached 2 bedroom units on erf sizes ranging from 94m^2 to 120m^2 , depending on the design of the unit;
3. Single 3 Row 2 bedroom Housing units on erf sizes ranging from 75m^2 to 116 m^2 depending on the location and design of the unit in the row;
4. Single 4 Row 2 bedroom Housing units on erf sizes ranging from 75m^2 to 116m^2 depending on the location and design of the unit in the row.

The subsidy double storey housing includes:

1. Double storey 2 bedroom Semi-Detached units on erf sizes ranging from 88m^2 to 92m^2 depending on the design of the unit;
2. Double Storey 2 bedroom 3 Row Housing units on erf sizes ranging from 52m^2 to 92m^2 depending on the location and design of the unit in the row;
3. Double Storey 2 bedroom 4 Row Housing units on erf sizes ranging from 52m^2 to 92m^2 depending on the location and design of the unit in the row;

The Gap housing includes:

1. Single Storey Freestanding 3 bedroom units on erf sizes ranging from 141m^2 to 165m^2

depending on the design of the unit;

2. Single Storey Semi-Detached 2 bedroom units on erf sizes ranging from 120m^2 to 127m^2 depending on the design of the unit. These units include an additional area for possible expansion.
3. Double Storey Semi-Detached 2 bedroom units on erf sizes ranging from 92m^2 to 102m^2 depending on the design of the unit.

The proposed rental units (CRU's) will cover a floor plan area of approximately 40m^2. Additionally, Temporary Relocation Areas (TRA's) fitted with bulk services including sewage, potable water and electricity, will be made available on erf sizes of approximately 105m^2.

It is proposed to allocate three erven for Primary Schools and two erven for Secondary Schools. Specific locations will be set out to accommodate Places of Worship, Creches, Pre-Primary Schools, Sport Fields and taxi bays. A conceptual open space network will run throughout the development. A Civic and Business Node will be created in the centre of the development, providing a location for retail, offices, a Library, a Post Office and a Community Centre. A primary storm water drainage system with a large storm water retention facility will be constructed in the south eastern corner and alongside the southern border. This area will also serve as a sport facility, providing sport fields for the local community.

Please refer to Figure 11 for the proposed residential development areas.

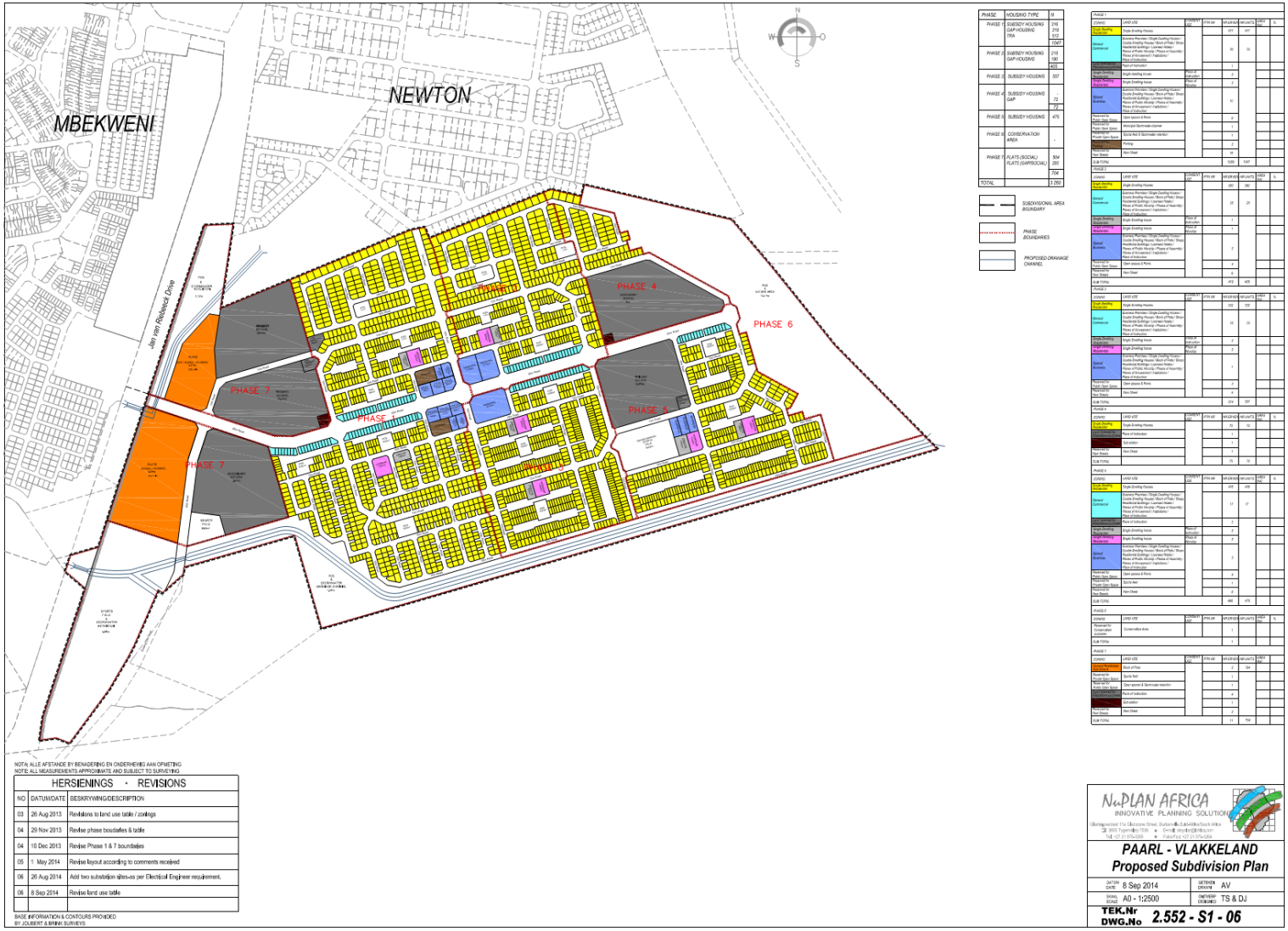

Figure 11: Proposed locations for the built structures on the Vlakkeland Development.

B-5.2 Access and Internal Roads

Three access point to the site is currently proposed. These include

- From the existing Jan van Riebeeck Drive / Buitekant Street intersection, through the north of the site via Rand Street.
- A new traffic signal controlled intersection (Main Development Access) located 770 metres south of Buitekant Street and 800 metres north of Roggeland Road.
- From the existing Jan van Riebeeck Drive / Roggeland Road intersection, to the south of the site via Beets Street.

Jan van Riebeeck is a class 2 road within a "Sub-Urban" Road Side Environment (RSE). The recommended intersection spacing in the Road Assess Guidelines (RAG) is 800 metres for traffic signal controlled intersections, with the above criteria. The distance between the existing Buitekant Street and Roggeland Road intersection is 1570 metres and there is also an open stormwater channel at the midpoint between these two intersections. Hence, the proposed new Vlakkeland Main Access have to be provided slightly north of the midpoint, at 770 metres south of the Buitekant Street intersection and 800 Metres north of the Roggeland Road intersection. This intersection position was discussed and approved in principle with officials at the provincial government.

An East-West connectivity road with a width of 25m will serve as the economic and business hub along which the smaller internal roads (10m – 13m in width) will flow to the North and South of the development.

Please refer to Figure 12 for the Access and Internal Road structure layout

B-5.3 Sensitive Buffer areas

A Critical Biodiversity Area (CB) has been identified in the north eastern corner of the site. This site is botanically sensitive and it was decided that this entire erf should be protected and rehabilitated to prevent destruction. Further concerns were raised that there should be a heritage buffer next to Bo Dal Road. A 40m buffer strip was thus added next to Bo Dal Road in Alternative 1, Layout 4.. Due to the botanical constraints in this area as well as the visual screen that had to be incorporated, this buffer was further extended to create a wide buffer. This buffer has to be protected and conserved and seen as a no-go area due to the sensitive nature of the plants on this site.

The Kleinbosch River storm water channel runs along the southern boundary of the site. This channel also serves as a 40m buffer strip between the SAHRA Heritage property to the south and the development.

Please refer to Figure 13 for the visual representation for the proposed Sensitivity Buffers.

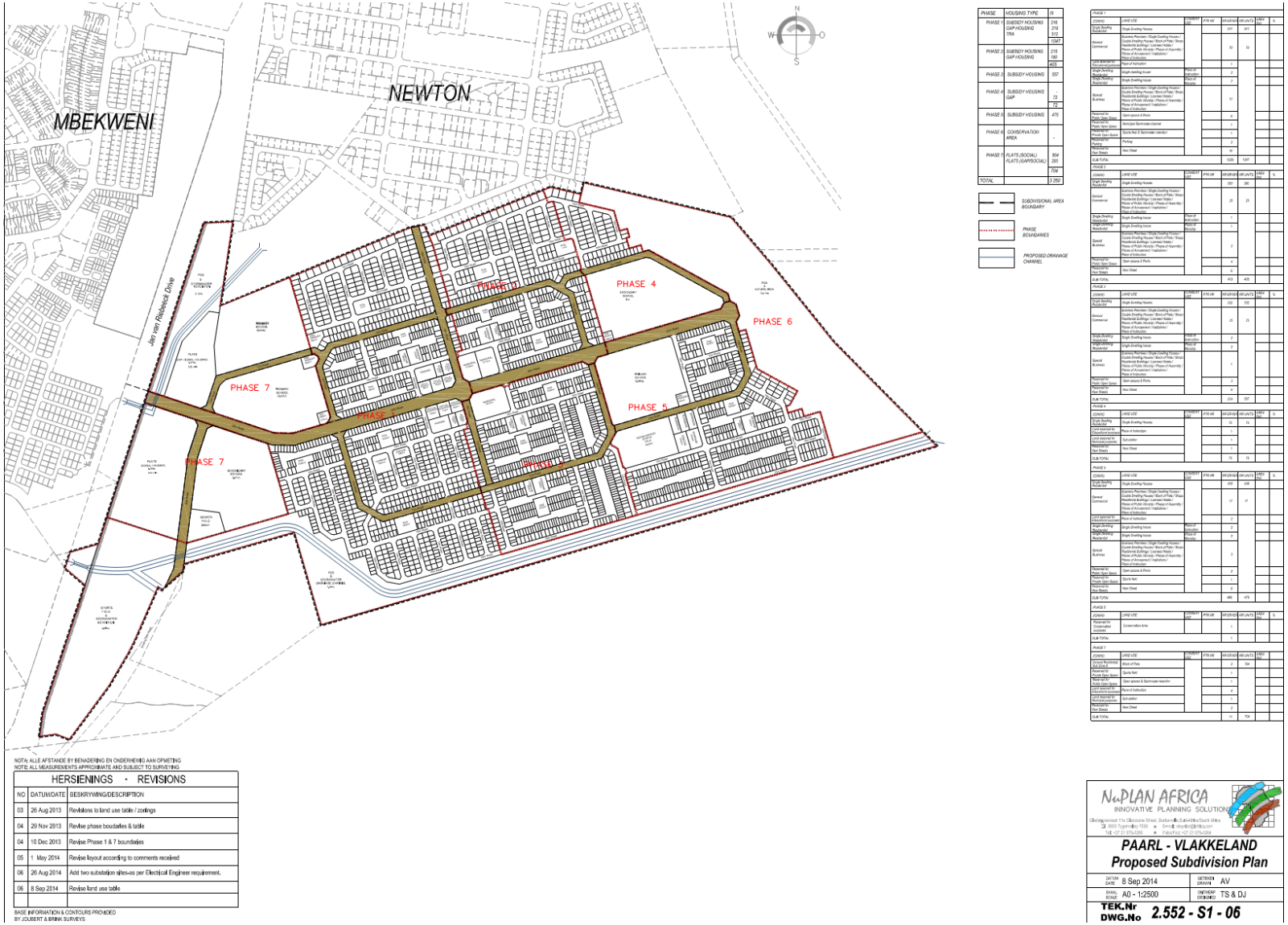

Figure 12: The internal road structure of the proposed Vlakkeland Development.

Figure 13: The proposed Sensitivity Buffers (Botanical, Visual and Heritage)

B-5.4 Proposed Storm water Infrastructure

Internal stormwater for the proposed development will be accommodated in a major and minor system. The minor system, which will be constructed for the convenience of the public, requires that the run-off the removed swiftly from residential areas through catchpits and manholes with spacing not more than 80meters between structures. This will be supported by an underground network of pipes and culverts. The major stormwater system will be constructed in accordance with measures to accommodate the occurance of storms at a higher interval than can be accommodated by the minor system. Infrastructure include natural watercourses, large conduits, roads, stormwater retention facilities (to the west of the proposed development) and floodplains. These systems can be characterised as being open and above ground level and can accommodate run-off from the minor stormwater systems. The effects of Climate Change, which is a predicted increase of 15% in rainfall and therefore stormwater runoff, have been included in all stormwater infrastructure to be constructed on site. Please refer to Annexure J in Lyner's Service Inestigation (Addendum F-8) for Graeme McGill Consulting's Addendum to the Stormwater Plan Prepared by Lyners Consulting Engineers and Project Managers.

Two storm water drainage systems are located east of Jan van Riebeeck Drive, gathering and channeling water to the Berg River farther west. The main drainage line is situated 400m north of the south western corner of the proposed site and a smaller drainage line is situated another 350m north. The Kleinbosch, Seven Springs, Mbekweni and Dal River reside over most of the western side of the site.

It is proposed to realign and divert these watercourses into a primary storm water drainage system. The Kleinbosch River which crosses the site will be diverted back to its original alignment (off the site).

The storm water drainage system will be constructed along the southern boundary of the site directing the storm water to the storm water retention facility in the south west corner of the site. It will then connect to the existing storm water drainage system west of Jan van Riebeeck drive and discharge the water into the Berg River. This diversion is required to divert water to the side of the development (potentially less pollution) and to open up more needed developable land.

Two retention ponds are to be constructed into which the pre- and post-development storm water will flow. Retention pond 1 is situated to the North-Western side of the proposed development next to the Jan van Riebeeck Drive and has an estimated 1:100 year peak inflow of 20.1m^3/s and a maximum outflow of 19m^3/s. This retention pond will cover an area of approximately 2.13ha and will be used as public open space. Retention pond 2 is located to the South-West of the proposed development next to the Jan van Riebeeck Drive. The maximum 1:100 year flood inflow is a total of 101.1m^3/s and an outflow of 92m^3/s. This retention

pond will cover an area of approximately 5.88ha and will be used as a Sports field as well.

Please refer to Figure 14 for the locations of the proposed Storm water infrastructure.

B-5.5 Proposed Sewage Network

Accodring to Lyners's Service Investigation (September 2014), there are currently no bulk sewerage services available in the vicinity of the proposed development to accommodate the flows from Vlakkeland. The Paarl sewer network however, runs adjacent to the proposed site and GLS investiged the the impact of the proposed development on the existing sewer network in their report "Vlakkeland Affordable Housing Development, Wellington: Capacity Analysis of the Bulk Water & Sewer Services" (dated 26 August 2014). It became apparent that the topography of the site allowed for the proposed development's sewerage to be accommodated by the Mbekweni pumpting station to the west of the site. Upgrades to the sewerage infrastructure are necessary and these include a new bulk sewer line from Jan van Riebeeck Drive to the existing Mbekweni pump station, the upgrading of the pump station to accommodate the increased flow as well as a new rising main to the Paarl WWTW. Please refer to the Lyners Service Investigation in Addendum F-8.

Bulk Water Supply

According to the preliminary engineering services report (September 2014), there are currently no dedicated water supply for the proposed development. However according to GLS Consulting's Capacity Analysis (August 2014, Please refer to Addendum F-8), the development is situated within the water priority area and can be accommodated in the existing Van Blerk/Newton reservoir zone. The water will be supplied from the van Blerk/Con Marine and Newton reservoirs in the Wellington water system. Water in Wellington is mainly supplied via two bulk water pipelines ie the Leliefontein pipeline (bulk gravity pipeline between the Leliefontein reservoir in Paarl and the Newton and Con Marine reservoirs in Wellington) as well as the "strawberry King" pipeline, which is a bulk gravity line from the Courtrai suburb un Paarl to the Newton suburb in Wellington. During Summer months, the Strawberry King line is frequently out of service due to it's current bad state of repair and has therefore incufficient capacity to accommodate any additional developments. It is therefore proposed that no construction can commence before the upgrading of this bulk water supply pipeline have been completed. This upgrade is currently in its planning phase and can only be constructed during Winter when the capacity of the line is not required.

According to GLS Consulting, the total capacity required in the existing Wellington water system is calculated at 23 367kl/d (271 l/s) and the capacity of the existing bulk system (including the upgraded Strawberry King line) is calculated at 21 945 kl/d (254 l/s). The existing

bulk water supply capacity is therefore insufficient to accommodate the total developmet. Phases 1&2 can however, be accommodated.

Electricity Services

According to Eimac (Pty) Ltd, the preliminary supply of electricity shall be at the existing Dalwiding S/S, which should be upgraded to make provision for this development. The existing 185mm^2 u/g cable which runs in a North-easterly direction past the proposed development and feeding existing development, can be used for the initial small phases of the development, but new bulk 185mm^2 u/g transmission cables feeding from Dalweiding S/S shall be required to service the rest of the development. Eimac (Pty) Ltd have confirmed that adequate capacity shall then be available at the main feeder Dalweiding S/S to service this development. Please refer to Annexure K for Eimac (Pty) Ltd's Electrical Services analysis.

Figure 15 is a visual representation of the final preferred layout (Layout 5), a culmination of the above described areas.

The layout evolution is further discussed in Section B-6 below.

Figure 14: Proposed Storm water Retention Ponds 1 (North-West) and 2 (South-West).

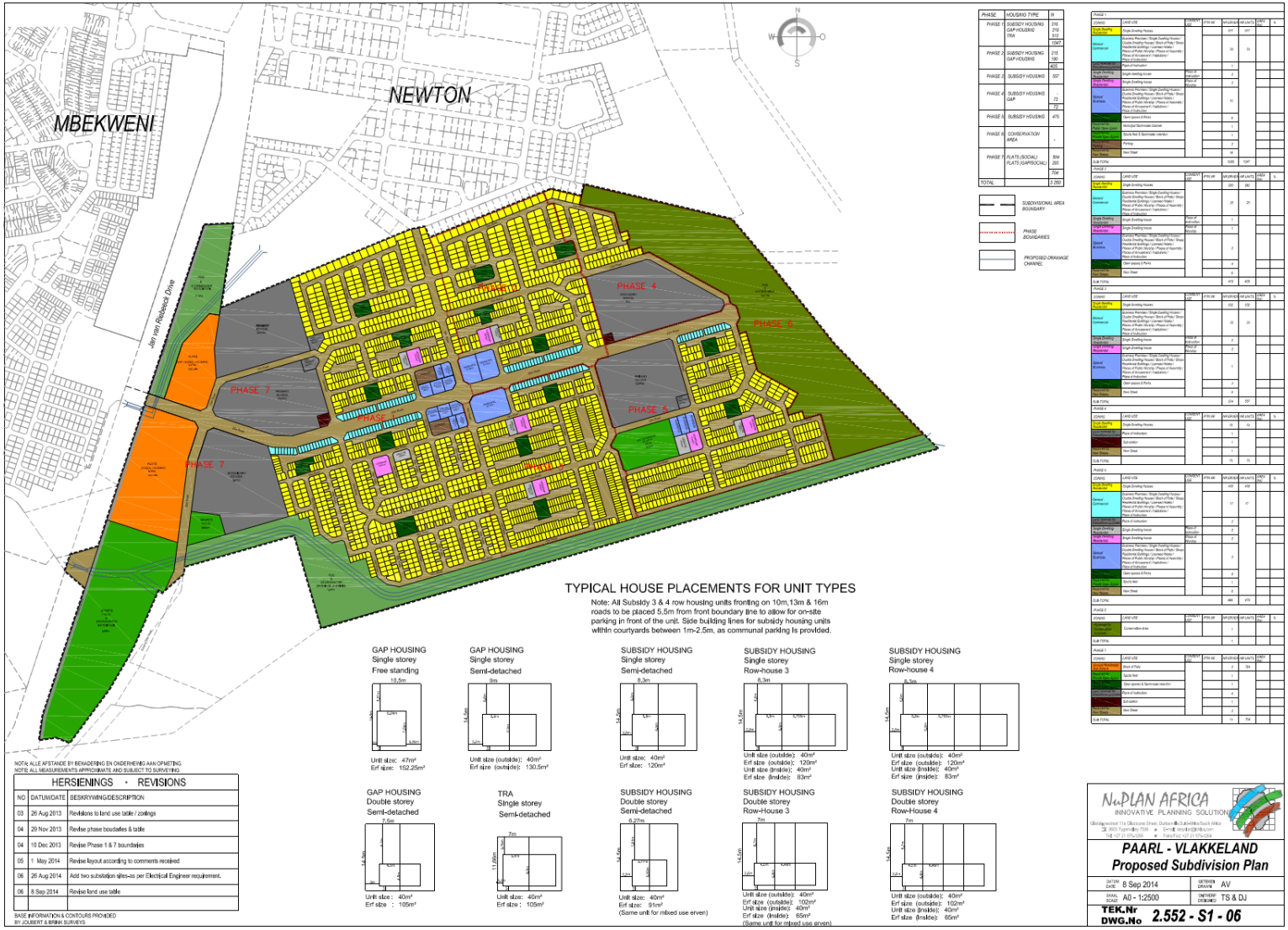

Figure 15: Proposed Development Layout

B-6 LAYOUT EVOLUTION

B-6.1 Development of Layout Alternatives

This section explains the evolution of the proposed Vlakkeland Housing Development. Several issues, concerns from I&AP's, technical detail and sensitive environments resulted in several layout changes. Several layouts were therefore drafted and each one was discussed and assessed with the relevant departments and specialist studies.

The following aspects played a role in informing the proposed layout alternatives:

- Access from Jan van Riebeeck Drive;
- The public interface onto Jan van Riebeeck Drive requires special attention as this route is identified as a Strategic Activity Spine in the Densification, Urbanization Strategy and Open Space Utilization Policy, 2007;
- The Drakenstein Spatial Development Framework earmarks the area next to Jan van Riebeeck Drive for mixed use development;
- Integration of Vlakkeland and the proposed Erf 557 development to the east of Jan van Riebeeck Drive;
- The channelization of the Mbekweni, Kleinbosch and Dal Rivers to the north-west and south of the site respectively (to the previous alignment);
- Botanical constraints to the east of the site;
- Visual constraints and required buffers to the east of the site;
- SAHRA Heritage site to the south of the proposed development;
- Several historical farms to the east of Bo Dal Road;
- The lower density residential area, Newton, to the north of the site;
- The need for a cemetery as part of the development. (This was decided against during the process as new regulations pertaining to the location of cemeteries were received which prohibits a cemetery within 500m of a residential area.)
- According to the Terms of Reference the development had to include the following residential mix:
    - 70% Subsidy housing
    - 15% GAP
    - 15% Social Housing (CRU's)
- A temporary relocation area (TRA) of 500 units should also be accommodated in the development.

The following general principles apply to the all the frameworks:

- A mix use development consisting of Subsidized, GAP and Social housing as well as the full spectrum of social facilities that is required.
- Main movement is in an east west direction and secondary movement in a north-south direction linking Newton with the proposed development.
- Higher density development as well as the higher order social facilities is proposed along these main movement routes.
- Lower density GAP housing is proposed to the north adjacent to Newton which is an existing lower density residential area. Higher density multi-storey rental units and sport fields are proposed next to Jan van Riebeeck in order to create a visually pleasing interface.

The difference between layouts 1, 2 and 3 is mainly the access from Jan van Riebeeck and the uses adjacent to Jan van Riebeeck.

B-6.1.1 Layout 1 (Alternative 4)

In Layout 1 (Figure 16:) the location of the access was determined by the proposed Erf 557 development to the east of Jan van Riebeeck Drive. The intension was to integrate Vlakkeland, Erf 557 and Mbekweni via a full intersection on Jan van Riebeeck Drive. This resulted in an intersection spacing of 650m from Wamkelekile Street. During discussions with the Provincial Department of Roads and Transport this proposal was not accepted as it is not in line with the intersection spacing standards of 800m as prescribed in the Road Access Guidelines (RAG).

B-6.1.2 Layout 2 (Alternative 5)

Layout 2 (Figure 117:) was thus drafted where the access on Jan van Riebeeck Drive was moved to the south in order to be in line with the 800m RAG standards. This could however not be achieved as there is an existing storm water channel at this position.

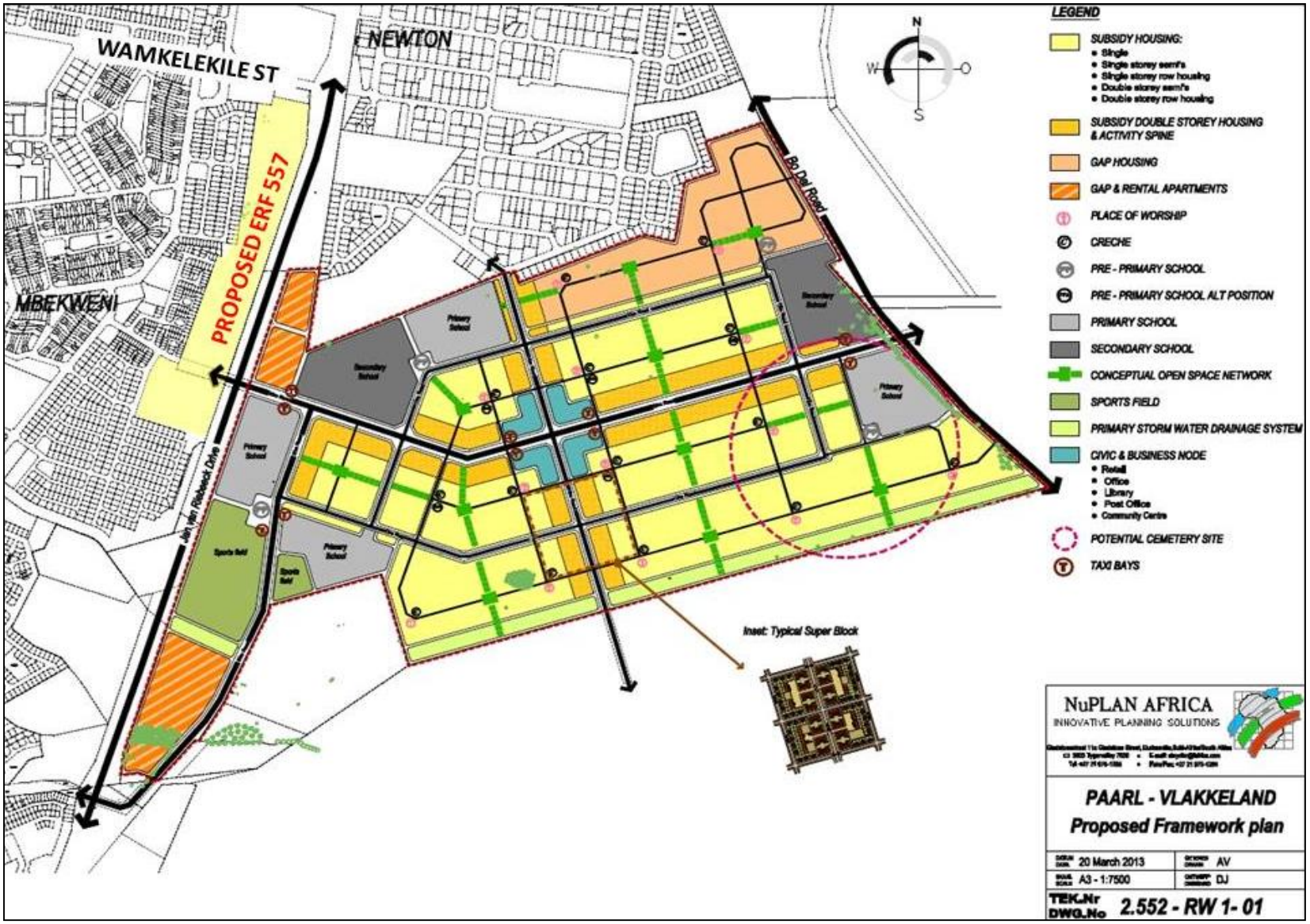

Figure 16:Development Layout 1 *(Alternative 4)

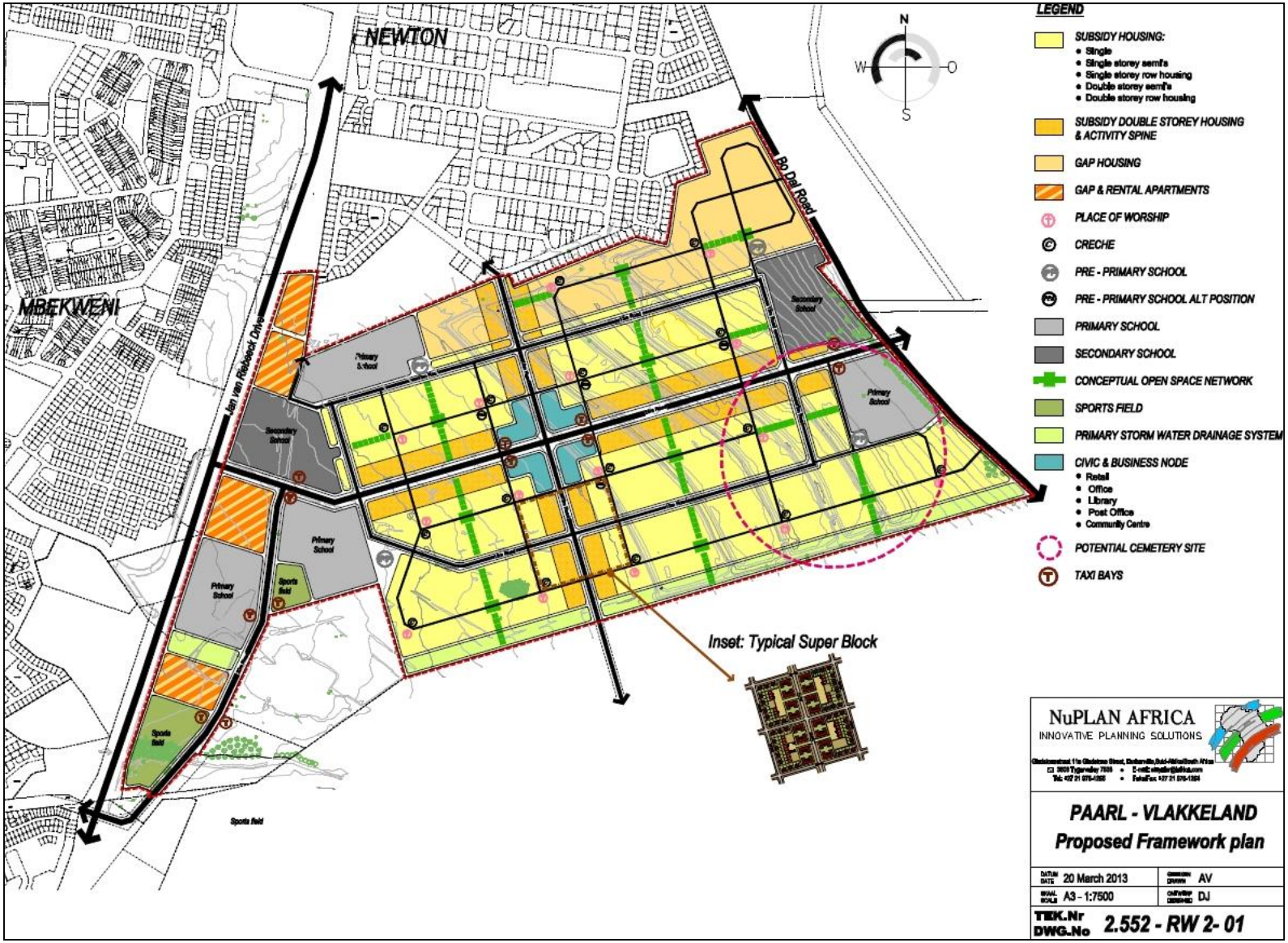

Figure 117:Development Layout 2 (Alternative 5)

B-6.1.3 Layout 3 (A&B) (Alternative 2&3)

The third Development Layout (**Figure 18:** and **Figure19:**) was subsequently drafted where the access point was moved slightly to the north of the storm water channel resulting in an intersection spacing of 770m from Wamkelekile Street. This intersection spacing was accepted by the Provincial Road Engineers.

Two Alternatives (3A and 3B) were drafted for Framework 3:
*The first layout alternative makes provision for two cemetery sites to the east of the development next to Bo Dal Road (**Figure 18:**); - This alternative is not deemed feasible due to the buffer of 500m that is required from a new cemetery to a residential development.*

*The second alternative not including the cemetery (**Figure19:**).*
These two layout alternatives were circulated to the Mayoral Committee where it was decided that a cemetery is not possible due to new regulations from the Department of Health and therefore Layout 3A (Alternative 2) was discarded.

Layout 3B (Alternative 3) (**Figure19:**) indicates two possible positions for the TRA, either to the east or to the west of the development.
The educational facilities located next to Jan van Riebeeck on Layout alternative 2 and 3 were replaced with a larger sport field, detention facility and walk-up units in Layout 3B.
During this part of the project concerns were raised that there should be a heritage buffer next to Bo Dal Road. A 40m buffer strip was thus added next to Bo Dal Road in Alternative 1, Layout 4.. Due to the botanical constraints in this area as well as the visual screen that had to be incorporated, this buffer was further extended to create a wide buffer. This buffer has to be protected and conserved and seen as a no-go area due to the sensitive nature of the plants on this site.

The Kleinbosch River storm water channel runs along the southern boundary of the site. This channel also serves as a 40m buffer strip between the SAHRA Heritage property to the south and the development.

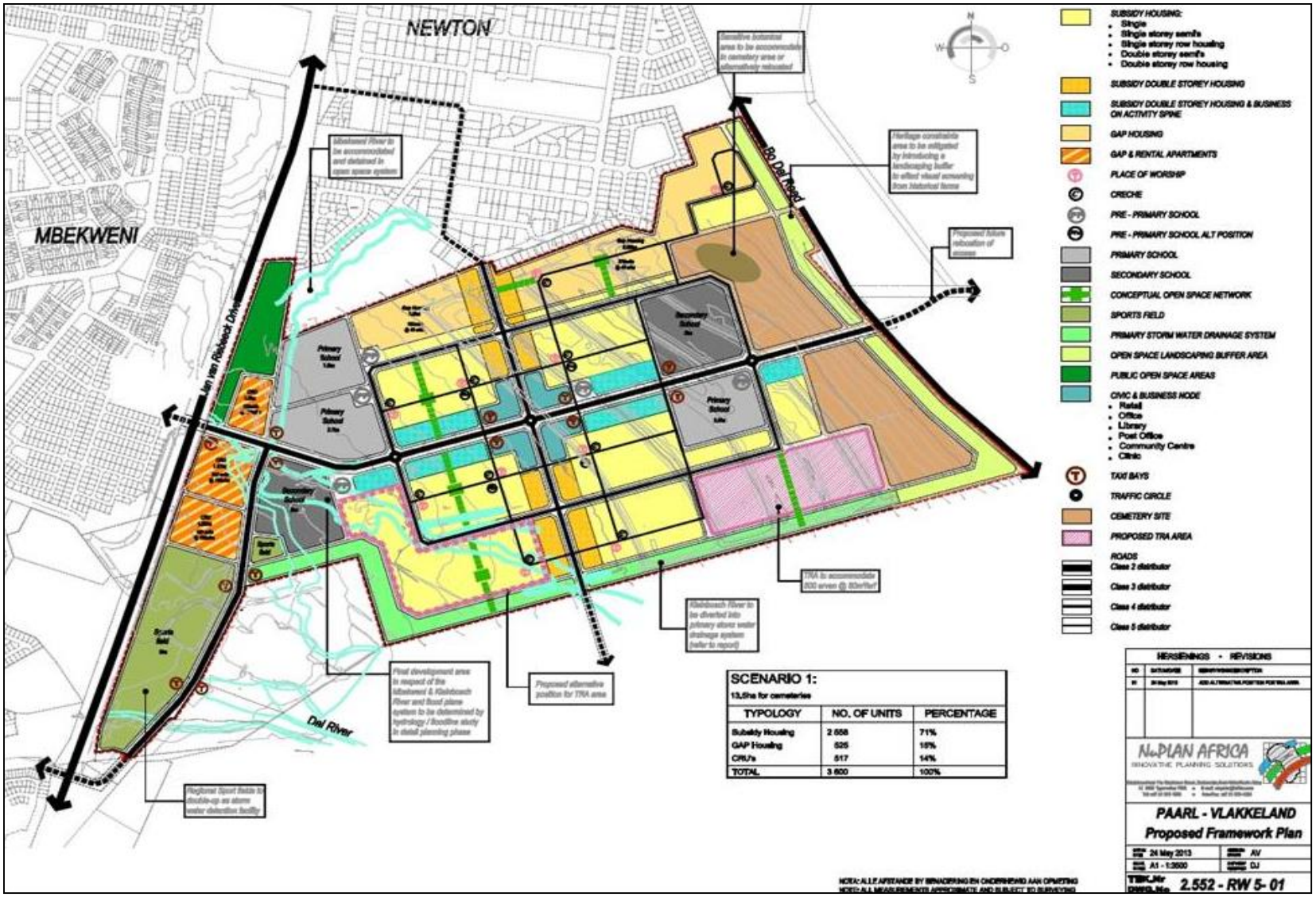

Figure 18:Development Layout 3A (Alternative 2)

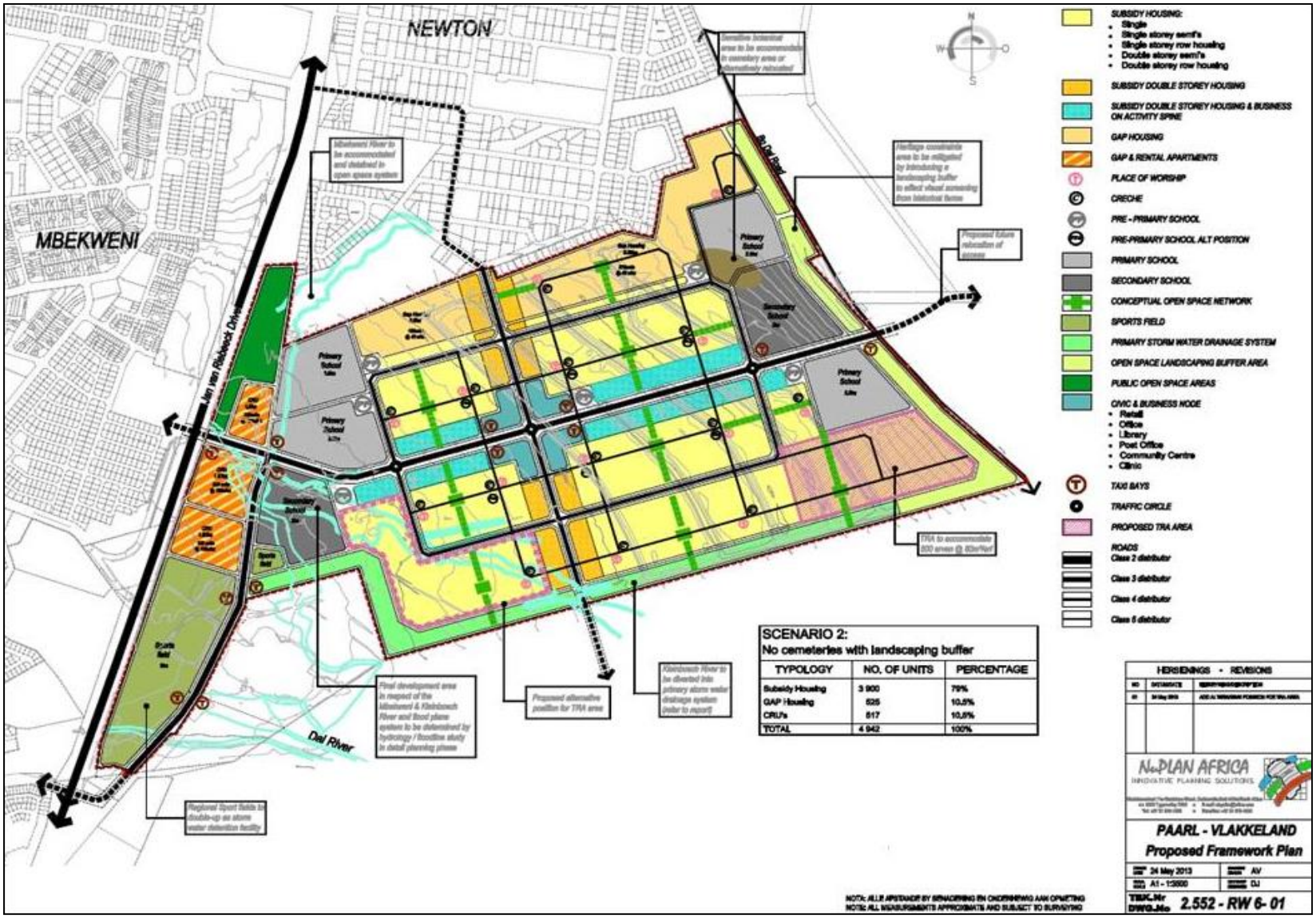

Figure19: Development Layout 3B (Alternative 3)

B-6.1.4 Layout 4 (Alternative 1)

The development is a mixed use development consisting of subsidized, GAP and Rental Units. There is an approximate of 3 191 units which gives a Gross density of 31.4du/ha and a Net density of 95du/ha.

The housing distribution is based on the principle of higher densities along the main movement and Public Transport routes and lower densities adjacent to existing residential areas. The layout design promotes walkable communities with all residential precincts within walking distance of community facilities and public transport routes. The residential distribution is thus as follows and illustrated in **Figure 20:**:

- The Transit Relocation Area is proposed to the south-west, in Phase 1 of the development.
- Higher density subsidised units (semi-detached double storey) along the main activity street (the 25m east-west route) as well as the north-south link to Newton.
- The zoning for subsidised units along the 25m activity street will include consent use for Businesses in order to encourage retail activity along this street.
- The subsidised units are located in the central and south-eastern parts of the development.
- Lower density GAP housing to the north of the site adjacent to the existing residential area of Newton. These are proposed to be single storey freestanding and semi-detached units.
- The density increases further from Newton with higher density GAP housing units (semi-detached double storey) proposed along one of the 13m main internal movement routes. This ensures a gradual transition between the GAP and subsidised units.
- Subsidy and GAP flats are proposed adjacent to Jan van Riebeeck Drive. Due to the importance of Jan van Riebeeck Drive as well as the principles for development along this road set out in the SDF, a decision was taken that single residential units will not be suitable but rather higher density flats that can be maintained by an authority. This will thus ensure a visually pleasing interface onto Jan van Riebeeck Drive.

B-6.1.5 Preferred Alternative (Layout 5)

Due to the increase in the buffered areas and public open space, the development layout was altered to increase the amount of housing units this development can accommodate and therefore increase the feasibility of the project. The result was an increase of 69 housing units to a total of 3 260 after the completion of all seven phases and based on the same principles as set out in Alternative 1. Please refer to Figures 11-14 for the preferred development layout design for the proposed Vlakkeland Housing development.

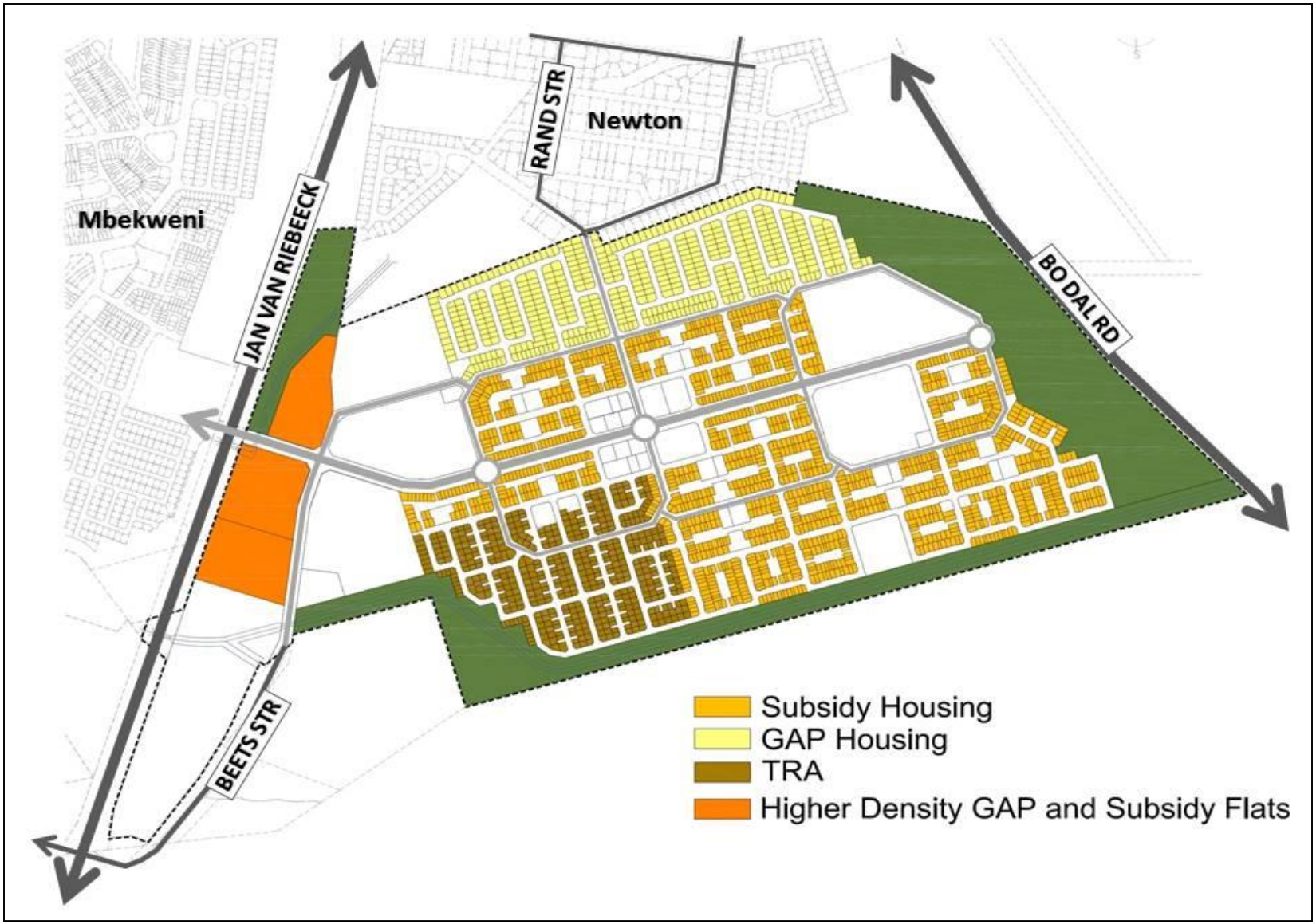

Figure 20:Residential Distribution

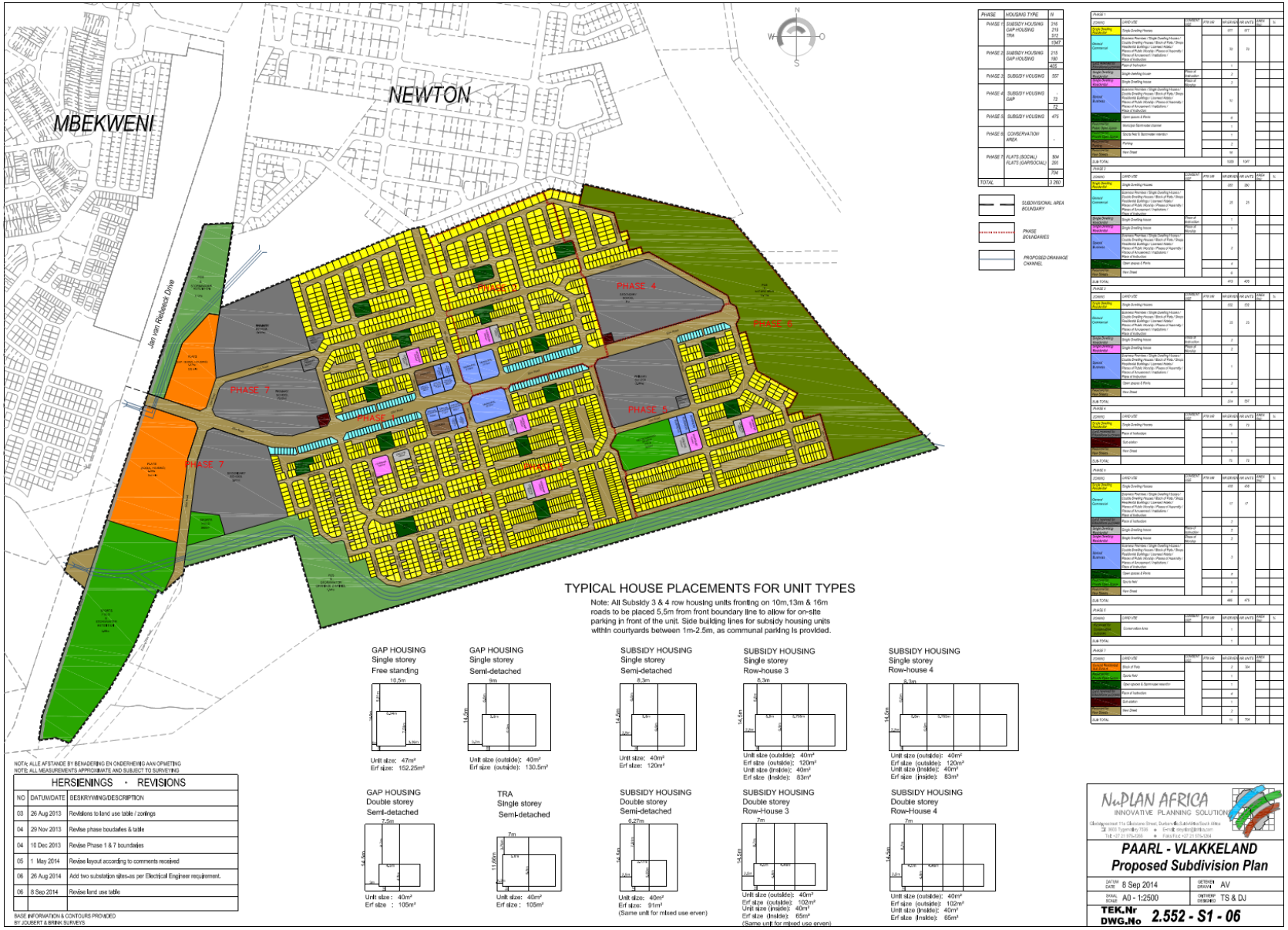

Figure 21: Preferred Layout Design for the proposed Vlakkeland Development (Layout 5).

B-6 ENGINEERING SERVICES

B-6.1 Water Supply

B-6.1.1 Existing Water Supply

Currently there is an existing 375mm diameter water line running adjacent to Jan van Riebeeck Drive to the west of the proposed development of Vlakkeland.

B-6.1.2 Water Demand

The water demand for the development was based on the following:

Table 7: Water Demand of the Vlakkeland Development

Description	No or m²	Demand ℓ/day/unit or ℓ/day/m²	Total demand (kℓ/day)
High density residential unit	3191	600	1915
Educational	138300	2.5	345
Business and commercial	13800	2.5	35
Churches	13	2000	26
Parks and Public open spaces	16	12000	192
TOTAL			**2513**

B-6.1.3 Bulk Services

In accordance to the Municipal Water Master Plan (WMP) 2012 the capacity of the current 375mm diameter bulk water line will have sufficient capacity to supply water for a portion of the proposed site. However the spare capacity on the existing water line is limited and will not be sufficient to supply the entire development. Therefore a few upgrades will be required as the development progresses.

B-6.1.4 Link Services

During the construction of the proposed Vlakkeland development, link services will also be installed. The link water services will consist of HDPE PE 100 PN12.5 pipes ranging from 200mm diameter to 315mm diameter.

B-6.1.5 Internal Services

The internal reticulation system will comply with the requirements of Drakenstein Municipality.

The internal distribution network will consist primarily of HDPE PE100 PN12.5 (110mm diameter to 200mm diameter) pipes with individual erf connections branching off. It is the intention to provide

a basic network of larger diameter pipes to fulfil the fire requirements with smaller diameter pipes to supply the normal domestic demand.

Pipes will be installed according to SANS 1200 with a minimum cover of 800mm above pipes not constructed in roadways and 1000mm for pipes constructed in roadways.

The preliminary water reticulation layout was determined and is attached in Annexure F.

The total costs for the proposed water infrastructure is R 32 550 116.

B-6.2 Sewage

B-6.2.1 Existing Services

There are currently no other bulk sewerage services available in the immediate vicinity of the proposed development.

The existing Paarl Waste Water Treatment Works (WWTW) should have sufficient capacity to accommodate the sewage of the newly proposed development after the recent upgrades.

The existing Mbekweni Pumping Station located to the west of Mbekweni, next to the railway currently has sufficient capacity but should be upgraded as the demand increase.

B-6.2.2 Expected Sewage Flow

The expected sewage flow calculations were based on the following and are as follows:

- Discharge for development : 2261kℓ/day (Assumed to be 90% of water demand)
- Peak factor (“Redbook”) : 2,63
- Infiltration factor : 50%
- Average daily wet weather flow : 69ℓ/s
- Peak flow rate : 103ℓ/s

B-6.2.3 Future Pumping Station and Bulk Services

Due to the location of the development all sewage will flow towards the existing Mbekweni pumping station.

In accordance with the Municipal Sewer Masterplan 2012, the following items were identified. These items should be evaluated and confirmed at the detailed design stage.

Item	Description
DPS 1.4	Upgrade exiting pumping station
DPS 1.5	1419m x 500mm diameter upgrade existing rising main
DPS 1.6	110m x 450mm diameter new gravity pipe
DPS 1.7	412m x 400mm diameter new gravity pipe
DPS 1.8	327m x 200mm diameter new gravity pipe

B-6.2.4 Internal Reticulation

The internal reticulation system will comply with the requirements of Drakenstein Municipality.

A new sewage reticulation system consisting of a minimum diameter of 160mm PVC-U class 34 sewer pipelines will be constructed to service all the units. Individual erf connections will also be provided. The reticulation system will drain towards the main connection point where after it will drain towards the Mbekweni pumping station.

The total costs for the proposed water infrastructure is R 34 741 085.

B-6.3 Stormwater

A Stormwater Management Plan was completed (October 2013) and is attached in Addendum F-9.

Included in Addendum F-9 (SWMP) is the proposed stormwater network layout.

B-6.3.1 Stormwater Design Principles

The internal stormwater network for the proposed development will be accommodated in a major and minor system.

The minor system is for the convenience of the public and requires that the run-off be removed rapidly from the areas by means of a system of catch pits and manholes with spacing not more than 80 meters between structures, and a network of underground pipes or culverts. This system is usually designed for a design storm occurrence of 2 years for residential land uses, and 5 years for high value general commercial and industrial areas.

The major system will accommodate storms of higher occurrence intervals and consists of natural watercourses, large conduits, roads, stormwater storage facilities and floodplains. These systems are usually “open” or above ground systems, and usually accept stormwater from the minor system.

B-6.3.2 Minor System

The internal underground pipe network per sub-catchment will drain towards detention facilities located to the west of Beets Street. This underground pipe network will have a minimum diameter of 375mm and a maximum diameter of 1200mm diameter with minimum velocities of 0,7m/s to ensure the clean flow of the system and a maximum velocity of 2.5m/s to ensure the efficiency of network. It will be able to accommodate the smaller floods.

Detention ponds will collect stormwater and slowly release it at a controlled rate so that downstream areas are not flooded or eroded. The ponds will be dry structures that can serve as open areas or parks during dry seasons and detention facilities during wet periods.

B-6.3.3 Major System

The major system will be able to accommodate larger floods by means of the proposed street network as well as shaped areas to convey stormwater safely away from people and properties. Part of the major storm event will be accommodated in the underground pipe network. This pipe network must also accommodate the overflows of the detention facilities during major storms or longer wet periods.

In conjunction with the report FLOOD STUDY,ERF 8378 (VLAKKELAND), PAARL, MBEKWENI, KLEINBOSCH and DAL RIVERS conducted by SINSKE CONSULT dated June 2013 and a report Drommedaris Emergency Housing Project Report on Bulk Stormwater Management conducted by Ninham Shand dated November 2005 a summary of the stormwater plan based on current information available is as follow.

B-6.3.3.1 Seven Springs

The flow of the Seven Springs catchment area crosses Dal Loop Road and enters the proposed development from the eastern boundary. The proposed runoff of the proposed development will be collected in a channel and will run along the southern boundary of the proposed development in a westerly direction and will then change direction towards a new culvert under Beets Street. From the new culvert it will flow into a proposed detention area with a low flow channel towards the existing culvert under Jan van Riebeeck Drive.

B-6.3.3.2 Mbekweni River

The Mbekweni River enters the proposed development in the North-West. The flow is current in an open channel with insufficient capacity. It is proposed that the channel is reinstated to ensure flow towards Jan van Riebeeck Drive into the detention facility enclosed by Jan Van Riebeeck Drive and Beets Street. From the detention facility the flow will be south towards a new culvert under the proposed access road and the existing culvert under Jan van Riebeeck.

B-6.3.3.3 Kleinbosch River

The Kleinbosch River crosses Dal Loop Road through a culvert. The river flows together with tributary flow, in a westerly direction towards a network of channels (vlei). Through the vlei the total flow of the Kleinbosch River finally is directed towards a new culvert under Beets Street.

From the new culvert it will flow into a proposed detention area with a low flow channel towards the existing culvert under Jan van Riebeeck Drive.

An alternative flow for the Kleinbosch River was investigated. It was proposed that the Kleinbosch River be realigned to its original position south of the Vlakkeland development area, on the SAHRA property. The river was to feed into the currently deteriorated wetland south of the Vlakkeland site and thereby not only creating a pleasant natural resource, but also diverting the water away from the proposed development.

Graeme McGill Consulting Hydrologist was appointed to investigate the feasibility of this option in relation to the initial proposed realignment of the river into the storm water system south of the Vlakkeland site. The assessment resolved the suspicion that the current flow of the Kleinbosch river was due to agricultural works which previously directed the flow of the runoff but which have now fallen into disrepair resulting in the river entering the aquifer area on the Vlakkeland property. The resulting recommendations were to (i) collect the runoff in the planned Stormwater Channel 1 which collects the runoff from the Seven Springs catchment and therefore diverting in along the southern boundary into the planned detention pond 2 or (ii) construct a wetland on the SAHRA property which will receive the Kleinbosch river runoff and attenuate the peak flow and then divert it to the Dal River. Please refer to Figure 14 which indicates the location of the proposed detention ponds.

Due to the elevation differences between the Vlakkeland and SAHRA properties, the construction of the wetland was deemed not feasible, but will remain an alternative for this assessment. Provision has been made for attenuation in detention pond 2 and therefore alternative 1 has been decided upon as per recommendation form Graeme McGill Consulting.

B-6.3.3.4 Dal River

The Dal River only affects the proposed development situated between Beets Street and Jan van Riebeeck Drive. The Dal River crosses Dal Loop Road through a culvert, with tributary flow through culverts. The river flows in westerly direction towards Beets Street. The river will cross Beets Street through a new culvert and will then flow in an outfall channel to the existing culvert under Jan van Riebeeck Drive.

B-6.3.3.5 Detention

The location of the detention facilities will be on the western side of the proposed development in the area enclosed by Jan van Riebeeck Drive and Beets Street. From the proposed detention facilities flow will be in a westerly direction to the existing culverts under Jan van Riebeeck Drive. Please refer to Figure 14 for the visual representation of the location of the proposed stormwater retention areas. All storm water infrastructure have been designed to accommodate the 1:100 year flood period as well as an additional 14% predicted increase in run-off due to Climate Change. However, due to the nature of the Dal River into which the run-off will flow, the culvert was designed to the standards of a 1:20 year flood throughput at any given time, which is the total capacity the Dal River can accommodate. Due to this, pre- and post-development runoff will be exactly the same.

Please note that the detention facilities will also allow for the attenuation of the approved Topprime development to the South West of the Vlakkeland development site.

The total estimated costs for the proposed water infrastructure is R 46 229 809.

B-6.4 Electricity Services

B-6.4.1 External Electrical Services

B-6.4.1.1 Supply area

The specific area to be developed falls into the electricity supply area of Drakenstein Municipality, and bulk services will therefore be provided from the nearest Municipal network with adequate capacity.

All designs, material and equipment to be used as well as installation practices will therefore be based on the Drakenstein Municipal guidelines for new electricity networks.

All completed networks will be handed over to Drakenstein Municipality once completed, who will then be responsible for the operation and maintenance thereof.

B-6.4.1.2 Maximum demand

By using an ADMD of 2kVA per residential unit, and an average demand of 80VA/m^2 for the non-residential area, the maximum demand for the total development is estimated at 8MVA.

B-6.4.1.3 Supply point

An existing 11kV switching station, fed from the Municipal 66/11kV Dalweiding substation with 2 x 185mm^2 11kV cables, is situated close to the Vlakkeland development. However, by taking into account existing load in the area, as well as the required load for Vlakkeland and other private developments in the area, adequate capacity for the 8MVA will not be available on the existing 11kV infrastructure.

The next logical supply point is therefore the mentioned Dalweiding 66/11kV substation, approximately 2.5km form the Vlakkeland site.

At the Dalweiding 66/11kV substation, a new 20MVA 66/11kV bay will have to be installed to cater for the new 11kV supply to Vlakkeland. Primary 11kV cables will therefore be installed from the new 66/11kV bay to a new switching station inside the development, from where secondary cables will be installed in ring formations.

B-6.4.1.4 Scope of work

In order to supply the Vlakkeland development with adequate and reliable bulk electricity supply, the following scope of work is proposed - (Refer to drawing 0894/E/001 for layout of proposed services):

- Complete 20MVA 66/11kV bay at Dalweiding substation.

- New 11kV circuit breakers at Dalweiding Substation.
- Primary 185mm^2 11kV cables between Dalweiding 66/11kV substation and the development.
- New 11kV brick-built switching station inside the development, complete with 11kV circuit breakers for the primary and secondary 11kV cables.

B-6.4.2 Internal Services

B-6.4.2.1 11kV Networks

The 11kV network will consists of secondary 95mm^2 11kV cables feeding from the mentioned new 11kV switching station, as well as miniature substations placed as per specific load areas. All new 11kV cables will be installed in ring formations, thereby minimizing the risk for interrupted supply to areas due to cable failures. (See attached drawing 0894/E/001 for proposed layout of these services)

B-6.4.2.2 Low voltage networks

All low voltage networks, including house and commercial/business/institutional connections will be underground and will consist of copper cables and ground- standing distribution kiosks.

Connections to specific commercial/business/institutional erven will be based on the zoning of such erven, as well as the anticipated demand for it.

Metering shall be as per the newest Municipal guidelines for electricity services, and shall mainly be based on a split- prepayment type metering system.

B-6.4.2.3 Streetlighting

Conventional streetfront streetlighting as per the newest Municipal guidelines for electricity services shall be installed for the total development, and will mainly consist of concrete poles with bottom entry luminaires.

B-6.4.2.4 Bulk electricity infrastructure contribution

Although bulk infrastructure contributions (BICL's) for the electricity supply might be payable, the amount thereof will be significantly less than the cost of the bulk networks, and as such the payment of these contributions is recommended to be waived in totality.

B-6.5 Solid Waste Management

The Refuse Collection Service will be provided by the Drakenstein Municipality – Solid Waste Department.
The vehicle access and waste collection requirements for the provision of solid waste services will be based on the accepted standards as defined by Drakenstein. These requirements will be implemented as part of the detail design and incorporate details provided by Drakenstein Municipality – Solid Waste Department

B-6.6 Access road

There is one existing access to the proposed development from the Jan van Riebeeck Drive / Roggeland Road intersection.

The main access to the Vlakkeland site will be from Jan van Riebeeck Drive (MR201) at a new intersection, located 770m south of Buitekant Street and 800m north of Roggeland Road. However, other accesses to Jan van Riebeeck Road in the south of the site are proposed.

Three accesses are proposed from Jan van Riebeeck Drive as follows:

- From the existing Jan van Riebeeck Drive / Buitekant Street intersection, through the north of the site via Rand Street.
- A new traffic signal controlled intersection (Main Development Access) located 770 metres south of Buitekant Street and 800 metres north of Roggeland Road.
- From the existing Jan van Riebeeck Drive / Roggeland Road intersection, to the south of the site via Beets Street.

Jan van Riebeeck is a class 2 road within a “Sub-Urban” Road Side Environment (RSE). The recommended intersection spacing in the Road Assess Guidelines (RAG) is 800 metres for traffic signal controlled intersections, with the above criteria. The distance between the existing Buitekant Street and Roggeland Road intersection is 1570 metres and there is also an open stormwater channel at the midpoint between these two intersections. Hence, the proposed new Vlakkeland Main Access have to be provided slightly north of the midpoint, at 770 metres south of the Buitekant Street intersection and 800 Metres north of the Roggeland Road intersection. This intersection position was discussed and approved in principle with officials at the provincial government.

B-6.7 Traffic

All study intersections are currently operating at acceptable Levels-Of-Service (LOS). Hence, no road upgrades are proposed from an intersection capacity point of view.

The study intersections will operate at unacceptable Levels-Of-Service (LOS) except the Buitekant Street / Van Riebeeck Drive intersection. Thus it is proposed that the Roggeland Street / Van Riebeeck Drive and the Springbok Street / Jan van Riebeeck Drive intersection be upgraded to signalised intersections. A dedicated right and left turn lanes are also proposed on the north and southbound approaches to the Jan van Riebeeck / Vlakkeland Development access. These turning lanes are warranted as requested in the Road Access Guidelines.

The development is expected to generate 2013 weekday a.m. peak hour trips (992/1021, in-/outbound) and 1356 p.m. peak hour trips (792/564, in-/outbound).

Most study intersections will continue to operate at acceptable LOS during all peak periods with all the proposed upgrades in place.

It is proposed that dedicated right and left turn lanes be provided on the south and northbound approaches to the Jan van Riebeeck Drive / Vlakkeland Access intersection.

The Jan van Riebeeck Drive / Roggeland Rads intersection should be upgraded to a signalised intersection with additional dedicated right-turn lanes on both the east – and westbound approaches to the intersection.

Jan van Riebeeck Drive should be upgraded to a signalised intersection.

It was furthermore proposed by ITS Engineers (Pty) Ltd. that two additional road upgrades be constructed to account for the cumulative effect of the other developments in close proximity to the Vlakkeland development on the overall pressure on traffic in this area. The proposed developments in the area include:

- Erf 553 Development (on the Western border of the Jan van Riebeeck Drive), 469 weekday AM peak hour trips (211/258 in/outbound) and 745 weekday PM peak hour trips (266/ 213 in/outbound trips;
- Fynbos Development (North of the Vlakkeland development and East of Newton), 52 weekday AM peak hour trips (18/34, in/outbound) and 52 PM peak hour trips (25/27, in/outbound);
- Farm 1254 Development (North of the Fynbos development and East of Newton), 10 AM peak hour trips (5/5, in/outbound) and 10 PM peak hour trips (5/5, in/outbound);
- Erf 8398 Development (Nestled between the Vlakkeland Development to the North and

the SHARA property to the South), 99 AM peak hour trips (24/75 in/outbound) and 90 PM peak hour trips (69/30, in/outbound);

- Dal Josafat Erf 16161 Development (South of the SAHRA site and to the East of the Jan van Riebeeck Drive), 2040 AM peak hour traffic (797/1243, in/outbound) and 2149 PM peak hour trips (1202/947 in/outbound).

These upgrades include:

1. Intersection 1: the construction of a westbound left-turn lande at the Jan van Riebeeck Drive / Ring Road / Roggeland Road intersection; and
2. Intersection 2: the construction of a wastebound righ-turn lande at the Jan van Riebeeck Drive / Wamkelekile Road/ Buitekant Street intersection.

(Please refer to Addendum F6.2 for Addendum A of the Transport Impact Study).

There will be three accesses to the proposed development of which only one access currently exists. This access is from Jan van Riebeeck Drive / Roggeland Road intersection. The existing accesses will remain the accesses for the future additional development.
It was observed that there is a need for public transport facilities on site. Taxis stop in the yellow shoulder and pick / drop people. Thus it is proposed that taxi embayments be provided next to the Jan van Riebeeck Drive / Vlakkeland development access intersection.

It is recommended that pedestrian sidewalks of at least 1.5 metres wide must be provided at all intersections, to ensure a safe walking environment at the intersections. Sufficient fencing should be provided to keep pedestrians from crossing the road wherever necessary.

SECTION C: DESCRIPTION OF THE ENVIRONMENT

C-1 BIOPHYSICAL ENVIRONMENT

C-1.1 Geology, Land Types and Soils

The geology can be described as quaternary alluvium derived from a mix of Table Mountain sandstones and Cape Granite on the slopes. There is a considerable depth of alluvia material that is sand and organic, overlying a basement of eroded river cobbles and stones. The soil profile can be estimated to lie between 0.8 m and 2 m deep with very few rocks and stones in the upper half. Soil forming is dominated by the accumulation of the organic material as a result of the flooding events over the winter periods and vegetation erosion.

Geo-technical information pertaining to the site was obtained from RA Bradshaw and Associates CC who conducted a Geotechnical Investigation of the Vlakkeland site in 2008. The report stated that residential development can occur on the entire site except in the south western corner below the 1:50 year floodline as illustrated in the figure below.

According to the findings the developable area is divided into three categories, namely an area that is suitable for normal strip footings for the houses, an area where 60% of the strip footings have to be slightly reinforced and an area where all the strip footings should slightly be reinforced. Please refer to Figure 32: below.

C-1.2 Topography

The subject properties were surveyed by Joubert Brink Surveys and 1m contours was generated as illustrated on the Figure below. The site slopes mildly to the south-west. The site was found to be extensively transformed from its natural state, specifically due to impacts from past agricultural activities and a number of old sewerage ponds that have been created on the site. The western section of the site is traversed by three rivers, consisting of the Mbekweni River from the north, the Bo Dal River from the south east and the Kleinbosch River form the east. Please refer to Figure .

Figure 22: Topography and Drainage of the site

C-1.3 Wetlands and Hydrology

The greater portion of the site is taken up by a series of wastewater effluent retention ponds utilised by the Paarl Municipality for several decades until circa 1997 (Mr Cedric Morkel, pers. Comm – Bill Harding.). Effluent was pumped to the ponds and chlorinated. Overflow from the ponds was conveyed via a pipeline from the south-western corner of the ponds to the Berg River. When use of the ponds was terminated, the pond walls were breached and the site vacated. A small, degraded streamline enters the site from the south via an indistinct drainage line that has been variously manipulated to direct flows along the property boundary towards the west. The bulk of the flow conveyed by this streamline appears to discharge over a broad area on the adjoining property.

An examination of aerial photography for the years 1938 and 1966 (Figure 24), prior to the construction of the retention pond system, reveals farmlands and the small stream with the stream being very indistinct and becoming more apparent with development of the upstream catchment.

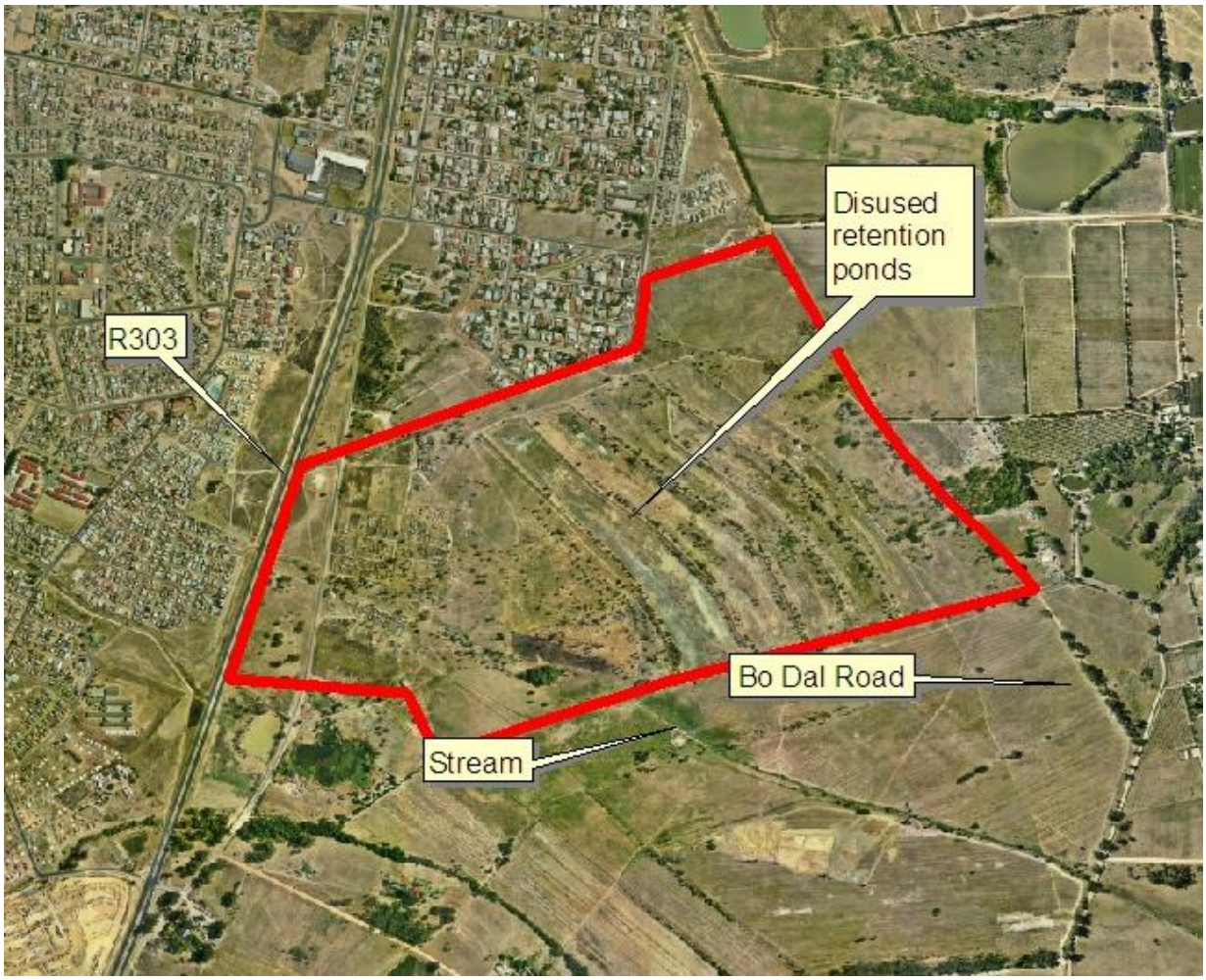

Figure 23: The Vlakkeland site (2009 image) (Source: Drakenstein Municipality).

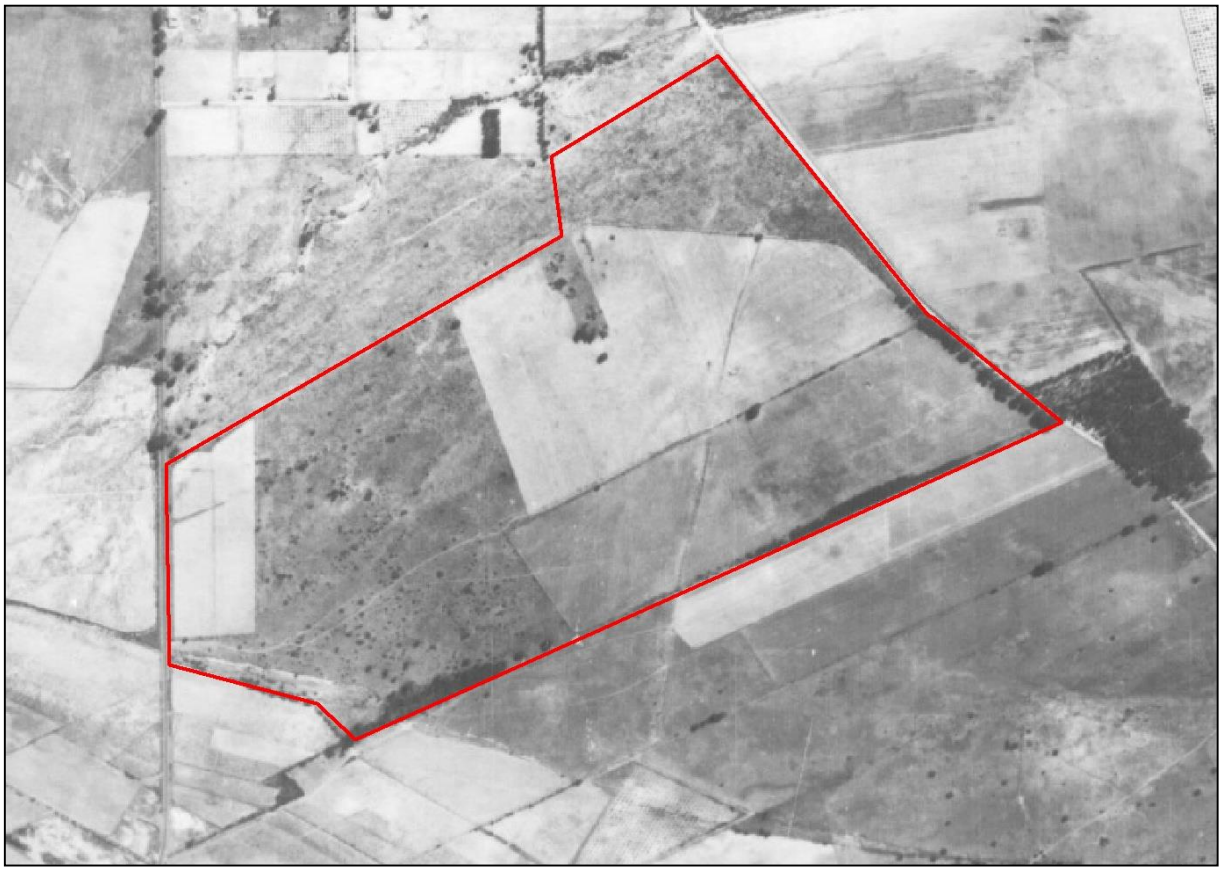

Figure 24: The Vlakkeland site as in 1938.

The streamline, entering the site towards the south-western corner, appears as little more than a field (tile) drain. Please note that the Kleinbosch river is located along the border of the site and does not transverse the site at all.

C-1.3.1 Stream

The Kleinbosch Stream that passes through the site rises in the foothill slopes to the southwest and by the time it reaches the Bo Dal Road it is already severely degraded and lacking in any formal management (Please refer to Appendix B, Figure 3 in the Freshwater Assessment attached, Addendum F-1). The stream was not flowing at the time of this site visit. The stream becomes a severely-degraded urban drainage line when it passes through the informal settlement alongside the R303 and thence to the Berg River. The informal settlement contains a number of pens and shelters for pigs and other farm animals, these roaming freely in the local area. These conditions have worsened considerably since 2010 when DHEC assessed the adjoining Klein Vlakkeland site.

At the point of intersection with the southern boundary of the property, as well as up- and downstream thereof, the streamline is notional at best and occurs as little more than a boggy,

man-modified ditch. There is no residual stream integrity and the ecological importance of the drainage line is considered to be extremely low[3].

The Bo Dal Road, along the eastern boundary of the site, has been recently embanked and surfaced. This upgrade has included a number of culverts beneath the road that currently discharging in an uncontrolled fashion on the site, principally into the bed of the easternmost pond.

C-1.3.2 Wetlands

There is a tiny area of highly-disturbed wetland in the extreme south-western corner of the property, this being part of a series of excavated dams and ponds, i.e. man-made, on the adjoining Klein Vlakkeland property. This area has degraded almost beyond recognition since it was previously assessed by DHEC (see Appendix C of Addendum F-1 of this report).

A follow up Freshwater study was conducted in 2014 by DHEC's Dr Harding (Please refer to Addendum F1.1). This study indicated that the Kleinbosch River, which feeds the wetland to the South-western corner, in fact terminates on the SHARA property south of the Vlakkeland Development and was flowing south of the shallow berm between the SAHRA and Vlakkeland properties towards the TopPrime residential development site. Please refer to Figure 25 below for an indication of the Top Prime development location. It is assumed that the berms were built for the management of field drains, but have since been damaged and lead to blocking and overflowing in an broad, spread-out fashion. This was confirmed during a hydrological assessment conducted by Graeme McGill. The assessment of the Geotechnical report (Please refer to Addendum F10) together with consultation with Professor Cornie van Huyssteen of Free State University, revealed that alluvial substrates were present west and south west of the evaporation ponds, located to the east of the Vlakkeland property. The resulting conclusion was drawn that the aforementioned area was found to be a shallow perched aquifer of approximately 0.4m in depth and to wet and fluidised to support vegetation except for stunted wetland-associated plants. The presence of invasive *Pennisetum macrourum* in the shallow depressions towards the south west corner led to the presumption of the existence of a wetland on this site and is similar to the soil characteristics on the neighbouring site which is currently being developed for housing.

It should be noted that this entire area will be filled with approximately 1m soil layer prior to construction in order to ensure an even surface and to ensure that the storm water is properly managed in this development. This aquifer will therefore not be impacted upon and will not have an impact on the proposed development.

[3] *Dr. Bill Harding, DHEC, 2013*

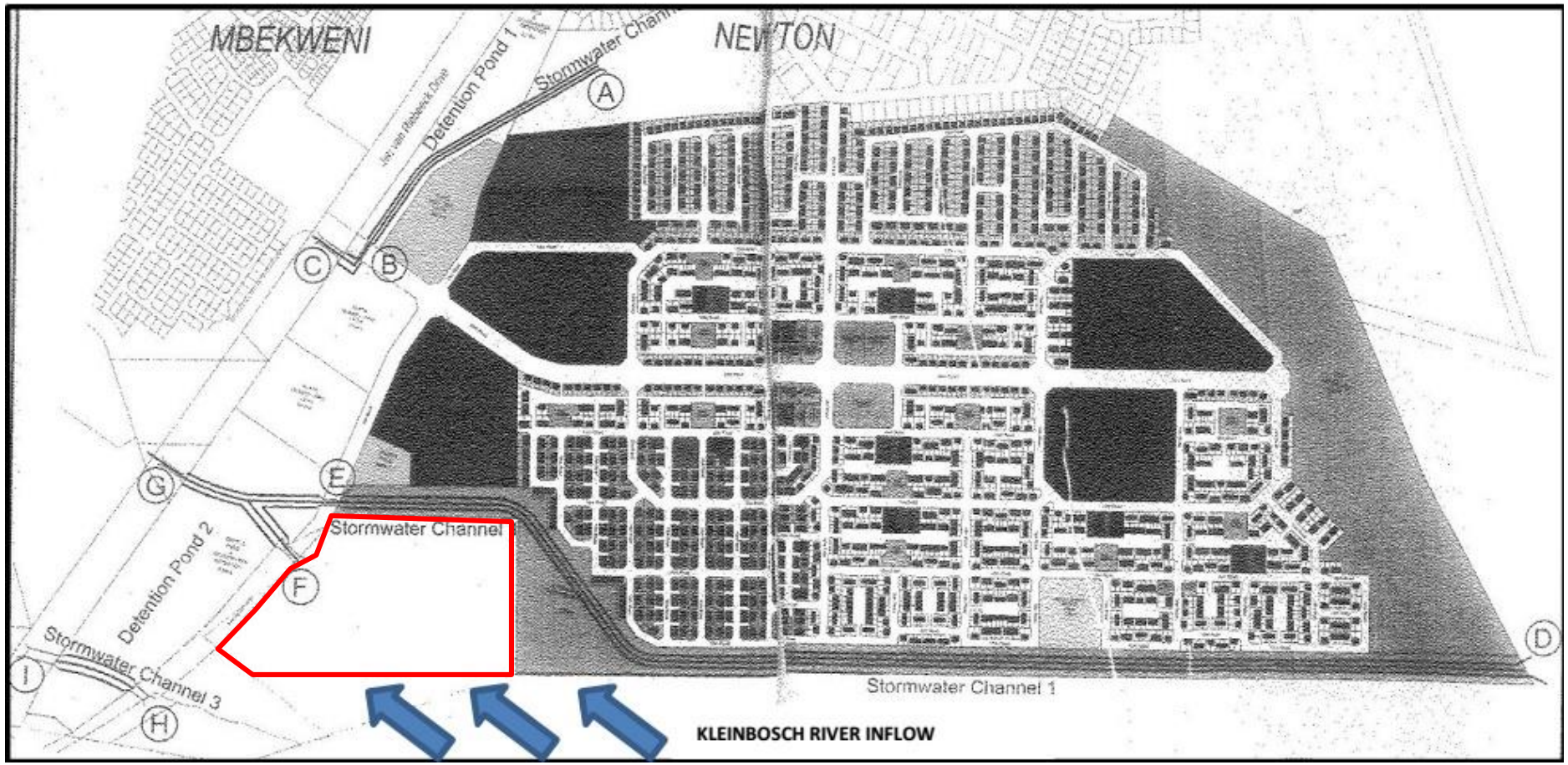

Figure 25: Proposed Storm water infrastructure for the Vlakkeland Development (Location of the TopPrime Development indicated in Red)

C-1.3.3 Other features

The site contains a large area of five longitudinal retention ponds (aligned north-south) on the middle to eastern portion of the property. These ponds are no longer in use and have been breached to preclude them from retaining rainwater. Some boggy areas supporting wetland vegetation have developed in the easternmost and adjacent pan, these having possibly given rise to the previous noting of possible wetland presence. These areas have arisen as a consequence of the construction of the pans and their retention of shallow water levels, either directly rain fed or from the culverts installed under the upgraded Bo Dal Road.

Accordingly, and as is confirmed from the historical record (Figure 24), there are no natural wetlands on the site. In this regard, the following definition of 'wetlands' is subscribed to by DHEC when evaluating such areas:

"Wetland" *means an area that is inundated or saturated by surface water and/or groundwater at a frequency and duration sufficient to support, and that under normal circumstances does support, a prevalence of vegetation typically-adapted (obligate) for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas. Wetlands do* ***not*** *include those artificial wetlands intentionally-created from non-wetland sites, including but not limited to, irrigation and drainage ditches, grass-lined swales, canals, detention facilities, wastewater treatment facilities, farm dams or ponds, and landscape amenities, or those wetlands that were unintentionally created as a result of the construction of a road, street, or highway. Wetlands may, however, include those artificial wetlands intentionally-created from non-wetland areas to mitigate the conversion of wetlands and/or any man-made areas that have, over time, developed especial, rare or irreplaceable ecosystem functional value(s) and services.*

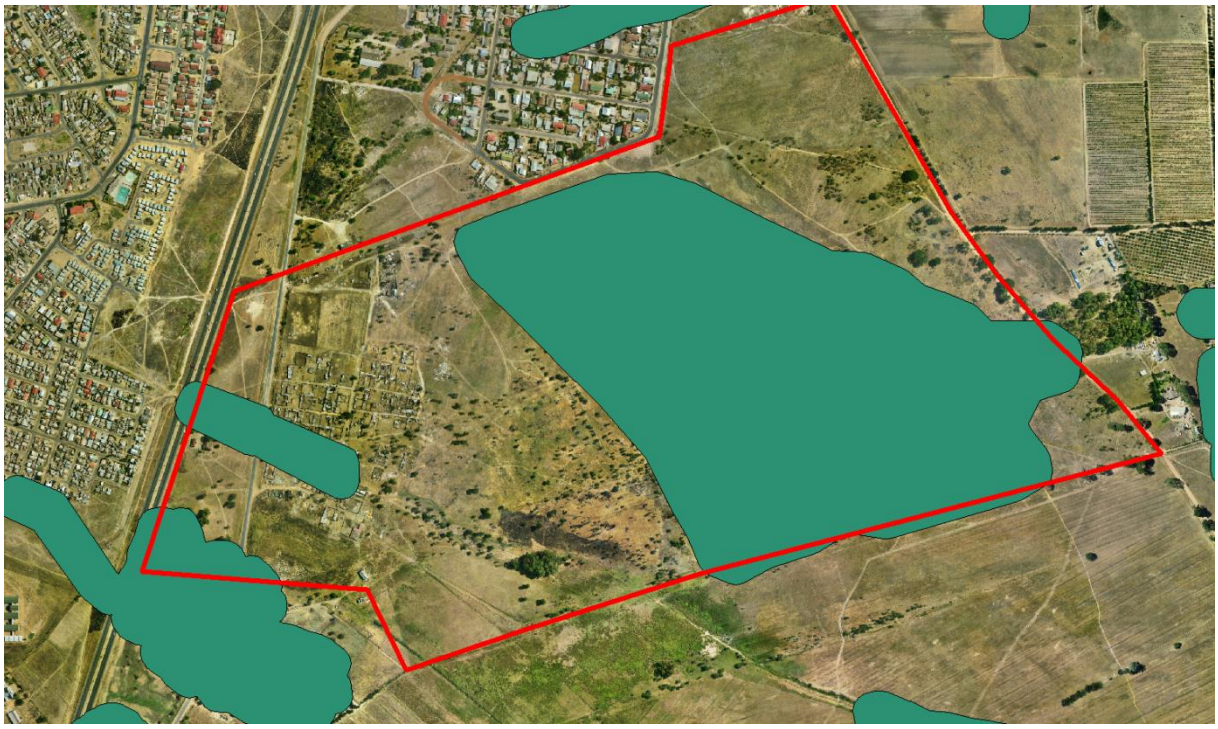

Figure 26: Drakenstein EMF GIS wetlands layer

The figure above shows possible wetland areas on the site. It was confirmed during the site visit by Dr. Harding that this information is incorrect. The wetland areas are completely artificial and dysfunctional as aquatic environments.

The Freshwater Assessment by Dr. Harding concluded the following (full report attached as Addendum F-1):

- The Drakenstein EMF indicates the sewerage ponds and disused dam to the south-west as wetlands. This classification is clearly incorrect according to the definition provided in the Aquatics Assessment. There are no National Freshwater Ecosystem Priority Areas (NFEPA) wetlands mapped for this site.
- "The site encompasses a reach of highly degraded streamline passing through the south-western portion of the property. The development of the site has included re-aligning the streamline along the western boundary. Given that the streamline is already so degraded, from both recent and historical abuse, it was the opinion of the freshwater specialist that this is an option well-worth considering. It would, however, require that the rehabilitation and re-alignment of the streamline be extended upstream towards the Bo Dal Road and also be dependent on the future planning and drainage needs of the adjacent site. These do not appear to be insurmountable issues."

Dr. Sinske was appointed as the Floodline Specialist to determine and test the feasibility of the

proposals made by Dr. Harding. In his report (attached as) Dr. Sinske concluded that the above proposal is feasible for both the Kleinbosch River and the Mbekweni River.

A follow up Freshwater study was conducted in 2014 by DHEC's Dr Harding (Please refer to Addendum F1.1). This study indicated that the Kleinbosch River, which feeds the weland to the South-western corner, in fact terminates on the SHARA property south of the Vlakkeland Development and was flowing south of the shallow berm between the SAHRA and Vlakkeland properties towards the TopPrime residential development site. It is assumed that the berms were built for the management of field drains, but have since been damaged and lead to blocking and overflowing in an broad, spread-out fashion. This was confirmed during a hydrological assessment conducted by Graeme McGill. The assessment of the Geotechnical report (Please refer to Addendum F10) together with consultation with Professor Cornie van Huyssteen of Free State University, revealed that alluvial substrates were present west and south west of the evaporation ponds, located to the east of the Vlakkeland property. The resulting conclusion was drawn that the aforementioned area was found to be a shallow perched aquifer of approximately 0.4m in depth and to wet and fluidized to support vegetation except for stunted wetland-associated plants. The presence of invasive *Pennisetum macrourum* in the shallow depressions towards the south west corner led to the presumption of the existence of a wetland on this site and is similar to the soil characteristics on the neighbouring site which is currently being developed for housing.

As a result of this, Dr Harding suggested the re-alignment of the Kleinbosch River along the southern boundary of the Vlakkeland property, which will create as elongated natural wetland feature along the northern border of the SAHRA property and ultimately connecting to the Dal River on the SAHRA site. This diversion will not have a negative effect on the aquifer on the Vlakkeland site, as the site will be infilled to level out the slight gradient, and the hydraulic linkage to the south west will not be altered.

Dr Harding's report therefore concluded that should alternative one be implemented, where the Kleinboch River is realigned to it's original position to the Dal River, the wetland characteristics on the Vlakkeland site will disappear. However, similarly in the case where alternative two is implemented, where the Kleinbosch river is connected in a channel from the SAHRA site to the outlet from Vlakkeland, the overland spillage which lead to the prevalence of the wetland characteristics will also disappear.

It should be noted that this entire area will be filled with approximately 1m soil layer prior to construction in order to ensure an even surface and to ensure that the storm water is properly managed in this development. This aquifer will therefore not be impacted upon and will not have an impact on the proposed development.

C-1.4 Climate

The study site, as with most of the South-western Cape falls within the Mediterranean Climate, where 80% of the mean annual precipitation for this area (approximately 817mm- 906mm) is received in winter, in the months May to September. The daily maximum temperature is about 28°C in mid-summer and 17°C in mid winter. Prevailing winds are south easterly during the summer and north-westerly during the winter (DWAF 2004).

C-1.5 Flora

Two Botanical Assessments were undertaken for the proposed development. Both Botanical Assessments was undertaken by Dr. Dave McDonald, once in 2010 and then the site was revisited in 2013.

C-1.5.1 General Vegetation

Originally Swartland Alluvuim Fynbos covered the site. This vegetation type is regarded as critically endangered. The conservation target is 30% but nearly 10% is conserved in the Waterval Nature Reserve, Winterhoek and private reserves such as Elandsberg, Langerug and Wiesenhof Wildpark. More than 75% have already been transformed into vineyards, olive orchards, pine plantations, urban settlements and by the building of the Voëlvlei and Wemmershoek Dams. This vegetation type mostly grows in undulating plains, adjacent mountains and river basins. The vegetation is a matrix of low, evergreen shrubland with emergent sparse, moderately tall shrubs and a conspicuous graminoid layer. Proteoid, restioid and asteraceous fynbos types are dominants, with closed-scrub fynbos common along the river courses. Ericaceous and restioid fynbos are found in seeps.

In consultation with CREW SANBI it was confirmed that during a Spring 2014 botanical assessment of the site, endangered vegetation was found on site. Additional information regarding the presence these threatened species were requested from CREW SANBI after comments were received during the first EIA public commenting period regarding a spring botanical assessment. According to Mr Ebrahim, CREW CFR program manager at SANBI, the following were identified on site (EN = Endangered & VU = Vulnerable): *Anthospermum ericifolium*(EN), *Lobostemon capitatus* (VU), *Geissorhiza tulbaghensis* (EN), *Monopsis variifolia* (EN), *Athanasia crenata* (EN), *Merciera tetraloba* (EN), *Erepsia cf.ramosa* (VU), *Phylica strigulosa* (VU), *Leucadendron lanigerum var. lanigerum* (EN), *Tritoniopsis elongate* (EN), *Aspalathus aculeate* (EN), *Aspalathus muraltioides* (EN).
All of these endangered and vulnerable species were found within the existing botanical buffer zone to the east of the site.

C-1.5.2 ERF 33027 and land above dams and along Bo Dal Road

ERF 33027 was not previously surveyed since the area fell outside the site boundary when McDonald (2010) surveyed the site. Although the outer edges of the erf are highly transformed the major portion contains a number of species of conservation concern. It is also important to note that there were a number of bulb species that could not be identified since only the leaves were visible and no flowers present.

The area has been heavily disturbed in the past and as a result is dominated by several grasses and weeds, including (D = dominant; A = additional), *Echium plantagineum*, *Echium vulgare*, *Hypochoeris radicata* (A), *Lupinus* sp. and *Fumaria muralis* (A). Despite the obvious past disturbance of the land, probably due to it being both cultivated and using as a grazing area, there are a number of remnant indigenous species present. Important observations include two bulb species, namely the **VULNERABLE** *Gladiolus recurvus* and the **VULNERABLE** *Spiloxene alba*. The former species occurs sporadically across the erf whereas the latter species occurs in high numbers in the vicinity of **waypoint 020** (33° 40.591'S; 19° 0.436'E) to **024** (33° 40.644'S; 19° 0.599'E) (Figure 3). Between waypoints **020** and **023** (33° 40.589'S; 19° 0.533'E) there are high numbers (of a striking and unique form) of the **ENDANGERED** *Monsonia speciosa*. This perennial species is a resprouter, with individuals living to 30 years (www.redlist.sanbi.org). This means the population has probably persisted for many decades or longer, depending on the land use history. <u>The population is a red flag and must be conserved in perpetuity</u>.

In addition to the species of conservation concern there are a number of more common remnant species, including *Aspalathus spinosa* subsp*. spinosa* (D), *Cotula turbinata* (D), *Arctotis calendula* (D), *Oxalis purpurea* (D), *Oxalis* cf*. droseroides* (D), *Oxalis pes-caprae* (A), *Oxalis obtusa* (A), *Cyanella hyacinthoides* (D), *Eriospermum* sp*.* (A), *Ficinia* sp*.* (A), *Pelargonium triste* (A), *Pelargonium* sp*.* (D), *Trachyandra falcata* (A), *Moraea* sp. (D), *Lachenalia* sp., *Romulea flava* (A) and *Dimorphotheca sinuata*.

The portion of land immediately south and southeast of ERF 33027 has light infestations of Port Jackson Willow (*Acacia saligna*) and a number of remnant species previously described by McDonald including *Bobartia* cf*. indica, Diospyros glabra, Micranthus alopecuroides, Otholobium* sp*., Ruschia bracteata, Salvia africana-caerulea, Searsia angustifolia, Searsia laevigata* and *Spiloxene flaccida.*

In May 2010 when McDonald visited the site no important species were visible, however, during the July survey a healthy population of the **VULNERABLE** *Gladiolus recurvus* was flowering. The species extends from ERF 33027 as scattered individuals to the south and southwest (above the dams) and occurs as a population of thousands of plants from **waypoint 027** (33° 40.757'S; 19° 0.633'E) to **029** (33° 40.800'S; 19° 0.696'E) (Figure 3). This confirms McDonald's assertion that the area may have harbored important species, despite being degraded and infested by Port Jackson Willow and gum trees (*Eucalyptus* sp).

C-1.5.3 Land portion along Jan van Riebeeck Drive (ERVEN 12833/8359/8399/8400/12828)

The strip of land along Jan van Riebeeck Drive is highly transformed and contains no remaining species of conservation concern. The area between waypoint **033** (33° 40.669'S; 18° 59.921'E) and **037** (33° 41.167'S; 18° 59.792'E) is dominated by weeds and pioneer species, including several grasses (e.g. *Cynodon dactylon*) and pioneers such as *Arctotis calendula, Oxalis pes-caprae, Echium plantagineum* and *Cotula turbinata* (Figure 3). South of **waypoint 037** and immediately north of **waypoint 038** (33° 41.280'S; 18° 59.678'E) there is a stand of mature gum trees (*Eucalyptus* sp.). The artificial (or modified) wetlands include a pond between **waypoint 036** and **037**. A number of wetland associated species occur here such as *Phragmites australis*, *Juncus effusis*, *Pennisetum macrourum*, *Searsia angustifolia*, along with the aliens *Acacia mearnsii* and *Sesbania punicea*. A number of additional dryland aliens include *Cereus* cf*. jamacaru, Rubus cuneifolius, Ricinis communis* and *Tropaeolum majus*.

C-1.5.4 ERF 8378

The area between the dams and Beets Street is highly degraded, with no intact natural vegetation remaining. There are, however, several remnant species. These are in the form of either persistent or pioneer species, including extensive populations of *Oxalis purpurea, Oxalis versicolor, Oxalis pes-caprae, Cotula turbinata* and *Moraea* sp. Additional species include *Lachenalia* sp. (speckled leaf), *Aspalathus spinosa* subsp*. spinosa, Asparagus rubicundus* and *Eriospermum* sp. There are large quantities of dumped rubble and litter around the perimeter of informal settlement and pigpens. This area and the remaining areas on the ERF have not changed since McDonald's (2010) assessment. Importantly no species of conservation concern were found.

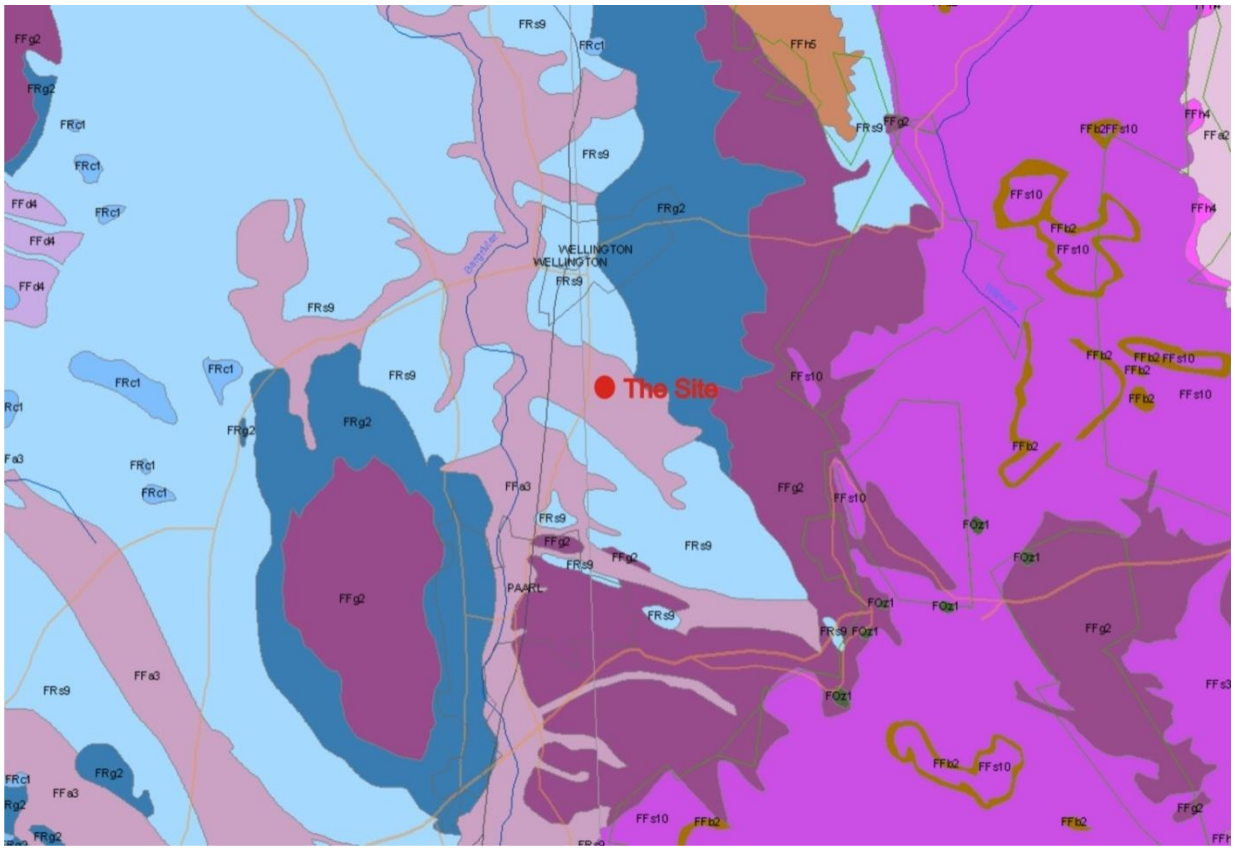

Figure 27: Portion of the vegetation map of southern Africa.

FFa 3 = Swartland Alluvium Fynbos (Mucina et al. 2005).

C-1.6 Fauna

Due to the highly disturbed nature of the site and the past and present agricultural practices in the area, there are no signs of large faunal species residing or occurring anywhere near the site.

C-2 SOCIAL ENVIRONMENT

C-2.1 Visual

The site is situated on a floodplain and has a naturally flat topography. The landscape is largely used for agricultural purposes where scattered indigenous vegetation is dispersed amongst problematic weeds and alien tree species. Informal farmers have settled in the western part of the site. Informal structures have been constructed by these farmers and are also visible from the passing Jan van Riebeeck high way. The site is slightly more elevated to the north eastern corner and less elevated to the south western corner.

C-2.2 Heritage

Erf 33027 (not forming part of the development area anymore due to sensitive vegetation) and a portion of Erf 8378 along Bo Dal road are of heritage significance in terms of scientific significance in that they include rare and endangered aspects of South Africa's natural heritage.

Beyond that, the site itself, Erven 8359, 8378, 8399, rem 8370, 8400, 12628, 12633 and 33027 Paarl has no further intrinsic heritage significance. There are two structures older than 60 years on Erf 8378 (one still standing and in use, the other now a ruin); and two buildings on Erf 12633 (both still standing and in use). None of these structures are of historical significance or display architectural or aesthetic merit. The site thus contains no structures of heritage significance nor does it illustrate links to historic landscape patterns of significance. There is no direct significant association with an historic person, group or event. No archaeological heritage resources have been identified and the archaeological impact assessment finds that no mitigation or monitoring is required.

However, the property is bordered on its eastern and southern boundaries by an historical rural landscape that is largely intact and of high heritage significance (proposed Grade 2) in terms of the following:

- Historical/social/linguistic significance: The strong association of the area, in particular Kleinbosch, with the origins of the Afrikaans Language Movement.
- Architectural significance: The high concentration of conservation worthy farmsteads including, inter alia, Non Pareille, Roggeland, Schoongezicht, Kleinbosch and Valencia, all National or Provincial Heritage Sites.
- Aesthetic significance: The broad cultural landscape provides the context for the historical farms and farm werfs. This includes the strong visual spatial quality of the area, with the vivid mountain backdrop to the east, the plains of the Vlakkeland, the rural character, and the landmark qualities of a number of historic homesteads within this landscape.

In principle, the Heritage assessment supports the development of erven 8359, 8378, 8399, rem 8370, 8400, 12628 and 12633 (erf 33027 has been excluded from the preferred alternative) Paarl for the development of a new residential area, with associated commercial and community facilities, for the following reasons:

- There are no significant historic associations of this landholding;
- With the exception of the eastern portion of erf 8359, the site has not been identified as being of heritage significance;
- There are no structures of heritage significance on the site, although there are buildings older than 60 years which will be demolished. Demolition thereof is not opposed.
- No archaeological heritage resources have been identified and the archaeological impact assessment finds that no mitigation or monitoring is required.
- It falls within the Paarl Urban Edge and can be seen as a logical expansion of the adjoining residential area. Urban development is unavoidable and must be expected.

On 13 August 2014 the IAComm reviewed the Heritage Impact Assessment and an authorisation was subsequently granted on 20 August 2014 (Please refer to Addendum E2 for the Heritage Record of Decision). However, during the meeting it became known that the Vlakkeland site is currently informally used as an initiation school and that it should be adequately attended to. This will be included as a recommendation for the municipality, who is the property owners and developers and therefore the responsible party.

C-2.3 Archaeological Resources

Other surveys in the region have generally shown the most frequent archaeological heritage resources to be Early Stone Age (ESA) artefacts. Such artefacts (flakes, cores and occasional hand-axes) are routinely exposed through ploughing of the agricultural lands and are widely dispersed along the western edge of the Cape Folded Belt mountains from Somerset West in the south (Orton 2004), through Stellenbosch, Paarl and Wellington (Goodwin & Van Riet Lowe 1929; Orton & Webley 2013) to the Gouda and Porterville area in the north (Hart 1984; Orton 2008, 2010a). Recent surveys have revealed many ESA artefacts in and around Paarl (Orton 2006, 2010c, 2010d; Orton & Hart 2008; Orton & Webley 2013). While Later Stone Age (LSA) material seems to be rare, when such sites are found they could have research value (e.g. Orton 2012).

The site is densely littered with the remains of many structures in the form of piles of rubble scattered over the landscape. While a set of cement floors were noted near the south-western corner of the site the majority of the rubble may well have come from other areas and been dumped here.

No graves or evidence of burials was seen on the site.
No archaeological impacts will be experienced.

C-2.4 Noise

The majority of noise levels to be generated by the development will be confined to the construction period and will take place during work hours. Measures will be taken during construction to increase the sound absorption of the buildings next to Jan van Ribeeck Drive so as to minimise the noise impact generated by traffic on the proposed new development.

C-2.5 Socio-economics

A part of the site in the west is currently occupied by structures created by informal farmers. It is aimed to move these farmers to a suitable location and this might have a negative socio-economic impact on the settlers. The proposed development will however mostly have positive socio-economic impacts in creating job opportunities during the construction and operational phase. The development will also include the construction of subsidy houses suitable for residential and business purposes. This will give residents the opportunity to start and run their own business. The proposed development will also provide the future Vlakkeland community and surrounding communities with four primary schools and two secondary schools which will provide the youth with an education and opportunities.

C-2.6 Road Links

The site is essentially located in the area to the east of Jan van Riebeeck Road between Paarl and Wellington and therefore relative strategically located in terms of regional access. This is further reinforced by the Bo Dal Road on its eastern boundary. The area between Paarl and Wellington is relatively well connected with north-south linkages, but lack in east-west connections between the north-south linkages.

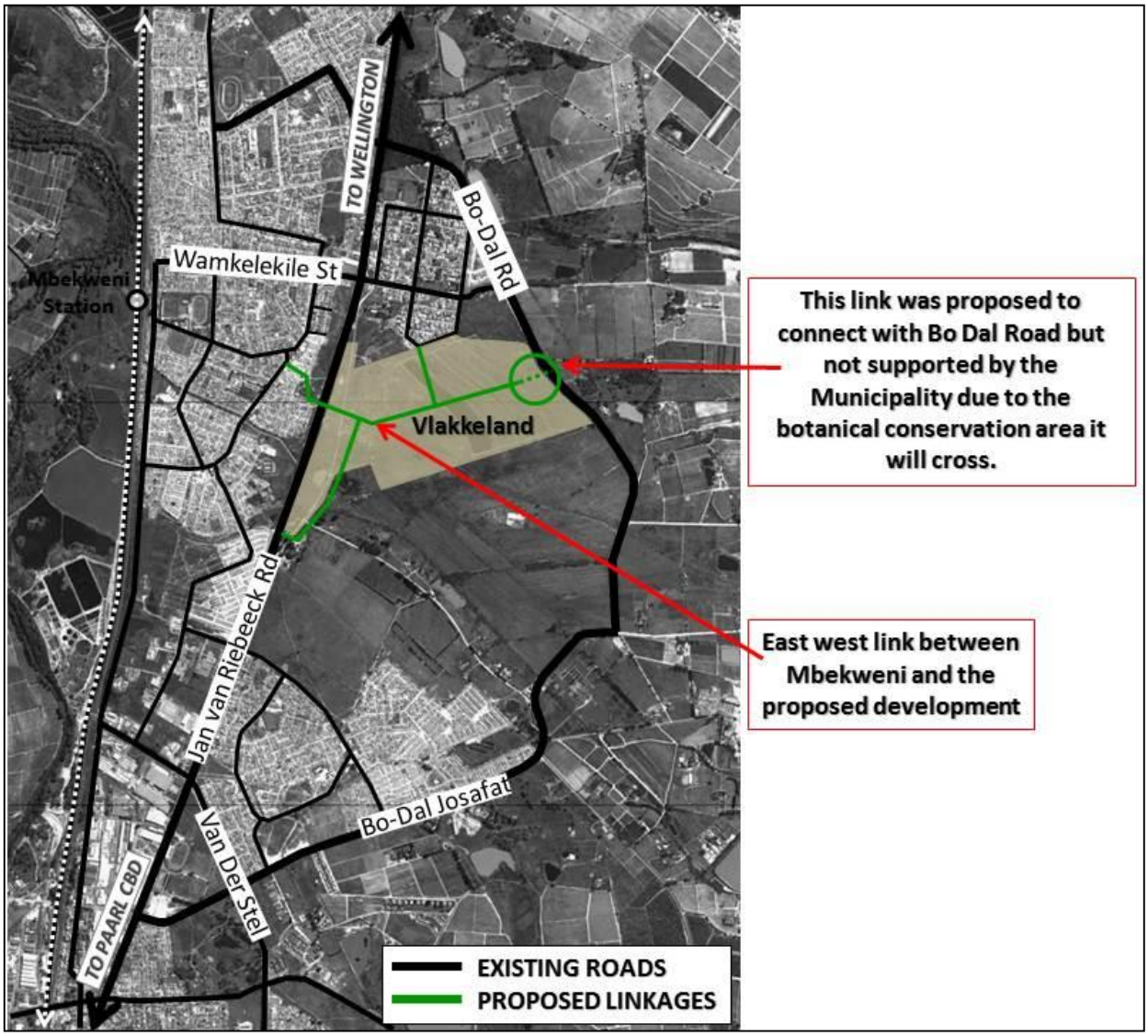

Figure 28: Road Links in the area

(Nuplan, 2013)

C-2.7 Road Based Transport

People movement in the study area is essentially road vehicle-based due to Jan van Riebeeck being the primary regional connector between Wellington and Paarl. In contrast to the more affluent population north and south of Mbekweni/Newton, the majority of the population in these areas make use of privately-operated minibus taxis and bus services, which operate along the main routes in the area, particularly in a north-south direction along Jan Van Riebeeck[4].

C-2.8 Rail

A passenger line currently links the Cape Town CBD and Paarl stations with the Wellington stations and further north. The line is located to the east of Mbekweni in relative close proximity to the Vlakkeland site and easily accessible via the existing and proposed road links as illustrated in the figure below.

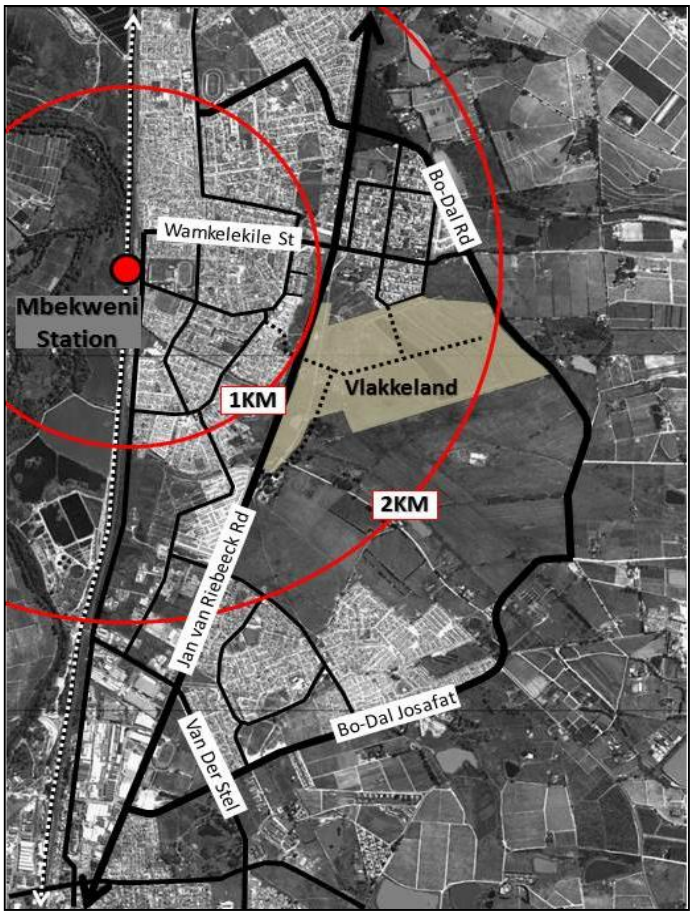

Figure 29: Rail linkages

[4] *Nuplan*

SECTION D: NEED AND DESIRABILITY OF THE DEVELOPMENT

D-1 BACKGROUND TO NEED AND DESIRABILITY

[5]When formulating project proposals and when evaluating project specific applications, the strategic context of such applications and the broader societal needs and the public interest must be considered. In an effort to better address these considerations and its associated cumulative impacts, the NEMA also provides for the compilation of information and maps that specify the attributes of the environment in particular geographical areas, including the sensitivity, extent, interrelationship and significance of such attributes which must be taken into account. The Environmental Management Framework ("EMF") Regulations of 2010 state that EMFs must, inter alia, "specify the attributes of the environment in the area, including the sensitivity, extent, interrelationship and significance of those attributes, state the environmental management priorities of the area, indicate the kind of developments or land uses that would have a significant impact on those attributes and those that would not and indicate the kind of developments or land uses that would be undesirable in the area or in specific parts of the area".

It is, however, important to realise that a plan, framework or strategy for an area does not ultimately determine if an EIA is refused or granted. When "need and desirability" must be considered as part of an EIA process, the content of the IDPs , SDFs, EMFs and other relevant plans, frameworks and strategies must be taken into account when considering the merits of each application. Whether a proposed activity will be in line with or deviation from the plan, framework or strategy per se is not the issue, but rather the ecological, social and economic impacts that will result because of the alignment or deviation. As such, the EIA must specifically provide information on these impacts in order to be able to consider the merits of the specific application.
Where a proposed activity deviates from a plan, framework or strategy, the burden of proof falls on the applicant (and the Environmental Assessment Practitioner) to show why the impacts associated with the deviation might be justifiable.

The need and desirability of development must be measured against the abovementioned contents of the IDP, SDF and EMF for the area, and the sustainable development vision, goals, objectives, strategies and plans formulated in, and the desired spatial form and pattern of land use reflected in, the area's IDP and SDF. While project-level EIA decision-making therefore must help us stay on course by finding the alternative that will take us closer to the desired aim/goal, it is through Integrated Development Planning (and the SDF process) that the desired

[5] DEA&DP Guideline on Need and Desirability (March 2013)

destination is firstly to be considered and the map drawn of how to get there.

Financial viability must be considered within the context of justifiable economic development, measured against the broader societal short-term and long-term needs. While the financial viability considerations of the private developer might indicate if a development is "do-able", the "need and desirability" will be determined by considering the broader community's needs and interests as reflected in an IDP, SDF and EMF for the area, and as determined by the EIA.

While the importance of job creation and economic growth for South Africa cannot be denied, the Constitution calls for justifiable economic development. The specific needs of the broader community must therefore be considered together with the opportunity costs and distributional consequences in order to determine whether or not the development will result in the securing of ecological sustainable development and the promotion of justifiable social and economic development – in other words to ensure that the development will be socially, economically and environmentally sustainable.

D-1.1 Questions to be engaged with when considering Need and Desirability

In light of the above, the need for and desirability of a proposed activity must specifically and explicitly be addressed throughout the EIA process (screening, "scoping", and assessment) when dealing with individual impacts and specifically in the overall impact summary by taking into account the answers to inter alia the following questions:

- How will this development (and its separate elements/aspects) impact on the ecological integrity of the area;
- How were the following ecological integrity considerations taken into account;
- Threatened Ecosystems
- Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries,
- wetlands, and similar systems require specific attention in management and planning procedures,
- especially where they are subject to significant human resource usage and development pressure,
- Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"),
- Conservation targets,
- Ecological drivers of the ecosystem,
- Environmental attributes and management proposals contained in relevant Environmental
- Management Frameworks,
- Environmental attributes and management proposals contained in relevant Spatial
- Development Framework, and

- Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).
- How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?
- How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?
- What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?
- How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?
- How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?
- Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)
- Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the

opportunity costs of using these resources for the proposed development alternative?).

While the concept of need and desirability relates to the type of development being proposed, essentially, the concept of need and desirability can be explained in terms of the general meaning of its two components in which need refers to time and desirability to place – i.e. is this the right time and is it the right place for locating the type of land-use/activity being proposed? Need and desirability can also be equated to wise use of land.

D-2 NEED

The demand for housing is one of the biggest issues in South Africa. In the Western Cape (excluding the City of Cape Town) the number of dwelling units in informal settlements is estimated at 51 224 according to the 2007 censes. According to the 2010 database or waiting list, estimates for housing demand in Drakenstein vary from 10 200 (including low-, medium- and high-income units) to 22 748 (low-income units).

The region of Paarl and Wellington clearly suffers from a shortage of houses for the local community. Developable land in Paarl/Wellington area is scarce due to the sensitive nature of the natural environment in general, the heritage and visual sensitivity of most of the area as well as the good quality of most of the agricultural land in the area. Over population is therefore a major concern and this development will provide the needed housing for the local community.

The community that's forced to live in informal settlements has to live in conditions where no ablution facilities or running water are available. Their current houses are not water tight and the walls stay damp during winter. These conditions are unhealthy and people are prone to deceases like Tuberculosis. Some informal houses consist of a single bedroom and most families are forced to live in confined spaces.

The Drakenstein Municipality is desperate to provide a solution by establishment of a residential development. The proposed site is situated in the Paarl Valley between Paarl and Wellington in the Western Cape. The 108ha site is located south of the Newton residential development and east of the Mbekweni residential area. The western boundary of the site is bounded by Jan van Riebeeck Drive, Bo-Dal Road serves as the site's eastern boundary. Properties used for agricultural purposes are situated east of Bo Dal Road and a heritage conservation site is situated to the south. The proposed site is zoned for agricultural purposes but it is currently mostly vacant and is an area prone to attract trouble makers. A group of informal farmers have settled close to the western site boundary. The degraded state of the site and lack of maintenance also pose a threat to indigenes threatened and endangered vegetative species present on the site.

The community is also in need of safe parks and youth orientated activities. Youth centres, day care centres, play grounds and sport facilities are major needs to provide the youth of the community with save and proactive activities. Local sport teams can't improve their skills because of the lack of practicing facilities.

There is also a need for more schools in the area as the existing schools are struggling to cope

with large classes and too many pupils. The establishment of more schools will provide more educational opportunities for the community and it will create more jobs for local teachers.

Drakenstein Municipality has a duty toward the people in the region to provide them with healthy, save an affordable livening conditions.

The proposed development aims to create a much needed business node to give the community the opportunity to start and sustain their own businesses and to generate an income for their families.

The proposed development will fit into the surrounding area and existing residential developments like Mbekweni and the newly developed Roggeland to the west and Newton to the North of the site. It will also generate temporary and permanent jobs during the construction phase and operational phase. This development is focused on the community of Paarl and Wellington and their needs and desirability for save and affordable housing.

Table 8: Need and Desirability Questions

Question	Answer
How will this development (and its separate elements/aspects) impact on the ecological integrity of the area;	The overall area has been highly impacted on before by previous farming activities. The site was also used as part of the Waste water Treatment Works in the past (1960's). Some botanical sensitive areas may however be present. These areas will be avoided as far as possible.
How were the following ecological integrity considerations taken into account;	
• Threatened Ecosystems	May be present and will be avoided;
• Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries,	May be present and will be avoided.;
• wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure,	There are no wetlands present on the site but four streams (two larger ones) transverses the site. These streams/watercourses will be diverted (realigned) to the borders of the site in order to ensure better water quality, toprotect the proposed new housing development and to open up more space for development. The Kleinbosch River (largest watercourse) will be realigned back to its original location and will be connected with the Dal River (please refer to the 1938 aerial photo.
• Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"),	Some CBA's may be present on the site. These areas will be protected and will receive the necessary buffer area.
• Ecological drivers of the ecosystem,	The Botanical sensitive areas will be avoided and will be protected. The rivers/watercourses.
• Environmental attributes and management proposals contained in relevant Environmental Management Frameworks,	
• Environmental attributes and management proposals contained in relevant Spatial Development Framework, and	No RAMSAR sites are located on the property. Buffers of 30m will be allocated next to the realigned rivers.
• Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.).	

Question	**Answer**
How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The possible sensitive Botanical areas will be avoided. This was determined by means of a Botanical Assessment. The Kleinbosch river, which will be realigned, will receive a 30m buffer area for protection and better management.
How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The possible sensitive Botanical areas will be avoided. This was determined by means of a Botanical Assessment. The Kleinbosch river, which will be realigned, will receive a 30m buffer area for protection and better management.
What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Some building rubble will be generated. This will be re-used for the construction and compaction of roads and infrastructure. The informal farm building currently present on the site (squatter buildings) will be recycled and/or disposed of at a licenced landfill site.
How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Solar geysers will be promoted. Energy saving lighting solutions will be sourced.
How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of	Solar geysers will be promoted. Energy saving lighting solutions will be sourced.

acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?	
Question	**Answer**
Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. de-materialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life	Solar geysers will be promoted. Energy saving lighting solutions will be sourced.
Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources for the proposed development alternative	The use of natural renewable resources (sunlight) will be much more expensive initially, but an extensive financial saving is expected in the long run.

D-2.1 Location and Accessibility

The proposed site is situated in the Paarl Valley between Paarl and Wellington in the Western Cape. The 108ha site is located south of the Newton residential development and east of the Mbekweni residential area. The western boundary of the site is bounded by Jan van Riebeeck Drive, Bo-Dal Road serves as the site's eastern boundary. Properties used for agricultural purposes are situated east of Bo Dal Road and a heritage conservation site is situated to the south.

D-2.2 Proximity of Commercial and Employment Opportunities

The proposed development aims to create a much needed business node to give the community the opportunity to start and sustain their own businesses and to generate an income for their families.

The proposed development will fit into the surrounding area and existing residential developments like Mbekweni and the newly developed Roggeland to the west and Newton to the North of the site. It will also generate temporary and permanent jobs during the construction phase and operational phase. This development is focused on the community of Paarl and Wellington and their needs and desirability for save and affordable housing.

D-2.3 Infill Planning of Available Land within the Urban Edge

The site is situated within the urban edge of Drakenstein Municipality.
The demand for housing is one of the biggest issues in South Africa. In the Western Cape (excluding the City of Cape Town) the number of dwelling units in informal settlements is estimated at 51 224 according to the 2007 censes. According to the 2010 database or waiting list, estimates for housing demand in Drakenstein vary from 10 200 (including low-, medium- and high-income units) to 22 748 (low-income units).

The region of Paarl and Wellington clearly suffers from a shortage of houses for the local community. Developable land in Paarl/Wellington area is scarce due to the sensitive nature of the natural environment in general, the heritage and visual sensitivity of most of the area as well as the good quality of most of the agricultural land in the area. Over population is therefore a major concern and this development will provide the needed housing for the local community.

The Drakenstein Municipality is desperate to provide a solution by establishment of a residential development.
The community is also in need of save parks and youth orientated activities. Youth centres, day care centres, play grounds and sport facilities are major needs to provide the youth of the community with save and proactive activities. Local sport teams can't improve their skills

because of the lack of practicing facilities.

There is also a need for more schools in the area as the existing schools are struggling to cope with large classes and too many pupils. The establishment of more schools will provide more educational opportunities for the community and it will create more jobs for local teachers.

Drakenstein Municipality has a duty toward the people in the region to provide them with healthy, save an affordable livening conditions.

D-2.4 Compatibility with Surrounding Area

The proposed development will fit into the surrounding area and existing residential developments like Mbekweni and the newly developed Roggeland to the west and Newton to the North of the site. It will also generate temporary and permanent jobs during the construction phase and operational phase. This development is focused on the community of Paarl and Wellington and their needs and desirability for save and affordable housing.

D-2.5 Existing Land Use Rights

Properties used for agricultural purposes are situated east of Bo Dal Road and a heritage conservation site is situated to the south. The proposed site is zoned for agricultural purposes but it is currently mostly vacant and is an area prone to attract trouble makers. A group of informal farmers have settled close to the western site boundary. The degraded state of the site and lack of maintenance also pose a threat to indigenes threatened and endangered vegetative species present on the site.

D-2.6 Provincial Spatial Development Framework (PSDF) and Urban Edge

The proposed development is in line with the PSDF as the additional residential development will contribute to a more optimal utilization of the existing urban infrastructure. In addition the site is located within the approved urban edge.

D-2.7 Integrated Development Plan and Spatial Development Framework

Densification such as the proposed development is encouraged as it provides for more efficient use of existing services and infrastructure in the built environment. The development can be seen as infill development.

D-2.8 Approved Structure Plan of the Municipality

The proposed development falls within the Drakenstein (Paarl) urban edge and will contribute to the development of a more compact town. The development is situated in close proximity to existing residential developments and will thus contribute to the sustainable densification of the existing urban environment.

The use of the site for Residential/housing will fit in within the area.

D-2.9 Does the community/area need the activity and the associated land

The Drakenstein Municipality is desperate to provide a solution by establishment of a residential development.
The community is also in need of save parks and youth orientated activities. Youth centres, day care centres, play grounds and sport facilities are major needs to provide the youth of the community with save and proactive activities. Local sport teams can't improve their skills because of the lack of practicing facilities.

D-2.10 How will the development impact on people's health and wellbeing

This will improve the housing conditions of thousands of people currently living in informal houses.

D-3 DESIRABILITY

[6]

D-3.1 Suitability of the Vlakkeland Development

In the 18 years since 1994 a number of large initiatives have been launched and implemented to fulfill the urban development requirements of the Western Cape. Despite all these efforts we are only marginally closer to addressing the multiple needs for jobs, health, education and housing. It is clear that a multi-pronged strategy of upgrading existing settlements, infill development, social housing, etc. has to be supplemented by large scale greenfields development, without which they will not be achievable due to land prices, infrastructure constraints and lack of alternative locations.

D-3.2 Compatibility with Forward Planning Documents and Policies

The planning fit of the proposed development is discussed below and tested for consistency and compliancy to the various applicable planning policies:

D-3.2.1 Western Cape's Draft Strategic Plan

The Vlakkeland development is consistent with the outcomes of the Plan in terms of creating growth and jobs, increasing access to safe and efficient transport, increasing wellness, developing integrated sustainable human settlements and optimizing resource-use efficiency, increasing social cohesion and reducing poverty.

D-3.2.2 Drakenstein Integrated Development Plan 2012 – 2017 (IDP)

In the Drakenstein Municipal IDP (2012 – 2017) as approved on 30 May 2012, Key Performance Area KPA 6: Social and Community Development, is applicable to the Vlakkeland development. In terms of this KPA, IDP ref KP 1052 and 1053 is relevant, being "Implementation of Integrated Human Settlement Strategy Plan through addressing housing backlogs and reduce the housing demand"

The proposed Vlakkeland development is consistent with this Key Performance Area as it will assist in addressing the housing backlog and reduce the housing demand. It is furthermore a fully integrated development with a variety of housing typologies and densities, complemented by a full spectrum of educational, sport, retail and commercial, municipal facilities as well as other community facilities, supported further by the creation of walkable communities and a strong public transport accessibility grid.

[6] *From the LUPO Application – Nuplan, 2013*

D-3.2.3 Provincial Spatial Development Framework (PSDF)

The PSDF (2009) purports to be aligned with the National Spatial Development Perspective and endorses the vision of PGWC to create a 'home for all'. In order to achieve this vision the PSDF claims to:

- be the spatial expression of the Provincial Growth and development Strategy (PGDS);
- guide (metropolitan, district and local) municipal integrated development plans (IDPs) and spatial development frameworks (SDFs) and provincial and municipal framework plans (i.e. sub-SDF spatial plans);
- help prioritize and align investment and infrastructure plans or other provincial departments, as well as national departments' and parastatals' plans and programs in the Province;
- provide clear signals to the private sector about desired development directions;
- increase predictability in the development environment, for example by establishing no-go, conditional and 'go' areas for development;
- redress the spatial legacy of apartheid.

The PSDF is a policy document that is applied in terms of the conformity principle; it does not create or take away any rights to use land, but on the other hand upgrading of existing rights will have to conform to the PSDF. However, like all guidelines, the PSDF must not be applied rigidly but in a developmental way that takes account of the particular circumstances of each case. The latter goal is achieved through the consistency principle.

The PSDF is implemented in accordance with the consistency principle that applies in the relations between development applications vis-à-vis relevant spatial development frameworks or framework plans, and in the relations between lower- and higher-order spatial development frameworks or framework plans in the plans hierarchy. Furthermore development applications must be consistent with relevant spatial development frameworks.

The relevant framework and plan that the anticipated Vlakkeland development must be measured against, is the Drakenstein SDF. This plan designates the subject property for "new urban development" and will thus fall in category 1 as per the above table and will not require amendment of the Drakenstein SDF or the PSDF.

The compliance and/or consistency of the Vlakkeland proposals with the PSDF are summarized below. For easy reference, the numbering used corresponds with that of the PSDF (2009).

Table 9: Vlakkeland's Compliance with the PSDF

AREA OF INTERVENTION: SOCIAL AND ECONOMIC DEVELOPMENT – IMPROVE QUALITY OF LIFE AND ADDRESS POVERTY	
Objective 1	**Align the future settlement pattern of the province with areas of economic potential and the location of environmental resources**
Strategies:	a) Identify existing settlements with sufficient natural and built environment resources and economic potential to accommodate long term sustainable population growth. b) Determine the best share of transport models (rail and road) for the long term future freight and passenger needs of the Province.
2.3.1 PROVINCIAL URBANISATION STRATEGY	
Vlakkeland Rating : Compliant	
The provincial settlement pattern is optimized with regard to where people live and the availability of resources, land and future economic growth. The current focus of urbanization, which is likely to continue, is on the land between Paarl and Wellington.	
2.3.2 COMBINED ROAD AND RAIL TRANSPORT CORRIDORS	
Vlakkeland Rating : Compliant	
Vlakkeland is located in the existing urban environment of Paarl en Wellington, adjacent to the mobility corridor of Jan van Riebeeck Road and in close proximity to the railway line and Mbekweni station.	
2.3.3 TOURIST ROADS	
Vlakkeland Rating : Not applicable	
The PSDF identified certain tourist routes that need to be upgraded to strengthen opportunities. The Vlakkeland development is not located on any of the identified tourist routes.	
2.3.4 ECONOMIC DEVELOPMENT LOCATIONS	
Vlakkeland Rating : Compliant	
The PSDF mentions that The MEDS strategy identified certain potential economic development locations. The PSDF should encourage these areas through policy support and social, economic and infra structural investment. The Vlakkeland development is located in or near these locations. (Cape Winelands)	
Objective 2	**Deliver human development programs and basic needs programs wherever they may be required.**
Strategies:	a) Use the Provincial Human Capital and Social Capital development strategies and the municipalities' integrated development plans (IDPs), to identify

	settlements throughout the Province which are in need of human development programs. b) Deliver these programs from existing facilities where possible which should be renovated and shared by the various delivery institutions and organisations where necessary. c) It may be necessary and appropriate to deliver certain programs on a periodic basis using the periodic market system in remote rural areas.
2.3.5 SETTLEMENTS WITH HIGH LEVELS OF HUMAN DEMAND	
Vlakkeland Rating : Compliant	
The proposed Vlakkeland development is located in an existing urban environment identified as an area which is in need of human development programmes.	
2.3.6 DELIVERY OF SERVICES TO SETTLEMENTS WITH LOW GROWTH POTENTIAL OR SMALL POPULATIONS	
Vlakkeland Rating: Not applicable	
This objective is not applicable to Vlakkeland due to its urban location in a high growth potential area.	
Objective 3	**Strategically invest scarce public sector resources where they will generate the highest socio-economic returns**
Strategies:	a) Identify settlements using the NSPD and Growth Potential study guidelines to prioritize where fixed investment should be directed. b) Align the initiatives from provincial, local and national government departments, state owned enterprises, public entities and the private sector to ensure maximum socio-economic return on investment.
2.3.7 PRIORITY FIXED INVESTMENT URBAN SETTLEMENTS	
Vlakkeland Rating : Compliant	
As a general principle, fixed investment should be directed towards urban settlements that exhibit high economic growth potential and high human need. This policy furthermore implies that settlements with large numbers of people would take precedence over those with only a few residents. Given the nature, extent and structure of Vlakkeland it is abundantly clear that this principle is complied with.	
2.3.8 SUPPORT LOCAL INITIATIVES	
Vlakkeland Rating : Not applicable	
Vlakkeland is not located in a small settlement with less than 5000 people.	

Objective 4	**Support land reform**
Strategies:	a) Identify land suitable for achieving the national land reform goal of transferring 30% of land to Coloured and Coloured or Black ownership by 2015 b) Value land at market rates based on commercial rather than speculative returns c) Land reform policy is reviewed on an ongoing basis. While the broad goals of the SDF and the Department of Agriculture with regard to protection of agricultural land are fully supported, there is a need for flexibility with respect to minimum farm sizes and support of family and cooperative farming. d) Establish guidelines appropriate to the needs of land reform projects that do not undermine broad PSDF policy
2.3.9 LAND REFORM	
Vlakkeland Rating: Not applicable	
This objective is not applicable to the Vlakkeland development due to it not being a restitution project.	
Objective 5	**Conserve and strengthen the sense of place of important natural, cultural and productive landscapes, artifacts and buildings**
Strategies:	a) Identify and map key heritage resources b) Ensure their protection in the face of increasing urban and rural development c) Encourage regional and Western Cape building styles, urban design and land use patterns d) Strongly discourage the copycatting of foreign building styles and unsympathetic form and massing e) Improve the appearance, pedestrian accessibility and performance of main streets and civic spaces in urban settlements f) Promote tree planting and greening in urban settlements
2.3.10 HERITAGE RESOURCES	
Vlakkeland Rating : Compliant	
The strategies of this objective is fully implemented and supported in the proposed Vlakkeland development.	
2.3.11 APPROPRIATE ARCHITECTURAL CHARACTER	
Vlakkeland Rating : Compliant	

The strategies of this objective is fully implemented and supported in the proposed Vlakkeland development.
2.3.12 URBAN DESIGN AND ARCHITECTURAL GUIDELINES
Vlakkeland Rating : Compliant
The strategies of this objective is fully implemented and supported in the proposed Vlakkeland development.
2.3.13 SCENIC QUALITY
Vlakkeland Rating : Compliant
The scenic quality of the site from the cultural landscape is recognized and will be assessed and dealt with in the visual impact to be conducted in the EIA phase of the proposed project.
2.3.14 TRANSMISSION LINES, PIPELINES, TELECOMMUNICATIONS MASTS AND WIND FARMS
Vlakkeland Rating : Compliant
The proposed development will route pipelines, transmission lines and telecommunication masts along existing and planned transport corridors rather than along point-to-point cross country routes
2.3.15 TREES AND GREENING FOR AMENITY
Vlakkeland Rating : Compliant
The principles of tree planting, urban greening, bio-diversity and conservation forms an integral part of the development proposal.
AREA OF INTERVENTION: URBAN RESTRUCTURING – REDUCE SPATIAL DISCRIMINATION AND INEFFICIENCIES

Objective 6	**End the apartheid structure of urban settlements**
Strategies:	a) Prohibit further outward expansion of urban settlements that entrenches the current spatial apartheid pattern and results in urban sprawl b) Prohibit further alienation-tenure development outside of Urban Edges as they perpetuate apartheid settlement patterns c) Ensure that public funds are not spent in perpetuating segregated and unsustainable settlement patterns. d) Use socio-economic gradients based on walking distance to create a far higher level of integration than currently exist while remaining sensitive to community social norms and levels of living. e) Use publicly owned land and premises to spatially integrate urban areas and to give access for second economy operators into first economy spaces.

	f) Draw tight Urban Edges around towns, including therein largely just current built areas, except also including open land adjacent to routes between traditional racial elements of towns, for 1-2km width along such routes, for allowing medium density mixed use development to integrate the separate elements of such towns.
2.3.16 RESTRUCTURING URBAN SETTLEMENTS	
Vlakkeland Rating : Compliant	
In terms of the strategies above, it is imperative that the apartheid settlement pattern is dismantled as soon as possible. Vlakkeland is a development that caters for a fully integrated community with a range of unit types and densities to accommodate a range of income groups.	
2.3.17 DENSIFICATION	
Vlakkeland Rating : Compliant	
Vlakkeland is located within the urban edge and will be developed in terms of a densification model to ensure densities in excess of 25u/ha.	
2.3.18 DENSIFICATION AND HERITAGE	
Vlakkeland Rating : Compliant	
Specialist Baseline and Assessment Studies will be compiled for the proposed development, inclusive of Heritage and Archaeology in the prescribed EIA process.	
2.3.19 SOCIO-ECONOMIC INTEGRATION	
Vlakkeland Rating : Compliant	
The Vlakkeland development is an integrated community with a gradient of income levels accommodated and which is consistent with the principle of socio-economic gradient. It provides for a range of income levels, densities and typologies.	
2.3.20 SOCIAL AND SUBSIDY HOUSING ON PRIVATELY OWNED LAND AND PUBLIC LAND	
Vlakkeland Rating : Compliant	
The Vlakkeland development is a public sector project on municipal land.	
2.3.21 OPPORTUNITIES FOR INTEGRATED SETTLEMENTS ON PUBLICLY OWNED LAND	
Vlakkeland Rating : Compliant	
The proposed development is located on public land.	
Objective 7	**Conveniently locate urban activities and promote public and non-motorised transport**
Strategies:	a) Use walkable distance as the primary measure of accessibility b) Densify urban settlements, especially along mains transport routes, at modal interchanges and at other foci

	of opportunity c) Identify areas of highest accessibility that can be designed to maximize safe social and economic activity, especially for participants in the 2nd economy d) Restructure road networks to promote economic activity in appropriate locations e) Cluster community facilities together with commercial, transport, informal sector and other activities so as to maximize their convenience, safety and social and economic potential.
2.3.22 INTEGRATION OF URBAN ACTIVITIES	
Vlakkeland Rating : Compliant	
The principle of integration of urban activities is applied to the proposed development. All five major activities are available within 1km from the development and some of the major activities will be provided in the development.	
2.3.23 PROMOTION OF PUBLIC AND NON-MOTORISED TRANSPORT	
Vlakkeland : Compliant	
The proposed development takes access off Jan van Riebeeck Road which is earmarked as a BRT route and all residential precincts are within walking distance of public transport routes. The primary collector through Vlakkeland is also designed to accommodate cycle lanes.	
2.3.24 CREATING A REINFORCING AND INTEGRATING CIVIC FRAMEWORK AND DELIVERY OF SERVICES IN URBAN SETTLEMENTS WITH HIGH GROWTH POTENTIAL	
Vlakkeland Rating: Compliant	
The principle is supported and the facilities are located at points of highest access.	
2.3.25 CLUSTER CIVIC, COMMERCIAL AND RESIDENTIAL ACTIVITIES	
Vlakkeland Rating : Compliant	
The Vlakkeland development supports this principle as the required facilities are clustered.	
2.3.26 PUBLIC SPACE FOR PUBLIC LIFE	
Vlakkeland Rating: Compliant	
The urban design of Vlakkeland fully endorse this principle with a clear hierarchy of urban spaces, integrated with the nodal structure and road network, promoting community life and creating space for more informal activities, music, art, civic events, etc.	
AREA OF INTERVENTION : ENVIRONMENTAL SUSTAINABILITY – ENSURE THAT THERE IS SUFFICIENT ENVIRONMENTAL CAPITAL FOR FUTURE GENERATIONS	
Objective 8	**Protect biodiversity and agricultural resources**
Strategies:	a) Prevent the inappropriate conversion of biodiverse rich

	rural areas, existing agricultural activity and soil with agricultural potential and important cultural and scenic landscapes to other uses. b) Provide the highest protection to rivers and remaining areas of critically endangered biodiversity c) Cease urban development outside of Urban Edges
2.3.27 LAND USE MANAGEMENT	
Vlakkeland Rating: Compliant	
The land on which Vlakkeland is located has been classified in terms of the Broad Spatial Planning Categories in the Drakenstein SDF as being Urban Development.	
2.3.28 CORE AREAS	
Vlakkeland Rating : Compliant	
The land on which the proposed development is located is not within a 'core area'.	
2.3.29 BUFFER AREAS	
Vlakkeland Rating : Compliant	
The land on which the proposed development is located is not within a 'buffer area'.	
2.3.30 INTENSIVE AGRICULTURE AND AGRO-FORESTRY AREAS	
Vlakkeland Rating : Compliant	
The Vlakkeland development is not located on land with a SPC designation of 'Intensive Agriculture'.	
2.3.31 URBAN EDGES	
Vlakkeland Rating: Compliant	
The Vlakkeland development is located within the approved Urban Edge.	
2.3.32 DEVELOPMENT OUTSIDE THE URBAN EDGE	
Vlakkeland Rating : Compliant	
No development outside the Urban Edge is proposed for Vlakkeland.	
2.3.33 URBAN DEVELOPMENT	
Vlakkeland Rating : Compliant	
The proposed development is within the approved Urban Edge.	
2.3.34 PERI-URBAN SETTLEMENTS	
Vlakkeland Rating: Not applicable	
This objective relates to upgrading of existing peri-urban settlements and is thus not applicable to Vlakkeland.	
2.3.35 COASTAL AND RIVER BANK ZONES	
Vlakkeland Rating: Compliant	

All coastal eco-systems and riparian zones are sensitive. Wetland and Freshwater specialists in the person of Dr Bill Harding and floodline specialist Prof Sinske have been appointed to investigate the rivers, possible wetlands and floodplains that occur on the site and proposed that the rivers be channeled.
2.3.36 ADAPTING TO GLOBAL CLIMATE CHANGE AND SEA LEVEL RISE
Vlakkeland Rating: Compliant
The proposed development will comply with the required proposal made by the Wetalnd and Freshwater specialists in terms of channeling.

Objective 9	**Minimise the consumption of scarce environmental resources, particularly water, fuel, building materials, mineral resources, electricity and land.**
Strategies:	a) Enforce new building codes that require the reduction of water and energy consumption, and the use of renewable building material wherever possible; and, b) Restructure urban settlements so as to minimize the need to travel
2.3.37 WASTE WATER (SEWAGE) TREATMENT	
Vlakkeland Rating: Compliant	
Waste water from the proposed Vlakkeland development will be discharged by a new sewer line to the Mbekweni pump station. Sufficient bulk capacity is available at the Mbekweni Waste Water Treatment Works.	
2.3.38 BUILDING MATERIALS	
Vlakkeland Rating: Compliant	
The Vlakkeland development supports the principle, but being a subsidy based development, it may not be feasible to implement.	
2.3.39 WATER CONSERVATION	
Vlakkeland Rating: Compliant	
The Vlakkeland development supports the principle, but being a subsidy based development, it may not be feasible to implement.	
2.3.40 WASTE RECYCLING	
Vlakkeland Rating: Compliant	
The Vlakkeland development supports the principle, but being a subsidy based development, it may not be feasible to implement.	
2.3.41 NOISE AIR AND FUEL CONSUMPTION	

Vlakkeland Rating: Compliant
The Vlakkeland development will introduce a pedestrian/public transport orientated development with integration of residential neighbourhoods and community facilities to reduce transportation.
2.3.42 RENEWABLE ENERGY RESOURCES
Vlakkeland Rating: Compliant
The Vlakkeland development supports the principle, but being a subsidy based development, it may not be feasible to implement.

From the above summary it is clear that the application for the proposed development complies with the applicable strategies and objectives of the PSDF.

D-3.2.4 Drakenstein Spatial Development Framework

The proposed development is consistent with the key drivers on which the SDF is based as illustrated in the table below:

Table 10: Vlakkeland's Compliance with the SDF

SDF Proposal	Vlakkeland Rating	Motivation
The Drakenstein Housing Department has identified a number of current and future housing projects to address the need for housing in the area. One of these projects is a housing project on the Vlakkeland site.	*Consistent*	This is the implementation phase of the SDF proposal.
"The provision of social facilities must be seen in their broader context as contributing to the creation of community cohesion and a sense of place. Existing facilities are more often than not embedded within local areas making them relatively inaccessible to everyone accept those in their immediate vicinity. Constraints such as the availability of suitable land, public resources and building costs dictate a move away from local area orientated facilities towards shared facilities. To facilitate sharing, such facilities should, however, be located in a manner that is accessible to the greatest possible amount of users. Locations along important public transportation routes and at areas promoting clustering of similar facilities, present ideal opportunities for maximum exposure of facilities of this nature".	*Consistent*	Social facilities are provided along the major transport corridor and clustered for maximum exposure of facilities of this nature.

The movement and access proposals contained in this Spatial Development Framework is aimed at complementing the strong north-south linkages in the Paarl-Mbekweni-Wellington urban centre with east-west "integrators" providing improved linkages between historically segregated communities to the east and west of the Berg River	*Consistent*	The Vlakkeland development is located directly to the east of Jan Van Riebeeck Road and through the proposed east-west intersection from erf 557 to Vlakkeland will contribute to the east-west "integrators".
The potential for infill housing on sites identified through the urban audit of vacant and under-utilized land must be prioritised to promote the creation of a more compact urban form.	*Consistent*	The proposed Vlakkeland development is located to the south of Newton-East and is vacant under-utilized land.
Strengthening of east-west road linkages to aid integration of communities	*Consistent*	The Vlakkeland development proposes a new east-west road linkage, linking Mbekweni to Vlakkeland and thus promotes integration of communities.
The promotion of land uses to create clusters of community facilities, economic development and job opportunities along Jan van Riebeeck Road to improve access to facilities/opportunities for communities residing along its length; Attention should be given to "live/work" opportunities and high density residential development on land fronting onto Jan van Riebeeck Road and Van der Stel Street.	*Consistent*	The layout design make provision for clustering of community facilities at the point of highest access as well as "live/work" opportunities on the primary collector. High density development was provided along Jan Van Riebeeck Road.

From the above it is clear that the Vlakkeland development is consistent with the founding principles formulated in the Drakenstein SDF to guide future development along Jan Van Riebeeck Road and in the Mbekweni Area.

D-3.2.5 Triple Bottom Line

The three pillars of sustainability also referred to as the "triple bottom line" (PSDF 2009) are:

Ecological integrity (health of the Planet): This refers to the continued wholeness and success of the environment in terms of providing for and sustaining life on Earth or as a subset thereof such as a region or town, and concerns both the natural and the human-made environment. Due to the fact that the survival of species, including our own, ultimately depends on the ecology, ecological integrity is then the key factor in the environmental sustainability equation. The Vlakkeland development model is based on an approach whereby the integrity of the ecology and natural environment is respected and where the human-made environment is modeled to ensure a healthy and pleasant environment. To this end the Heritage, Botanical, Visual, Freshwater and Wetlands and Traffic impacts were assessed by specialists.

Social equity (situation of the people): Within a secure ecology, society can move towards needs fulfillment for all. Social equity refers to both material human wellbeing (the absence of poverty) and spiritual human wellbeing, i.e. provision of a physical and moral space where the continuity of a complex society and ecology is sought to be maintained and enhanced, and its health attained

The very essence of the Vlakkeland development model is reflected in its structuring of an integrated settlement pattern, social infrastructure and a range of housing opportunities are provided in an ecological environment that is maintained and enhanced, linked to an integrated system of open spaces and creational opportunities to ensure a physical and moral space for human wellbeing.

Economic efficiency (attainment of Prosperity): If human needs are met, society can seek prosperity through economic efficiency. This refers to the optimization of benefit at the lowest cost, i.e. optimal development must be achieved at the lowest possible cost – and moreover, to comply with the sustainability principle, taking all costs now and in future into consideration. The whole Vlakkeland development model is structured to attain economic efficiency in terms of efficiency for residents (i.e walkable neighbourhoods, integrated transport, proximity to community facilities, regional accessibility, etc). It is also structured to ensure the minimum cost to the environment to ensure the long term sustainability thereof.

D-3.2.6 Other Desirability Indicators

Other indicators having relevance to the desirability of the project is:

- The land is already in municipal ownership;
- Services can be provided with certain upgrades;
- The further degradation of the river systems can be addressed with proper channelization;
- The maintenance cost of the channelled rivers will be far less than the current degrading river systems;
- The channelling of the rivers will form an effective buffer between the development and the Heritage site to the south of the proposed Vlakkeland development;
- The development will enable proper access to erf 557 on the western side of Jan van Riebeeck Road;
- The housing need will be addressed.

SECTION E: PUBLIC PARTICIPATION

E-1 PUBLIC PARTICIPATION PROCESS

Public participation is the involvement of all parties who potentially have an interest in a development or project, or be affected by it. The principal objective of public participation is to inform and enrich decision-making. This is also its key role in the Scoping Report.

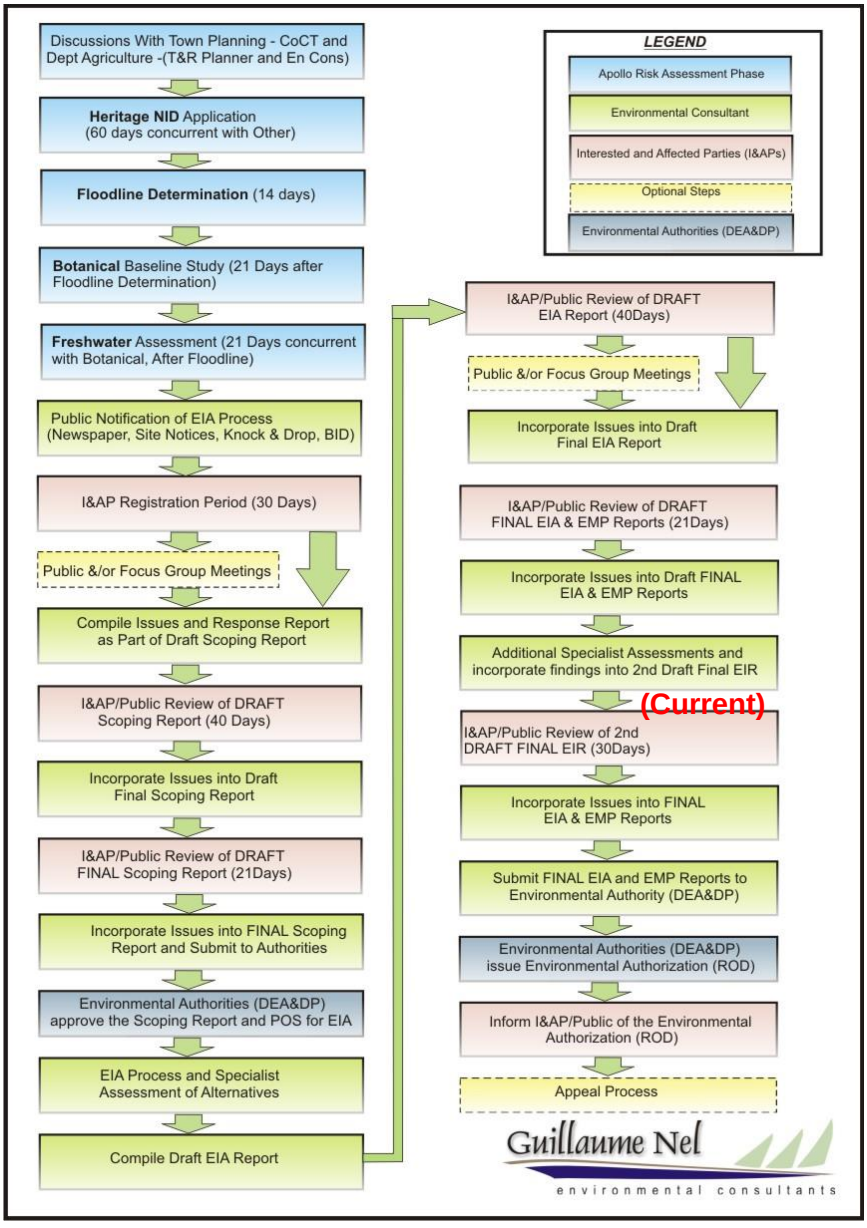

Figure 30: The Public Participation Process

E-2 PROCESS FOLLOWED TO DATE

E-2.1 First Public Participation (40 Day review) – 1t Draft Scoping Report

The required public participation processes during the review of the **1st Draft Scoping Report** was conducted from **09 May 2013 – 24 June 2013** (total of 46 days). This process included the following:

- Distribution of Background Information Documents (via hand) on the 09th of May 2013 to land owners within 100m from the boundary of the proposed development (these residents already received notifications via post)
- Erection of 7 site notices on and around the site at strategic locations;
- The placement of an advertisement in the Paarl Post on Thursday 09 May 2013;
- Registered letters to the following:
  - Adjacent land owners (they were also notified by Knock and Drop Letters)
  - Cape Nature
  - Department of Water Affairs
  - Department of Agriculture
  - Department of Transport and Public Works
  - Drakenstein Municipality
  - Ward Councillor
  - Department of Human Settlements

Comments on the 1st Draft Scoping report were incorporated in the 2nd Draft Scoping report.

E-2.1.1 Newspaper Advertisement

An advertisement, notifying the public of the Environmental Impact Assessment process and requesting Interested and Affected Parties (I&APs) to register with and submit their comments to Guillaume Nel Environmental Consultants (GNEC), was placed in the regional Afrikaans newspaper **Paarl Post on 09 May 2013**. I&AP's were given until **24 June 2013** to comment on the Draft Scoping Report. Please refer to Addendum for a copy of the newspaper advert.

E-2.1.2 Site notice

To inform surrounding communities and immediately adjacent landowners of the proposed development, **seven notices** were erected on site at visible and accessible locations close to the site on **Thursday 09 May 2013.**

E-2.1.3 Direct Notification of Identified I&AP

Key stakeholders comprising of the following sectors, were directly informed of the proposed development by post on the Thursday 09 May 2013.

- Provincial Authorities;
- Local Authorities;
- Ward Councillors;
- Non-governmental organizations;
- Directly adjacent landowners; and
- Other Interested and affected parties.

E-2.1.4 Concerns Raised by I&AP's

Interested and affected parties were to register by completing registration forms and forwarding comments by email, fax and telephone. The I&AP's comments were captured on a Comments and Response Report (CCR) and on a database, acknowledged and forwarded to the relevant specialists for their consideration – Where applicable.

E-2.1.5 Draft Scoping Report for Public Review

Comments on the report were incorporated into the 2nd Draft Scoping which was send out for further review.

E-2.2 Second Public Participation (21 day review) – 2nd Draft Scoping Report

The required public participation processes during the review of the **2nd Draft Scoping** Report was conducted from **25 July 2013 – 19 August 2013** (Total of 24 days).

This process consisted of the following:

Due to the fact that only a few responses from I&Aps residing in the surrounding area were received during the initial (40 day) PP process, it was the decision of the Independent Environmental Team to redo some of the actions which was already completed in the initial PP round. This included:

- Distribution of an additional 48 Background Information Documents (BIDs) (via hand) on the **25th of July 2013** to land owners within 100m from the boundary of the proposed development (these residents already received notifications via post and/or knock and drops);
- Erection of an additional 3 site notices on and around the site at strategic locations as the previous seven (7) was removed/stolen;
- Registered letters to the following:
  - All registered I&Aps
  - Cape Nature
  - Department of Water Affairs

- Department of Agriculture
- Department of Transport and Public Works
- Department of Human Settlement
- Drakenstein Municipality
- Ward Councillor
- Heritage Western Cape
- Drakenstein Heritage Foundation
- Paarl 300 Foundation
- ASKO

E-2.2.1 Site notice

To inform surrounding communities and immediately adjacent landowners of the proposed development, three additional notices were erected on site at visible and accessible locations close to the site on **Wednesday 25 July 2013**.

E-2.2.2 Direct Notification of Identified I&AP

Key stakeholders comprising of the following sectors, were directly informed of the review period by registered post on the **25 July 2013**.

- Provincial Authorities;
- Local Authorities;
- Ward Councillors;
- Non-governmental organizations;
- Directly adjacent landowners; and
- Other Interested and affected parties.

E-2.2.3 Concerns Raised by I&AP's

New Interested and affected parties were again to register by completing registration forms and forwarding comments by email, fax and telephone. The I&AP's comments was captured on a database, acknowledged and forwarded to the relevant specialists for their consideration. The issues were also captured in a Comments and Response Report (CRR).

E-2.2.4 Draft Scoping Report for Public Review

Comments on the 2nd Draft Scoping report were incorporated into the Final Scoping report, submitted to the DEA&DP as well as in the Environmental Impact Report (EIR).

E-2.2.5 Final Scoping Report

The Final Scoping Report was submitted to DEA&DP on the 5th of November 2013 and was approved by DEA&DP on the 19th of December 2013.

E-2.2.5 1st Draft EIA Report for public review

The 1st Draft EIR was made available for Public Comment from 17 February 2014 to 31 March 2014. Issues and/or concerns were incorporated and addressed in the 2nd Draft EIR to be submitted for a 21 day review period.

The 1st Draft Environmental Impact Assessment report combines the results of the specialist studies, a full assessment of the impacts (including cumulative) and proposed alternatives. An Environmental Management Plan (EMP), environmental impact statement and an authorisation opinion concluded the 1st Draft EIR.

E-2.2.6 2nd Draft EIA Report for public review

The 2nd Draft EIA report further combines the input from the professional team, NGO's and State Departments. Consideration was given to the input from the Registered I&AP during the review of the 2nd Draft EIR. The necessary changes were made to the 1st Draft EIR. The 2nd Draft EIR was again made available to all registered interested and affected parties for comment 21 day comment from 23 September 2014 to 17 October 2014.

The Final Report, to be submitted to the Department of Environmental Affairs and Development Planning (DEA&DP) will include responses received from NGO's, State Departments and other I&AP's during both the 1st Draft and 2nd Draft EIR Review periods.

E-3 COMMENT AND RESPONSE REPORT

Registered I&APS' concerns raised, as well as responses to these concerns, are detailed in the Comment and Response Report.

Table 11: Comments and Response Report

Issues / comment raised by:	Date	Means of communication	Issue / comment	Response
«Name»	«Date_of_Comms»	«Means_of_Comms»	«Comment»	«Response»
Shaun Dyers Heritage Western Cape	24 April 2013	E-mail	A Heritage Impact Assessment (HIA) is required consisting of a visual impact study assessing the impact of the proposals on the cultural landscape with an integrated set of recommendations. The comment of SAHRA has to be included.	Noted. A visual impact assessment, archaeological impact assessment and heritage impact assessment will be completed. Comments to the SAHRA site was included in the study.
«Name»	«Date_of_Comms»	«Means_of_Comms»	«Comment»	«Response»
Marlese Stone Department of Transport and Public Works	24 May 2013	E-mail	Dear Dané The notice of Environmental Impact Assessment Process for the proposed residential development on erven 8359, remainder of 8370, 8378, 8399, 8400, 12628, 12633, and 33027 in Paarl (DEA&DP REFERENCE NO: 16/3/1/2/B3/28/1006/13) has reference. This Department would like to comment as follows: During the planning phase of the project sufficient land must be reserved for future provincial infrastructure development (schools and health facilities) in the area.	Noted. The development proposes the construction of 2 secondary schools, 4 primary schools, 4 pre-primary schools, 11 cheches, 12 worship facilities, 1 library, 1 community centre and 1 clinic.
«Name»	«Date_of_Comms»	«Means_of_Comms»	«Comment»	«Response»

Alana Duffell-Canham Cape Nature	27 May 2013	E-mail	1. The proposed development site was covered mostly by Swartland Alluvium Fynbos with Swartland Shale Renosterveld occurring in the south-western part of the site. Both of these vegetation types are considered to be Critically Endangered. Although much of the site appears to be degraded and transformed there are still some natural vegetation remnants which may be of conservation value. We are therefore pleased to note that a botanical specialist will be involved in the next phase of the environmental impact process. 2. We are also concerned that the proposal plans to completely divert the streams and drainage channels on site. This should only be done if absolutely necessary with advice from a freshwater specialist as well as a geohydrologist. 3. There are also wetland areas on the site. Wetlands provided a number of valuable ecosystem services. Even degraded wetlands with little or no indigenous vegetation may provide valuable functions and therefore should not be lost. The full extent of permanent and seasonal wetlands should be determined as well as buffer zones before the development layout/design is finalised. Wetland delineation and buffer determination should be done by a suitably qualified wetland/freshwater specialist.	Although a Baseline Botanical Assessment was conducted, an additional study will be carried out during the winter to ensure a proper assessment of the plants on this site. A botanical assessment will therefore be conducted by Dave Mc Donanld in every season to ensure a diligent assessment and will be included in the EIR. Botanical assessments of the site took place in May 2010, November 2008 and June 2013. All sensitive areas will be avoided. The streams will be realigned to its original alignment. A Freshwater Study, flood line assessment, Geotechnical and SWMP was conducted and the proposal to re-divert the streams to its original alignment is supported. The freshwater specialist confirmed no wetlands are present on the site.

			4. It is important that stormwater is planned for and managed in such a way that the natural environment is not impacted on. Planning should include consideration of where stormwater will be discharged and if it will be treated prior to discharge (for example by retention dams and/or artificial wetlands). CapeNature does not support the discharge of stormwater directly into rivers or sensitive wetlands.	A pre-liminary location for a stormwater retention pond have been allocated and will be assessed. The watercourses will receive the necessary buffer areas and the watercourses will be delineated. The necessary storm water retention is planned. Large retention ponds will be constructed which will also act as polishing facilities.
«Name»	«Date_of_Comms»	«Means_of_Comms»	«Comment»	«Response»
Cor Van Der Walt Department of Agriculture	27 May 2013	Post	The Western Cape Department of Agriculture has no objection against the proposed residential development on Erf No. 8359, Erf No. 8370, Erf No. 8378, Erf No. 8399, Erf No. 8400, Erf No. 12633, Erf No. 12628, Erf No. 33027, Paarl. The said properties lie within the urban edge and forms part of the proposed development within the Spatial Development Framework. Please note: Kindly quote the above-mentioned reference number in any future correspondence in respect of the application. The Department reserves the right to revise initial comments and request further information based on the information received.	Noted. Thank you.
«Name»	«Date_of_Comms»	«Means_of_Comms»	«Comment»	«Response»
Chris Bornman	28 May 2013	E-mail	Dear Dané,	Thank you for registering.

			I would like to register as an Interested and Affected Party for the proposed Rezoning and Residential Development project in Paarl. The GNEC Reference number is (70055) and the DEA&P reference number is 16/3/1/2/B3/28/1006/13	Confirmation that you are Registered
«Name»	«Date_of_Comms»	«Means_of_Comms»	«Comment»	«Response»
Nadia Gericke Mountain Rest Committee	21 June 2013	E-mail	ATTENTION: DANE VERMEULEN Attached please find the completed registration and comment sheet. Concerns about refuse & sewerage disposal. The proposed site is being used as an informal dump site at present, and the local authorities are not resolving this issue. Sector policing is currently not sufficient to service the area.	Registered. Noted. The proposed development will deal with the current dumping of material on this site. This is a problem with these large open areas in the Urban area.

«Name»	«Date_of_Comms»	«Comment»	«Response»
Arabel McClelland Department of Environmental Affairs and Development Planing	21 June 2013	Please note that the above application is made in terms of NEMA EIA Regulations 2010 only and reference to the 2006 EIA Regulations, as noted on page vii, is not applicable. Please note that the competent authority for this application is the Department of Environmental Affairs and Development Planning (DEA&DP) and not the Department of Environmental Affairs and Tourism (DEAT), as stated on the title page (incorrectly refers to DEAT Reference) and page 55. Some of the maps and layouts provided on A4 in the draft Scoping Report are illegible. Please ensure all maps, layouts and Site Development Plans are provided on A3 to allow for clear reading. According to the locality map provided (Figure 1), it appears that not all the affected erven that the proposed development site falls across have been listed in the Application Form as well as the draft Scoping Report. As such, it is requested that the application Form is duly amended and resubmitted to this Directorate to ensure that the property details listed correspond with the erven included as part of the development proposal. The Department notes the proposed development's intention to "realign and divert" existing watercourse on the site to drain into a storm water drainage system. It is requested that a freshwater specialist provide input with regards to the feasibility and potential impacts of this proposal. Further to the above, comment must be obtained from the Department of Water Affairs. Given the nature of the site, the proposed development and the reliance of the site's functioning on an effective storm water management system, a Stormwater Management Plan must be compiled and included in the EIA report. According to the provided list of State Departments notified of the draft Scoping Public Participation Process, the Department of Transport and Public Works and the Department of Human Settlements were not consulted, as requested in the DEA&DP's acknowledgement letter, dates 23 April 2013. It is requested that these departments are included in the consultation process as stakeholders going forward. In addition, it is	Noted, and will be addressed in the Final Scoping and was changed. The correct Competent authority is referenced. All maps will be provided in A3 and was made more legible. A more accurate locality map will be provided, indicating the erven in question. A new application form will be attached to the final coping Report. A freshwater, floodline and geotechnical assessment will be conducted and the proposed drainage system will be assessed. Application for a Water Use Licence is underway. DWA is also a registered I&AP. Comment from DWA is included in the Scoping Report and proof of submitting a WULA will be submitted as part of the Final EIR. A stromwater management plan will be included in the EIR. Large retention areas are planned in the south western corner of the site. This will also act as polishing facility for storm water. The Department of Transport and Public Works and the Department on Human Settlement were given the opportunity to comment Draft Scoping report. HWC is also an I&AP. The Guidelines as requested by DEA&DP were addressed in the Scoping and EIA Report. These items were incorporated into the report. The Needs and Desirability for the proposed development was addressed and will be included in the

		requested that Heritage Western cape is included as a stakeholder and notified as an authority. Please note that the Department must be informed of the notification of the aforementioned State Departments in order to give effect to section 240(2) and (3) of the National Environmental Management Amendment Act ("NEMA") (as amended). You are advised that in undertaking the Scoping and EIA process you must take into account the applicable guidelines developed by the Department. Other guidelines not referred to in the draft Scoping Report that may be applicable to the proposed development include, inter alia, the following: Guidelines on Need and Desirability, March 2013; Guideline on Public Participation, March 2013; Guideline for involving Heritage Specialists in EIA Processes, 2005; In terms of the NEMA EIA Regulations 2010, when considering an application, the Department must take into account a number of specific considerations including inter alia, the need for and desirability of any proposed development. As such, the need for and desirability of the proposed activity must be considered and reported on in the Scoping and EIA Report. The Scoping and EIA report must reflect how the strategic context of the site in relation to the broader surrounding has been considered in addressing need and desirability. In the Department's opinion, this aspect is not sufficiently addressed in the draft Scoping Report and should be expanded on in the final Scoping Report and EIA phase. This is with particular respect to the both the greater development as well as its constituent components. It is recommended that the Department's latest Need and Desirability Guideline (March 2013). Available on the abovementioned website, should be referred to in this regard. According to the site description, the site originally contained Swartland Alluvium Fynbos with Swartland Shale Renosterveld occurring in the south western portion of the site. These vegetation types are considered to be Critically Endangered in terms of Section 52 of the National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004). Although the site has been describes as largely transformed, a critical Biodiversity Area (CBA) is noted and remnants of natural vegetation may still be in existence, as identified in table 3 of section F-2 (page 34). Given the above, the	Final Scoping Report and EIR An entire section focusses on the need and desirability. Access alternatives, layout alternatives and stormwater retention layout alternatives were included in the Final Scoping. The cumulative impacts were addressed in the Final Scoping. The socio-economic impacts have been addressed in the Final Scoping. A Botanical Assessment will be undertaken as part of the EIA process and will address these issues. Activity 12 of Government Notice No. R546 (Listing Notice 3) was included in the Scoping Report. Botanical included.

		Department advises that should 300m2 or more of vegetation where 75% or more of the vegetative cover constitutes indigenous vegetation is cleared, Activity 12 of Government Notice No. R546 (Listing Notice 3) will be applicable. It is noted that input from a botanical specialist has not been included in the Plan of Study for EIA. It is therefore required that a botanical impact assessment be included in the list of specialists studies identified in the Plan of Study for EIA. Regulation 28 (1) (c) stipulated that a Scoping Report must contain a description of any feasible and reasonable alternatives that have been identified. It is indicated that the only alternatives considered that will be assessed in the EIA phase, in addition to the no-go option, is the development with or without a cemetery. Given the scale, location and nature of the development, consideration must be given to additional alternatives, such as layout, activity, operational and technology alternatives, to avoid negative impacts, mitigate unavoidable negative impacts and maximize positive impacts. Regulation 28 (1) (g) and Regulation 31 (1) (l) requires a description and assessment of each identifies potentially significant impact to include cumulative impacts. Although brief mention has been made that the cumulative impacts of the development in its entirety will be ascertained, the cumulative impacts have not been included in the methodology associated with the assessment process or identified environmental issues in Section G. it is requested that provision for identification, description and assessment of cumulative impacts is included in the final Scoping Report and Plan of study for EIA. Furthermore, the degree to which the impact may cause irreplaceable impacts as per Regulation 31 (l) (vi). Further to the above, the Department notes that the potential socio-economic impacts associated with the proposed development have not been identified in Section F. Please note that the Final Scoping Report must include the following; Proof that notice boards, advertisements and notices notifying potentially Interested and Affected Parties ("I&APs") of the application have been displayed, places or given.	Alternatives were addressed in the final Scoping Report. More alternatives will be addressed during the EIA phase of the project. This will be addressed in detail during the EIA phase of the project. The cumulative impacts will also be assessed. The people renting the properties on site will be moved. No other persons currently reside on the site Proof was provided as part of this report. Included here in this I&RR. Included

		A list of all persons or organisations that were identified and registered as I&APs. Any representations and comments received in connection with the application or the Draft Scoping Report. The minutes of any meetings held by die Environmental Assessment Practitioner ("EAP") with I&APs and other role players that record the views of the participants. Any responses by the EAP to those representations, comments and views. A summary of issues raised by I&APs, the date of receipt of and the response of the EAP to those issues.	
«Name»	«Date_of_Comms»	«Comment»	«Response»
André Jonker	22 June 2013	Attention Dané Vermeulen Attached, please find "REGISTRATION AND COMMENT SHEET" for Andre Jonker as affected party. The Paarl central business district suffers traffic congestion. Roads leading to Paarl are insufficient to cope with current population and business needs. Developing the Vlakkeland area without consideration for Paarl infrastructure will be negative economically for the whole region.	Registered. Noted. A traffic impact assessment will be conducted to ensure the functionality of the surrounding road infrastructure. The correct and safe distances will be used for proposed traffic lights. This development will take the Paarl Infrastructure into account and is being undertaken with the help of the Drakenstein Traffic and Engineering department

«Name»	«Date_of_Comms»	«Comment»	«Response»
Masela Blantina Ramaite Department of Water Affairs	05 July 2013	Freshwater studies must be conducted as the proposed development will encompass the realignment and diversion of the Kleinbosch and Mbekweni Rivers which reside over most of the western side of the site. Please note that any watercourse diversion or realignment (temporary or permanent) triggers section 21(c) and (i) which requires a water use authorisation according to the Department's regulations. Wetland Assessment has to be conducted to confirm any existing wetlands on site as any development within 500m from the boundary of a wetland constitutes a water use licence according to the Department's regulations. It is indicated on page 24, section c subsection 1.3, that the Kleinbosch and Mbekweni Rivers' flood lines may rise during the rainy winter season. How will this be managed or avoided as will pose health risk to the "then" residents. Furthermore any development within the 1:100 year flood line or 100 metres from a watercourse of riparian habitat constitute a water use authorisation. Please specify how stormwater retention ponds will be dealt with. It is stated that the construction of a cemetery might also form part of the development. Please indicate in the final scoping report whether the cemetery will be part of the proposed development. All the requirements of the National Water Act 1998 (Act No. 36 of 1998) and other relevant legislation must be adhered to all times.	A freshwater study will be conducted and included in the EIR and will focus on the realignment of the river and the possible wetlands on the site. A water Use Licence forms part of this assessment and will be submitted to DWA prior to submitting the final EIR An aquatics study will be conducted to determine if any vulnerable wetlands occur on the site. A stormwater management plan will ensure the efficiency of stormwater run off. This will be include in the EIR. The entire management of the Stormwater and the management of safety of people on the proposed development will be addressed in the floodline report and engineering documents which will form part of the EIR. At the end of the Scoping Phase, it looks like the cemetery will not form part of the development. The EIA report will focus on the Detention ponds and will include a detailed Stormwater Management Plan (SWMP)

«Name»	«Date_of_Comms»	«Comment»	«Response»
Jimmy Knaggs Drakenstein Municipality	27 July 2013	An environmental management plan (operational) is requires for the whole development including any remaining remnants of natural vegetation, including but not limited to, The bio-diversity corridor formed by any river (as determined in the River Environmental Management Plan), All wetland areas (including a buffer around them as determined in the EMF) A buffer/transition area /zone as determined in the EMF adjacent to any large natural area whether declared as a nature reserve or not, Any special habitat areas (such as silcrete patches) and the buffer zone around them as determined in the EMF. A botanical assessment was conducted by Nick Helme Botanical Surveys in 2008 for municipal properties in the vicinity of farm 361 and included the proposed development erven in this proposal. The assessment found that the primary area of botanical concern lays east of old sewer evaporation ponds. Even though this area supports some patches alien invasive trees and shrubs, the vegetation is less disturbed here and consequently supports more diverse indigenous flora with at least 9 rare species. There is a high possibility of additional rare species being present in this area. The study proposed that this area be conserved and managed as a single conservation area.	A meeting was held on the 26th of August 2013 with Jimmy Knaggs, Bill Harding and Gerhard Nel to address the issues raised in Jimmy Knaggs' report. Meeting notes: Confirmation that the Re-alignment of the Kleinbosch river will be to its original location. Confirm if Sinske took SAHRA property runoff into consideration (Lyners aksie). Did Sinske use 1:50 or 1:100 to cater for river finding its natural course (Lyners). Discussion around bulks and the cost thereof and if the cost of bulks outways the cost of purchasing new land for development . Sinske to look at water runoff next to Newton (meet with neighboring developer). General discussion around flood lines and the following options were put on the table a) stay as is i.e no go in river areas b) canalize as naturally as possible. If canalize design to guarantee that it will work long term and that it should be self maintaining. A Bio-diversity corridor will form part of the diverted rivers. The Kleinbosch river to be realigned to its original alignment. Confirmation was received on the 30th of June 2014 from CREW SANBI (included in Addendum F3.3) that no additional Botanical areas are known on this site All

«Name»	«Date_of_Comms»	«Comment»	«Response»
			botanical areas are included in the "no-go" areas as per the Preferred Alternative.
«Name»	«Date_of_Comms»	«Comment»	«Response»
Jimmy Knaggs Drakenstein Municipality	27 July 2013	The study also highlighted that the wet area below the ponds need further assessment at an appropriate season as it's known to support the endangered bulb Haementhus pumilio which is most easily visible when if flowers between March and April. CREW and Botsoc needs to be included in this investigation. A thorough botanical assessment must be submitted with the environmental impact report which must consider the recommendations specified in the 2008 botanical assessment. This assessment must be at least a three season assessment autumn, winter and spring. The Drakenstein Environmental Management Framework indicates that there are wetlands present within the proposed development area. All wetlands or sponge areas shall be considered as "no-go" areas. No development will be allowed in these areas and a buffer as required in the EMF will be applied around these areas, measured from the wetland boundary. The freshwater assessment must include a site specific wetland delineation, but identify all wetlands delineation, but must also take into account those area of a similar nature adjacent to the site, to identify all wetlands within the site and to provide suited setback lines as well as assess the potential impacts that may arise from any development or associated infrastructure. The determination of	Buffers will be allocated to botanical and freshwater areas.assessment of Nick Helme was taken into consideration. This area will be reassessed during the correct time of the year. Sensitive areas will be regarded as no-go areas. We will therefore work from three assessments: Nick Helme (2008), Dave McDonald (2010) and Dave McDonald (2013) Re-assessment. Wetland will be assessed This will form part of the EIA process. Bill Harding (Wetland Specialist) to work closely with Jimmy Knaggs on this matter. WULA will be applied for. Wetland areas will be avoided.

«Name»	«Date_of_Comms»	«Comment»	«Response»
		a boundary of the wetland must be based on soil, vegetation or hydrological indicators as found in the DWA manuals. Drakenstein does not support the infilling of wetlands under any circumstances. This proposed development is situated at the confluence of a number of rivers and minor water courses and this aspect needs to be studied carefully to evaluate the value of this feature within the drainage pattern for the area. Note no seepage water drainage will be allowed in the development. The Drakenstein Environmental Management Framework indicated that the south western portion of the proposed development is within the 1:50 year flood line. It is required that a site specific floodline determination for both the 1:50 and 1:100 year be determined and included in the freshwater assessment. The recent declaration of Intent by the Mayor and municipal Manager sets ethos and ethical standard for all development near/adjacent to rivers. Experience has shown that one cannot successfully "move" rivers and any such suggestions are not supported. No machinery shall be used within the stream channel. Although it is agreed that most of the riparian habitat is somewhat to seriously compromised that is no excuse to destroy it all, remember a habitat or ecosystem can be restored but can never be recreated at another place. All invasive alien vegetation shall be removed from the riparian zone and this area shall be rehabilitated using local indigenous species. Should the development be approved then a search and rescue shall be conducted during the winter and early spring prior to the start of construction.	River to be realigned to its original location. This will be dealt with during the WULA These issues were included in the Freshwater assessment as well as the Revisit of the Freshwater Specialist during the EIA Process. It was further addressed in the Hydrology assessment by Graeme McGill. A Floodline study was conducted by Dr. Sinske of Stellenbosch. Please note that the river will not be realigned but will be aligned back to its original alignment.

«Name»	«Date_of_Comms»	«Comment»	«Response»
		All viable plants i.e. young plants and those able to re-sprout are to be dug up from the construction site, planted into bags, grown and stored under nursery conditions all to accepted horticultural practice and used for rehabilitation of the construction site and surroundings once construction has been completed. These plants shall also be used in the properties adjacent to the conservation areas and riparian areas as no non local indigenous species will ne allowed in these properties. All ripe seed is to be collected for later redistribution. All nonviable vegetation is to be removed, chipped and stored for use as mulch. Top soil to a depth of 300mm is to be removed from the construction site and is to be stock-piled and re-used during rehabilitation. In the event that construction carries on into the rainy season provision must be made to prevent any soil erosion whatsoever. The construction site is to be rehabilitated by replacing the top soil and mulching with all the nonviable vegetation that has been chipped. All the plants that have been kept in the nursery must be replanted to the satisfaction of the Environmental Management Department; a minimum of a one year maintenance period will be instituted on completion. This will include replanting of any areas in which none of the rehabilitation work has been successful. A geotechnical investigation is required to assess the suitability and the feasibility of the proposed development site from a geotechnical perspective and to provide an overview of the founding conditions for structures, to identify the presence of problematic conditions, assess subgrade conditions for roads as well as the excavation	Included in the recommendations and CEMP The topsoil was removed, therefore topsoil will be used for the filling of the western portion of the site. To be included in the EMP This was undertaken. Please refer to Addendum F10.

«Name»	«Date_of_Comms»	«Comment»	«Response»
		conditions for the installation of underground services. No ground water source is to be compromised due to the development. The requirements of the National Water Act (Act no.36 of 1998) and the National Environmental Management: Waste Act (Act no 59 of 2008) shall be adhered to throughout the construction and operational phases of the activity. The entire project shall be covered by one comprehensive construction environmental management plan and be overseen by a single Environmental Control Officer. The ECO shall conduct monthly audits the results of which shall be submitted to the Environmental Management Department. The Environmental Management Department shall be present at all site meetings. No disturbance, maiming or killing of any living creature will be tolerated No damage or pollution to the environment whatsoever will be tolerated outside the construction site. Dust suppression measures shall be specifically dealt with. No indigenous plant material is to be removed from the site. All work in the rehabilitation and riparian areas is to be carried out by hand as far as possible. Any machinery used on site must be in good state of repair with no leaks what so ever. If any oil / fuel chemical spills do occur, they are to be contained and the incident is to be treated as a section 30 incident until proved otherwise and shall immediately be reported to the Environmental Management Department. Once construction is completed all waste materials and contaminated subsoil is to be removed and disposed of at an	An Application in terms of NWA was submitted on the 15th of April 2014. Please refer to Addendum C-4 for a copy of the proof of submittion. Included in the EMP and EIR recommendations

«Name»	«Date_of_Comms»	«Comment»	«Response»
		acceptable registered landfill site outside the development, proof of compliance shall be required. No fires will be allowed on the construction site or surroundings. On completion of construction prior to rehabilitation an inspection by the Head Environmental Management or his appointee shall be carried out. A final inspection will carried out once rehabilitation has been completed. A proper analysis of the stormwater run-off is required, only predevelopement run-off will be allowed into the existing system. The flood mitigation plan for Mbekweni as designed by Ninham Shand must be implemented and incorporated into the design of any stormwater detention facility. Pollution control must be instituted al all stormwater outfalls. No development is allowed within the 1:100 year flood line. The sustainability of the project needs to be analysed in the light of the fact that Drakensten is no longer sustainable on a number of fronts. To this end the latest SOER document and the 2012 NEMA section 16 report need to be consulted. An analysis of the eco/carbon footprint of the development due to the construction of non-renewable resources must be carries out for the actual construction phase and for the operational phase and mitigation measures are to be developed and implanted simultaneously with the project. As the effects of climate change are uncertain at this stage the most probable scenario as contained within the Provincial Climate Change policy is to be adopted for this project and all alternatives must include this in any multi criteria decision making model. In	Included in the SWMP Part of the EMP To be included by the Engineers assessments. This is agreed to. The EMP will be compiled in such a manner.

«Name»	«Date_of_Comms»	«Comment»	«Response»
		these models the social component shall not have a weight in excess of any other component. A bulk service capacity analysis needs to be carried out so as to quantify any required upgrading. Any alterations to the existing road network will be the responsibility of the developer, including design, approval and construction of any extra traffic control and or traffic calming as detailed in the TIA. A waste recovery/recycling initiative is being implemented in Drakenstein and the development will have to be prepared to comply with any requirements once the project is finalized.	Included in the TIA Waste management Plan is part of the EMP
«Name»	«Date_of_Comms»	«Comment»	«Response»
Alana Duffell-Canham Cape Nature	08 August 2013	• The proposed development site was covered mostly by Swartland Alluvium Fynbos with Swartland Shale Renosterveld occurring in the south-western part of the site. Both of these vegetation types are considered to be Critically Endangered. Although much of the site appears to be degraded and transformed there are still some natural vegetation remnants remaining. Since our last comments dated 27 May 2013, we have been provided with additional botanical information and have been able to access information for a part of the site (previously known as farm 361) which is now incorporated into this application. • CapeNature visited this site in Spring of 2008. This visit, together with the information provided by Nike Helme in 2008, and the more recent information from Dave McDonald in 2013, confirms that this part of the site is of high conservation value at	A botanical assessment of the entire site will be carried out, All botanical sensitive areas to be regarded as no-go areas. Three assessment s will be used for this project. The proposed development will take all of this into consideration and will avoid rather than mitigate. Plans to protect and mitigate will be included in the Final EIR

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		a regional scale with more than 15 rare and/or endangered plant species already identified. • Although the entire vegetation remnant is relatively small, it is likely that this fragment falls in the top 1 percentile of large functional remnants of this critically endangered vegetation type. • None of this habitat fragment should be developed, as even where degraded the surrounding habitat is likely to support ecological processes (e.g. pollination) and thus plays an important role in the long term viability of the remnant. Any further loss will make the remaining habitat less viable in the long term. We therefore do not support any development, including a cemetery on this site. CapeNature does not consider search and rescue a suitable mitigation measure in this case. • Plans to manage the north-eastern most part of this application area (now erf 33027 and the eastern portion of erf 8378) as a conservation area by the municipality should be revisited. The land swap undertaken between the private landowner and the municipality was done with the intention that the natural vegetation on farm 361 is which was proposed on a portion of farm 361 and Erf 1254) and yet this application will result in complete transformation of this site.	It will all be protected and no development will be allowed on this section of the property. This section will also act as a Visual and Heritage buffer with no development allowed. Due to the presence of endangered vegetation, the cemetery will no longer be planned in this area. After the Botanical assessmets, it was decided to remove Erf 33027 from the proposed development area. This erf and the botanically sensitive area on erf 8378 will be regarded as no-go areas and will be protected from development. The no-go area to the east of the Vlakkeland development and this erf will be connected and linked to each other.

«Name»	«Date_of_Comms»	«Comment»	«Response»
Y L Immelman (Adams) Shekinah Lodge Bodal rd	18 August 2013	We have received notification of the imminent development that is proposed for the open tract of land directly opposite our property. WE OBJECT IN THE STRONGEST POSSIBLE TERMS! 1. This area is a wetland area. During winter, this area is an absolute picture perfect wetland – see photos of wetlands attached. On the sunny days, the area is massed with flowers and birdlife – our version of the West Coast flowers! See photo of the flowers attached. Unfortunately the photos of the flowers are not the clearest as they were taken on a cell phone but it gives you a good idea. 2. In 2007 we bought this property with the express purpose of leaving the suburbs with high density dwelling and loads of neighbours and settling in a country setting not far from the towns. We found our property on Bodal road. It is our little utopia. Peaceful and quiet with stunning views. 3. We have been really happy here and have begun to develop our property with a view to it increasing in value and utilising it as our retirement in the future. 4. We are now advised that our peaceful utopia is to be converted into a situation where we will find ourselves with thousands of neighbours! Right on our doorstep! Our view is to be of thousands of tiny little 40 square meter houses and related "developements and additions". 5. How are families able to live in 40 square meters? The largest housing erf on the proposed plan is 152 square meters with the smallest erf being only 91 square meters! History has shown that this type of housing will lead to shacks ("Developments and additions") being built out the sides and backs of the brick building	An aquatics assessment will be conducted to determine if any viable wetlands are present on the site. A Botanical Assessment will also be carried out and all sensitive areas will be excluded from the development plans. A buffer area of 120m is proposed between your residence and the proposed development. This area will be landscaped with trees for a further visual screen. The Botanical sensitive area will remain as is with no development. Please note that this site is located within the approved Urban Edge of the Drakenstein Municipality. Houses to be build will be in accordance with RDP housing. Please note that Gap housing will also be provided. A 120m buffer area will also screen your house from the proposed development. The house sizes are determined by the Department of Housing. The idea is to try to move away from shack development. No access to Bo Dal Road is planned.

		and in no time at all will land up looking similar to a squatter camp. See attached photos. 6. The traffic that this development will bring will increase the noise and safety risks on Bodal Rd. Since the tarring of this road, it has become a racetrack and we feel that it is only a matter of time until this road leads to fatalities and life loss. A number of animals have already lost their lives on this road. The proposed road entering into this development is directly opposite our property. This in itself will lead to a major increase in traffic past our property. We work with dogs and needed an area where dogs barking would not be disturbing to the neighbours. Should this development go ahead, passing traffic and pedestrians will incite the dogs into barking more resulting in a noisier neighbourhood and possibly leading to complaints. 7.What is to become of all the trees and indigenous vegetation in the area to be developed? 8. This type of development will lead to a snowball effect with all the surrounding areas being bought up and used for low cost housing. The end result of all of this will be a drastic drop in the value of our property in addition to our lifestyle being changed for the worst. We will no longer be able to sell our property with a view or a peaceful country lifestyle. 9.The visual impact of this development from our side is huge! 10. The "buffer" zone or greenbelt that is proposed to run parallel with Bodal rd is nowhere near wide enough. From what we could make out on the plans, it would place the first row of houses right in the wetlands! This is not ideal for either the future homeowners or ourselves. 11. The police are currently unable to service the properties that are already here. How is it proposed that they service this new	There will therefore not be an significant traffic impact in the area. This can not be contended but it should be noted that the site is within the urban edge and was deemed for development. The traffic impact assessment is to address all possible impacts on traffic. The noise levels will rise. This will however be a residential development and not an Industrial development. The buffer of approved 100m (20m from the edge of the development (next to the Bo Dal road))will further screen noise. The indigenous vegetation is to be protected. No residential development will occur on areas with sensitive vegetation. Only access roads will be allowed through the buffer areas. Trees found on site is mostly exotic and invasive aliens. The Botanical, Heritage and Visual Buffer of approx.. 120m will mitigate this impact. It was confirmed by a Freshwater specialist (Dr. Bill Harding) that no wetlands are present on the site. The old sewage evaporation dams must not be regarded as wetlands.

		development as well? History has also shown that in high density living areas, crime increases. This is all unacceptable to us! In summary: our peaceful country lifestyle with a low crime rate on a property with a stunning view is to be changed into a noisy area with high density housing which history tells us will become an area similar to a squatter camp with a high crime rate. Our green wetland country view is to be replaced with a view of high density housing resembling a squatter camp. This proposed development will have a serious negative impact of the lives of those owning or living on farms and small holdings along Bodal Rd as well as the environment. Please note our strongest objections to this project. Thanking you	With more people residing in the area, more Police will be required. GNEC cannot argue with the facts as you mentioned.
«Name»	«Date_of_Comms»	«Comment»	«Response»
Mr Ralf Obry Proud Heritage Prop. Good Hope Farm	26 August 2013	Already enough traffic on Bo Dal Road, also heavy traffic danger for primary school and kindergarten. Have you seen the site after heavy rains? Wetland – too cost intensive, we are against the development: more traffic, more noise, less value for our property.	A traffic impact assessment will be conducted to determine the impact of the proposed development. An aquatics study will also be conducted to establish whether or not wetlands are present on the site. The roads will have to be upgraded to cater for additional traffic. Please note that no access to Bo Dal Road is planned as part of this application.

«Name»	«Date_of_Comms»	«Comment»	«Response»
Dr E Albertyn (Consultant Paarl 300 Foundation)	30/08/2013	PROPOSED RESIDENTIAL DEVELOPMENT (VLAKKELAND) ON ERF 8359, RE/ERF 8370, ERF 8378, ERF 8399, ERF 8400, ERF 12628, ERF 12633 AND ERF 33027 IN PAARL, WESTERN CAPE. DRAFT SCOPING REPORT (SECOND PP) (DEA&DP REF:16/3/1/2/B3/28/1006/13) The Paarl 300 Foundation is concerned about the heritage and the visual impact of the site and would like to comment on the final HIA (after the proposals have been assessed) before the latter report is submitted to HWC. Thank you for the opportunity to comment.	A HIA, AIA and a VIA will be conducted to determine the full extent of the impact of the proposed development on the area. An ROD from Heritage Western Cape has been received on 20 August 2014 Please refer to Addendum E-2
«Name»	«Date_of_Comms»	«Comment»	«Response»
Chantelle de Kock AKSO	05 September 2013	Hi AKSO had a look at the scoping documents and the draft HIA. On 4 September 2013. The committee would like to see the final specialist studies such as the VIA and the final HIA before commenting on the application. Regards Chantelle	Ms De Kock will be provided with the requested documents as soon as it is made available. Please refer the documents as part of the EIA Report and please provide further comments

«Name»	«Date_of_Comms»	«Comment»	«Response»
Faisal Fakier Department of Public Works and Transport	13 September 2013	Your letter dated 25 July 2013 refers. The Branch would like to register as an interested and affected party. The proposed development will generate significant traffic and a Traffic Impact Assessment will be required when the application in terms of LUPO is made. The proposal affects various roads of different categories that will no longer be a Provincial concern with respect to road maintenance, as Section 66 (3) of the Roads Ordinance would apply. Sections of MR201, DR1119 and and OP5262 are affected. This Branch offers no objection to the proposed development, however, it would require the matters noted above to be addressed at the appropriate stage of the project. Faisal Fakier Pr. Eng.	A traffic impact assessment will be conducted. Thank you.
«Name»	«Date_of_Comms»	«Comment»	«Response»
Cathy Raymond Drakenstein Heritage Foundation	08 October 2013	RE : DEA&DP REF : 16/3/1/2/B3/28/1006/13 Vlakkeland The DHF has no objection in principle to the proposed development on the erven mentioned in the final scoping report of September 2013. Kind Regards, Cathy Raymond SECRETARY	Thank You
«Name»	«Date_of_Comms»	«Comment»	«Response»
Marlese Stone Department of Transport and Public Works,	21 February 2014	Kindly note that in terms of this Department's norms and standards, the required land extent for a Primary School is 2.5 ha and for a Secondary School is 3.5 ha.	Comment from Western Cape Government Department of Education: Infrastructure Planning and Management have indicated that the appropriate size for Secondary

Western Cape Government		Furthermore, it would be appreciated if the subject properties be rezoned for educational purposes.	Schools are 3ha. This has been indicated on the layout design (Figure 17) The rezoning of the subject properties will be applied for during the LUPO Application and does not form part of the EIA process.
«Name»	«Date_of_Comms»	«Comment»	«Response»
Alana Duffell-Canham Cape Nature	25 February 2014	1. We are pleased to note that Erf 33027, which is of very high botanical value, has been removed from the development application area. We note that it is proposed to set aside this area as part of a public open space area. Although we support this site being conserved we are concerned that insufficient consideration has been given towards adequate protection of the site into perpetuity. Recommendations as to how will it be protected from degradation as a result of grazing, trampling, dumping etc. during the operational phase of the development need to be provided. We note that it is proposed to erect bollards around the site to prevent vehicles accessing the site but these will not prevent humans and livestock from entering the site on foot. Consideration could possibly be given to using the site for environmental education purposes with controlled access and information boards. 2. CapeNature strongly supports the comments made by Drakenstein municipality regarding the restoration and buffering of the streams on site. Although rehabilitation is mentioned in the EMP, a more detailed rehabilitation plan should be drawn up for all open space areas and corridors and included as an appendix to the Construction EMP. For example, what will active re-vegetation entail, what species should be used, how long should it take to complete etc. The success of rehabilitation in light of associated time lags also needs	Two alternatives in terms of the fencing of the sensitive areas exist. Firstly, fencing will be constructed on the proposed residential development side of the buffer zone of alternatively, fencing will be constructed on the side of the Bo Dal road. This area will be managed by the Municipality. A River Maintenance Plan has been drafted. Please refer to the EMP Please also note that the proposed adjustment is to take the river back to its original alignment.

		to be considered. Seeds and topsoil cannot be stored for too long and the rehabilitated areas also need enough time to establish before being exposed to disturbance which is likely to arise from residents. 3. Open space corridors must be maintained and protected from degradation once the development is occupied and activities such as dumping, littering and grazing in the riparian areas must be prevented. Management of these areas must be included in a separate Operational EMP. Details should include frequency of maintenance activities and monitoring as well as person(s) responsible. 4. All of the rivers on site will require extensive works including realignment, new culverts, drains and landscaping. These activities should be carried out in the drier season to decrease the risk or erosion and sedimentation. 5. Severe flood events have increased regionally and all stormwater management devices and detention areas for all the streams should be designed to handle 1:100 year flood models. Grass used in the channels should preferably be of non-invasive species (i.e. not kikuyu) as although the immediate vicinity is largely degraded and transformed at present, grass could invade the rehabilitated riparian areas at a later stage and restrict the growth of indigenous vegetation.	Propose EPWP project for river and open space maintenance implementation – This has been included as a recommendation for authorisation as well as in the Operational EMP. As no river will cross the site, and as a result of the wetland, it will be difficult to access the river so as to be able to pollute it. This is included in the EAP Recommendations and EMP for approval. These activities should be conducted during spring and summer. According to the Stormwater Managmenet Plan drafted by Lyners in October 2013, all stormwater management devices and detention facilities can accommodate the 1:100 year flood models and allowance was further made for an additional 14% over and above the 1:100 flood levels as required by the Drakenstein Municipality. Only indigenous vegetation will be used during the rehabilitation of the watercourses. This has been included in the Construction EMP
«Name»	«Date_of_Comms»	«Comment»	«Response»
Gerrit Coetzee Western Cape Government Department of Education:	07 March 2014	Deon, Ek verwys na die bostaande aansoek en die epos korrespondensie hieronder. Soos bespreek, sien aangehegte kommentaar vanaf WKOD op die aansoek. Ons werk op ‘n standard van 3ha vir ‘n hoerskool en 2.5ha vir ‘n laerskool	This has been indicated on the preferred layout design.

Infrastructure Planning and Management		eiendom. Ek sal dit waardeer indien julle dit kan oorweeg om jul kommentaar te wysig om by ons kommentaar aan te sluif. Ek sal 'n punt maak om in die toekoms ons kommentaar ook aan julle te stuur vir kennisname.	
«Name»	«Date_of_Comms»	«Comment»	«Response»
Gerrit Coetzee Western Cape Government Department of Education: Infrastructure Planning and Management	20 May 2013	I refer to the above-mentioned subject, our meeting 18 April 2013 and your email dated 29 April 2013. The Western Cape Education Department (WCED) would like to comment as follows on the proposed development. Based on the information received, your office has been appointed by the Department of Human Settlements to investigate the housing need for the Cape Winelands District Municipality. One of the assignments has been to do a pre-assessment study of the properties and area concerned. As a result the WCED have been provided with a layout plan for the proposed Vlakkeland development on properties located east of Mbekweni / Jan van Riebeeck Drive and south of Newton. This proposed development will provide approximately 3600 to 4000 dwelling units and provide according to norms and standards 4 primary school sites and 2 secondary school sites, with a number of pre-primary schools throughout the development. Both the primary and secondary schools conform to the norms and standards of the department in terms of the size of the erven provided. The spread of school properties provided are also well distributed across the development. Based on the information provided, the WCED in principal supports the proposed development and layout as presented to the department in drawing number 2.552 – RW – 4-07, on condition that: 1. All school properties should be kept vacant and free from illegal occupants; 2. No watercourse or wetland may transverse the school properties concerned;	Thank you This will be drafted in the EMP

		3. The properties concerned should be zoned for educational purposes; 4. The WCED reserve the right to revise this comment on receipts of the formal rezoning application. Further to this the WCED has also been provided with a proposed layout plan (pre-feasibility proposal) for erven 557 & 2316. Mbekweni, Based on the proposed layout plan, Erf 2316 is required in order to provide a suitable access point to the proposed development on Erf 557 directly from Jan van Riebeeck Drive. Based on the information presented to this department Erf 2316 is zoned educational and belongs to the Drakenstein Municipality. According to the pre-feasibility proposal, Erf 2316 is paramount to un-locking the development of Erf 557 in terms of getting access directy of Jan van Riebeeck Drive and linking with the future development of Vlakkeland. Based on this information provided, the WCED in principal supports the proposed development of Erf 2316 together with the development of Erf 557 as presented to the department in drawing number 2553 – RW 2-02, on condition that: 1. Prior to the development of Erf 2316, all school properties proposed in the Vlakkeland development should be available and zoned appropriately for development of educational facilities; The WCED reserve the right to revise this comment on receipt of the formal rezoning application.	No watercourses will transverse the Vlakkeland property and therefore no watercourses will cross the school properties. The rezoning of the poperties in question will be applied for during the LUPO application process and therefore has no influence on the EIA process. Noted. Thank you The rezoning of the properties in question will be applied for during the LUPO application process and therefore has no influence on the EIA process.
«Name»	«Date_of_Comms»	«Comment»	«Response»

Paarl 300 Stigting	26 March 2014	The Paarl 300 Foundation supports the recommendations of the HIA.	Thank You
«Name»	«Date_of_Comms»	«Comment»	«Response»
Cor van der Walt Western Cape Government Department of Agriculture: Land Use Management	10 March 2014	Please refer to our letter dated 2013/11/12. We do not have any further comments. Letter dated 2013/11/12: 1. The Western Cape Department of Agriculture has no objection to the consolidation, rezoning, subdivision, consent use, departure and closure of public road on Erven No. 8399, 8400, 12628, 12633 and Remainder of Erven No. 8378 and 8359, Paarl. 2. Please note: a. That this is only a recommendation to the relevant deciding Authorities in terms of the Subdivision of Agricultural Land Act 70 of 1970. Conservation of Agricultural Resources Act no 43 of 1983 and the Land Use Planning Ordinance 15 of 1985. The applicant must provide the local government and the National Department of Agriculture, Fisheries and Forestry with copies of the application. b. Kindly quote the above-mentioned reference number in any future correspondence in respect of the application The Department reserves the right to revise initial comments and request further information based on the information received.	Thank You Noted.
«Name»	«Date_of_Comms»	«Comment»	«Response»
Jimmy Knaggs Drakenstein Municipality:	31 March 2014	In our letter ref 15/4/1(1521) dated 22 July 2013 a number of issues were identified for particular attention and this has not been done, comment will be made in the sections that follow.	

Environmental Management		1. It is suggested that the project description be rewritten to reflect a more environmentally sensitive perspective. 2. There appears to be some inconsistency between the various specialists' reports, with definite contradictions in places.	It should be accepted that differences in opinion will exist between specialists in different disciplines. During the EIA consultation process, issues were discussed and common ground was found between specialists and the technical team that resulted in the preferred alternative (Layout 5) as discussed in this 2nd Draft EIR.
		3. It is trite to accept the proposal from the town planner/s prior to the EIA process being complete, the alternatives need to include development proposals other than just housing or variations on that theme.	Alternatives in terms of the flow of the Kleinbosch River have been assessed and included in the analysis. However, housing is what is currently needed and what is proposed by the Department
		4. There is a clear lack of understanding of the difference between stormwater drainage and a riverine or wetland ecosystem, this needs to be addressed.	The wetland features on site have been assessed by various specialists (as discussed within the report) and the conclusion was drawn that it is in fact not a wetland, but a perched aquifer which developed as a result of previous agricultural activities and have not been maintained. The Kleinbosch River, which is the subject watercourse that lead to the creation of this man made aquifer, will be realigned to its original position south of the Vlakkeland property ultimately flowing into the Dal River. The major stormwater system on the Vlakkeland property includes two channels

			directing stormwater runoff around the site (North - channel 1 and South channel 2). This includes runoff from the Seven Springs stream flowing to the South East of the property (East of the Bo Dal road) which will flow into the detention area to the South West, as well as the Mbekweni river entering from the North Eat which will flow into the detention area in the North West of the site.
		5. Sustainability and climate change is also an area of concern.	All Storm water infrastructure has been designed with an extra capacity of 14% for the predicted increase in storm water runoff due to Climate Change.
		6. The proposal is the establishment of a community between 8000 to 15000 people which equates to a small town and this impact must be dealt with.	Provision has been made within the design for civic services, business opportunities, retail, increased traffic on the Jan van Riebeek Drive, civil infrastructure, educational institutions, places of worship and recreational facilities to accommodate the community that will be established on the Vlakkeland property.
		7. Although this is an EIA the extent of the proposal needs to examine cumulative impacts wider than just the site and its immediate surroundings elements of SEA nee need to be incorporated into the assessment.	The EIR has been updated to include the cumulative impact of each of the anticipated impacts. Please refer to Section J for discussions regrarding these impacts.
		8. It must be remembered that urban conservation is the conservation, preservation and rehabilitation of small degraded areas as opposed to the magnate of Cape	

		Nature to protect and preserve the pristine conservation areas. CLIMATE CHANGE 9. As the effects of climate change are uncertain at this stage the most probable scenario as contained within the Provincial Climate Change policy is to be adopted for this project and all alternatives must include this in any multi criteria decision making model. In these models the social component shall not have a weight in excess of any other component. 10. What specific adaptation and mitigation measures are to be put in place to counter the impact of the development. FLORA 11. The department agrees that the area east of old sewer evaporation ponds along Bo Dal Road is of great botanical significance and must be protected as a conservation area and must be protected by a buffer zone. 12. It is clearly a mosaic of at least three of the Cape Floristic Kingdom's vegetation types, Swartland Shale Renosterveld, Swartland Alluvium Fynbos, Boland Granite Fynbos and as all three are either critically endangered or endangered every effort must be made to preserve as much as possible and make provision for the expansion of the ecosystem. 13. The botanical assessment by McDonald failed to consider the findings of Nick Helm Botanical Surveys which was conducted in 2008. The Nick Helm botanical study highlighted that the wet area to the south west of	The conservation of the sensitive buffer areas is discussed in the Operational EMP (OEMP). An extra 14% capacity has been added to the storm water infrastructure for the predicted increase in runoff due to a predicted increase in rainfall in the area. A 120m buffer zone has been included to incorporate the visual, botanical and heritage concerns. An extra 14% capacity has been added to the storm water infrastructure for the predicted increase in runoff due to a predicted increase in rainfall in the area The botanical study as well as CREW SANBI concluded that these sensitive vegetation can only be found to the East of the evaporation ponds. This area has been included in the 120m buffer zone. GNEC is of the opinion that sufficient Botanical assessments have been conducted on site to fully identify all the species present on site. Furthermore, confirmed with CREW SANBI –

		the ponds need further assessment at an appropriate season. The Department requests that a final botanical assessment be conducted during spring to capture any species that may have been missed in the may 2010 and July 2013 assessments. CREW SANBI, CapeNature and Botsoc needs to be included in this investigation.	same area as identified by Dr. McDonald (Bergwind Surveyors). Please note that 3 Botanical Assessments were undertaken: 1. Nick Helme: Autum 2006 2. Dave McDonald: Summer 2010 3. Dave McDonald: Winter 2013 The CREW info concluded that the 3 Botanicals were correct. No additional areas of concern are relevant to the proposed site.
		14. t is possible that the conservation area will need to be extended once the study has been completed. The main reason is that there will be a gradual change in vegetation from the renosterveld/fynbos area to the wetland.	Due to the realignment of the Kleinbosch River to its original flow as well as the infilling of the property for construction purposes, the degraded and man made perched aquifer (as defined by Dr. Harding) will dry up and therefore no area containing wetland characteristics will be present on site. Therefore, there will be no change in vegetation as the area in question will be a built-up environment. Mc Donald's recommendations were that no development should happen on the areas indicated as sensitive vegetation. This area has been included in the Botanical buffer area in the updated Layout (Layout 5) and therefore will not be drafted into the EMP.
		15. The EMP must include the recommendations of the botanical assessments of both Helm and Mc Donald and any other recommendations once the studies have been completed. Any development activity in that this area must be prohibited and the area conserved and rehabilitated.	This is included in the operational EMP.

		16. This area must be cleared of all alien vegetation and rubble and the fence must be maintained to prevent further dumping 17. Suggestions are to be included as to how the conservation area/s is/are to be managed post development. FAUNA 18. A fauna specialist report must be conducted to determine if there are any ecologically significant species present. The 1st draft EIA only mentioned that there were no large fauna species near the site, however there could be important invertebrates and small vertebrates utilising the site as a suitable habitat. AQUATIC 19. No evidence can be found that climate change has been taken into account in any of the studies related to the streams, rivers and wetlands. This will have to be done, and the farm dams upstream will have to be taken into account and sufficient provision must be made for runoff should any, or all, of the dams overflow or burst. We cannot be seen to be putting vulnerable communities at risk. 20. While the 2013 aquatic assessment report by DHEC states that no wetlands are present on the site, it does state that there is a disturbed "man-made" wetland present in the extreme south west corner of the site and boggy areas supporting wetland vegetation in the eastern most and adjacent pan.	As this responsibility will fall on the Drakenstein Municipality, it is suggested in the EAP Recommendations that the clearing of alien vegetation and overall management of the sensitive areas be included in the EPWP so as to facilitate the creation of temporary and permanent employment opportunities. Furthermore, these areas need to be fenced off from the public so as to minimise the potential negative effects of human behaviour on the natural environment. Dr Harding indicated during his second visit to the site that no Fauna exists on site. This formed part of the follow-up assessmentof Dr. Harding. An extra 14% capacity has been added to the stormwater infrastructure for the predicted increase in runoff due to a predicted increase in rainfall in the area. Please refer to the updated Hydrology Report. A follow up Freshwater study was conducted in 2014 by DHEC's Dr Harding (Please refer to Addendum F1.1). This study indicated that the Kleinbosch River, which feeds the weland to the South-western corner, in fact terminates on the SHARA property south of the Vlakkeland

		21. This is inconsistent with the National Wetlands information contained in the BGIS of SANBI and the Drakenstein EMF. 22. This is also inconsistent with the findings of Toni Belcher who conducted the freshwater assessment of the Mbekweni River in 2010. The department supports the findings of the Belcher assessment as this has been aligned with the Drakenstein EMF and River EMP. 23. Further support for the notion of natural welands is found in the definition of wetlands in the Nation Water Act and this must be adhered to. It must be remembered that a wetland does not need to be "wet" all the time.	Development and was flowing south of the shallow berm between the SAHRA and Vlakkeland properties towards the TopPrime residential development site. It is assumed that the berms were built for the management of field drains, but have since been damaged and lead to blocking and overflowing in an broad, spread-out fashion. This was confirmed during a hydrological assessment conducted by Graeme McGill. The assessment of the Geotechnical report (Please refer to Addendum F10) together with consultation with Professor Cornie van Huyssteen of Free State University, revealed that alluvial substrates were present west and south west of the evaporation ponds, located to the east of the Vlakkeland property. The resulting conclusion was drawn that the aforementioned area was found to be a shallow perched aquifer of approximately 0.4m in depth and to wet and fluidized to support vegetation except for stunted wetland-associated plants. The presence of invasive *Pennisetum macrourum* in the shallow depressions towards the south west corner led to the presumption of the existence of a wetland on this site and is similar to the soil characteristics on the neighbouring site which is currently being developed for housing. As a result of this, Dr Harding suggested the

			re-alignment of the Kleinbosch River along the southern boundary of the Vlakkeland property, which will create as elongated natural wetland feature along the northern border of the SAHRA property and ultimately connecting to the Dal River on the SAHRA site. This diversion will not have a negative effect on the aquifer on the Vlakkeland site, as the site will be infilled to level out the slight gradient, and the hydraulic linkage to the south west will not be altered. Dr Harding's report therefore concluded that should alternative one be implemented, where the Kleinboch River is realigned to it's original position to the Dal River, the wetland characteristics on the Vlakkeland site will disappear. However, similarly in the case where alternative two is implemented, where the Kleinbosch river is connected in a channel from the SAHRA site to the outlet from Vlakkeland, the overland spillage which lead to the prevalence of the wetland characteristics will also disappear.
		24. The proposed development area is at a confluence of a number of rivers and streams and it is clear from old aerial photos that the area acted as a seep or water storage area so attenuating floods. The four main ones are as described but as they merge there was continual branching and recombining and the parts of what we see today are manmade but this was done a long time	After re-evaluation of the site it became apparent that the wetland in the south western corner was infact an aquifer with wetland characteristics due to the additional water entering from the Kleinbosch River. This area needs to be in filled during construction and therefore the Kleinbosch River will no longer be able to feed it and will in time be completely dry. Furthermore, the

		ago and there is no reason to perpetuate the reckless behaviour. 25. The geotechnical investigation supports the fact that the proposed development area lies in a valley bottom wetland, there is evidence of gleyed soils with mottles and a lot is said about subsurface water in the rainy season. 26. Over time this has been impacted upon by ill-conceived development. 27. It is required that transects be done in accordance with the latest DWA guidelines to delineate the extent of the wetlands. 28. The 2013 Declaration of Intent by the Mayor and Municipal Manager sets the ethos and ethical standard for all development near/adjacent to rivers. 29. Experience has shown that one cannot successfully "move" rivers and any such suggestions are not supported. 30. The Kleinbosch River remains in its original position at least as far back as 1938 the Kleinbosch River must be rehabilitated in the preferred layout. 31. What about the Seven Springs river/catchment this has not been dealt with? 32. The re-alignment of the Kleinbosch River can be included as an alternative where this option is chosen it must be comprehensively justified. It was never agreed that the re-alignment was accepted only that it could be investigated as an option. AIR QUALITY	infilling will in no way affect the underground water movement from the aquifer to the Berg River. Noted. This has been included in assessments. The current flow is not the original and will be diverted back to the original flow. The river will be re-aligned to its original form and will meet up with the Dal River The Seven Springs river will flow into the stormwater drainage system along the Southern boundary of the property. The re-alignment has been investigated and included as option five (preferred alternatice) in Section K of the 2nd Draft EIR. The nature and extent of air pollution will be similar to the existing neighbouring residential areas, Mbekweni and Newton. It

		33. The impact on air quality from the development has not been addressed, this includes the extra traffic and burning of fuel for domestic purposes.	will therefore not have an significant impact on the community and natural environment and will be within acceptable limits.
		34. The impact of agricultural activities on the air quality of the proposed development has not been addressed.	No agricultural activities will be conducted on site as the small scale informal piggery will be moved to an approved site. Furthermore, agricultural activities on the neighbouring farm will not have a significant impact on the proposed development as no significant impact have been noted in the Newton area, which also border the same farm as Vlakkeland.
		NOISE 35. The issue of noise has only been dealt with for the construction phase what about the increase as a result of the increase in population density and activities post construction.	Noise levels during operation phase will be similar to the neighbouring Newton and Mbekweni residential areas and will therefore not have a significant negative environmental impact.
		ROADS 36. The TIS is noted but the TIA must be submitted for comment. To this end a meeting with the PRE needs to be facilitated so as to ensure a co-ordinated response to the TIA and traffic issues.	Please find attached in Addendum F6.2 the updated TIS (Dated 21 August 2014)
		37. The TIS does not take into account the impact of erf 16161 Paarl and the Fynbos and Aurora development of Farm 361.	This has been included in the updated TIS in Addendum F6.2.
		38. On street parking bays along the main roads cannot be used for cycle lanes as well, provide extra NMT facility. 39. All sidewalks along main roads to be a minimum of 2.5m (if at all possible, provide a paved width of 3.4m to serve as a combined pedestrian/NMT area. 1.5m for	Parking bays, side walk widths and public transport drop offs/pick up points will be decided upon on phase by phase-base during the LUPO process and does not form part of the EIA process.

		pedestrians and1.9m for NMT) and in residential areas a minimum of 1.8m. 40. Although the TIS provided by ITS states that a substantial proportion of the new trips generated will be internal, it must be noted that due to the economic development of the area in the future more trips will be leaving the development area resulting in an increased demand on the road network. 41. It must be remembered that there will be between 4000 to 6000 economically active people in the development (total population of 8000 to 15000) with job opportunities numbering in the hundreds. 42. Proper taxi drop off/pick up points must be provided along the main roads. STORMWATER 43. The stormwater, river, wetland networks have not been properly dealt with in the reports. It must be remembered that there are at least 4 main rivers that have been canalised into 2 canals and they have limited capacity and this must be managed 44. One issue of grace concern is the lack of attention paid to the exiting untenable situation with the Mbekweni River that was canalised a number of years ago.	Calculations for peak AM and PM trips in and out of the proposed development have been included in the TIA (Addendum F6.2). The preferred layout design (Layout 5) includes an East-West linking main road for the facilitation of easy access to the economic centre of the proposed development. Parking bays, side walk widths and public transport drop offs/pick up points will be decided upon on phase by phase-base during the LUPO process and does not form part of the EIA process. All storm water infrastructure and detention areas have been designed to accommodate post-development runoff as well as an extra 14% capacity for the predicted increase in runoff due to Climate Change. Furthermore, please refer to the River Maintenance Management Plan attached to the 2nd Draft EMP The Kleinbosch river will not follow in the Mbekweni River's footsteps as it will not be canalised, only re-aligned to it's original position where sufficient capacity in the Stormwater Management Plan has been allocated for the additional water.

		45. Provision must be made to attenuate the pre-development runoff to the 1:20 year flood as this is all the canalised section can accommodate, to this must be added the post development runoff. No increase in the size of the culverts under Jan van Riebeeck Drive will be considered, in fact some of them need to be closed or reduced in size. 46. Earlier studies have shown that Jan van Riebeeck Drive will have to be lifted by some 1 meter or a "dam wall" created upstream to be able to accommodate this detention requirement. 47. After the Mbekweni River has been passed through under the Bo Dal Road there is a proposed detention facility, as part of the farm 361 development, to manage water flow through Newton and should this overflow it will be in the form of overland flow into the old evaporation ponds, this needs to be dealt with. 48. It must be remembered that any additional flow in the Dal River will impact on the proposed development east of the railway line on erf 584M and this is unacceptable. The flow in the Dal River must be limited to the 1:50 year flood. 49. It is acknowledged that although from an engineering and planning perspective the realignment of a river may be desirable it is contrary to all environmental reason.	No changes will be made to the culvert under Jan van Riebeeck Drive. The retention facility has been designed in such a way as to accommodate the pre- and post development runoff to a 1:20year flood. The Vlakkeland property will be in-filled during construction as a result of the slope and to accommodate the post-development stormwater run-off in the retention dam located to the south west of the site. A stormwater channel will be constructed along the Northern border of the Vlakkeland property which will have sufficient capacity to accommodate the overflow from the Newton area. This runoff will flow into the north-western detention area on the Vlakkeland property. Sufficient capacity exists in the stormwater channel and retention facility to accommodate the additional runoff and will not impact on the proposed development on Erf 584M. According to Dr Harding, the rehabilitation of the Kleinbosch river on the SAHRA property and its linkage to the Dal River which is in fair ecological condition upstream of Beets Road but severely degraded downstream, would maximise the ecological corridor services that the Kleinbosch could contribute to

		50. Gabion construction is unacceptable all riverine corridors must be rehabilitated to a natural state. Such action is also contrary to Drakenstein's stated policies including the SDF, Draft EMF, REMP, Biodiversity Priority Areas and the Winelands Biosphere Reserve. 51. Realignment of the rivers cannot be supported due to the inherent danger that it holds for a high risk community when the river over tops and floods the surrounding area. 52. The easiest way to achieve pollution control is to retain the existing wetlands in the detention area and expand this so as to enable them to filter the runoff from both higher up the catchment and the proposed development, pollution control/management is vital to the success of the drive to clear the Berg River of pollution. WATER 53. A bulk service capacity analysis needs to be carried out by council's consultant, GLS engineers, so as to quantify any required upgrading. 54. NOTE: Untill the southern Wellington connection (Strawberry Kind line) to the main supply from Wemmershoek has been upgraded there is insufficient guarantee of water supply for the development. The two projects must be implemented simultaneously but in any event the pipeline must be completed before the first occupant moves in. 55. A minimum of a 6m wide corridor (from the eastern road reserve boundary to 3m east of the pipe) must remain open along existing 375mm diameter bulk water pipe east of Jan van Riebeeck Drive and no construction is allowed within this corridor. SEWAGE	A river maintenance management plan is included in the updated EIR After re-evaluation of the site it became apparent that the wetland in the south western corner was infact an aquifer with wetland characteristics due to the additional water entering from the Kleinbosch River. This area needs to be in filled during construction and therefore the Kleinbosch River will no longer be able to feed it and will in time be completely dry. Please refer to Addendum F-8 for GLS engineer's services report We are aware of this and it has been incorporated into the projected planning for construction. This will be included in the LUPO application and does not form part of the EIA evaluations.

		56. All of the site construction new or upgrade needs to be shown on a plan so as to present a complete picture. This must include the upgrade to the Mbekweni pump station and the upgrade to the rising main from the pump station to the Paarl WWTW. 57. Allowances must be made to connect proposed developments between this proposal and the existing Newtown. AGRICULTURE 58. Intensive agriculture n the site has been haphazard over the years and has never covered the whole site. 59. The only intensive agriculture practiced at present is that of the small scale farmers and this aspect needs to be properly dealt with even so far as to include it in one of the options. GENERAL 60. The sustainability of the project needs to be analysed in the light of the fact that Drakenstein, along with the rest of the world, is no longer sustainable on a number of fronts. To this end the latest SOER document and the 2012 NEMA section 16 report need to be consulted. 61. An analysis of the eco-carbon footprint of the development due to the consumption of non-renewable resources must be carried out for the actual construction phase and for the operational phase and mitigation measures are to be developed and implemented simultaneously with the project.	All sewage will flow in an east to west direction linking up at the western boundary of the proposed site next to the Jan van Riebeeck Drive. Sewage will then pass through underneath the Jan van Riebeeck Drive ultimately flowing next to the Dal River to the Mbekweni sewage pump station. In consultation with the Western Cape Government Department of Agriculture, it was made known that the soil quality is not hazardous and therefore safe to build and live on. Alternative sites for the relocation of the informal livestock is currently under assessment. It has been agreed upon by the Municipality and the project team that these farmers will not be moved before a suitable site has been found.

		62. A waste recovery/recycling initiative is being implemented in Drakenstein and the development will have to be prepared to comply with any requirements once the project is finalised.	
«Name»	«Date_of_Comms»	«Comment»	«Response»
DEA&DP: Land Management (Region 1)	15 April 2014	The following is the Department's provisional comment on the dEIR and must be addressed in the final EIR: 1. The Department notes that a request has been made to the Department of Water Affairs to dispense with the requirement for a Water Use Licence in terms of section 22(3) of the National Water Act, 1998 (Act No. 36 of 1998) in line with co-operative governance but that this decision is still pending. The Department herewith reminds the applicant, that in the case where a decision is taken to maintain the requirement for a Water Use Licence, proof of submission of the Water Use Licence Application to the Department of Water Affairs must be included with the final EIR submitted to the Department for decision-making. 2. Further to the above, due to the nature and scale of the proposed development and proposed realignment of watercourses and anticipated impact on wetlands, comment must be obtained from the Department of Water Affairs and included in the final EIR for submission to the Department. 3. Based on the interim comment provided by Heritage Western Cape and the final comments received from the South African Heritage Resource Agency, final comment must be obtained from Heritage Western Cape and included in the final EIR submitted to the Department 4. In addition to the above,, comments from, but not limited to, the following relevant authorities must be obtained	Please refer to Addendum C-4 for proof of submitted WULA DWA will be registered as an I&AP and notified of the commenting period, however an application for a water use license has been made (Please refer to Addendum C-4 for proof of submitted WULA) and comments received on this application will be regarded as sufficient. An ROD was received from Heritage Western Cape. Please refer to Addendum E-2. These Departments have been registered as Interested and Affected Parties and will be notified of the 21day commenting period and

		during the EIA phase PPP and included in the final EIR submitted for decision-making: a. Department of Transport and Public Works; and b. Department of Human Settlements. 5. Addendum F-9 contains the Stormwater Management Plan, however Annexures (A, B and C) have been omitted from this report. It is understood that Annexures B and C refer to the Flood Line Study and Aquatics Study, as previously included in Appendices F-7 and F-1 respectively, although it is requested that as a minimum Annexure A is attached to the Stormwater Management Plan for reference. Similarly, Annexure H of the Services Investigation undertaken by Lyners has been omitted from Appendix F-8. Please clarify if this annexure in fact refers to the Stormwater Management Plan included as Appendix F-9. Furthermore, the Flood Line study contained in Appendix F-7 does include the appendices noted on page 10 of the report. 6. Please note that since solid waste removal, effluent discharge, water and electricity supply will be provided by the municipality, written confirmation that the municipality has sufficient available capacity to provide the necessary services to the proposed development must be obtained and submitted with the final EIR for decision making. Although provision has been made for such correspondence in Addendum D, it was noted that none was included in the dEIR. 7. Regulation 31(1)(1) of the National Environmental Management Act ("NEMA"), (Act No. 107 of 1998) Environmental Impact Assessment Regulations ("EIA"), 2010, requires a description and assessment of each identified potentially significant impact to include cumulative impacts. It is noted that the cumulative impacts have not been included in the methodology associated with the assessment proves and only identified with respect to potential heritage impacts. It is requested that provision for identification, description and assessment of cumulative impacts is included in the EIR and consideration given to cumulative impacts relating to other potential environmental impacts.	provided with a copy of the 2nd Draft EIR for their review. Bulk Municipal services have been confirmed. Please refer to Addendum D The EIR has been updated to include the cumulative impact of each of the anticipated impacts. Please refer to Section J for discussions regrarding these impacts.

		8. In accordance with Regulation 31(2)(m), a description of any assumptions, uncertainties and gaps in knowledge must be included in the EIR. Please expand on this aspect within the final EIR.	The EIR has been updated to include Section L: Assumptions and Knowledge Gaps.
		9. Furthermore, it is requested that the Environmental Impact statement include a comparative assessment of the positive and negative implications of the proposed activity and identified alternatives as per Regulation 31(2)(m).	The EIR has been updated to include a comparative assessment of the direct and indirect implications of the proposed development.
		10. In accordance with Regulation 32, please note that declarations of all the appointed specialists' independence are to be included with the final EIR submitted to the Department for Decision-making.	Noted
		11. As per the requirements of Regulation 33, please include the details of the person who prepared the Environmental Management Programme ("EMP") and their expertise to prepare the EMP contained in Section M. In addition, in line with the aforementioned Regulation's requirements, it is requested that a brief project description is included in the introduction of the EMP as contained in Section M. It is recommended that a similar format approach to the EMP is utilised as the "Waste, Water Use and Electricity Consumption Minimisation and management Plan as Part of the EMP", namely where the EMP could be seen as a stand-alone document to be included in contract documentation in due course as well as a vital component of the EIR.	Please refer to Section N for these updates
		12. In addition, it is noted that certain tables within the EMP make reference to "Groot Phesantekraal Phase 4". It is requested that this corrected.	This has been corrected.
		13. Given the nature, scale and potential sensitivity of the proposed activity, it is requested that consideration is given to prescribing the frequency of the Environmental Control Officer's ("ECO") inspections and not requesting the Department to determine such. It is, however, recommended by the Department that consideration is given to setting the minimum frequency of ECO inspections to every two weeks during the construction phase.	The frequency of ECO inspections have been included in the updated EMP.

		14. Please ensure that all recommendations and mitigation measures stipulated in the specialist reports are included in the EMP to be submitted with the final EIR.	The specialist recommendations have been included in the updated EMP
		15. In line with the comments received by Cape Nature, dated 25 February 2014, the Department is in agreement that additional detail should be provided on the proposed restoration and rehabilitation plans for the streams and open space areas, corridors and buffers within the EMP. This should be carried through to include measures for the operation phase with regards to maintenance and management of open spaces and buffer areas.	A River Maintenance Plan has been drafted and attached to the EMP
		16. Please ensure that an original signed and dated applicant declaration is submitted along with the final EIR to the Department.	Noted
		17. The Environmental assessment Practitioner ("EAP") is reminded that the following must be included in the final EIR submitted to the Department for decision-making with respect to the details of the public participation process conducted:	Noted
		a. Steps undertaken in accordance with the plan of study;	Noted
		b. A list of persons, organisations and organs of state that were registered as interested and affected parties;	
		c. A summary of comments received from, and a summary of issues raised by registered interested and affected parties, the date of receipt of these comments and the response of the EAP to those comments; and	
		d. Copies of any representations and comments received from registered interested and affected parties.	
		18. In addition to the above, it is requested that proof of notices notifying potentially Interested and affected Parties ("I&APs") of the EIR have been displayed, placed or given.	This is included in Addendum B-2.1.1 containing the Public Participation Process documentation.

		According to the dEIR, a small portion of the site comprises informal livestock pens and paddocks of emergent farmers. Please provide clarity on proposed relocation plans for these farmers as well as the livestock on both a temporary and long-term basis.	Alternative sites for the relocation of the informal livestock is currently under assessment. It has been agreed upon by the Municipality and the project team that these farmers will not be moved before a suitable site has been found.

SECTION F: APPROACH TO THE PROJECT

F-1 AUTHORITY CONSULTATION

Authority consultation plays an integral role in any EIA process. The authorities guide the process through highlighting the necessary legislative requirements and key areas of concerns.

F-2 APPROVAL OF SCOPING AND PLAN OF STUDY FOR EIA

F-2.1 Registration of the Project with DEA&DP

An Application for Authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998) as amended and the Environmental Impact Assessment (EIA) Regulations were submitted on 12 April 2013 to the Department Environmental Affairs and Development planning (DEA&DP). DEA&DP acknowledged receipt of the above documentation and DEA&DP Reference 16/3/1/2/B3/28/1006/13 was assigned to the project. DEA&DP provided the authorisation that the project may proceed with the Scoping Process in terms of the Environmental Impact Assessment Regulations as discussed above.

F-3 SCOPING PROCESS

The Scoping Report identified the key issues or concerns as highlighted by the relevant authorities, interested and/or affected parties (I&AP) and professional judgement by the Environmental Assessment Practitioner. In addition, the Scoping component of the EIA process allows for the identification of the anticipated impacts, particularly those, which require specialist investigations.

F-3.1 Current Application

The 1st Draft Scoping Report (First Round) was available for public review from 09 May 2013 to 24 June 2013.

The 2nd Draft Scoping Report (second Round) was available for Public Review from 25 July 2013 to 19 August 2013.

The Final Scoping Report was submitted on 05 November 2013 and was approved/accepted by DE&DP on the 19th of December 2013.

The 1st Draft Environmental Impact Assessment Report (EIR) was submitted for public comment from 17 February until 31 March 2014.

The 2nd Draft Environmental Impact Assessment Report (EIR) was submitted for public

comment from **23 September until 17 October 2014.**

F-4 ENVIRONMENTAL IMPACT ASSESSMENT PROCESS

This Environmental Impact Assessment Report uses the Scoping Report as a basis for the key issues and concerns that were identified. It further includes the results of the specialist studies, a full assessment of the impacts and proposed alternatives.

F-5 DESCRIPTION OF THE BASELINE ENVIRONMENT

The baseline environment (or prevalent environmental status) of the project represents the current prevailing environmental conditions and existing levels of pollution or degradation prior to the proposed development. The baseline information is therefore indicative of the current environmental status. Baseline information was gathered through visual inspections of the site and its surroundings, desktop studies as well as preliminary specialist findings.

The baseline description provides an indication of:

- Current environmental conditions;
- Current levels of disturbance/degradation; and
- Environmental and social sensitivity / tolerance to change.

The baseline information serves as a reference point to scientifically measure or professionally judge the future changes to the environment based on impacts associated with the proposed project.

SECTION G: INVESTIGATION METHODOLOGY

This section details the investigative methodology used by the specialists to undertake their specialist studies.

IMPACT IDENTIFICATION AND ASSESSMENT METHODOLOGY

The identification and assessment of environmental impacts is a multi-faceted process, which combines quantitative and qualitative descriptions and evaluations. It involves the application of scientific measurements and professional judgement to determine the significance of environmental impacts associated with the proposed project. The process involves consideration of inter alia: the purpose and need for the project; views and concerns of interested and affected parties, general public interest; and environmental legislation and guidelines.

The generic criteria and systematic approach used to identify, describe and assess impacts are outlined below. The assessment of the impacts has been conducted according to a synthesis of criteria required by the integrated environmental management procedure.

G-1 TRANSPORT IMPACT ASSESSMENT

The Traffic Impact Assessment was done by Dr. Christoff Krogscheepers of ITS Cape (Pty) Ltd. The assessment was carried out in August 2013.

The report must summarise the transportation conditions within the vicinity of the proposed development and provide an assessment of the transportation impacts on the surrounding road network. The analysis should evaluate both the existing year (2013) and future year traffic conditions during the expected peak traffic hours of the development. The study outline refers and the methodology for the study is outlined as follows:

- Study the site context in terms of the receiving environment and determine the sphere of influence of the site from a traffic point of view.
- Liaise with the Road Authorities terms of the issues and constraints on the existing roads, in the study area, and the scope of work.
- Obtain background traffic information for the status quo at the key intersections during the weekday AM and PM peak hours.
- Evaluate the existing traffic operations at the key intersections during peak hours on Jan van Riebeeck Road adjacent to the site.

- Determine the acceptable desired access to the site.
- Evaluate proposed alternative access routes.
- Determine the trip generation and distribution of the proposed development given the
- anticipated improvements to the road network.
- Evaluate the future traffic operations with the proposed development including other
- background projects under consideration.
- Determine the possible traffic impacts from the proposed development and the appropriate mitigation measures to be applied.
- Prepare a written TIA report for your purposes.

The TIA has been drafted (dated 21 August 2014). Please refer to Addendum F-6.2

G-2 HERITAGE IMPACT ASSESSMENT

- The HIA was structured to fulfill the requirements of Section 38(3) of the NHRA and will include, interalia:
- Assessment of the potential for impact on any buildings older than 60 years or of heritage significance;
- Assessment of the potential for impact on any other features (including landscapes) of cultural historical significance;
- Although not required by HWC, an Archaeological Impact Assessment (AIA) was undertaken since there are large quantities of rubble on the site and archaeological material is known to have been found in the vicinity.
- The findings of this AIA was integrated into the HIA Report.
- The HIA was further be informed by a Visual Impact Assessment (VIA);
- I&APs (including the South African Heritage Resources Agency – SAHRA) were invited to comment on the draft Heritage Impact Assessment. The findings of these processes were considered for incorporation into the findings and recommendations of the Report before final submission to HWC.
- Information gathered during site inspections and documentary research of literary and official sources on the site and surrounding area.
- Documentary research were undertaken of records of the Deeds Office, the Surveyor General, the Chief Directorate: Surveys and Mapping, and SAHRA.
- Research was also undertaken into secondary material relating to the area which is relatively well documented.

G-3 FRESHWATER / WETLAND ASSESSMENT

The Assessment is intended to present the ecological condition and conservation importance of possible wetlands and surface water bodies, together with an assessment of the ecosystem services likely to be provided by the wetlands. Potential impacts of the proposed development on the wetlands were evaluated and recommendations were provided for the protection of the wetlands and surface water bodies (including suggested buffer areas and ecological corridors). The assessment should at least include the following:

- Examination of the Wetlands Map for the Drakenstein Municipality, to determine whether any wetlands have been mapped on or in close proximity to the subject site.
- Detailed analysis of recent aerial photographs of the study area, to determine whether any wetlands appear to be present on or adjacent to the site;
- Site visit/Ground Truthing to determine whether any wetland areas are present on or in the immediate vicinity of the subject property, in addition to the possible wetland areas indicated on the Drakenstein map;
- During this site visit, the DWAF (2005) guidelines for the identification and delineation of wetlands is to be followed;
- Stormwater management and the impacts thereof on freshwater systems must be considered – The possible diversion of the Kleinboch River were assessed;
- This involved making observations as to whether any areas are inundated or saturated with water, using a soil auger to examine the soil characteristics at a number of sampling points (determined whether any signs of hydromorphism are present), and determining whether any plants are present that are indicative of wetland conditions;
- The approximate extent of any wetland areas that are identified must be mapped by recording a number of coordinates along the edges of the wetlands using a hand-held GPS unit (poles may also be knocked into the ground to mark out the edges of the wetlands).
- Mark out all wetland edges and any other important features identified during the fieldwork with a land surveyor including buffer areas and connectivity zones should it be required or relevant.
- Production of a map showing the location and approximate extent of the wetland areas identified on and in close proximity to the site.
- Preparation of an Opportunities and Constraints Report, providing guidelines for the proposed development based on the findings of the investigations undertaken;
- Input into the planning process to develop an ecologically sensitive Site Development Plan;
- Preparation of a Freshwater Assessment Report, once an ecologically sensitive preferred Site Development Plan has been generated by the Project Team.

G-4 BOTANICAL RE-ASSESSESSMENT

The Terms of Reference provided were to (a) re-assess the entire site and in more detail, paying particular attention to the patch of vegetation above the dams and below Bo Dal Road (ERF 33027) previously identified by McDonald as having conservation value, and to (b) advise whether:

- This must be retained at all costs; or
- Can be removed/developed; or
- Search and Rescue and replanted (if possible); or
- Must remain with possible indication of connectivity area/zones

In view of the above, the following question was put forward:
If the vegetation on ERF 33027 must be conserved, would it be possible to develop a cemetery at this site or will the impact be too severe.

G-5 VISUAL IMPACT ASSESSMENT

A desktop and site survey was carried out making use of maps and aerial photographs. This was used to identify landforms and landscape patterns, as well as to determine the viewshed.
A photographic survey of the site and surrounding areas was conducted which determined the visibility of the site and the proposed development from within the surrounding landscape.
A 3D computer model can be generated (should it be required) using the 5 metre contours and spot heights obtained from the 1:10 000 ortho-photos.
It will be possible to test any chosen viewpoint within the model for the amount of visual impact that it would experience. It will be able to do a complex viewshed analysis based on the individual planned structures in the development.
Significant viewpoints and areas where views of the site are possible was identified and analysed.
An evaluation was made of potential visual impacts on all areas where visual influence is anticipated.
Relevant mitigation measures will be proposed.

The following time frame is anticipated with regards to the way forward:

Table 12: Anticipated time frames with reference to the EIA process

Activity	Date	
	Start	**End**
SCOPING PHASE		
Notifying and Registration of I&APs	09 May 2013	24 June 2013
Public Review of Draft Scoping Report	09 May 2013	24 June 2013
Public Review of Final Scoping Report	25 July 2013	19 August 2013
Submission of Final Scoping Report and PoS for EIA to the Authorities	4 November 2013	
Authority Review of Final Scoping Report and PoS for EIA	4 November 2013	19 December 2013
EIA PHASE		
Specialist Assessments	May 2013	January 2014
Integrate specialist findings in EIA Report	December 2013	February 2014
Submission of 1t Draft EIA Report to I&APs	17 February 2014	31 March 2014
Address issues and Finalise Issues and Response Report	25 March 2014	5 April 2014
Submission of 2nd Draft EIA and EMP to I&Aps (2nd PP)	23 September 2014	17 October 2014
Submission of Final EIA and EMP to Authorities	29 October 2014	29 October 2014
Expected Decision from DEA&DP	January 2015	

SECTION H: ASSESSMENT PROCEDURE

The Scoping phase of the environmental process determined that more information on certain aspects of the development was required. As a follow up to the Scoping phase, a comprehensive Environmental Impact Assessment (EIA) is now required.

This Plan of Study (PoS) for the Environmental Impact Assessment (EIA) outlines the procedure to be followed and methods to be employed in investigating and assessing all the issues identified in the Scoping phase. GNEC has compiled this Plan of Study for EIA, which outlines the sequence of actions to be taken in order to complete the EIA process and, ultimately, to obtain an environmental authorisation for the applicant (Drakenstein Local Municipality) regarding the proposed project.
The Plan of Study for EIA is based on the findings and recommendations of the Scoping Report and the related process.

H-1 SCOPE OF THE EIA

The scope of the EIA includes the immediate surroundings of the 108 ha site that includes Erf 8359, RE/Erf 8370, Erf 8378, Erf 8399, Erf 8400, Erf 12628, Erf 12633 and Erf 33027 of Paarl (see Figure 1 Locality Map). The proposed residential development will be re-examined and a further alternative might be investigated, in light of the findings of the specialist studies that were mentioned in this Scoping Report.

H-1.1 Purpose of the Plan of Study for EIA

Issues and concerns raised by the I&APs and key stakeholders during the Public Participation Process, was collected and processed in the Final Comments and Response document, which forms a part of the Final Scoping Report.
The next step of the EIA process was the development of guidelines for execution of the impact assessment and the compilation of an Environmental Impact Report (EIR). The Plan of Study for the EIR outlines these guidelines.

H-2 ENVIRONMENTAL ISSUES IDENTIFIED DURING SCOPING

The key environmental issues identified by the Scoping phase were determined through an internal process based on similar developments, desktop analysis, revision of existing information, historical data, consultation with Interested and Affected Parties and the relevant authorities such as the Department of Environmental Affairs and Development Planning (DEA & DP). Potential risk sources / impacts were identified by the GNEC EIA team who has been on site to appraise the environment and identify the potential impacts of the development.

This Scoping Report evaluates and highlights the most significant issues that require further investigation during the EIA. The Environmental Investigation Team will thus focus on discipline-specific problems, seeking to examine each significant issue in further detail through the relevant specialist studies.

Other issues that were identified by consultation with I&APs and key stakeholders during the Scoping phase were incorporated in the specialists' terms of reference.
Issues relevant to the environmental investigation were included in the list of key environmental issues. The EIR will examine each issue and, based on the findings of the specialist studies, assess the significance of the impacts of the development. Suitable mitigation measures for all identified impacts will be provided by all specialist studies.
The issues will be grouped into broad categories as follows:

- Key issue 1: The physical and biological environment; and
- Key issue 2: The man made environment.

H-2.1 The physical and biological environment

In the EIA phase, the specialist studies to be conducted in the study area will need to further examine the following key impacts:

- Impact on Freshwater / Wetland resources
- Botanical Impacts

H-2.2 The man-made environment

The issues identified here are based on specifics such as:

- Visual Impacts
- Impact on Heritage and cultural resources
- Traffic Impact
- Archaeological Impacts; and

These issues will be further investigated, to provide more information in this regard.

H-3 PUBLIC PARTICIPATION PROCESS

The database of the stakeholders were developed during the scoping process were used as a basis to ensure that these stakeholders are involved and participate in the EIA process. The advertisement of the proposed development includes i.e. newspapers, notices at entrances to the site as well as on-site, distributed Background Information Document – BIDs to relevant authorities and commenting authorities, and adjacent landowners.

Should it be necessary for a public meeting during the EIA phase, the necessary arrangements will be made to house such a meeting.

H-4 APPROACH TO THE STUDY

The specialist provided Terms of Reference for the approach to be used in the study. Assumptions and sources of information must also be clearly identified. The knowledge of local people were incorporated in the study. The description of the study approach included a short discussion of the appropriateness of the methods used in the specialist study in terms of local and international trends and specific practice.

H-4.1 Description of the affected environment

A description of the affected environment must be provided. The focus of this description must be relevant to the specialist's field of expertise. The specialist must provide an indication of the sensitivity of the affected environment. Sensitivity, in this context, refers to the "ability" of an affected environment to tolerate disturbance, for example, if disturbance of the natural habitat results in the permanent loss of its biodiversity. If the affected environment is categorised as having a "low tolerance" to disturbance it is, therefore, termed a highly sensitive habitat. If, on the other hand, a habitat is able to withstand significant disturbance without a marked impact on its biodiversity, the affected environment could be categorised as having a high tolerance to disturbance (i. e. "low sensitivity" habitat).

H-4.2 Impact identification and assessment

The specialist must make a clear statement, identifying the environmental impacts of the construction, operation and management of the proposed development. As far as possible, the specialist must quantify the suite of potential environmental impacts identified in the study and assess the significance of the impacts according to the criteria set out below. Each impact will be assessed and rated. The assessment of the data must, where possible, be based on accepted scientific techniques, failing which the specialist is to make judgements based on his/her professional expertise and experience.

H-5 ASSESSMENT PROCEDURE

The criteria for the description and assessment of environmental impacts were drawn from the EIA Regulations, published by the Department of Environmental Affairs and Development planning (April 1998) in terms of the National Environmental Management Act, 1998 (Act No.107 of 1998).

The level of detail was somewhat fine-tuned by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed it is necessary to establish a rating system, which is consistent throughout all criteria. For such purposes each aspect was assigned a value, ranging from 1-5, depending on its definition.

H-5.1 Potential Impact

This is an appraisal of the type of effect the proposed activity would have on the affected environmental component. Its description should include what is being affected and how it is being affected.

H-5.2 Extent

The physical and spatial scale of the impact is classified as:

H-5.2.1 Footprint (1)

The impacted area extends only as far as the activity.

H-5.2.2 Site (2)

The impact could affect the whole, or a measurable portion of the site.

H-5.2.3 Regional (3)

The impact could affect the area including the neighbouring farms, the transport routes and the adjoining towns.

H-5.2.4 National (4)

The impact could have a national affect.

H-5.2.5 International (5)

The impact could have an affect outside the boundaries of South Africa

H-5.3 Duration

The lifetime of the impact, which is measured in relation to the lifetime of the proposed base.

H-5.3.1 Short term (1)

The impact will either disappear with mitigation or will be mitigated through a natural process

in a period shorter than any of the phases.

H-5.3.2 Short to medium term (2)

The impact will last up to the end of the phases, where after it will be entirely negated.

H-5.3.3 Medium term (3)

The impact will last up to the end of the phases, where after it will be entirely negated.

H-5.3.4 Long term (4)

The impact will continue or last for the entire operational lifetime of the Development, but will be mitigated by direct human action or by natural processes thereafter.

H-5.3.5 Permanent (5)

This is the only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

H-5.4 Intensity

The intensity of the impact is considered here by examining whether the impact is destructive or benign, whether it destroys the impacted environment, alters its functioning, or slightly alters the environment itself. These are rated as:

H-5.4.1 Low (1)

The impact alters the affected environment in such a way that the natural processes or functions are not affected.

H-5.4.2 Medium (3)

The affected environment is altered, but functions and processes continue, albeit in a modified way.

H-5.4.3 High (5)

Function or process of the affected environment is disturbed to the extent where it temporarily or permanently ceases.
This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

H-5.5 Probability

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the life cycle of the activity, and not at any given time. The classes are rated as follows:

H-5.5.1 Improbable (1)

The possibility of the impact occurring is none, due either to the circumstances, design or experience.

H-5.5.2 Possible (2)

The possibility of the impact occurring is very low, due either to the circumstances, design or experience.

H-5.5.3 Likely (3)

There is a possibility that the impact will occur to the extent that provisions must therefore be made.

H-5.5.4 Highly Likely (4)

It is most likely that the impacts will occur at some stage of the Development. Plans must be drawn up before carrying out the activity.

H-5.5.5 Definite (5)

The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied on.

H-5.6 Determination of Significance – Without Mitigation

Significance is determined through a synthesis of impact characteristics, and is an indication of the importance of the impact in terms of both physical extent and time scale. The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as "positive". Significance is rated on the following scale:

H-5.6.1 Low (1)

The impact will be mitigated to the point where it is of limited importance.

H-5.6.2 Low to medium (2)

The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.

H-5.6.3 Medium (3)

Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.

H-5.6.4 Medium to high (4)

The impact is of great importance. Through implementing the correct mitigation measures the negative impacts will be reduced to acceptable levels

H-5.6.5 High (5)

The impact is of great importance. Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and, taken within the overall context of the project, is considered to be a fatal flaw in the project proposal. This could render the entire development option or entire project proposal unacceptable..

H-5.7 Determination of Significance – With Mitigation

Significance is determined through a synthesis of impact characteristics. It is an indication of the importance of the impact in terms of both physical extent and time scale, and therefore indicates the level of mitigation required. In this case the prediction refers to the foreseeable significance of the impact after the successful implementation of the suggested mitigation measures. Significance with mitigation is rated on the following scale:

H-5.7.1 Low (1)

The impact will be mitigated to the point where it is of limited importance.

H-5.7.2 Low to medium (2)

The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.

H-5.7.3 Medium (3)

Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.

H-5.7.4 Medium to high (4)

The impact is of great importance. Through implementing the correct mitigation measures the negative impacts will be reduced to acceptable levels

H-5.7.5 High (5)

The impact is of great importance. Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of great importance, and, taken within the overall context of the project, is considered to be a fatal flaw in the project proposal. This could render the entire development option or entire project proposal unacceptable.

H-6 METHODOLOGY

Each aspect within an impact description is assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project life cycle. Subsequently in order to establish a defined base upon which it becomes feasible to undertake a value based decision process it is necessary to sum all the criteria.

H-6.1 Ranking Weighting and Scaling

For each impact assessed a scaled weighting factor, or also referred to as the severity which is the sum of the frequency of activity and impact occurring, (refer to the table above) is attached to each respective impact. The purpose of including such a weighting is to ensure that each member of the working group is given the opportunity to introduce their value bias for each individual aspect.

The process of assigning such weights serves to highlight those aspects that are considered the most critical to the various stakeholders as well as providing a means whereby the impact assessor can successfully deal with the complexities that exist between the different impacts and associated aspect criteria.

Simply, such a weighting factor is indicative of the importance of impact in terms of the potential effect that the aspect could have on the surrounding environment. Therefore the aspect, which is considered to have a greater importance, will be given a higher weighting than that which is of lower importance.

H-6.2 Identifying the Potential Impacts Without Mitigation Measures (WOM)

Following the assigning of the necessary weights to the respective aspects through the sum of all criteria pertaining to any particular impact multiplied by its assigned weighting will result in a value of each impact before the implementation of the necessary mitigation measures.

Equation 1

Significance Rating = Consequence x Severity/Weighting factor
where
Consequence = Extent + Duration + Intensity
Severity/Weighting factor = Frequency of activity + Frequency of impact.

Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7	Column 8	Column 9	Column 10
Determine the consequence of the impact by summation (1+2+3)				**Determine the severity of the Impact by summation (5+6)**			**Product of consequence and severity determines significance Without Mitigation (4x7)**	**Sufficiency of the proposed mitigation**	**Product of Column 8 and Column 9 determines significance With Mitigation (8x9)**
Extent of impact	**Duration of impact**	**Intensity of impact**	**Sum**	**Probability**		**Sum**	**Significance rating (WOM)**	**Mitigation efficiency (ME)**	**Mitigated aspects (WM)**
				Frequency of impact	**Weighting Factor**				
Footprint = 1	**Short = 1**	**Low = 1**	**Sum of Column 1-3**	**Almost never = 0.1**	**Low = 0.1**	**Sum of Column 5-6**	**Low = 0-2.9**	**High = 0.2**	**Low = 0-2.9**
Site = 2	**Short to Medium = 2**	**Low to Medium = 2**	**Sum of Column 1-3**	**Improbable = 0.2**	**Low to Medium = 0.2**	**Sum of Column 5-6**	**Low to Medium = 3-5.9**	**Medium to High = 0.4**	**Low to Medium = 3-5.9**
Regional =3	**Medium = 3**	**Medium = 3**	**Sum of Column 1-3**	**Probable = 3**	**Medium = 0.3**	**Sum of Column 5-6**	**Medium = 6-8.9**	**Medium = 0.6**	**Medium = 6-8.9**
National = 4	**Medium to Long = 4**	**Medium to High = 4**	**Sum of Column 1-3**	**Highly Probable = 0.4**	**Medium to High = 0.4**	**Sum of Column 5-6**	**Medium to High = 9-11.9**	**Low to Medium = 0.8**	**Medium to High = 9-11.9**
International =5	**Long = 5**	**High = 5**	**Sum of Column 1-3**	**Definite = 0.5**	**High = 0.5**	**Sum of Column 5-6**	**High = 12-15**	**Low = 1**	**High = 12-15**

Figure 31: Ranking Weighting and Scaling Matrix

SECTION I: SUMMARY OF SPECIALIST FINDINGS

I-1 TRANSPORT IMPACT ASSESSMENT

All study intersections are currently operating at acceptable Levels-Of-Service (LOS). Hence, no road upgrades are proposed from an intersection capacity point of view.

The study indicated that intersections will operate at unacceptable Levels-Of-Service (LOS) accept the Buitekant Street / Van Riebeeck Drive intersection. Thus it is proposed that the Roggeland Street / Van Riebeeck Drive and the Springbok Street / Jan van Riebeeck Drive intersection be upgraded to signalised intersections. A dedicated right and left turn lanes are also proposed on the north and southbound approaches to the Jan van Riebeeck / Vlakkeland Development access. These turning lanes are warranted as requested in the Road Access Guidelines.

The development is expected to generate 2013 weekday a.m. peak hour trips (992/1021, in-/outbound) and 1356 p.m. peak hour trips (792/564, in-/outbound).

Most study intersections will continue to operate at acceptable LOS during all peak periods with all the proposed upgrades in place.

It is proposed that dedicated right and left turn lanes be provided on the south and northbound approaches to the Jan van Riebeeck Drive / Vlakkeland Access intersection.

The Jan van Riebeeck Drive / Roggeland Roads intersection should be upgraded to a signalised intersection with additional dedicated right-turn lanes on both the east – and westbound approaches to the intersection.

Jan van Riebeeck Drive should be upgraded to a signalised intersection.

There will be three accesses to the proposed development of which only one access currently exists. This access is from Jan van Riebeeck Drive / Roggeland Road intersection. The existing accesses will remain the accesses for the future additional development.
It was observed that there is a need for public transport facilities on site. Taxis stop in the yellow shoulder and pick / drop people. Thus it is proposed that taxi embayments be provided next to the Jan van Riebeeck Drive / Vlakkeland development access intersection.

It is recommended that pedestrian sidewalks of at least 1.5 metres wide must be provided at all intersections, to ensure a safe walking environment at the intersections. Sufficient fencing should be provided to keep pedestrians from crossing the road wherever necessary.

It was furthermore proposed by ITS Engineers (Pty) Ltd. that two additional road upgrades be constructed to account for the cumulative effect of the other developments in close proximity to the Vlakkeland development on the overall pressure on traffic in this area. The proposed developments in the area include:

- Erf 553 Development (on the Western border of the Jan van Riebeeck Drive), 469 weekday AM peak hour trips (211/258 in/outbound) and 745 weekday PM peak hour trips (266/ 213 in/outbound trips;
- Fynbos Development (North of the Vlakkeland development and East of Newton), 52 weekday AM peak hour trips (18/34, in/outbound) and 52 PM peak hour trips (25/27, in/outbound);
- Farm 1254 Development (North of the Fynbos development and East of Newton), 10 AM peak hour trips (5/5, in/outbound) and 10 PM peak hour trips (5/5, in/outbound);
- Erf 8398 Development (Nestled between the Vlakkeland Development to the North and the SHARA property to the South), 99 AM peak hour trips (24/75 in/outbound) and 90 PM peak hour trips (69/30, in/outbound);
- Dal Josafat Erf 16161 Development (South of the SAHRA site and to the East of the Jan van Riebeeck Drive), 2040 AM peak hour traffic (797/1243, in/outbound) and 2149 PM peak hour trips (1202/947 in/outbound).

These upgrades include:

3. Intersection 1: the construction of a westbound left-turn lande at the Jan van Riebeeck Drive / Ring Road / Roggeland Road intersection; and
4. Intersection 2: the construction of a wastebound righ-turn lande at the Jan van Riebeeck Drive / Wamkelekile Road/ Buitekant Street intersection.

(Please refer to Addendum F6.2 for Addendum A of the Transport Impact Study)

I-2 BOTANICAL ASSESSMENT

I-2.1 First Botanical Assessment (May 2010)

Dr McDonald concluded that no threatened plant species (red Date) were found in the survey and his observations indicate that Erf 8378 Paarl (Vlakkelamd) has been largely transformed from the original vegetation that would have occurred there. No Critical Endangered Swartland Alluvium Fynbos was found and botanically the conditions of the site are very poor. The only area of interest is in the north eastern corner of the site. It could be significant and requires further consideration.

I-2.2 Second Botanical Assessment (June/July 2013)

Erf 33027 was not previously surveyed since the area fell outside the site boundary when McDonald (2010) surveyed the site. Although the outer edges of the erf are highly transformed the major portion contains a number of species of conservation concern. It is also important to note that there were a number of bulb species that could not be identified since only the leaves were visible and no flowers present.

The area has been heavily disturbed in the past and as a result is dominated by several grasses and weeds, including (D=dominant; A=additional), *Echium plantagineum, Echium vulgare, Hypochoeris radicata* (A), *Lupinus* sp. and *Fumaria muralis* (A). Despite the obvious past disturbance of the land, probably due to it being both cultivated and using as a grazing area, there are a number of remnant indigenous species present. Important observations include two bulb species, namely the VULNERABLE *Gladiolus recurvus* and the CULNERABLE *Spiloxene alba.* The former species occurs sporadically across the erf whereas the latter species occurs in high numbers in the north east corner of the site. Also found in this area is high numbers of the ENDANGERED *Monsonia speciosa.* This perennial species is a resprouter, with individual living to 30 years, this means the population has probably persisted for many decades or longer, depending on the land use history. The population is red flag and must be conserved in perpetuity.

In addition to the species conservation concern there are a number of more common remnant species, including *Aspalathus spinosa* subsp. *Spinosa* (D), *Cotula turbinate* (D), *Arcotis calendula* (D), *Oxalis purpurea* (D), *Oxalis* cf. *droseriodes* (D), *Oxalis pes-caprea* (A)*, Oxalis obtuse* (A)*, Cyanella hyacinthoides* (D)*, Eriospermum* sp. (A), *Ficinia* sp. (A), *Pelargonium triste, Pelargonium* sp. (D), *Trachyandra falcate, Moraea* sp. (D), *Lachenalia* sp., *Romulea flava* (A) and *Spiloxene flaccid.* (D)

The portion of land immediately south and southeast of Erf 33027 has light infestations of Port Jackson Willow (*Acacia saligna*) and a number of remnant species previously describes by McDonald including *Bobartia* cf. *indica, Diospyros glabra, Micranthus*

alopecuroides, Otholobium sp., *Ruschia bracteata, Salvia africana-caerulea angustifolia, Searsia laevigata* and *Spiloxene flaccid.*

The area has been marked as a CBA in the Western Cape Spatial Development Framework (WCSDF) (Kirkwood *et al*. 2010). and is thus confirmed to hold conservation values due to threatened species associations.

Additional information regarding the presence of threatened species were requested from CREW SANBI after comments were received during the first EIA public commenting period regarding a spring botanical assessment. According to Mr Ebrahim, CREW CFR program manager at SANBI, the following were identified on site earlier in 2014 (EN = Endangered & VU = Vulnerable): *Anthospermum ericifolium*(EN), *Lobostemon capitatus* (VU), *Geissorhiza tulbaghensis* (EN), *Monopsis variifolia* (EN), *Athanasia crenata* (EN), *Merciera tetraloba* (EN), *Erepsia cf.ramosa* (VU), *Phylica strigulosa* (VU), *Leucadendron lanigerum var. lanigerum* (EN), *Tritoniopsis elongate* (EN), *Aspalathus aculeate* (EN), *Aspalathus muraltioides* (EN).
All of these endangered and vulnerable species were found within the existing botanical buffer zone to the east of the site.

I-3 HERITAGE IMPACT ASSESSMENT

[7]Erf 33027 and a portion of Erf 8378 along Bo Dal road are of heritage significance in terms of

- *Scientific significance* in that they include rare and endangered aspects of South Africa's natural heritage.

Beyond that, the site itself, Erven 8359, 8378, 8399, rem 8370, 8400, 12628, 12633 and 33027 Paarl has *no further intrinsic heritage significance*. There are two structures older than 60 years on Erf 8378 (one still standing and in use, the other now a ruin); and two buildings on Erf 12633 (both still standing and in use). None of these structures are of historical significance or display architectural or aesthetic merit. The site thus contains *no structures of heritage significance nor* does it illustrate links *to historic landscape patterns of significance* (it is not an integral component of the historic rural landscape). There is *no direct significant association* with an historic person, group or event. *No archaeological heritage resources* have been identified and the archaeological impact assessment finds that no mitigation or monitoring is required.

However, the property is bordered on its eastern and southern boundaries by an historical rural landscape that is largely intact and of high heritage significance (proposed Grade 2) in terms of the following:

- *Historical/social/linguistic significance:* The strong association of the area, in

[7] *C Postlethwayt January 2014*

particular Kleinbosch, with the origins of the Afrikaans Language Movement, the "Genootskap van Regte Afrikaners" and the editorship of the journal "Die Afrikaanse Patriot, (1876). The Huguenot Memorial School (1893), and an associated graveyard, is located on the farm.

- *Architectural significance:* The high concentration of conservation worthy farmsteads including inter alia, Non Pareil (granted 1694), Roggeland (granted 1691, the original Dal Josafat), Schoongezicht (granted 1694), Kleinbosch (granted 1692) and Valencia (1818), all National or Provincial Heritage Sites.
- *Aesthetic significance:* The broad cultural landscape provides the context for the historical farms and farm werfs. This includes the strong visual spatial quality of the area, with the vivid mountain backdrop to the east, the plains of the Vlakkeland, the rural character, and the landmark qualities of a number of historic homesteads within this landscape.

I-3.1 Heritage Resource Indicators & Design Informants

At the level of principal, it should be noted that in terms of the urban edge delimitation the site is included in the Urban Edge, within an area where new development in the valley is more easily accommodated and where it is least likely to have an adverse impact. With the exception of the eastern edge of the property, the remaining extent of the property has no heritage value. *Development of most of the site can therefore be considered and indeed is inevitable.*

However, the southern and eastern boundaries of the site adjoin a rural landscape of high heritage significance (including the adjoining Grade 1 Farm 1361 Dal Josaphat on the southern boundary) and the eastern boundary forms the Urban Edge line. The focus of an assessment of potential impacts must therefore largely lie in assessing the degree to which such development may impact upon the integrity of the heritage resources in the valley and the rural character of the surrounding landscape. Development within this landscape needs to ensure a positive response to the following:

I-4 FRESHWATER / WETLAND ASSESSMENT

- The Drakenstein EMF indicates the sewerage ponds and disused dam to the south-west as wetlands. This classification is clearly incorrect according to the definition provided in the Aquatics Assessment. There are no National Freshwater Ecosystem Priority Areas (NFEPA) wetlands mapped for this site.
- "The site encompasses a reach of highly degraded streamline passing through the south-western portion of the property. It is understood that the proposal for future development of the site has included re-aligning the streamline along the western boundary. Given that the streamline is already so degraded, from both recent and historical abuse, it is my opinion that this is an option well-worth considering. It would, however, require that the rehabilitation and re-alignment of the streamline be extended upstream towards the Bo Dal Road and also be dependent on the future planning and drainage needs of the adjacent site. These do not appear to be insurmountable issues."

Dr. Sinske was appointed as the Floodline Specialist to determine and test the feasibility of the proposals made by Dr. Harding. In his report Dr. Sinske concluded that the above proposal is feasible for both the Kleinbosch River and the Mbekweni River and made two alternative proposals for re-alignment of the two streamlines. Alternative 2 in his report was found to have the least impact on the township layout and was identified as the preferred alternative for the alignment of the two streamlines as illustrated in **Error! Reference source not found.**. The cross section of the drainage channel is illustrated in Figure 37.

A follow up Freshwater study was conducted in 2014 by DHEC's Dr Harding (Please refer to Addendum F1.1). This study indicated that the Kleinbosch River, which feeds the wetland to the South-western corner, in fact terminates on the SHARA property south of the Vlakkeland Development and was flowing south of the shallow berm between the SAHRA and Vlakkeland properties towards the TopPrime residential development site. It is assumed that the berms were built for the management of field drains, but have since been damaged and lead to blocking and overflowing in an broad, spread-out fashion. This was confirmed during a hydrological assessment conducted by Graeme McGill. The assessment of the Geotechnical report (Please refer to Addendum F10) together with consultation with Professor Cornie van Huyssteen of Free State University, revealed that alluvial substrates were present west and south west of the evaporation ponds, located to the east of the Vlakkeland property. The resulting conclusion was drawn that the aforementioned area was found to be a shallow perched aquifer of approximately 0.4m in depth and to wet and fluidised to support vegetation except for stunted wetland-associated plants. The presence of invasive *Pennisetum macrourum* in the shallow depressions towards the south west corner led to the presumption of the existence of a wetland on this site and is similar to the soil characteristics on the neighbouring site which is currently being developed

for housing.

As a result of this, Dr Harding suggested the re-alignment of the Kleinbosch River along the southern boundary of the Vlakkeland property, which will create an elongated natural wetland feature along the northern border of the SAHRA property and ultimately connecting to the Dal River on the SAHRA site. This diversion will not have a negative effect on the aquifer on the Vlakkeland site, as the site will be infilled to level out the slight gradient, and the hydraulic linkage to the south west will not be altered.

Dr Harding's report therefore concluded that should alternative one be implemented, where the Kleinboch River is realigned to it's original position to the Dal River, the wetland characteristics on the Vlakkeland site will disappear. However, similarly in the case where alternative two is implemented, where the Kleinbosch river is connected in a channel from the SAHRA site to the outlet from Vlakkeland, the overland spillage which lead to the prevalence of the wetland characteristics will also disappear.

I-5 VISUAL IMPACT ASSESSMENT

The site has a medium visual absorption capacity due to the presence of other similar development in the area. The development footprint will be enlarged but no new visual elements will be introduced into the overall landscape.

It is vitally important that the interface along the urban edge with Bo Dal Road is properly mitigated. The buffer zone provided along this edge along with the recommended mitigation screening will ensure that this edge is softened and the demarcation between the urban and agricultural areas is handled in a visually sensitive manner.

The mitigation of the southern edge of the development is also vitally important so that the visual impact on the historical erven to the south of the site is minimised.

Mitigation will also have to be undertaken along Jan van Riebeeck Drive to soften the visual impact of the double storey buildings along this edge.

With full mitigation the overall significance of the visual impact has been assessed as medium-low for the proposed development and this is considered acceptable for a development of this size and nature. It is therefore recommended that the project be allowed to proceed provided that the mitigation measures are implemented in full.

SECTION J: ASSESSMENT OF ANTICIPATED IMPACTS

J-1 IDENTIFICATION OF KEY ENVIRONMENTAL ISSUES

The key issues listed in the following section have been determined through an internal process based on similar developments, environmental scoping and public participation process as well as site visits.

The potential impacts and key issues identified include:

- Impacts on heritage and culture;
- Impacts on flora;
- Impacts on fauna;
- Freshwater Impacts;
- Visual Impacts;
- Impacts on traffic;

J-2 SUMMARY OF ANTICIPATED IMPACTS

Table 13 : Summary of anticipated impacts as identified during the Scoping phase of the EIA process

Environmental Aspect	Relevant Area	Environmental Objective	Potential Impacts	Additional Investigations	Potential Mitigation
PHYSICAL					
Freshwater	Site	To ensure the protection and future functioning of wetlands and freshwater systems	Fragmentation and possible loss of wetlands and freshwater systems. Loss of biodiversity, disruption of natural processes and functionality.	Wetland/Freshwater Assessment - Completed	After additional Freshwater Assessments it became known that no naturally occurring wetlands are present on site. It is proposed that the Kleinbosch river be realigned back to its original flow position to divert the runoff away from the developable area and to better manage the quality of the Kleinbosch and Seven Springs runoff.
Soils	Site	To determine the soil quality of the area. Determine the impact of the proposed development on the loss of potential agricultural soil.	Loss of good quality agricultural soil.	None	None
Agricultural Feasibility assessment	Site	To determine the agricultural feasibility of the site. To determine the potential impact on agriculture in the area with the loss of this site to the proposed development.	Loss of good quality agricultural soil.	None required by the Department of Agriculture	None

Environmental Aspect	Relevant Area	Environmental Objective	Potential Impacts	Additional Investigations	Potential Mitigation
Botanical	Region	To ensure that species of conservation importance are identified and preserved	Fragmentation of habitat, loss of species of conservation importance, loss of biodiversity, disruption of natural processes and functionality.	Botanical Assessment - Completed	Conservation of areas within new private open areas. Protection of sensitive areas and avoidance of these areas during construction and operational phases.
Fauna	Regional	To ensure that species of conservation importance are identified and preserved. To ensure that the ecological integrity and functionality of the system is maintained.	Loss of biodiversity, disruption of natural processes and functionality.	None	The protection of the Botanical Sensitive areas will provide habitat for current bird and other faunal species on the site.
SOCIAL SURROUNDINGS					
Safety & Security	Site	To assure safety within the site, particularly to prevent trespassers from neighbouring estates/ areas.	Trespassers; Threat to safety of residents and tourists.	Best Practice	High security with controlled access and constant monitoring.
Visual aspects	Regional	To minimise light and visual pollution; To ensure that the development blends in with the landscape character.	Alteration of Landscape Character	Visual Impact Assessment - Completed	Minimise the use of lighting and select low intensity lighting; and Non intrusive architectural design.
Traffic	Regional	To prevent congestion as a result of the development.	Traffic impact on surrounding road network	Traffic Impact Assessment - Completed	Creating an east-west linkage road running through the development.
Archaeological	Site	Protection of a variety of heritage resources including palaeontological, prehistoric and historical material (including ruins) more than 100 years old (Section 35), human remains older	Possible loss of a variety of heritage resources including palaeontological, prehistoric and historical material	Archaeological Impact Assessment - Completed	No archaeological impacts will be experienced.

Environmental Aspect	Relevant Area	Environmental Objective	Potential Impacts	Additional Investigations	Potential Mitigation
		than 60 years			
Heritage and Culture	Site	To ensure that all buildings, artefacts and symbols of culture and heritage significance are identified and preserved.	Loss of significant symbols of heritage and culture and a loss of sense of place.	Heritage Impact Assessment - Completed	Delineation of buffer zones. 40m is required on the southern boundary and 120m on the eastern boundary. An ROD from Heritage Western Cape has been received.
Socio-economic	Regional	To assure that the development is sustainable through community upliftment and involvement as well as the procurement of local people; Employment, transfer of skills and training.	Employment, Social upliftment; Increased investments in the area.	Best Practice	Procurement policies and integration of local communities.

J-3 IMPACT ASSESSMENT

The following section will describe, review and evaluate all impacts on the environment, which could be expected to occur as a result of all construction and operational activities relating to the proposed Vlakkeland Development. Furthermore, each section includes the cumulative impacts associated with the proposed development.

The project area referred to below entails the proposed affected footprint areas as a result of the Vlakkeland Development where the study area refers to the larger area surrounding the proposed footprints of the proposed development that have been assessed.

J-3.1 Ecological Impacts

J-3.1.1 Soils

Almost the entire property has been severely disturbed by decades of intensive agriculture and the sewage treatment ponds. The site has also been heavily grazed by cattle, goats and sheep. The geology can be described as quaternary alluvium derived from a mix of Table Mountain sandstones and Cape Granite on the slopes. There is a considerable depth of alluvia material that is sand and organic, overlying a basement of eroded river cobbles and stones. The soil profile can be estimated to lie between 0.8 m and 2 m deep with very few rocks and stones in the upper half. Soil forming is dominated by the accumulation of the organic material as a result of the flooding events over the winter periods and vegetation erosion.

Geo-technical information pertaining to the site was obtained from RA Bradshaw and Associates CC who conducted a Geotechnical Investigation of the Vlakkeland site in 2008. The report stated that residential development can occur on the entire site except in the south western corner below the 1:50 year floodline as illustrated in the figure below.

According to the findings the developable area is divided into three categories, namely an area that is suitable for normal strip footings for the houses, an area where 60% of the strip footings have to be slightly reinforced and an area where all the strip footings should slightly be reinforced. Please refer to Figure 32: below.

Figure 32:*Geo-Technical Information of the site*

J-3.1.1.1 Soil erosion

Notwithstanding the fact that the soil has a low natural erosion hazard, negative impacts in the form of soil erosion may possibly be expected, especially when exposed and the slope increased when stockpiled for rehabilitation objectives. Other sources can compact areas, causing increased runoff resulting in increased erosion. The significance of this impact with mitigation may, however, be assumed to be low.

J-3.1.1.2 Soil compaction

Although the compaction potential of the surface soil is low, compaction may be foreseen in those areas where loading and transporting of the material are experienced. Compaction of stockpiled topsoil may also be considered as a negative aspect. Yet the significance of the impact may only be assumed to be low with mitigation measures.

Table 14: Potential impacts on the soil

						Probability					
Activity	Nature of impact	Extent of impact	Duration of impact	Intensity of impact	Sum	Frequency of impact	Weighting factor	Sum	Significance Rating (WOM)	Mitigation efficiency (ME)	Mitigated Aspects (WM)
Construction and Stockpiling	Soil erosion	Site	Medium	Medium		Probable	Medium		Low - Medium	Medium	Low
		2	3	3	8	0.3	0.3	0.6	4.8	0.6	2.88
Loading and transport	Soil compaction	Footprint	Medium	Medium		Highly Probable	Medium		Low to medium	Medium-High	Low
		1	3	3	7	0.4	0.3	0.7	4.9	0.4	1.96

J-3.1.2 Natural vegetation

Discussion of the previous Botanical Assessments

Two separate botanical studies (2008 and 2010) were undertaken before the commencement of this project (see Figure 33:), which was used to guide drafting of the Conceptual Development Frameworks:

- In November 2008, Nick Helm conducted a *Botanical Assessment of Municipal properties in vicinity of erf 361, Newton, Paarl. A*n extensive area on the eastern boundary of erf 8378 has been identified as "Very High Conservation Value" and "High Conservation Value".

- A study by Nortje and De Villiers Engineers, *Feasibility Study for Housing on the Vlakkeland Site, May 2010*, contained a botanical scan by Dr. Dave McDonald. He identified a portion to the north-east of the site, approximately 1ha that has botanical significance and should be approached with caution (please refer to Figure 33: indicating the 2010 sensitive area).

- Dr. Dave McDonald was appointed in June 2013 as part of this assessment to do a reassessment of the site. The rationale for a reassessment is based on (1) McDonald's recommendation (in the 2010 scan) to conduct a botanical scan at a more suitable season in terms of the optimal detection of important plant species, in particular bulbs, and (2) due to the expansion of the site since 2010. A site revisit was also necessary to determine whether any changes have occurred on the property since 2010.

The only areas that should be conserved (no development allowed) are erf 33027 (not part of the study area anymore) and the area to the east of the old sewerage dams on Re/8378 as illustrated on

-

Please note that the entire area as identified during the 2008, 2010 and 2013 assessments as well as the areas indicated by SANBI CREW have been included as a conservation area in the preferred layout. No development will be allowed on this section of the site.

J-3.1.2.1 Conclusions and Constraints ERF 33027 and land east of evaporation ponds

(Please note that all mitigation measures and recommendations were included in the layout. All sensitive areas will be avoided during construction and operation)

- The area is degraded but holds conservation value due to the (1) large population of the **VULNERABLE** *Gladiolus recurvus*, (2) a viable population of the **ENDANGERED** *Monsonia speciosa*, and (3) scattered individuals of the **VULNERABLE** *Spiloxene alba*.
- There may be a number of additional species of conservation concern, which would only be identifiable during spring.
- **Mitigation measures are limited** and should take the form of **AVOIDANCE** wherever

possible. The area should be conserved and rehabilitated. This should include removal of all invasive alien plants, rubble and policing of dumping activities. Bollards should be erected to prevent people from driving onto the site and offloading rubble and waste material.

- The area has been marked as a CBA in the Western Cape Spatial Development Framework (WCSDF) (Kirkwood *et al*. 2010). and is thus confirmed to hold conservation values due to threatened species associations (Figure 6).

J-3.1.2.2 Conclusions and Constraints Land Portion along Jan van Riebeeck Drive

The strip of land along Jan van Riebeeck Drive is highly transformed and contains no remaining species of conservation concern.

- The area is highly transformed and has very little conservation value in terms of remnant vegetation or important species since none were detected. The designation of parts of this area as CBA's based on the presence of threatened species associations in the WCBF (Kirkwood *et al*. 2010) is therefore not supported based on these findings.

J-3.1.2.3 Conclusions and Constraints ERF 8378

No intact remnant natural vegetation was found, however, there are a number of species found on this site, which could be translocated for the purpose or restoring the degraded portions of the area next to Bo Dal Road.

- No threatened species associations were found during the 2008, 2010 and 2013 site assessments, which contradicts the WCBF (Kirkwood *et al.* 2010).

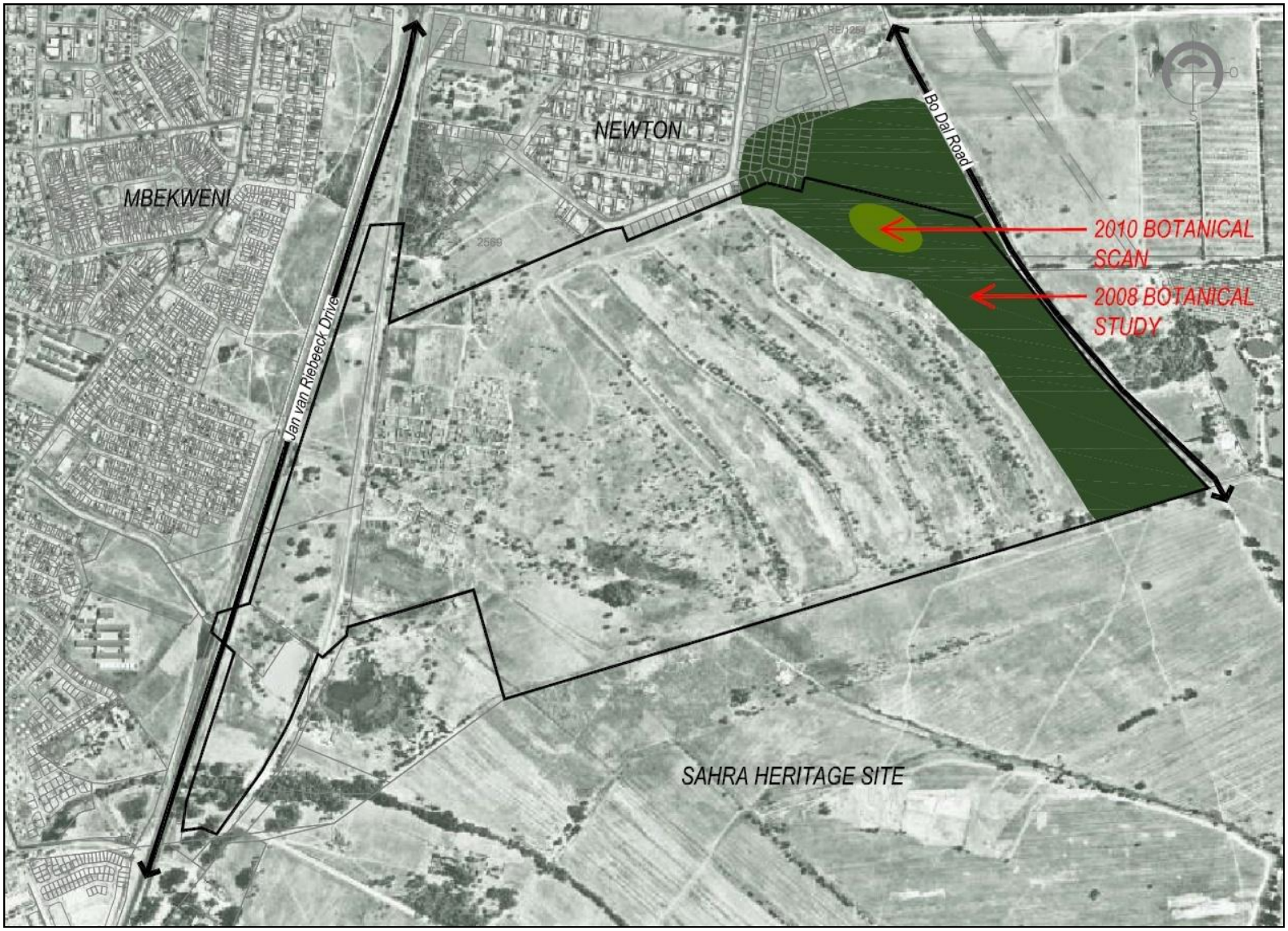

Figure 33:Botanical Sensitive areas as identified in 2008 and 2010

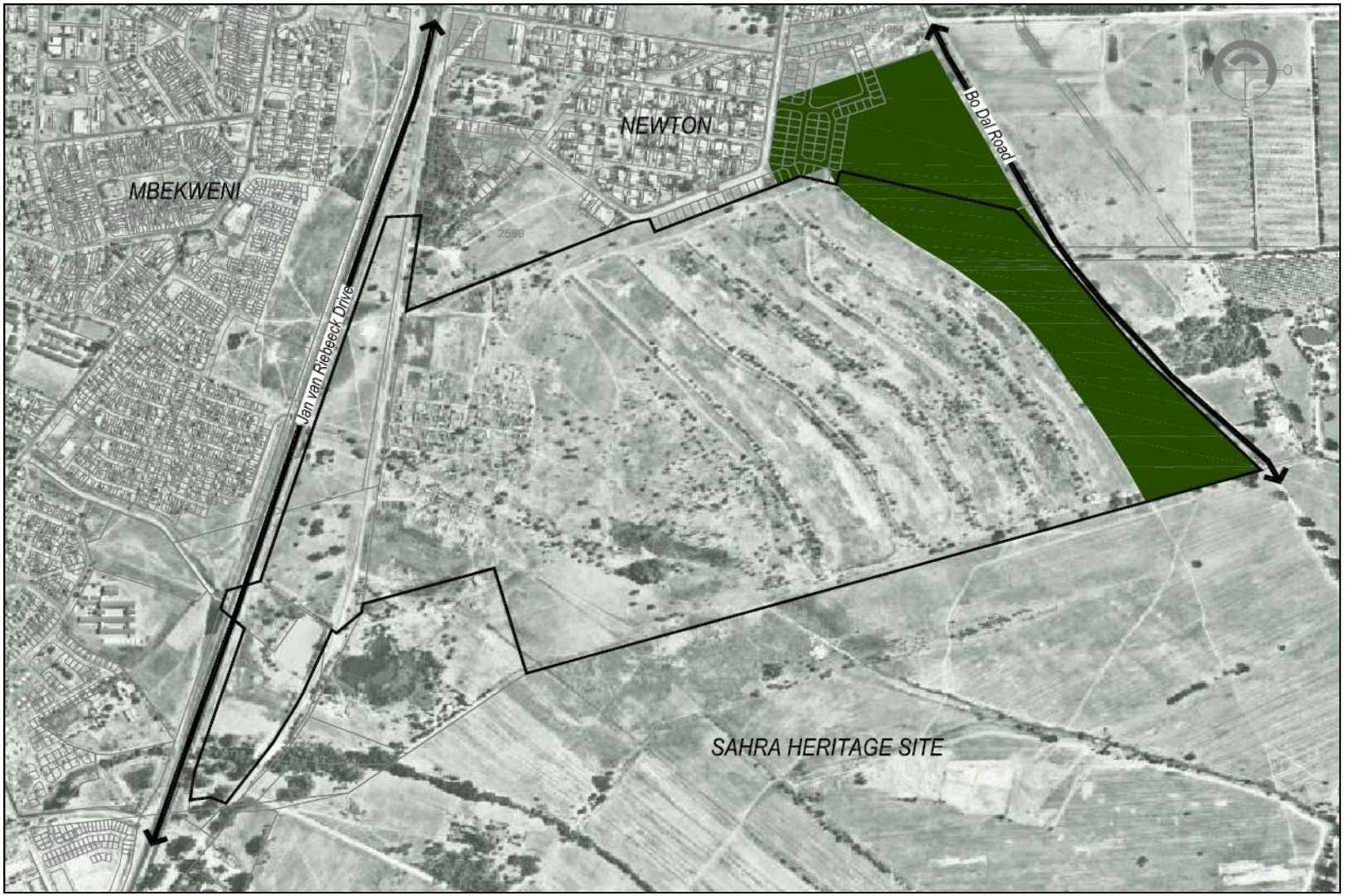

Figure 34: Botanical Sensitive Area, 2013 Assessment

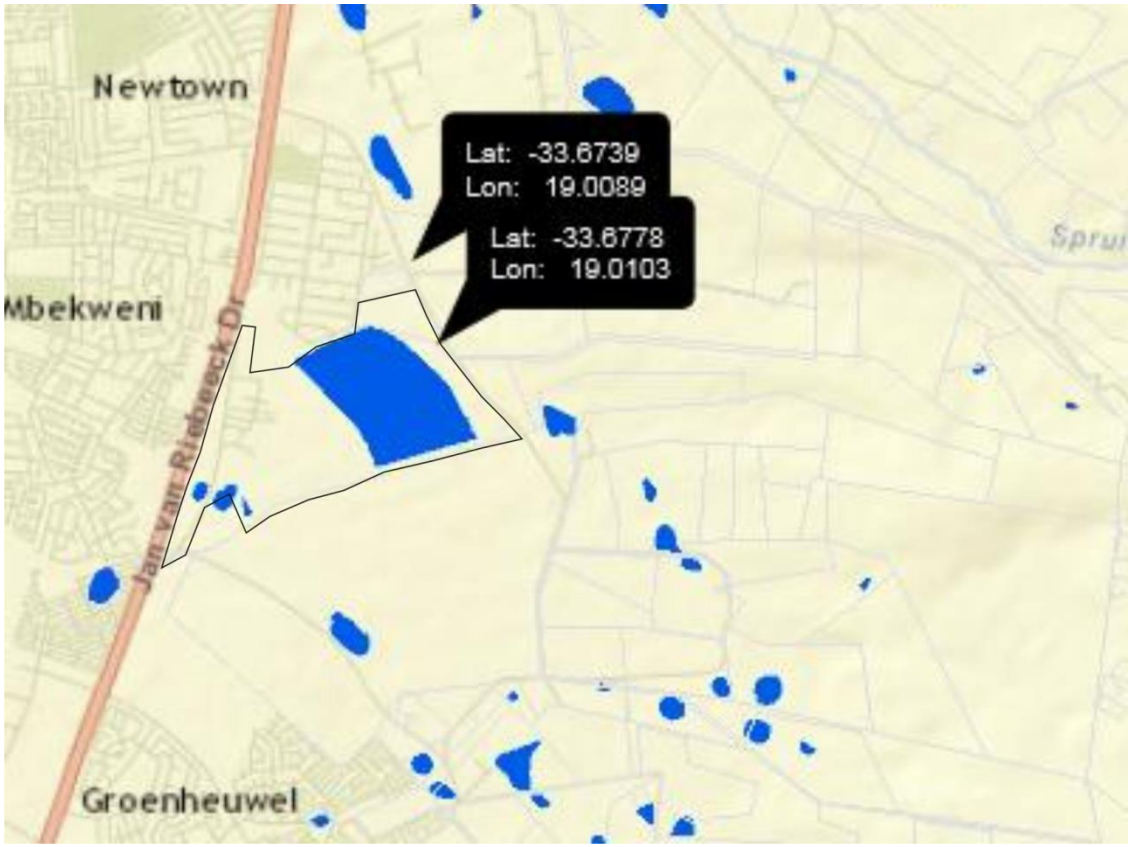

Figure 35: SANBI CREW Locations of Endangered Vegetation Areas.

Table 15: Potential impacts on the vegetation on the site

						Probability					
Activity	Nature of impact	Extent of impact	Duration of impact	Intensity of impact	Sum	Frequency of impact	Weighting factor	Sum	Significance Rating (WOM)	Mitigation efficiency (ME)	Mitigated Aspects (WM)
Construction and Operation	Removal and/or Damaging of Natural Vegetation	Footprint	Medium to Long	Medium to High		Highly Probable	Medium to High		Medium	High	Low
		1	4	4	9	0.4	0.4	0.7	7.2	0.2	1.44
Construction and Operation	Damaging and/or removal of Red data species	Footprint	Medium to Long	Medium to High		Highly Probable	Medium to High		Low - Medium	High	Low
		1	4	4	9	0.4	0.4	0.7	7.2	0.2	1.44
Construction and Operation	Developing on remainder of the site	Footprint	Permanent	Low		Definite	Low		Low - Medium	Medium to High	Low
		1	5	1	7	0.5	0.1	0.6	4.2	0.2	0.84
Loading and transport	Soil compaction	Footprint	Medium	Low - Medium		Highly Probable	Low to Medium		Low to medium	Medium-High	Low
		1	3	2	6	0.4	0.2	0.6	3.6	0.4	1.44

Explanation:

Source of the impact

The intrusion of the development on the patches of sensitive vegetation with High or Very High conservation value.

Description of the impact

Currently there are only a few small patches on the site with Rare and/or endangered species present. The construction of the Vlakkeland development could disturb these patches.

Significance

The significance of the impact is expected to be of a medium negative significance without mitigation. With mitigation the significance of the impact will decrease to a low negative.

Mitigation

No development should take place in areas if High or Very High conservation value (this was adhered to in the layout design for this proposed development). The remaining areas (agricultural lands of Very Low conservation value) are suitable for development.

It is essential that the proposed ecological corridors (40m buffer area along the proposed new Kleinbosch River) linking the sensitive area with the SAHRA area to the south of the site) be created. These areas are very important to allow for movement of plant, animals and birds and

will help ensure the long term viability of the small and currently unconnected vegetation patches.

Conclusion

The sensitive areas will form part of Green spaces which will be regarded as "No-Go" areas and which will be maintained by the HOA or the POAs. Corridors must be included in the approved layout. It is furthermore suggested that an ECO be appointed to conduct yearly audits for the life of the development (by the POA or the HOAs).

J-3.1.3 Fauna

Birds in general are highly mobile and can therefore temporarily vacate areas should adverse conditions prevail.

There are almost no natural vegetation present near and around the large man made dam near the south-eastern corner of the site due to heavy grazing, but the dam is important for many birds (including the Red Data Book listed Blue Crane). The dam is considered of high conservation value.

It is not foreseen that the rest of the proposed development will have any significant impacts on animal life in the area.

Table 16: Potential impacts on fauna

						Probability					
Activity	Nature of impact	Extent of impact	Duration of impact	Intensity of impact	Sum	Frequency of impact	Weighting factor	Sum	Significance Rating (WOM)	Mitigation efficiency (ME)	Mitigated Aspects (WM)
Construction and Stockpiling	Disturbance of Fauna on and near the site	Site	Medium to Long	Medium to High		Improbable	Medium		Medium to Low	Medium to High	Low
		2	4	4	10	0.2	0.3	0.5	5	0.4	2
Construction	Disturbance of natural habitats	Footprint	Medium to Long	Medium		Probable	Medium		Low to medium	Medium-High	Low
		1	4	3	8	0.3	0.3	0.6	4.8	0.4	1.92
Operation	Disturbance of natural habitats	Footprint	Long	Medium to High		Probable	Medium		Low to medium	Medium-High	Low
		1	5	4	10	0.3	0.3	0.6	4.8	0.4	1.92

Explanation:

Source of the impact

Construction of the proposed residential development.
Operational activities around the protected area and the SAHRA site.

Description of the impact

Construction of the proposed Vlakkeland Development will not occur in areas of High or Very High conservation value. At these sites it is unlikely that the bird community structure will be affected in any significant way. It is unlikely that there will be a change in the status quo, although temporary changes may occur due to the disturbances caused during construction. The areas of High and Very High conservation (like the botanical sensitive area and the adjacent SAHRA site) are unlikely to be affected by the proposed development, thus the impact on the birds residing or occupying this area will be short lived and insignificant.
Construction activities go hand in hand with high ambient noise levels and the eventual loss of habitat. Although construction is temporary some of the birds may vacate the area during the construction phase. These species typically occupy large home ranges which extend beyond the proposed site. Thus the impact on these types of species will be insignificant.

Significance

The significance of the impact on the various habitat types ranges from low-medium to medium. The impact can be substantially reduced to low negative significance with mitigation measures.

Mitigation

The manmade dam should not be disturbed during construction and operational phases. The dam is occasionally the host to at least two Red listed bird species, one of which may breed there.

Conclusion

The botanical sensitive area to the east and north east of the site is situated within the development, this area will be included as part of an Open area which will be protected as “No-Go” areas during construction. Limited access will be allowed during operation. The mitigation measures will therefore limit the possible impact on the fauna currently present in these areas. Significance ratings without mitigation (should the habitats be developed) are therefore relatively high (Rated as medium).

J-3.1.4 Surface Water

[8] The Drakenstein EMF indicates the sewerage ponds and disused dam to the south-west as wetlands. This classification is clearly incorrect according to the definition provided in the Aquatics Assessment. There are no National Freshwater Ecosystem Priority Areas (NFEPA) wetlands mapped for this site.

- "The site encompasses a reach of highly degraded streamline passing through the south-western portion of the property. The Freshwater specialist stated that, given that the streamline is already so degraded, from both recent and historical abuse, it was his opinion that the realignment of the Kleinbosh River to its original location is an option well-worth considering. It would, however, require that the rehabilitation and re-alignment of the streamline be extended upstream towards the Bo Dal Road and also be dependent on the future planning and drainage needs of the adjacent site. These do not appear to be insurmountable issues."

Dr. Sinske was appointed as the Floodline Specialist to determine and test the feasibility of the proposals made by Dr. Harding. In his report (attached as) Dr. Sinske concluded that the above proposal is feasible for both the Kleinbosch River and the Mbekweni River and made two alternative proposals for re-alignment of the two streamlines. Alternative 2 in his report was found to have the least impact on the township layout and was identified as the preferred alternative for the alignment of the two streamlines as illustrated in Figure 33:

The proposed re-alignment and channelling of the streamlines will open up a substantial area for development previously sterilized by the 1:50 and 1:100 year flood lines and also drastically reduce management costs and maintenance of the streamlines. A buffer of 40m is proposed around the streamline in order to allow for this system to also act as an ecological corridor.
The proposed Drainage Channel cross section for the re-aligned watercourse (to its original alignment) is illustrated in Figure 37 below.

[8] Please also refer to the wetland Assessment Addendum F-1 (Dr. Bill Harding)

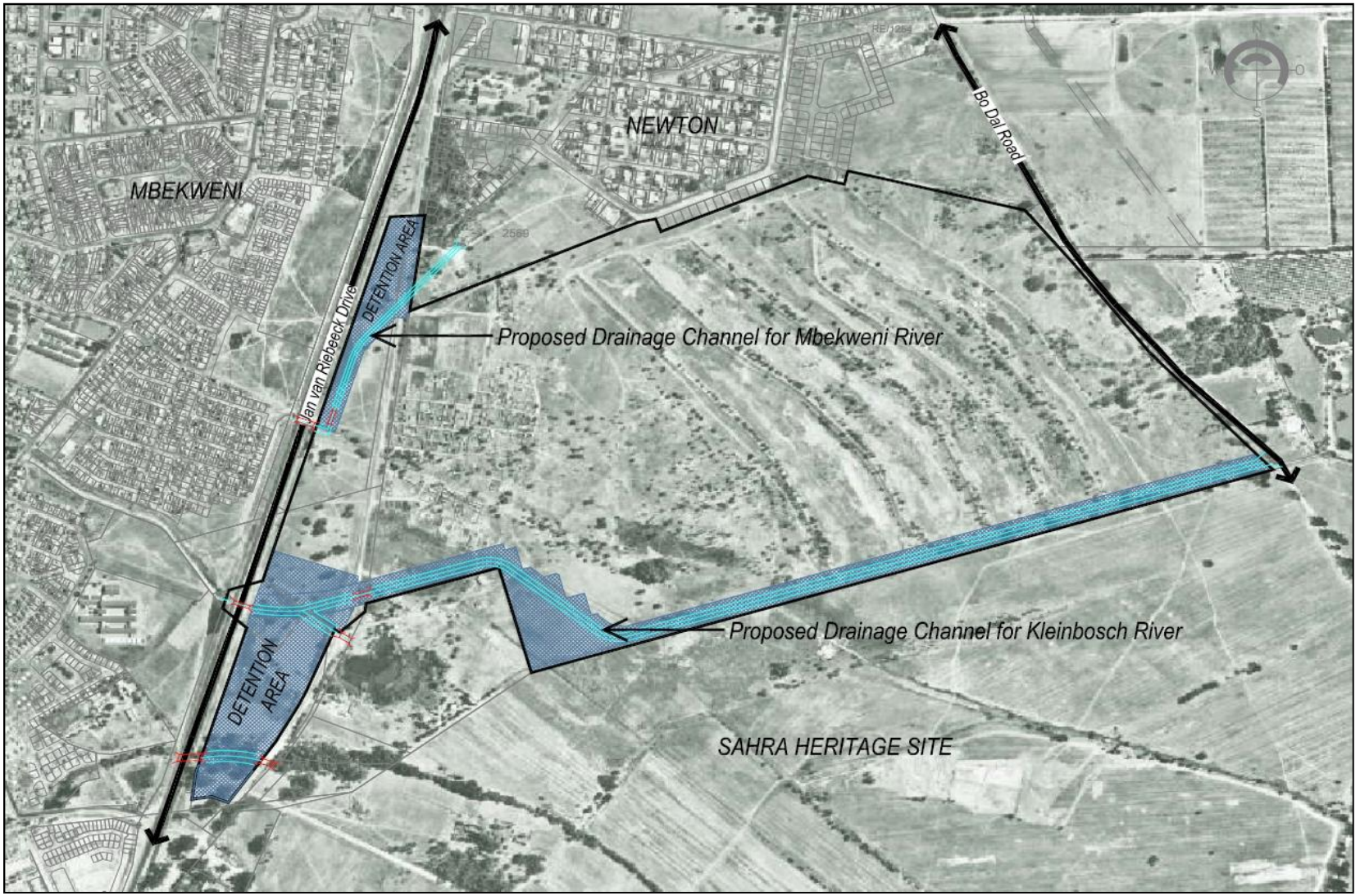

Figure 36: Proposed alignment of the river Channels
(Nuplan, 2013)

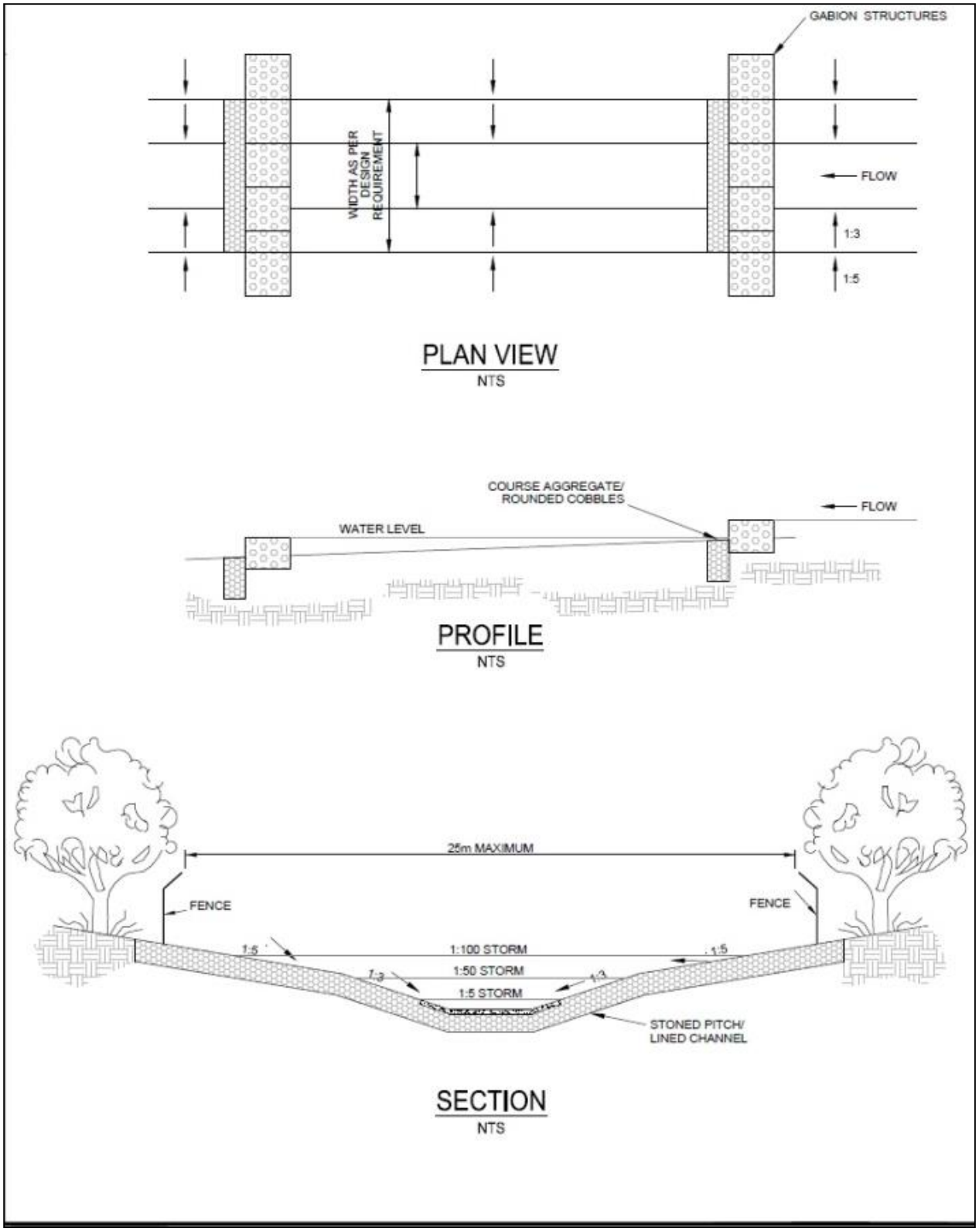

Figure 37: Typical Drainage Channel Cross Section

(Lyners, 2013)

Discussion:

- The wet areas surrounding the proposed new alignment (old alignment) will be protected by at least a 40 m buffer zone which.
- The original drainage line of the Kleinbosch River will be reinstated and an appropriate buffer allocated.
- Connectivity between the botanical sensitive areas and the SAHRA site will be created by this proposed buffer area.
- All other stormwater runoff from the area will be managed in a sensitively designed stormwater system that will ensure continued flood management and eventual discharge to the stream.

Table 17: Potential Impacts on Surface Water

						Probability					
Activity	Nature of impact	Extent of impact	Duration of impact	Intensity of impact	Sum	Frequency of impact	Weighting factor	Sum	Significance Rating (WOM)	Mitigation efficiency (ME)	Mitigated Aspects (WM)
Development on wetland areas	Development	Local	Long	Medium to high		Improbable	Medium High		Low to medium	High	Low
		3	4	4	11	0.2	0.3	0.5	5.5	0.2	1.1
Re-alignment of the watercourse	Destruction	Local	Medium	Medium		Probable	Medium to high		Low to medium	High	Low
		3	3	3	9	0.3	0.4	0.7	6.3	0.2	1.26

Explanation:

Source of the impact

The intrusion of the development on the existing watercourses on the site as well as the inclusion of the Stormwater management Plan as part of the system.

Description of the impact

The re-alignment of the Kleinbosch River back to its original alignment. The inclusion of the buffer area as indicated into the Open Space and conservancy area will assist in protecting the watercourse in future.

Significance

The significance of the impact is expected to be of a low to medium negative significance without mitigation. With mitigation the significance of the impact will decrease to a low negative.

Mitigation

All botanical and freshwater sensitive areas must be linked by means of a corridor system (as included in the Preferred Layout). These corridors or connectivity zones must be at least 40m wide.

No development should take place within the 40m buffer area as included in the layout.

Conclusion

The sensitive areas will form part of open spaces which will be regarded as “No-Go” areas. It is furthermore suggested that an ECO be appointed to conduct yearly audits for the life of the development to determine the nature and possible impacts on the watercourses due to residential activities in the area.

J-3.1.5 Groundwater

The potential exists for spills of contaminants such as fuels and lubricants (and other hydrocarbons) from construction vehicles that may impact negatively on the groundwater of the region. If the sanitary and ablution facilities on the construction sites are inadequate, it can result in health risks and groundwater contamination. Care must be taken that the construction does not extent 2m in depth.

Table 18: Potential Impacts on Groundwater

						Probability					
Activity	Nature of impact	Extent of impact	Duration of impact	Intensity of impact	Sum	Frequency of impact	Weighting factor	Sum	Significance Rating (WOM)	Mitigation efficiency (ME)	Mitigated Aspects (WM)
Fuel storage and refuelling of construction vehicles	Spill of contaminants	Site	Medium	Medium to high		Improbable	Medium		Low to medium	Medium to high	Low
		2	3	4	9	0.2	0.3	0.5	4.5	0.4	1.8
Sanitation without facilities	Groundwater Contamination	Site	Medium	Medium		Probable	Medium to high		Low to medium	High	Low
		2	3	3	8	0.3	0.4	0.7	5.6	0.2	1.12

J-3.1.6 Air Quality

Dust from vehicle entrainment represents the most significant source of dust during construction and hauling, with material handling representing the second largest source.

Table 19: Potential Impacts on air quality

						Probability					
Activity	Nature of impact	Extent of impact	Duration of impact	Intensity of impact	Sum	Frequency of impact	Weighting factor	Sum	Significance Rating (WOM)	Mitigation efficiency (ME)	Mitigated Aspects (WM)
Construction and hauling activities	Dust fallout	Regional	Medium	Low to medium		Probable	Low to medium		Low to medium	Medium	Low
		3	3	2	8	0.3	0.2	0.5	4	0.6	2.4

J-3.1.7 Noise

The construction activities will have a minor impact on the noise climate in the surrounding environment. In the worst case, with no mitigating measures, and using the limit levels, the impact will be NONE during daytime beyond a distance of 3km from the construction site. No construction will occur at night.

J-3.1.8 Cumulative Impacts

After the assessment of the individual anticipated impact on the ecological environment, the cumulative impacts as a result of the proposed development can be calculated as follows:

1.	Impact on soils:	Low (average rating after mitigation of 2.4)
2.	Impact on natural vegetation on site	Low (average rating after mitigation of 1.29)
3.	Impact on fauna	Low (average rating after mitigation of 1.94)
4.	Impact on surface water	Low (average rating after mitigation of 1.18)
5.	Impact on ground water	Low (average rating after mitigation of 1.46)
6.	Impact on air quality	Low (average rating after mitigation of 2.4)
7.	Impact of noise	Low (average rating after mitigation of 0.48)
Total average ecological impacts:		**Low (1.45)**

J-3.2 Social Impacts

J-3.2.1 Heritage Impacts

In principle, the Heritage Impact Assessment supported the development of erven 8359, 8378, 8399, rem 8370, 8400, 12628 and 12633 Paarl for the development of a new residential area, with associated commercial and community facilities, for the following reasons:

- There are no significant historic associations of this landholding;
- With the exception of the eastern portion of erf 8359, the site has not been identified as being of heritage significance;
- There are no structures of heritage significance on the site, although there are buildings older than 60 years which will be demolished. Demolition thereof is not opposed.
- No archaeological heritage resources have been identified and the archaeological impact assessment finds that no mitigation or monitoring is required.
- It falls within the Paarl Urban Edge and can be seen as a logical expansion of the adjoining residential area. Urban development is unavoidable and must be expected.

However, the heritage value of the adjoining context - the landmark Dal Josaphat werf and the broader agricultural landscape context – must be maintained. In this regard, the HIA concluded that the potential impacts of the proposed Alternative 2, with mitigation, are *medium to low* and this is considered acceptable for a development of this size and nature. Specifically, the assessed impacts on:

- the integrity and intactness of the historic farms and the rural landscape setting, are *negative* and of *medium to low significance with mitigatio*n;
- the Urban Edge condition, are *negative*, and of *medium-low significance with mitigation*;
- maintaining and enhancing Botanical Significance, are *negative*, and of *low significance with mitigation*.

The confidence in the findings of the HIA is medium-high provided that the eventual development stays within the broad parameters described in the development plans and architectural typologies, particularly in so far are they are relevant to the heritage indicators.

As this development is situated at the urban edge and will complete the local extent of infill, there should be no further cumulative visual or other heritage related impacts of heritage significance. However, should there be any intention to shift the urban edge further into this rural landscape the cumulative impacts could have a profoundly negative impact on the heritage resources of this region. For the same reason, it will be important that said development parameters and mitigation measures are adhered to and linked to any positive comment made by the heritage authorities.

Table 20: Possible Heritage Impacts

Potential for Impact upon:	**Before Mitigation**						**Mitigation measures**	**After mitigation**					
	Magnitude (10, 8, 6, 4, 2, 0)	Duration (1 – 5)	Extent/scale (0 – 5)	Probability (1 – 5)	Score	Significance rating		Magnitude (10, 8, 6, 4, 2, 0)	Duration (1 – 5)	Extent/scale (0 – 5)	Probability (1 – 5)	Score	Significance rating
The integrity and intactness of the historic farms and the rural landscape setting	4	4	2	4	14	Medium to low	Conservation area setback; POS/stormwater system; retention facility	4	4	2	4	14	Medium to low
The Urban Edge condition	4	4	2	4	14	Medium-low	As above; and tree planting to break up perceived density of development; single storey along southern boundary; positive road-open space interface; limited backyards onto Open Space	4	4	2	4	14	Medium-low

Potential for Impact upon:	**Before Mitigation**						**Mitigation measures**	**After mitigation**					
	Magnitude (10, 8, 6, 4, 2, 0)	Duration (1 – 5)	Extent/scale (0 – 5)	Probability (1 – 5)	Score	Significance rating		Magnitude (10, 8, 6, 4, 2, 0)	Duration (1 – 5)	Extent/scale (0 – 5)	Probability (1 – 5)	Score	Significance rating
Maintaining and enhancing Botanical Significance	6	5	3	4	18	medium	Exclusion of erf 33027 from development but inclusion as part of conservation area; active management and maintenance of integrated conservation area; and as above	4	5	3	4	16	low

Several of the mitigation measures identified have already been taken into consideration in the layout of Alternative 3[9]. The basic principles that are required for mitigation are however repeated here so that they can be used as a basis for any potential future changes to the development, should this be necessary, as the final detailed planning is undertaken.

J-3.2.1.1 Buffer Zone Areas

- It is *essential* that the buffer zone areas along Bo Dal Road and the southern boundary as demarcated in the Alternative 3 layout be retained should the layout be altered in any way (please refer to Figure 39:).
- Erf 33027 at the north east corner of the site, which has been omitted from the Alternative 3 layout, should ideally be reincorporated into the buffer zone along the Bo Dal Road edge. This is equally a botanically sensitive area and making it part of the conservation area will enhance the sustainability of the botanical resources, minimise the potential for future development on the erf and permanently formalise the visual buffer zone.
- The buffer zone (approx. 120m) adjacent to Bo Dal Road will provide a significant

[9] These mitigation measures are largely extracted from the VIA and are considered to fully satisfy the requirements of the heritage objectives. It should be noted that those mitigation measures that are of relevance to the visual impact objectives but not those of heritage have been excluded.

reduction in the intensity of the visual impact on the road and the areas on the slopes to the east, and will create a soft urban edge that maintains the demarcation between the urban areas to the west and the agricultural/rural areas to the east in a visually sensitive way (please refer to Figure 39:).

- Groups of trees are to be planted in random locations within this area. The positioning of the trees is to be determined by a botanical specialist in consultation with a landscape architect so that both the conservation objectives to preserve the fynbos identified by the botanist, and the visual mitigation objectives are met (please refer to Figure 38:).
- It should be noted that the aim of the visual mitigation is not to hide the development, but rather to break up the perceived density of the development to views from the road. The longitudinal views along the road should include only limited glimpses of the development when traveling in both directions while allowing intermittent views of the development when looking west perpendicular to the road.
- The fact that the outer edges of the Alternative 3 layout largely consist of road reserves is seen as positive as this will allow for the front of the houses to face onto the buffer zones. These are generally better maintained than the backyards of the properties which may be cluttered by the accumulation of visually unacceptable detritus and lean-to structures etc. There are a few properties which are an exception to this along both the eastern edge, (Bo Dal Road,) and the southern boundary. Special attention must be paid to mitigating the potential negative impacts of the backyards of these properties when placing the tree groups.
- Groups of trees are also to be planted along the southern buffer zone with the aim of breaking up the perceived density of the development and softening its edge to views from the historic werwe (A tree line along this edge was contemplated but this would constitute a significant visual impact in itself and its maintenance may be problematic. Additionally, as a result of the slope, the trees would have to be very tall to entirely shield the development and finding suitable indigenous species would be difficult. This idea was therefore rejected) (please refer to Figure 38:).
- The general location of the stormwater retention facility in the south-western corner of the site is important to retain as it has the visual effect of expanding the buffer zone at this point. This will assist in minimizing the potential for impact upon Goede Rust, the closest of the three werwe comprising the Dal Josaphat Farm1361.
- It will be difficult to ensure that the buffer zones do not become places for littering and dumping. It is therefore suggested that from the outset a means is found to create some buy-in from the community to preserve and maintain these areas.

J-3.2.1.2 Architectural

- No two storey buildings are to be placed along the southern and eastern boundaries of the development and they are to be kept as far from these boundaries as possible within the requirements of the planning. The additional distance between these buildings and the historic werwe will lower the intensity of the visual impact on them substantially. This is especially critical in order to minimise the visual impact on the Goede Rust werf.

J-3.2.1.3 Colours and finishes

- In general colours and textures of development particularly at the interface with the rural edges of the property must be chosen for their ability to blend into the surrounding environment with light earth-tones being predominant.
- Variation of colours, textures and finishes should be used to break up the apparent density of the development.
- Generally the roofs are to be medium to dark grey as this is the colour that best blends into the environment in all light conditions and across the seasonal colour changes. Other colour can be considered to provide contrast provided they are muted and do not call attention to themselves. No bright or contentious colours for the roofs, including green, are to be allowed.

J-3.2.1.4 Landscaping

- Apart from the planting in the buffer zones mentioned above, landscaping will be key in creating and maintaining a visually acceptable environment which is appropriate to the existing visual context.
- Tree planting within the development should be encouraged for both the individual erven,and the public spaces, schools etc. This will be the continuation of a long tradition of tree planting in the Paarl area and will provide for significant mitigation of the intensity of the visual impact over time as the trees mature. It will also create a far better quality of visual environment within the community itself.

J-3.2.1.5 Lighting

- It is essential that light spillage and pollution be kept to an absolute minimum. To this end all external lighting must be shielded in such a way that only the area that is meant to be lit is actually lit, and light is not allowed to spill into the surrounding landscape.
- The aim is to have no naked light sources, i.e. the light bulbs themselves, visible from outside the site. Only reflected light should be visible away from the site. This is especially true of the street lighting and any security lighting that may be installed. (Note that lights with translucent shields are considered to be direct sources of light and should also not be used where they can be seen away from the site.)

J-3.2.1.6 Fencing

- All fencing along the outer boundaries of the site is to be visually permeable. Solid walls, vibracrete type fencing and razor wire are to be discouraged.
- Vegetative screening of the fencing is to be encouraged where possible and appropriate.

J-3.2.1.7 Construction Phase

- There is to be a strict ban on any construction activities outside of the development area and construction workers are to be prevented from using the buffer zones for any purpose whatsoever. These are essentially conservation areas and must be protected as such.
- All construction scars are to be rehabilitated immediately after construction is complete. This is especially true for all activities related to the supply of infrastructure, some of which may be outside the development area. (i.e. sewer and water connections, etc.)

J-3.2.1.8 Cumulative Impacts

The proposed development will impact on the supply of formal dwellings provided by the municipality to the community in question and therefore will address the housing backlog experienced in the Drakenstein Municipality. Furthermore, the proposed development will have a positive impact on employment creation throughout the life cycle of the project (construction through to operational). The incorporation of educational facilities, places of worship and community centres will have a positive impact on community upliftment and social cohesion which, in conjunction with the sensitive buffer zones (Botanical and Heritage, which creates an aesthetically pleasing environment) could result in a positive sense of place.

The cumulative social impact on the community in question and the surrounding environment will therefore be positive as a result of the formalisation of the low cost housing in this region.

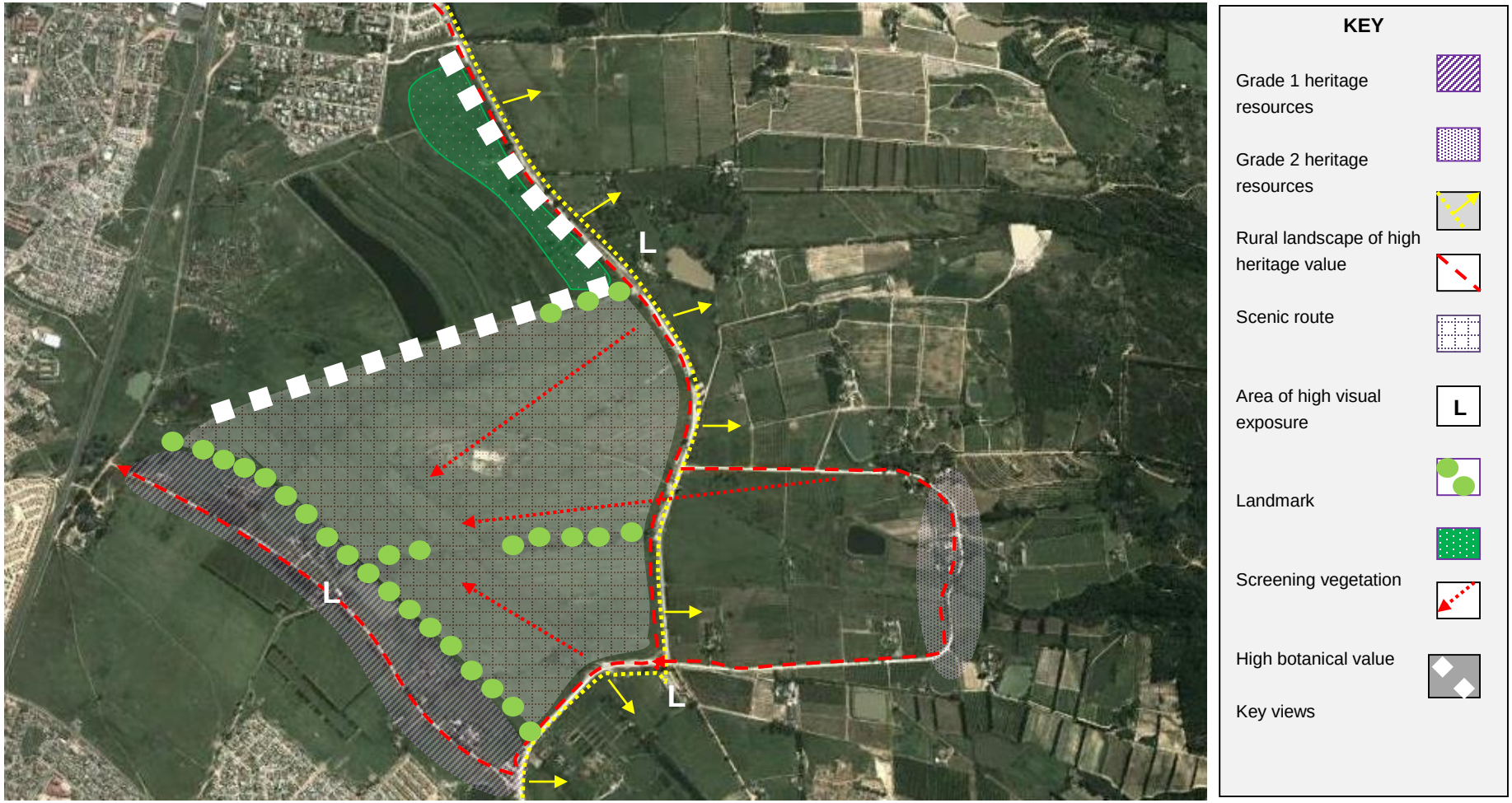

Figure 38:Heritage Indicators and Design Informants

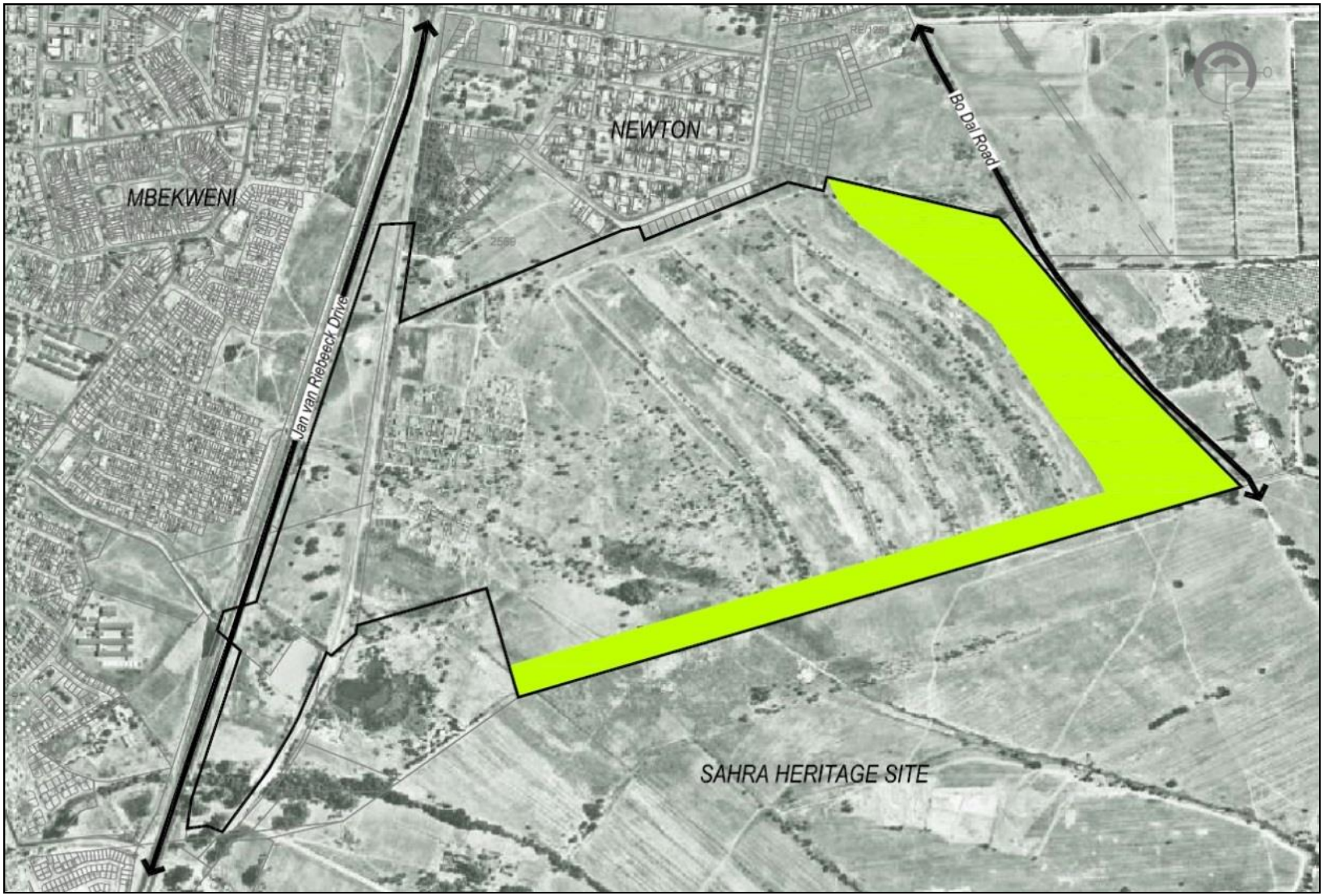

Figure 39:Heritage Buffers

J-3.2.3 Traffic Impacts

The TIA report investigated the expected transport related impacts of the Vlakkeland development, located east of Jan van Riebeeck Drive, south of the residential area of Newton and west of Bo Dal Road, on Erf 8378, Paarl. The TIA investigation resulted in the following recommendations:

J-3.2.3.1 Existing Traffic

All study intersections are currently operating at acceptable Levels-Of-Service (LOS). Hence, no road upgrades are proposed from an intersection capacity point of view.

J-3.2.3.2 Background Traffic

The following upgrades are proposed for this scenario:

Jan v. Riebeeck / Roggeland- / Ring Road intersection:

- Install a Traffic Signal, if and when warranted.

Jan v. Riebeeck / Mbekweni / (Future Vlakkeland access) intersection:

- Install a Traffic Signal, if/when warranted. Also construct northbound left-turn lane and southbound right-turn lane on Jan van Riebeeck Road plus provide an access road to Mbekweni.

Jan v. Riebeeck Drive / Bo Dal Road:

- Install a Traffic Signal, if and when warranted.

J-3.2.3.3 Development Trips

The development is expected to generate 2 013 weekday a.m. peak hour trips (992/1 021, in-/outbound) and 1 356 p.m. peak hour trips (792/564, in-/outbound).

J-3.2.3.4 Access

The main access to the Vlakkeland development will be from a new intersection along Jan van Riebeeck Drive (MR201), approximately 770 meters south of Buitekant Street and 800 meters north of Roggeland Road/Ring Road. Other accesses to Jan van Riebeeck Drive will also be possible via Rand Street to the north and/or Roggeland Road/Ring Road to the south of the site.

J-3.2.3.5 Total Traffic

The following upgrades are proposed for this scenario:

Jan v. Riebeeck Drive / Roggeland Road / Ring Road intersection:

Construct dedicated east- and westbound right-turn lanes and upgrade the traffic signal phases and settings to allow for turning phases from the side roads.

Jan v. Riebeeck Drive / Mbekweni / Vlakkeland Access intersection:

Construct a southbound left-turn lane and northbound right-turn lane along Jan van Riebeeck Road. Provide a separate right-turn lane and a shared through and left-turn lane on the westbound / development approach and upgrade the traffic signal phases and settings.

The upgrades should be funded by the developer, since it is directly related to the development.

J-3.2.3.6 Pedestrians

Provide pedestrian signal heads and phases at the traffic signals of the Jan van Riebeeck Drive / Vlakkeland Development Access intersection. Also provide a fence along the site boundary / frontage to force pedestrians to only cross at intersections. Provide a sidewalk of at least 2 meters wide along all major roads on-site and provide a pedestrian sidewalk between the commercial node within Vlakkeland, all the way along Rand Road and Newton Street to the Jan van Riebeeck Road / Buitekant Street intersection.

Street lighting should be provided at the future Jan van Riebeeck Drive / Vlakkeland Development Access intersection. This should improve the visibility and safety of this intersection for pedestrians during early mornings and late afternoons.

J-3.2.3.7 Public Transport

It is recommended that bus / taxi embayment's be provided along Jan van Riebeeck Drive on the downstream side of the new Vlakkeland Access intersection. Bus / taxi embayment's should also be provided on-site along all the major routes on-site.

J-3.2.3.8 General

The TIA Concluded that the impact of this development will be sufficiently mitigated if the upgrades recommended in the TIA report are in place.

J-3.2.3.9 Cumulative Impacts

After the consideration of the above anticipated impacts, the cumulative traffic impact can be summarised as follows:

1. Existing traffic: Low Impact
2. Background traffic: Low to Medium Impact
3. Development Trips Medium to High
4. Access Low
5. Total Traffic Medium
6. Pedestrians Low
7. Public Transport Low

Total Average Traffic Impact Low

J-3.2.4 Visual Impacts

J-3.2.4.1 Intensity of the Impact

Jan Van Riebeeck Drive and Adjacent Areas

The intensity of the visual impact on Jan van Riebeeck Drive for both alternatives will be the same.

Although the implementation of the development will only represent an increase in the area of the existing surrounding development, thereby not adding any new visual elements to the environment, the placement of the two storey flats along this edge could constitute a higher intensity visual impact if their Jan van Riebeeck Drive elevation is not carefully designed and mitigated.

The inclusion of the sports facilities along this edge, which will allow for a greater extent of unobstructed views towards the mountains, will have a positive effect in lowering the intensity of the visual impact along this road.

Table 21: Intensity of Visual Impact – Jan van Riebeeck Drive and Adjacent Areas

Alternative	Distance	Mitigation	Construction	Operational	Night
No development Alternative	±0m and further	-	-	Low	-
Alternative 1		Without mitigation	High	High	High
		With mitigation	Medium	Medium	Low
Alternative 2		Without mitigation	High	High	High
		With mitigation	Medium	Medium	Low

Bo Dal Road

The intensity of the visual impact on Bo Dal Road will be significantly reduced by the inclusion of the buffer zone in Alternative 2 although this is partly dependent on there being no future development on Erf 33027.

Table 22: Intensity of Visual Impact – Bo Dal Road

Alternative	Distance	Mitigation	Construction	Operational	Night
No development Alternative	±120m and further	-	-	Low	-
Alternative 1		Without mitigation	Medium	Medium	Medium
		With mitigation	Medium	Medium	Low
Alternative 2		Without mitigation	Medium	Medium	Medium
		With mitigation	Medium	Medium	Low

Newton

The intensity of the visual impact on the row of houses facing onto the site will be high as their entire visual context will be altered but the remainder of the houses in Newton will experience a low intensity impact or no impact at all.

Table 23 - Intensity of Visual Impact – Newton

Alternative	Distance	Mitigation	Construction	Operational	Night
No development Alternative	Width of the road reserve and further	-	-	Medium-low	-
Alternative 1		Without mitigation	High	High	High
		With mitigation	Medium	Medium	Low
Alternative 2		Without mitigation	High	High	High
		With mitigation	Medium	Medium	Low

Historic Werwe

The intensity of the visual impact on the Historic werwe will range between medium-high for the Goede Rust werf and medium-low for the Roggeland Werf.

The visual effect will be to alter the sense of place by bringing more urban development into what is traditionally a rural agricultural setting. The intensity will not be higher as there is already a significant amount of development within the views from the werwe.

Table 24: Intensity of Visual Impact – Historic Werwe

Alternative	Distance	Mitigation	Construction	Operational	Night
No development Alternative	±250m and further	-	-	Low	-
Alternative 1		Without mitigation	High to Medium	High to Medium	High to Medium
		With mitigation	Medium-high to Medium-low	Medium-high to Medium-low	Medium to Low
Alternative 2		Without mitigation	Medium-high	Medium-high	High to Medium
		With mitigation	Medium	Medium	Medium to Low

Slopes to the East

The intensity of the visual impact on the houses on the slopes above Bo Dal Road will depend on the orientation of the primary views of each house and the amount of local vegetation that is able to mitigate these views.

The intensity of all views from the mountains beyond will be low.

Table 25: Intensity of Visual Impact – Slopes to the East

Alternative	Distance	Mitigation	Construction	Operational	Night
No development Alternative	±120m and further	-	-	Low	-
Alternative 1		Without mitigation	High	High	High
		With mitigation	Medium-high	Medium-high	Low
Alternative 2		Without mitigation	Medium-high	Medium-high	Medium-high
		With mitigation	Medium-low	Medium-low	Low

Slopes to the West

The intensity of the visual impact on all other areas will mitigated by distance and that fact that the development will be seen as an extension of the existing urban fabric rather than representing a new visual element in the landscape.

Table 26: Intensity of Visual Impact – Slopes to the West

Alternative	Distance	Mitigation	Construction	Operational	Night
No development Alternative	±5000m and further	-	-	Low	-
Alternative 1		Without mitigation	Low	Low	Medium-low
		With mitigation	Low	Low	Low
Alternative 2		Without mitigation	Low	Low	Medium-low
		With mitigation	Low	Low	Low

J-3.2.4.2 DURATION OF VISUAL IMPACT

This assesses the visual impact in terms of the lifespan of the development and therefore the lifespan of the visual impact.

The duration of visual impacts associated with the construction phase will be short-term but will stretch over the implementation of the phases.

The duration of visual impacts associated with the operational phase will be long-term.

J-3.2.4.3 CUMULATIVE SIGNIFICANCE OF THE VISUAL IMPACT

This rating combines the ratings for the extent of the impact, the duration of the impact, the intensity of the impact and the sensitivity of the viewers to arrive at a rating for the impact as a whole.

It is very difficult to arrive at a single overall significance rating for a project of this type. This rating is based on the ratings in the sections preceding this one, but also on the experience of the independent visual specialist. There will always be a limited number of viewpoints within the viewshed from which the ratings in the table below may be considered too high or too low.

Table 27: Cumulative Significance of Visual Impact

Alternative	Mitigation	Construction	Operational	Night
No development Alternative	-	-	Low	-
Alternative 1	Without mitigation	High	Medium-high	High
	With mitigation	High	Medium	Medium-low
Alternative 2	Without mitigation	Medium-high	Medium	High
	With mitigation	Medium	Medium-low	Low

J-3.2.4.4 STATUS OF THE VISUAL IMPACT

This assessment rates the estimated perception of the development by viewers in terms of being positive, neutral, or negative.

The usual reaction to the sight of any new development, especially by those who know an area well, is negative, and that is likely to be the initial reaction to the proposed development by the viewers who live in the area, however, it is believed that, with time, the development will become part of the accepted landscape and achieve a neutral status although it is unlikely that it will be viewed as visually positive.

J-3.3 Total Conservation/Green Areas

Figure below indicates all the green and/or conservation areas which will be included in the proposed Vlakkeland residential area.

These include the following areas:

- 120m Buffer/conservation area to the east of the site (Botanical, Visual, Heritage Constraints) not to be developed. This area is to be cleared of all alien invasive vegetation and the rehabilitated. Trees have to be planted as a further visual buffer.
- 40m Buffer along the southern boundary of the site. A visual buffer is also recommended in this area. The proposed new alignment of the Kleinbosch River will be located in this buffer area;
- Large detention facility in the south western corner of the site. This detention (attenuation) facility will also double up as a sports facility (Soccer/Rugby field in drier times of the year).
- Detention facility to the north west of the site and the canalization of the Mbekweni River;
- Two further detention facilities to the south (middle) and south west of the site.

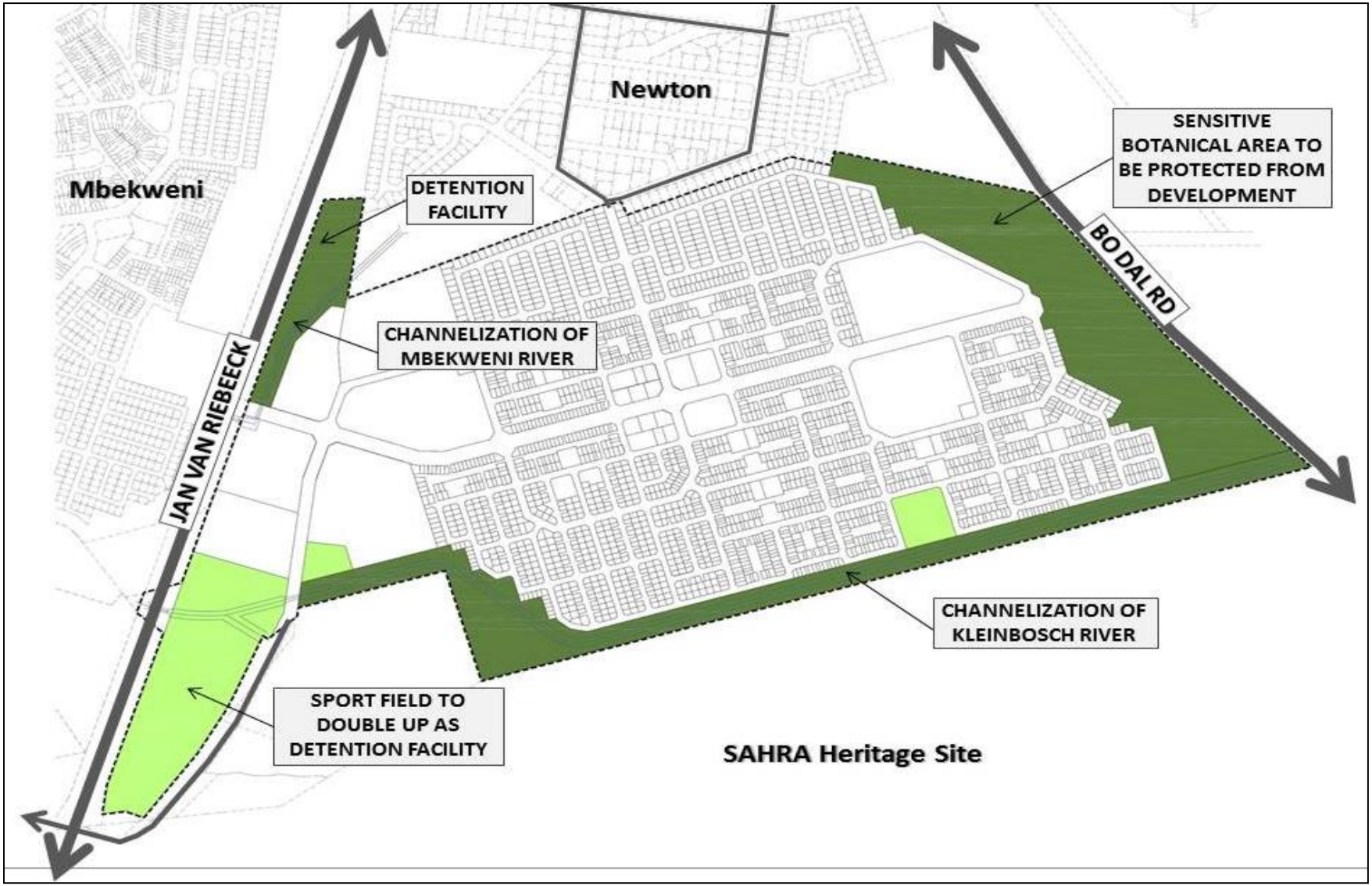

Figure 40: Total Green/Conservancy Areas as a result of Specialist Assessments and Recommendations

SECTION K: ASSESSMENT OF ALTERNATIVES

The identification of alternatives is an important component of the EIA process. Where possible, alternatives will be identified and investigated. The various alternatives will be assessed in terms of both environmental acceptability as well as economically feasibility. The preferred option will be highlighted and presented to the authorities in the EIR Report.

The following alternatives have been identified:

- Layout Alternatives
- Access Alternatives
- Stormwater Alternatives.
- The no-development alternative.

K-1 LAYOUT ALTERNATIVES

As discussed in Section B-6, the proposed layout went through a rigorous process to come up with the **preferred alternative (Layout 5). 5 Different alternatives were assessed namely:**

- **Layout 1 (Alternative 4)**
- **Layout 2 (Alternative 5)**
- **Layout 3A (Alternative 2)**
- **Layout 3B (Alternative 3)**
- **Layout 4 (Alternative 1)**
- **Layout 5 (Preferred alternative)**

K-1.1 Development of Layout Alternatives

This section explains the evolution of the proposed Vlakkeland Housing Development. Several issues, concerns from I&AP's, technical detail and sensitive environments resulted in several layout changes. Several layouts were therefore drafted and each one was assessed with the relevant departments and specialist studies.

The following aspects played a role in informing the proposed layout alternatives:

- Access from Jan van Riebeeck Drive;
- The public interface onto Jan van Riebeeck Drive requires special attention as this route is identified as a Strategic Activity Spine in the Densification, Urbanization Strategy and Open Space Utilization Policy, 2007;
- The Drakenstein Spatial Development Framework earmarks the area next to Jan van

Riebeeck Drive for mixed use development;

- Integration of Vlakkeland and the proposed Erf 557 development to the east of Jan van Riebeeck Drive;
- The channelization of the Mbekweni, Kleinbosch and Dal Rivers to the north-west and south of the site respectively (to the previous alignment);
- Botanical constraints to the east of the site;
- Visual constraints and required buffers to the east of the site;
- SAHRA Heritage site to the south of the proposed development;
- Several historical farms to the east of Bo Dal Road;
- The lower density residential area, Newton, to the north of the site;
- The need for a cemetery as part of the development. (This was decided against during the process as new regulations pertaining to the location of cemeteries were received which prohibits a cemetery within 500m of a residential area.)
- According to the Terms of Reference the development had to include the following residential mix:
    - 70% Subsidy housing
    - 15% GAP
    - 15% Social Housing (CRU's)
- A temporary relocation area (TRA) of 500 units should also be accommodated in the development.

The following general principles apply to the all the frameworks:

- A mix use development consisting of Subsidized, GAP and Social housing as well as the full spectrum of social facilities that is required.
- Main movement is in an east west direction and secondary movement in a north-south direction linking Newton with the proposed development.
- Higher density development as well as the higher order social facilities is proposed along these main movement routes.
- Lower density GAP housing is proposed to the north adjacent to Newton which is an existing lower density residential area. Higher density multi-storey rental units and sport fields are proposed next to Jan van Riebeeck in order to create a visually pleasing interface.

The difference between layouts 1 (Alternative 4), 2 (Alternative 5) and 3A (Alternative 2) is mainly the access from Jan van Riebeeck and the uses adjacent to Jan van Riebeeck.

K-1.1.1 Layout 1 (Alternative 4)

In Layout 1 (Alternative 4) (Figure) the location of the access was determined by the proposed Erf 557 development to the east of Jan van Riebeeck Drive. The intension was to integrate Vlakkeland, Erf 557 and Mbekweni via a full intersection on Jan van Riebeeck Drive. This resulted in an intersection spacing of 650m from Wamkelekile Street. During discussions with the Provincial Department of Roads and Transport this proposal was not accepted as it is not in line with the intersection spacing standards of 800m as prescribed in the Road Access Guidelines (RAG).

K-1.1.2 Layout 2 (Alternative 5)

Layout 2 (Alternative 5) (Figure) was thus drafted where the access on Jan van Riebeeck Drive was moved to the south in order to be in line with the 800m RAG standards. This could however not be achieved as there is an existing storm water channel at this position.

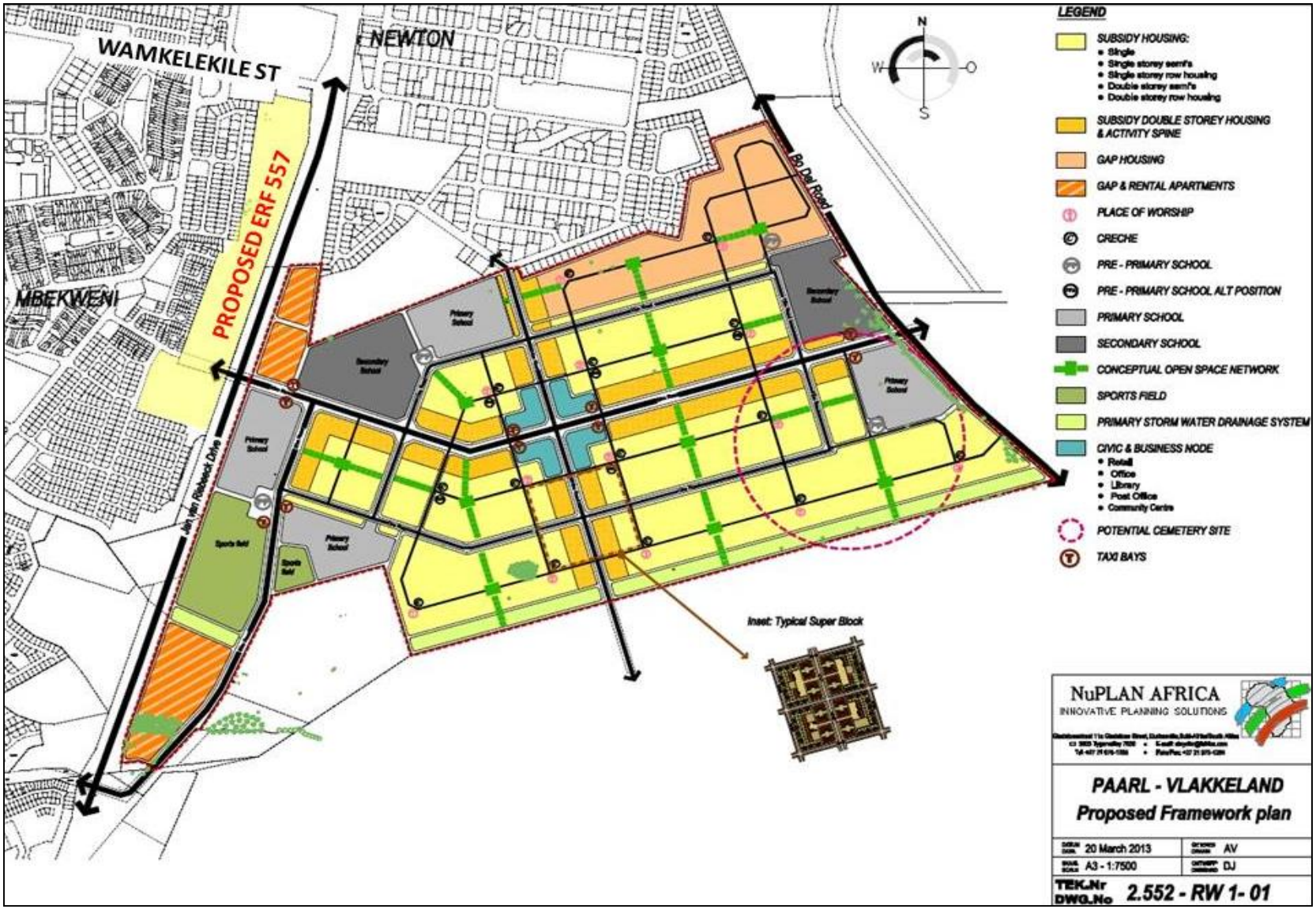

Figure 41: Development Layout 1 (Alternative 4)

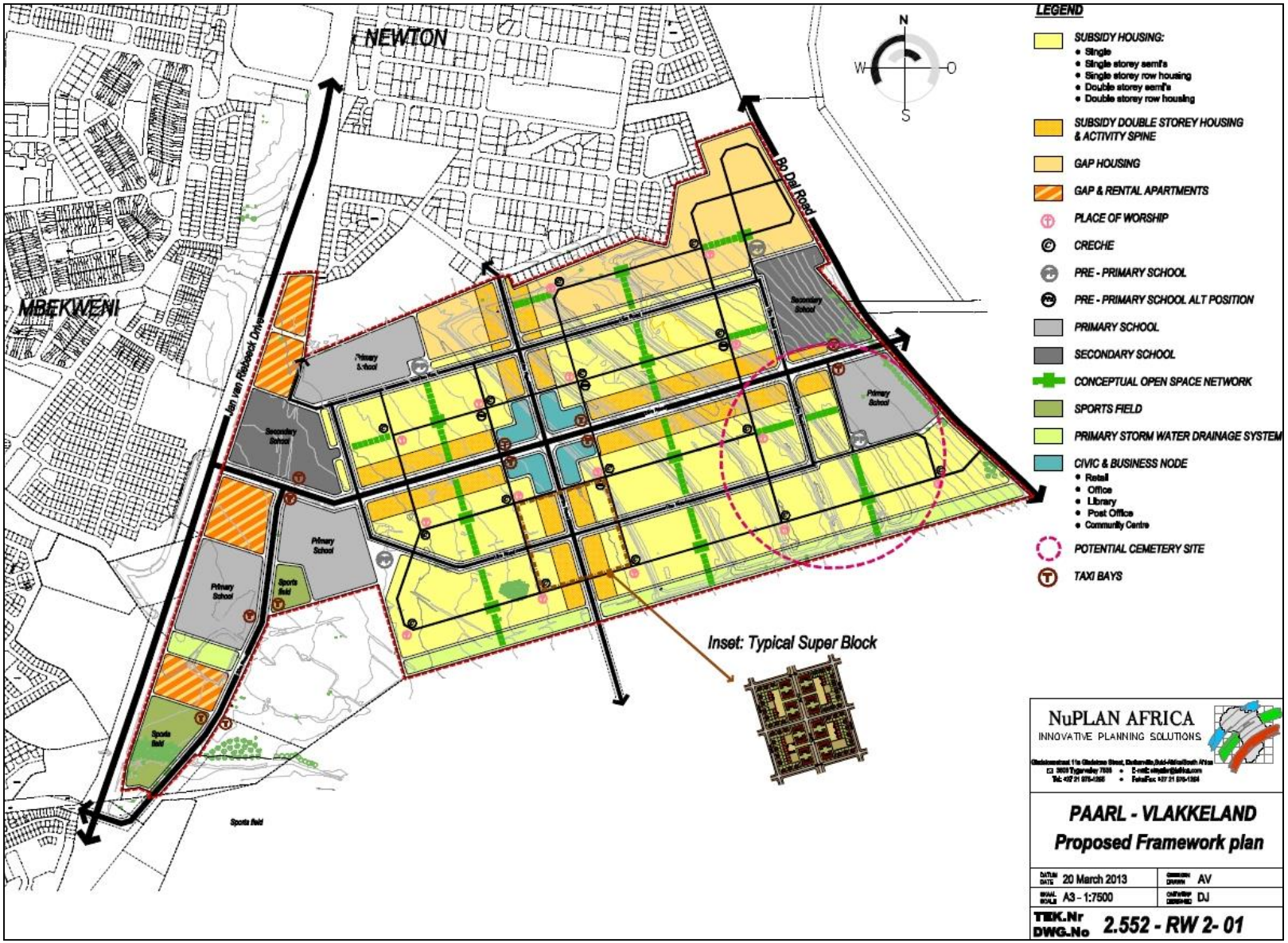

Figure 42: Development Layout 2 (Alternative 5)

K-1.1.3 Layout 3 A (Alternative 2) & Layout 3B (Alternative 3)

Layout 3A (Alternative 2), the third Development Layout was subsequently drafted where the access point was moved slightly to the north of the storm water channel resulting in an intersection spacing of 770m from Wamkelekile Street. This intersection spacing was accepted by the Provincial Road Engineers.

K-1.1.4 Two Alternatives (1 & 2) were drafted for Layout 3:

The first layout alternative makes provision for two cemetery sites to the east of the development next to Bo Dal Road (

Figure*); - This alternative is not deemed feasible due to the buffer of 500m that is required from a new cemetery to a residential development.*

*The second alternative not including the cemetery (**Figure19:**).*
These two layout alternatives were circulated to the Mayoral Committee where it was decided that a cemetery is not possible due to new regulations from the Department of Health and therefore Layout 3A was discarded.

Layout 3B (Alternative 3) (Figure) indicates two possible positions for the TRA, either to the east or to the west of the development.
The educational facilities located next to Jan van Riebeeck on Layout Alternative 2 and 3 were replaced with a larger sport field, detention facility and walk-up units in Alternative 3.
During this part of the project concerns were raised that there should be a heritage buffer next to Bo Dal Road. A 40m buffer strip was thus added next to Bo Dal Road. Due to the botanical constraints in this area as well as the visual screen that had to be incorporated, this buffer was further extended to create a wide buffer (**included in Layout 4 – Alternative 1**). This buffer has to be protected and conserved and seen as a no-go area due to the sensitive nature of the plants on this site.

The Kleinbosch River storm water channel runs along the southern boundary of the site. This channel also serves as a 40m buffer strip between the SAHRA Heritage property to the south and the development (This 40m buffer was also included in Layout 4, Alternative 1).

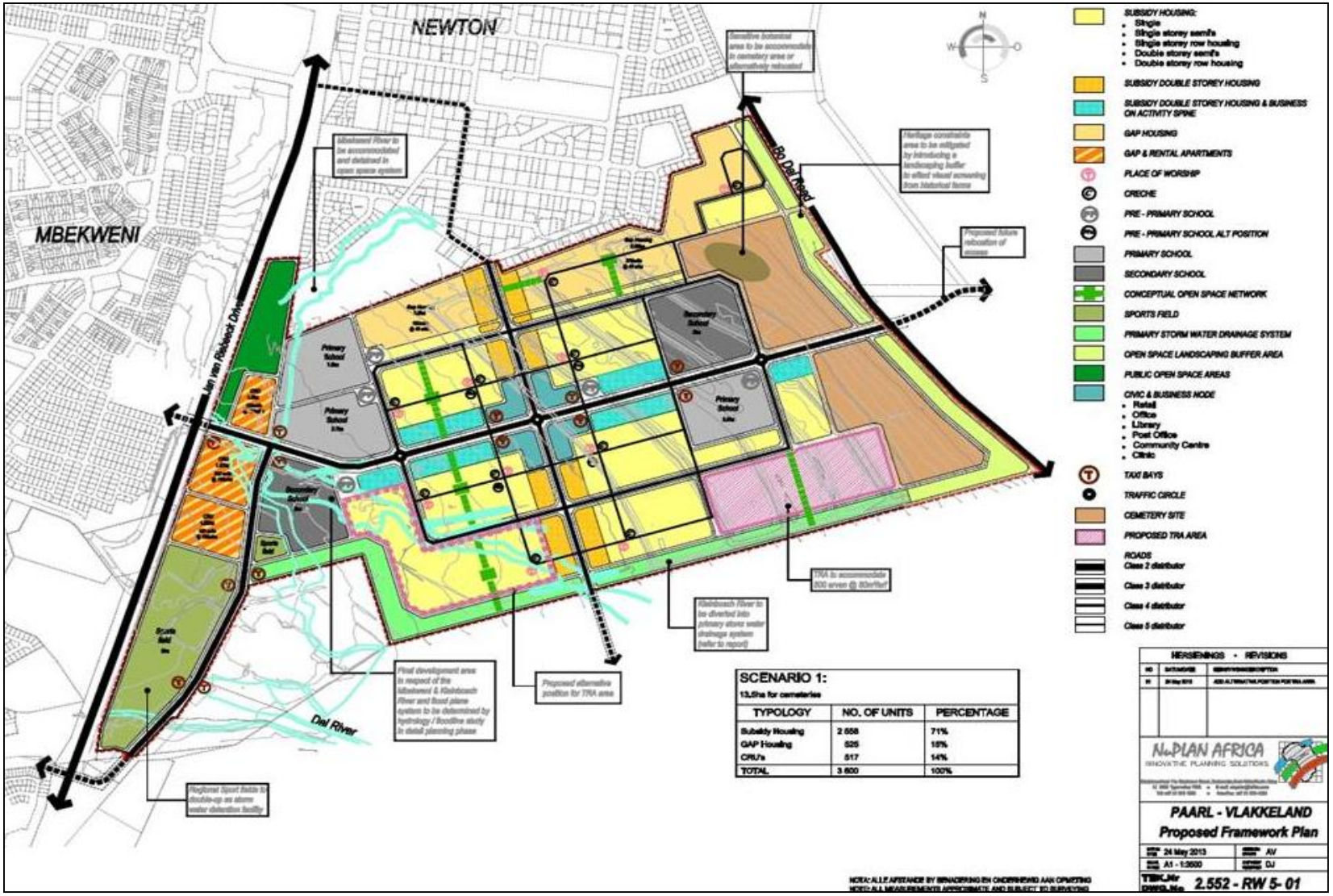

Figure 43: Development Layout 3A (Alternative 2)

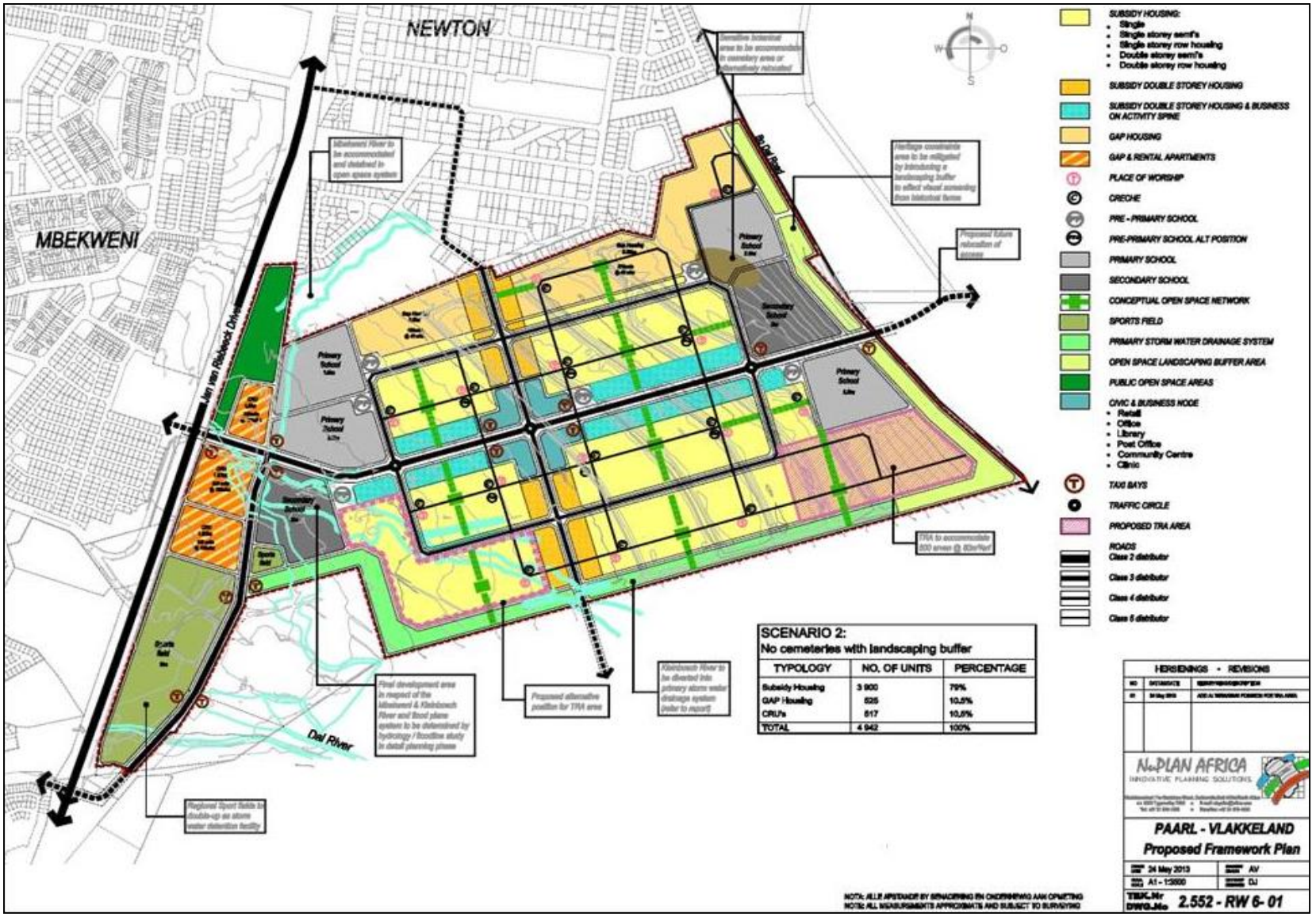

Figure 44: Development Layout 3B (Alternative 2 – The Preferred)

K-1.2 Layout 4(Alternative 1)

After the Botanical, Freshwater, Visual and Heritage Assessments was conducted, it was necessary to change the previous preferred layout (Alternative 3) again to include the necessary buffer and conservation areas as indicated in Figure .

This new layout, Layout 4– (Alternative 1) addresses the following issues as discussed above:

- A channel to the south of the development which will be located within a 40m wide green buffer area, diverting the Kleinbosch River to the west. This buffer area will be adequate from a Freshwater (Aquatic) and Historical point of view.
- A sport field is provided in the south-western corner as well as to the east of the site that can also be used for storm water retention.
- A channel and retention facility in the north-west corner diverting the Mbekweni River to the south.
- The protected Botanical area to the east as well as the channel to the south also serve as Heritage Buffer strips in order to limit visual impact from the historical farms and the SAHRA Heritage Site to the east and south respectively.
- In addition to these several sport fields and local play parks are distributed throughout the development.

The new alternative 1 (Layout 4) therefore includes the following:

- 120m Buffer/conservation area to the east of the site (Botanical, Visual, Heritage Constraints) not to be developed. This area is to be cleared of all alien invasive vegetation and the rehabilitated. Trees have to be planted as a further visual buffer.
- 40m Buffer along the southern boundary of the site. A visual buffer is also recommended in this area. The proposed new alignment of the Kleinbosch River will be located in this buffer area;
- Large detention facility in the south western corner of the site. This detention (attenuation) facility will also double up as a sports facility (Soccer/Rugby field in drier times of the year).
- Detention facility to the north west of the site and the canalization of the Mbekweni River;
- Two further detention facilities to the south (middle) and south west of the site.

K-1.2.1 Movement Network and Access Points

[10]Access to the site is proposed via three access points as indicated on Figure:

- From Jan van Riebeeck Drive to the west of the development. This new access will be the main entrance to the development.
- The second access is located to the south of the above mentioned entrance. This is an existing access – where Beets Street links with Jan van Riebeeck Drive.
- To the north of the site via Rand Street linking the development to Newton.

The proposed movement network consists of the following and is illustrated on FigureError! Reference source not found.:

- The primary collector (25m) runs in an east-west direction through the centre of the development. It enters the site at Jan van Riebeeck Drive and terminates to the west where the conservation area begins. This route is proposed to be an activity street and public transport link and was thus designed to accommodate on street parking, taxi/bus loading bays and non-motorised transport facilities such as pedestrian and cycle lanes. The route is also designed with traffic circles at strategic locations to reduce vehicle speeds.
- A further collector is the 20m route entering from Jan van Riebeeck Drive (at the existing Beets Street entrance) and the 16m route from Newton both linking with the main 25m route.
- Several 13m residential collectors are proposed throughout the area providing access to the higher order social facilities.
- All of the above mentioned routes are proposed to be the main Public Transport movement routes.
- In addition to these 10m residential access streets are proposed throughout the development.

[10] *Nuplan, 2013*

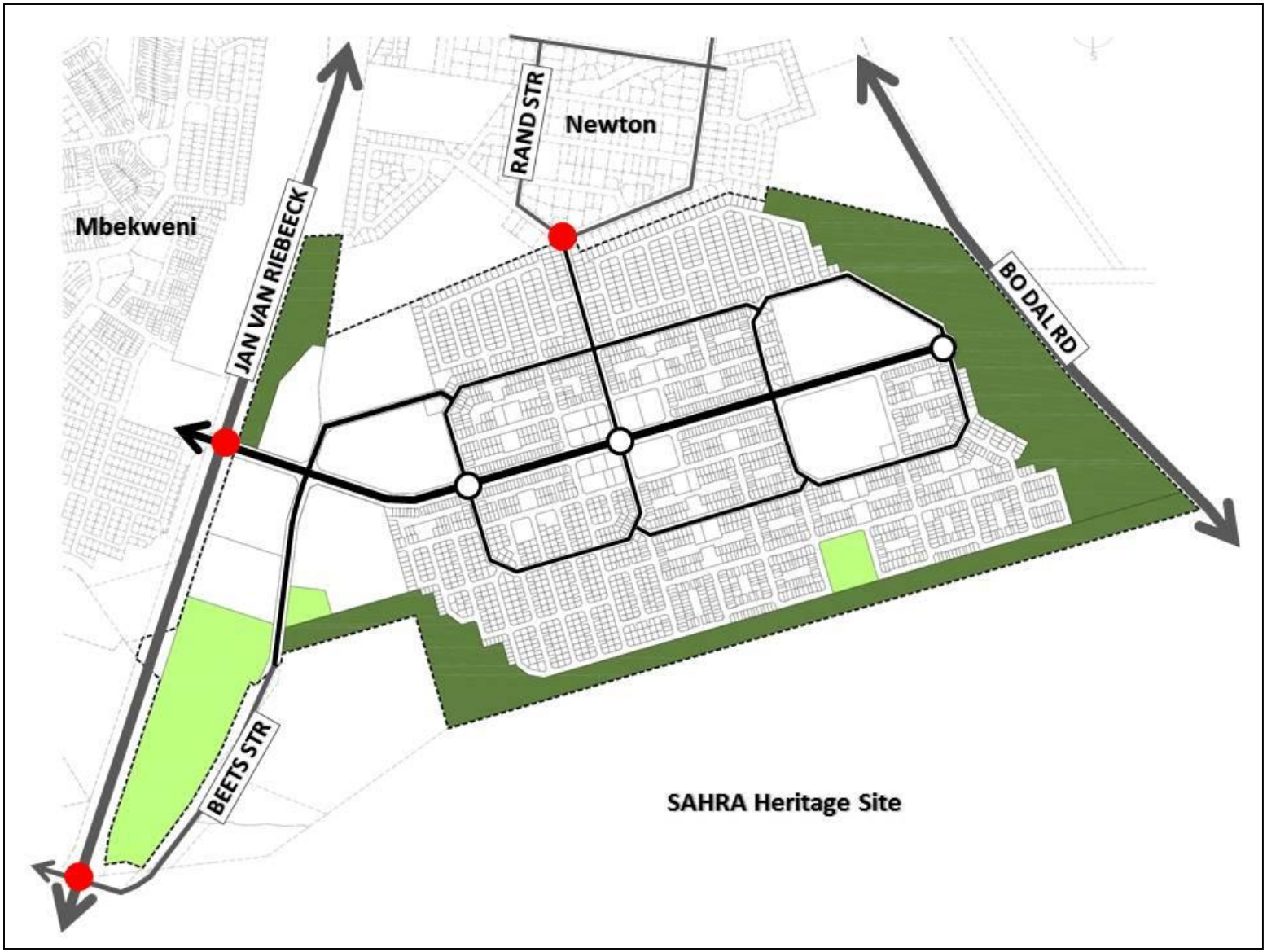

Figure 45: Road Network and Access

K-1.2.2 Non Residential Uses (Preferred Alternative)

The non-residential land uses include social facilities as well as retail and business uses. The social facilities were calculated according to standards prescribed by the Western Cape Government: Environmental Affairs & Development Planning.

The following non-residential uses are provided and illustrated in Figure:

- A Civic Node located in the centre of the development along the main movement route. This node is proposed to include the following uses:
  - *Retail and offices; and*
  - *A clinic, library and community centre.*
- Two Secondary and three Primary Schools. These are higher order social facilities and therefor located on the main Public Transport routes in order to ensure easy access.
- Three Pre-Primary Schools strategically located adjacent to the Primary Schools.
- Three sport fields:
  - *A Regional Sport Field next to Jan van Riebeeck Drive – this sport field also serves as a detention facility;*
  - *A smaller sport field as part of the Regional Sport Complex for smaller activities, to the north-west of the above mentioned sport field.*
  - *A neighbourhood sport field located to the east of the development, thus ensuring an equal distribution of facilities.*
- Twelve local play parks distributed through the development.
- Seven crèche's and places of worship in all instances located adjacent to each other.
- The crèche's, places of worship and play parks are grouped together for the following reasons:
  - *The parks can be multi-functional and used by the crèche's as play areas;*
  - *The parks provides for pedestrian movement through the residential area and thus enabling easier access to the crèche and place of worship.*

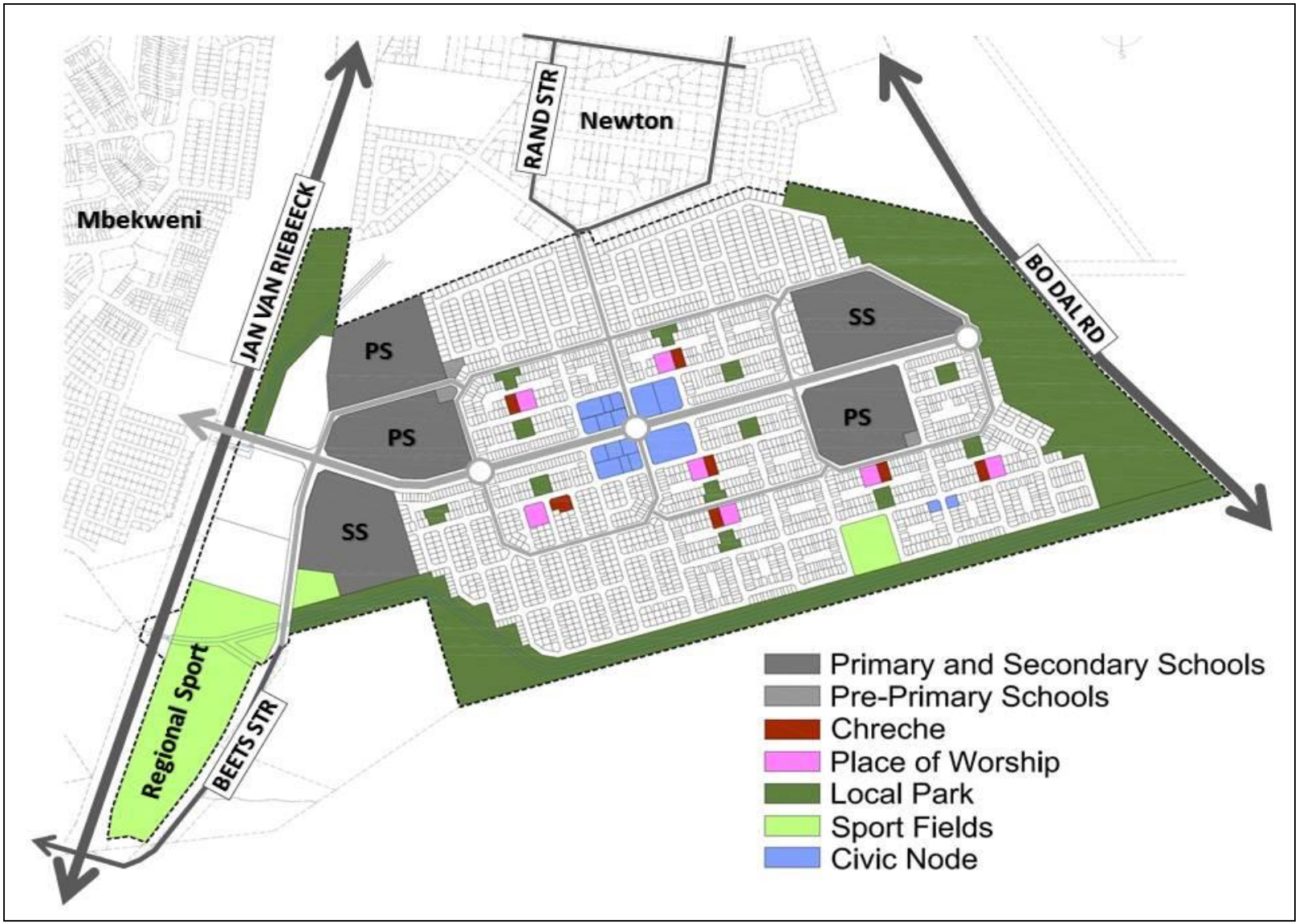

Figure 46: Non-residential Uses

K-1.2.3 Residential Distribution

The development is a mixed use development consisting of subsidized, GAP and Rental Units. There is an approximate of 3 191 units which gives a Gross density of 31.4du/ha and a Net density of 95du/ha.

The housing distribution is based on the principle of higher densities along the main movement and Public Transport routes and lower densities adjacent to existing residential areas. The layout design promotes walkable communities with all residential precincts within walking distance of community facilities and public transport routes. The residential distribution is thus as follows and illustrated in Figure:

- The Transit Relocation Area is proposed to the south-west, in Phase 1 of the development.
- Higher density subsidised units (semi-detached double storey) along the main activity street (the 25m east-west route) as well as the north-south link to Newton.
- The zoning for subsidised units along the 25m activity street will include consent use for Businesses in order to encourage retail activity along this street.
- The subsidised units are located in the central and south-eastern parts of the development.
- Lower density GAP housing to the north of the site adjacent to the existing residential area of Newton. These are proposed to be single storey freestanding and semi-detached units.
- The density increases further from Newton with higher density GAP housing units (semi-detached double storey) proposed along one of the 13m main internal movement routes. This ensures a gradual transition between the GAP and subsidised units.
- Subsidy and GAP flats are proposed adjacent to Jan van Riebeeck Drive. Due to the importance of Jan van Riebeeck Drive as well as the principles for development along this road set out in the SDF, a decision was taken that single residential units will not be suitable but rather higher density flats that can be maintained by an authority. This will thus ensure a visually pleasing interface onto Jan van Riebeeck Drive.

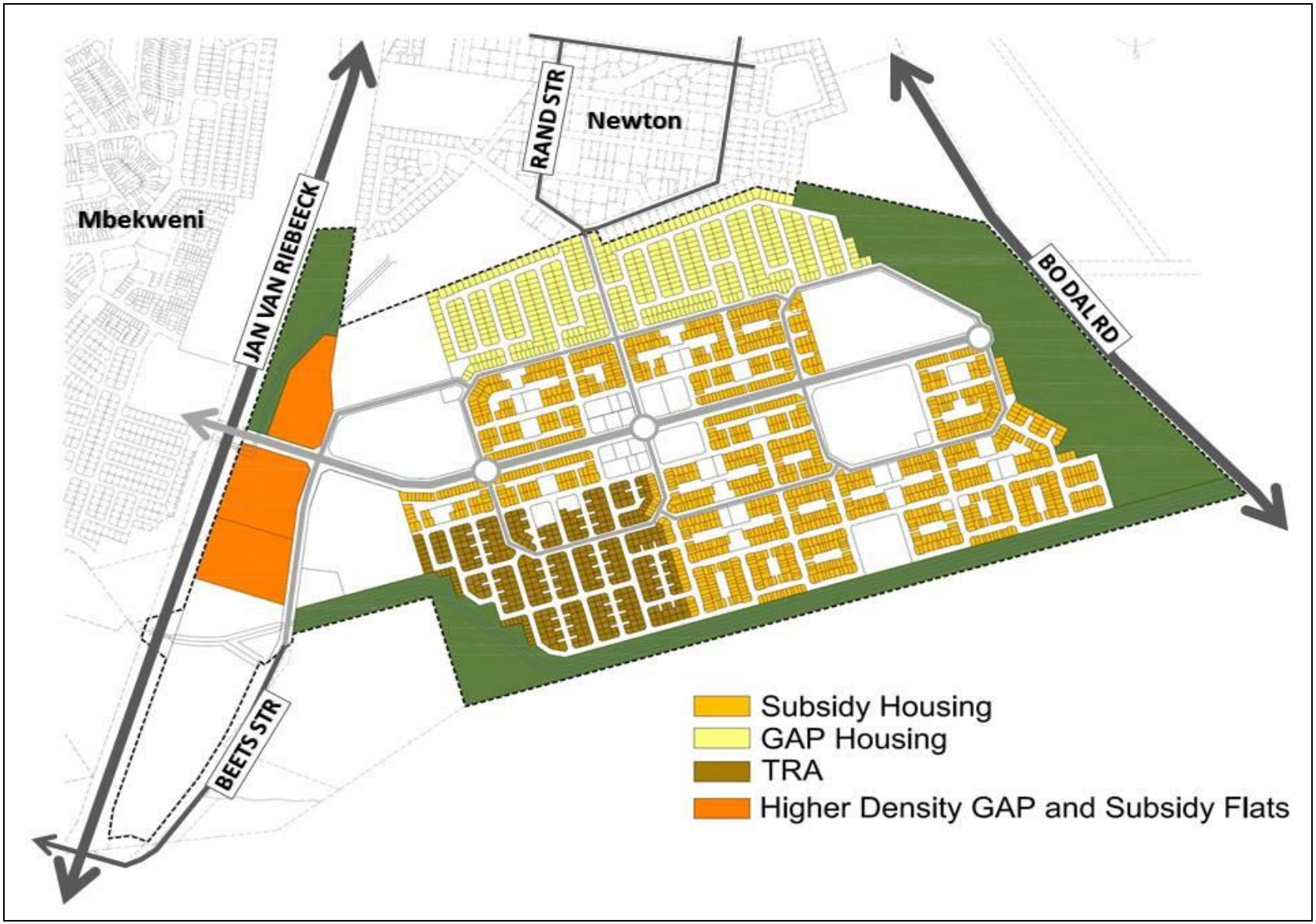

Figure 47: Residential Distribution

K-1.2.4 Residential Typologies and Superblocks

[11]The residential typologies consist of single and double storey freestanding, semi-detached and row units. Because an Implementing agent has not been appointed for the Vlakkeland development, residential typologies from ASLA, POWER and Brainwave Architects were sourced in order to determine suitable erf dimensions. In terms of parking, the following was decided together with the municipal Planning Officials:

- The freestanding and semi-detached units on the 10m, 13m, 16m and 25m roads will have on site parking (a 2.5 – 3m building line has been provided);
- The semi-detached and row units inside the courts have a building line of 1m – 2.5m as communal parking is provided within the courts;
- The row housing units on the 10m, 13m and 16m roads have a front building line of 5.5m to accommodate on-site parking in front of the unit.

The design of the development layout was based on the following principles:

- A 90 x 90m and 90 x 180m grid layout to:
  - *Reduce engineering infrastructure costs; and*
  - *Ensure a pedestrian friendly layout and movement network.*
- Range of housing typologies & erf sizes to cater for different needs and income groups:
  - *Different residential densities at appropriate locations.*
  - *GAP, Subsidised and Rental units.*
  - *Erf sizes ranging between 65m² - 150m².*
  - *Different building heights of units for definition and place making.*
- The Courtyard Concept:
  - *Superblocks illustrating the courtyard concept on figures below*
  - *The superblocks are designed based on 90m and 180m dimension.*
  - *Units are built around a courtyard.*
  - *The court is Multi-functional, it can be used as recreational space or for safe parking.*
  - *The recreational space compensate for the smaller erven.*
  - *The community can take ownership of the courts.*
  - *The intention is to have limited vehicular movement in the courts and therefor it is not designed to accommodate refuse removal truck movement – a communal bin area should thus be provided at the entrance of the courts where bins can be collected.*

[11] *Nuplan, 2013*

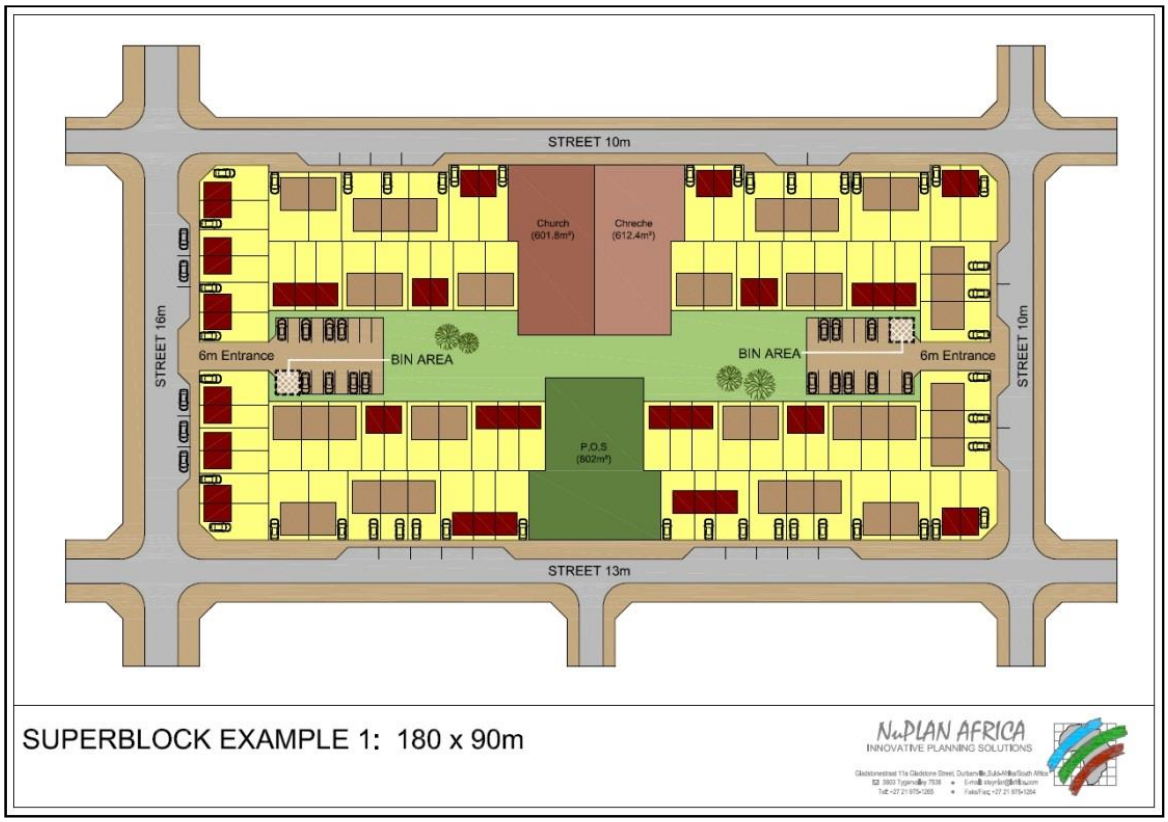

Figure 48: Superblock SDP 1

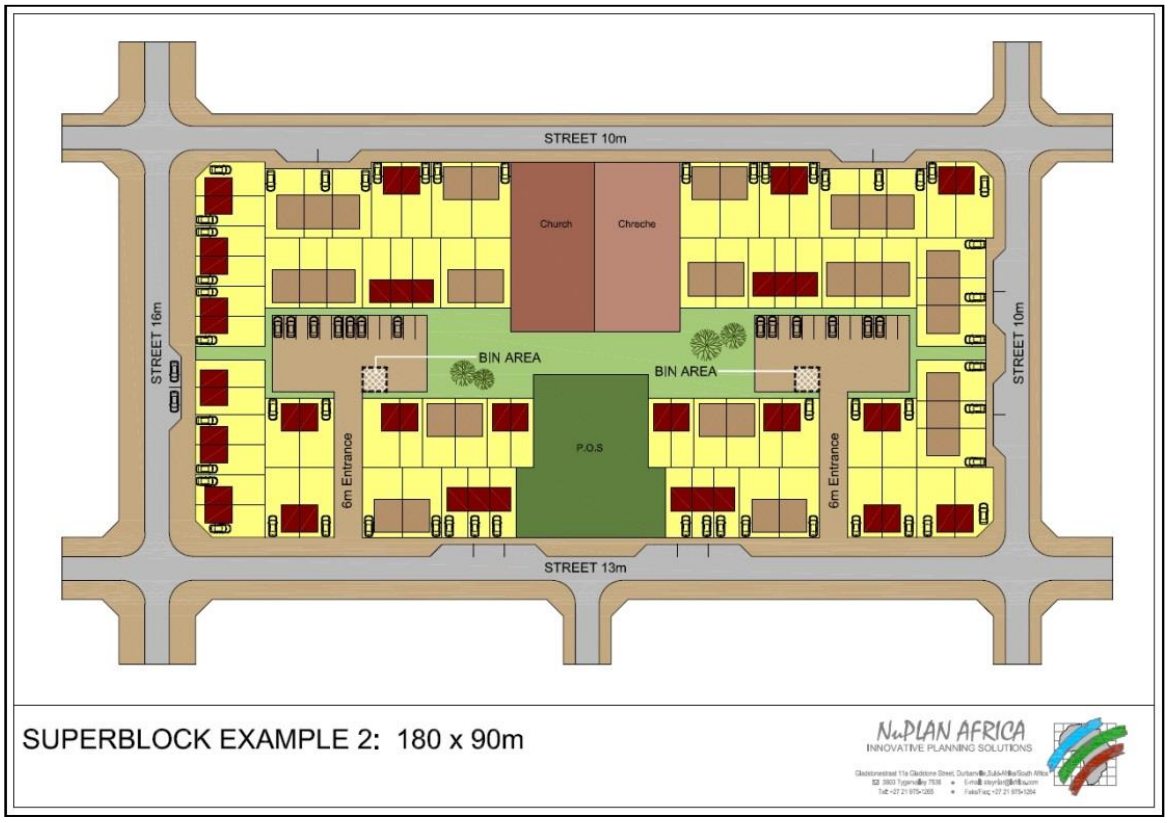

Figure 49: Superblock SDP 2

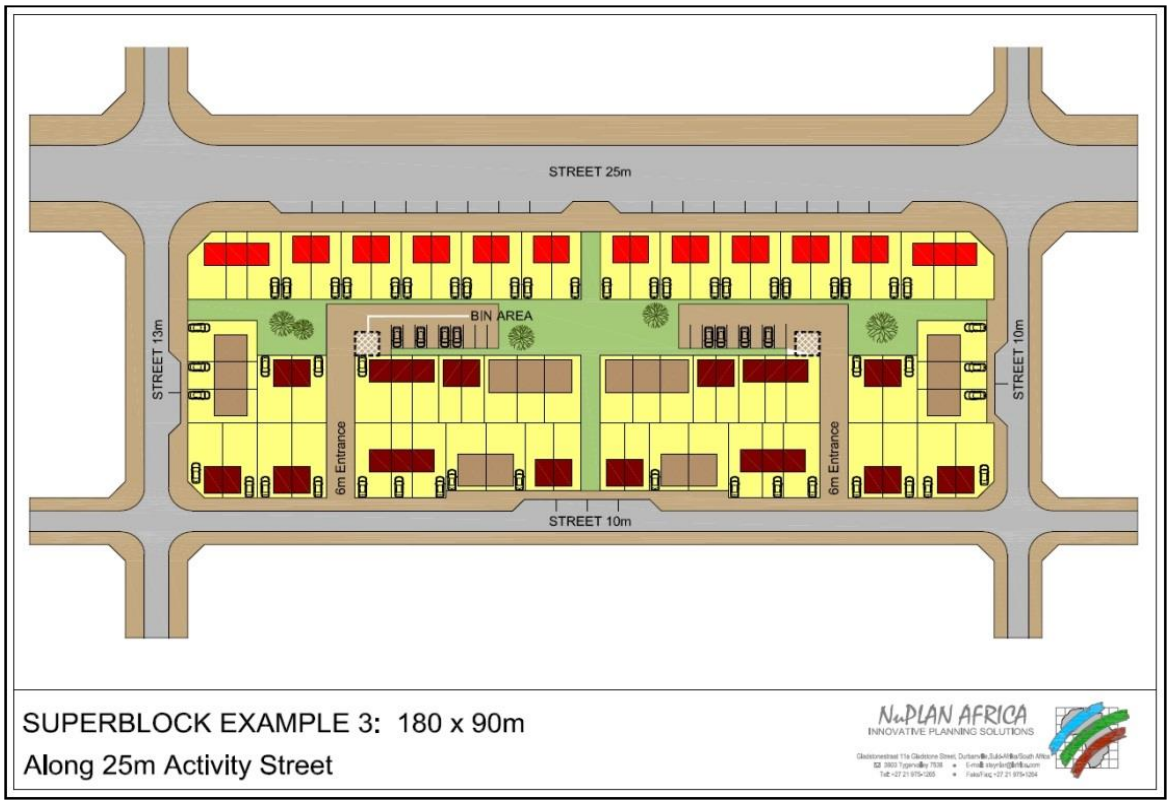

Figure 50: Superblock SDP 3

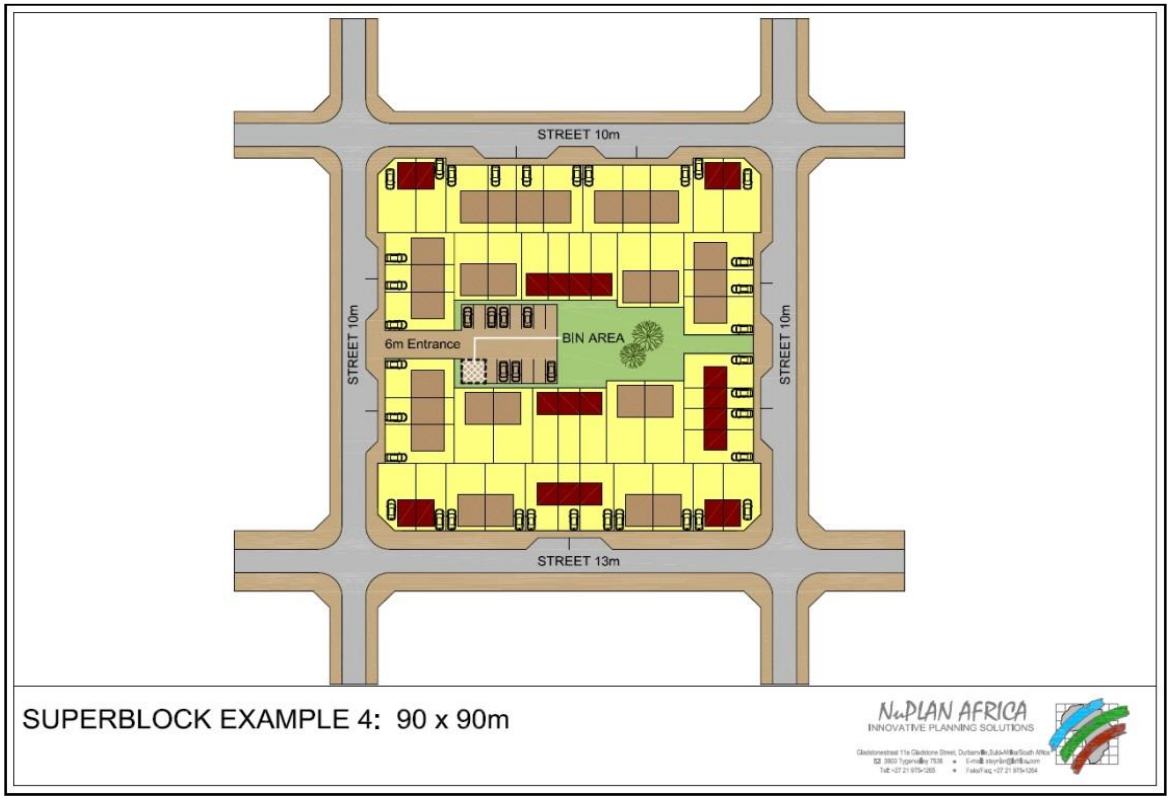

Figure 51: Superblock SDP 4

K-1.3 Preferred Alternative (Layout 5)

Layout 4 was used as the preferred Layout during the first Draft EIR Public Participation Process. Due to the nature of the comments received from the commenting authorities which included issues regarding plot sizes, buffered areas and public open spaces (will be addressed during the LUPO process and is not relevant to the EIA process), the layout was slightly adjusted to maximise the amount of dwellings that the property can provide and therefore increasing the feasibility of the development. The result was an increase from 3 191 to a total of 3 260 (69 units). This was the only alteration made to the layout design whilst keeping in mind the objectives set out for Layout 4 (Alternative 1).

Please refer to Figures 46 (a-d) for the new (Preferred) layout for the Vlakkeland Residential Development.

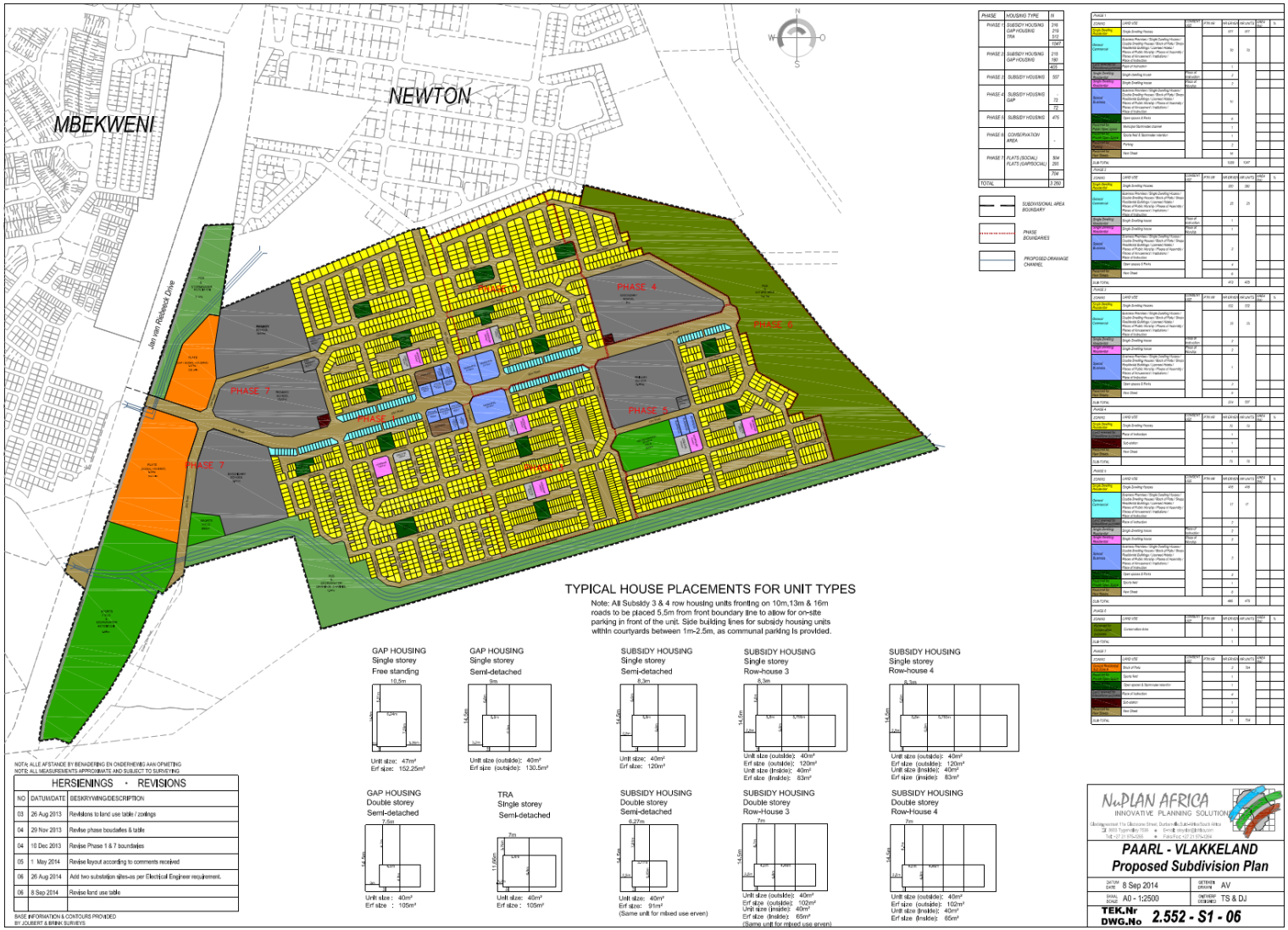

Figure 52: Layout 5 (Preferred Layout) for the Vlakkeland Residential Development, Paarl.

K-4 NO-DEVELOPMENT ALTERNATIVE

The Department of Environmental Affairs and Development Planning (DEA&DP) stresses that the no-go option should be considered in cases where the proposed development will have a significant negative impact that cannot be effectively or satisfactorily mitigated. The approach will consider the no-go option.

SECTION L – ASSUMPTIONS AND KNOWLEDGE GAPS

The following assumptions and knowledge gaps exist after the in depth assessment of the proposed development:

1. The assumption is made that the info on which this EIR is based is true and correct.
2. The range of alternatices is limited, in that the proposed is to supply as many as possible housing opportunities outside the possible environmental no-go areas.
3. A Spring botanical assessment was not undertaken as the previous 3 (Autum, Summer and Winter Assessments) as well as the knowledge and assessmetns of CREW SANBI all confirmed one specific area to be of a sensitive nature.
4. Due to the limited predictability of climate cycles and changes, which is not only naturally occurring but is influenced by human behaviour, the exact impact of climate change could not fully be addressed. Therefore an allowance of a 14% increase in capacity have been incorporated into all storm water infrastructure for the predicted rise in post development runoff in the future.
5. It is uncertain what the nature and extent of economic activity in the proposed development will entail and therefore no concrete predicted economic growth figures could be incorporated into the social impact assessment. It is assumed that the nature and extent thereof will be in line with similar developments and existing residential areas in its vicinity. Economic growth will however, only have a positive influence on the community and therefore no negative impacts are expected from this uncertainty.

SECTION M – ENVIRONMENTAL IMPACT STATEMENT

Based on this Environmental Impact Assessment for the proposed Vlakkeland Development in Paarl, the following is concluded:

The Drakenstein Municipality proposes the construction and establishment of a GAP and Low Cost residential development of approximately 3 260 units between Paarl and Wellington. The development will cover an area of approximately 108 ha comprising Erf 8359, Re/Erf 8370, Erf 8378, Erf 8399, Erf 8400, Erf 12628, Erf 12633 and Erf 33027. The site is situated to the east of Jan van Riebeeck Drive and to the west of Bo-Dal Road.

After the scoping phase of the EIA it was concluded that Erf 33027 would be excluded from the development due to the site being botanically sensitive. This property has been set aside for conservation purposes due to the presence of rare botanical species on this site. Erf 33027 will therefore serve as a public open space and will be rehabilitated to reserve any critical biodiversity species that might be present on the site. It will further act as a buffer between the proposed new development and existing residential developments and the farming community to the north east and east of the site.

The municipality proposes to develop a combination of subsidy housing, subsidy double storey housing, an activity spine, GAP housing and GAP and rental apartments on the above mentioned property. It is proposed to allocate four erven for Primary Schools and two erven for Secondary Schools. Specific locations will be set out to accommodate Places of Worship, Creches, Pre-Primary Schools, Sport Fields and taxi bays. A conceptual open space network will run throughout the development. A Civic and Business Node will be created in the centre of the development, providing a location for retail, offices, a Library, a Post Office and a Community Centre. A primary storm water drainage system with a large storm water retention facility will be constructed in the south eastern corner and alongside the southern boundary. This area will also serve as a sport facility, providing sport fields for the local community.

Access to the site will be taken from Jan van Riebeeck Drive (770m south of Mbekweni intersection) west of the site and from Bo Dal Road in the east.

Three storm water drainage systems are present west of Jan van Riebeeck Drive (on and near the Vlakkeland site), gathering and channelling water to the Berg River farther west. The main drainage line is situated 400m north of the south western corner of the proposed site and a smaller drainage line is situated another 350m north. The Kleinbosch and Mbekweni River resides over most of the western side of the site.

The EIA process identified numerous areas within the proposed site that are either ecologically or historically sensitive. Areas identified as historically sensitive are the SAHRA site to the south of the site and the Historical Farms to the east of the site.

Recommendations made were that a 120m and a 40m buffer should be introduced into the eastern and southern section of the site respectively to act as a visual screen and a development should not encroach into these buffer areas.
The Preferred Layout (Layout 5) and Alternative 1 (Layout 4) has taken this into consideration.

Several areas were identified as ecologically sensitive. The Botanically sensitive areas are also located to the east of the proposed development (on site). No development will take place in these areas which is also included in the 120m buffer area to the east of the site. The sensitive areas will be zoned and protected as open space.

The 40m buffer area will also act as a corridor to connect the botanical sensitive area to the SAHRA site which is located to the south of the proposed development site.

GNEC stands by their recommendation that these highly sensitive areas be avoided during development.

The environmental impacts of the proposed development are of a medium to low significance provided that the mitigatory measures identified in this EIA process are implemented. It is recommended that the development not encroach on the ecologically and historical sensitive areas. Should the proponent be unable to meet and/or implement the mitigation measures and recommendations contained within this report, detailed studies into the exact issue at hand must be undertaken before amendments to authorisations be made and before construction begins on site.

The Environmental Impact Assessment for the proposed Vlakkeland Development on the preferred site has detailed numerous impacts on the environment and historical aspects of the area. Some of these impacts are significant and other may be regarded as insignificant. However, with mitigation the vast majority of these impacts can be reduced to medium-low significance or insignificant impacts. The positive and negative implications can be summarised as follow:

Item	**Positive Impact**	**Negative Impact**
Direct	1. Addresses the housing backlog that exists within the Drakenstein Municipality. 2. Employment creation throughout life cycle of the proposed development (construction to operational) 3. Social Upliftment of the community in question	Increased Traffic on the Jan van Riebeeck Drive. However after the implementation of the mitigating measures described in the report, this will not have a significant negative effect on the surrounding area.
Indirect	Utilisation of vacant land for the development of the Drakenstein Municipality.	Changes in the flow of the watercourses in the vicinity. However after the

		implementation of the mitigating measures described in the report, this will not have a significant negative effect on the surrounding area.

Given the jobs (permanent and temporary) that will be created and the botanical and ecological protection that will be provided by means of the open space system and corridors, GNEC in our professional capacity as experienced and qualified environmental consultants believe that the proposed project be issued a positive environmental authorisation; however this authorisation must be accompanied with the following requirements:

- The sensitive botanical areas be protected and included in the Open Space system. This green (Open Space system) must be maintained by the Municipality.
- No people are to reside on the site for any period of time during the construction phase of the development, unless approval is granted by DEA&DP;
- Development must not be allowed to take place within the areas identified as ecologically sensitive or within the corridor/buffer areas;
- Development in these areas (sensitive areas) must not be approved should the layout of the development be amended in the future;
- An Environmental Control Officer must be present, at least once a week, during the construction phase of the development. The ECO must be suitably qualified and have adequate experience in handling projects of this size;
- The Environmental Management Programme (EMP) and River Maintenance Plan must be enforced throughout the life of the project;
- It is proposed that the River Maintenance Plan and the management of the sensitive buffer areas be made part of the Municipal EPWP programme to assist in the creation of temporary and permanent employment opportunities within the Drakenstein Municipality.
- Environmental audits reports must be submitted on a monthly basis to the proponent and DEA&DP once construction has begun. This is to ensure that mitigation measures are being implemented and to prevent environmental degradation during the operational phase;
- The Municipality is to appoint an ECO to perform an Environmental Audit every a year for the life of the project to ensure proper maintenance of the Private Open Spaces and the compliance to the OEMP.
- The stormwater retention area must be reviewed in terms of it's capacity to service the post-development runoff on site, before construction commences. This must be done in consultation with the Drakenstein Municipality and the Master Stormwater Management Plan. In the case where the retention areas must be expanded to accommodate additional post-development runoff, this must be done **on site** and therefore residential dwellings to be constructed must be removed to free up space for this expansion.
- All earthworks conducted in the watercourses on site must be done during the dryer seasons (therefore during Spring and Summer) so as to minimise potential water pollution due to construction activities.

SECTION N: ENVIRONMENTAL MANAGEMENT PROGRAM

RESPONSIBLE PARTIES FOR COMPILING THIS REPORT

Compiled by:	Euonell Grundling Guillaume Nel	Guillaume Nel Environmental Consultants
Reviewed by:	Guillaume Nel	Guillaume Nel Environmental Consultants

BACKGROUND TO GNEC

Guillaume Nel Environmental Consultants (GNEC) information.

1	**Company Registration Number**	2007/189057/23
2	**Physical Address**	45 Fabriek Street, Paarl, 7646
3	**Postal Address**	P.O. Box 2632, Paarl, 7620
4	**VAT Registration Number**	4570241465
5	**Telephone Number**	(021) 870 1874
6	**Fax Number**	(021) 870 1873
7	**Cell Phone Number**	072 1571 321
8	**E-mail**	guillaume@gnec.co.za
9	**BEE Status**	Level 4 Contributor
10	**Professional Registration**	SAATCA Certified Environmental Auditor, No. (EMA 375) (2003)
11	**Professional Registration**	Active Member of IAIASA
Guillaume's (EAP) Qualifications		
Degrees		MSc Environmental Management (PUK)
		B(Hons) Environmental Management (US)
		B Geography (US)
Certificates (University & SABS)		Environmental Law (PUK)
		EIA (PUK)
		EMS 14000 (PUK)
		Air Quality Management (PUK)
		Environmental Auditing (SABS)
		Geohydrological Principles
Experience as an EAP		Guillaume Nel has twelve years relevant experience as an environmental Assessment Practitioner

SECTION O: ADDENDUM

ADDENDUM A: CVS OF ENVIRONMENTAL ASSESSMENT PRACTITIONERS

CURRICULUM VITAE

Name:	GUILLAUME NEL
Name of Firm:	Guillaume Nel Environmental Consultants (GNEC)
Position:	Director
Date of Birth:	5 February 1974
Identity Number	740205 5050 083
Nationality:	South African
Home language:	Afrikaans/English
Years Relevant Experience:	Eleven Years

EDUCATIONAL QUALIFICATIONS

- **MSc**. Environmental Management, PU for CHE
- **Hons**. Environmental Management and Geographical Information Systems, US
- **B.** Environmental Management, US
- **Certificate**, Environmental Law, PU for CHE
- **Certificate**, Geohydrological Principles and Tools, PU for CHE
- **Certificate**, Environmental Management Systems, PU for CHE
- **Certificate**, Environmental Impact Assessment, PU for CHE
- **Certificate**, Air Quality Management, PU for CHE
- **Certificate**, ISO 14001 EMS Auditing, SABS

SAATCA Certified Environmental Auditor, No. (EMA 375) (2003)
Member of AIA SA

KEY QUALIFICATIONS

Environmental Impact Assessments:

Undertaken and Project Managed numerous Environmental Impact Assessments - such as:

- EIA for the new Shaw's Mountain Pass (MR269) between Hermanus and Caledon;
- EIA for a 430 ha residential Eco Estate in the Hottentots Holland Mountains;
- EIA's for Numerous Large Scale Low Cost and Gap Residential developments in the Western Cape;
- EIA's for Numerous Large Scale Low Density & Lifestyle Developments in the Western Cape;
- EIA for the Karoo Array telescope (KAT) in the Northern Cape (SKA);

- EIA for the Kudu Integration Powerline (Oranjemond to Vredendal) (ESKOM) (PP);
- EIA's for Numerous (>20) Industrial Developments (Western Cape and Gauteng);
- EIA for a new prison in Paarl (Department Public Works);
- EIA's for several new provincial roads/ passes in Overberg, Boland and Karoo (Dept Public Works);
- EIA processes for new road sections in the Northern Cape (SANRAL);;
- Molasses distillery in Kisumu, Kenya;
- EIA for the Sishen Mine Expansion Project (Kumba Recourses);
- EIA's for Lonmin Platinum (Pandora and Wonderkop Platinum Mines);
- Numerous Basic Assessment Applications (>100) for roads, residential, commercial and industrial developments in the Western Cape, Northern Cape, Karroo and Eastern Cape;
- Environmental Management Plans (>100) for Residential, Industrial, Commercial and Mining Developments in low and high sensitivity areas.

Environmental Management Programme Report (Including Mining EIA's):

The following noted-worthy projects have been successfully undertaken.

- Development of an EMPR/EIA for the Sishen Expansion Project - Kumba Resources;
- Development of various EMPR's for Lonmin Platinum Mines at Wonderkop and Pandora;
- Co-Developer of an EMPR for the Anglo Platinum, Rooderand project;
- Compilation of an EMPR for the Witwatersrand Gold Mining Realisation Trust; and
- Compilation of more than 70 EMPr's (EMProgrammes) for clay quarries, norite quarries and numerous borrow pits in the Overberg, Boland, Ceres Karoo and Gauteng.

Quantum Closure Costing System:

- Co-developer of a quantum closure costing system for the Xstrata Coal group in Mpumalanga;
- Developer of a quantum closure costing system for Impala Platinum;
- Closure costing sytem for a Protech, Norite Quarry in Roslyn;
- Closure costing system for the Ceramic Industries limited clay quarries;
- Closure costing system for Impala Platinum.

Legal and other compliance audits and ECO Audits:

- Undertaken a variety environmental compliance audits, which include:
- Spectre International's molasses distillery in Kenya (EMP and Legal compliance Audit);
- Numerous Pit rehabilitation/closure compliance Audits;
- Numerous Construction activities – EMP compliance Audits (>60);
- EMP compliance audit for African Brick clay quarry;
- Environmental Law and EMP compliance audits for numerous clay quarries and industries;

- Environmental Law (Legal) compliance audits for the local municipality of Mbombela (Previously known as Nelspruit);
- Environmental Law (Legal and ECO) compliance audits for the Roslyn, Automotive Supplier Park (Blue IQ).
- ECO Audits for numerous Residential Developments, Industrial Developments, Pipelines and other infrastructure.

Environmental Risk Assessments:

- Undertaken numerous Environmental Risk Assessments for mines, waste sites, infrastructure developments and industries.

Training:

- ECO Training for numerous entities.
- Assisting with the training workshops (X8) of the EIA regulations of April 2006 (Municipalities, Consultants and I&APs).

EMPLOYMENT EXPERIENCE

Director – Guillaume Nel Environmental Consultants (GNEC)
(Sept 2007 – Present)

- Office management;
- Financial projections/strategies and budget management;
- Marketing and Client liaison;
- Project Management and Planning;
- Project related, technical assistance to staff;
- Compilation and Project Management of Environmental Management Programmes (EMPr's), Environmental Impact Assessments (EIA's), as well as Basic Assessments and other smaller projects;
- Development of quantum closure costing systems and rehabilitation guidelines;
- Management of EMProgrammes for borrow pits and other mining activities;
- Management and undertaking of legal and other environmental related compliance audits;
- Management and compilation of mining authorizations and permit applications.

Regional Manager/Cape Regional Office - SEF (February 2005 – Sept 2007)

Environmental Manager: SEF (February 2003 – February 2005).

Environmental Assistant: Centre for Environmental Management (University of Potchefstroom for Christian Higher Education (January 2002-December 2002).

Guillaume Nel Environmental Consultants (GNEC) is a privately owned SMME that was established in 2007 with a combined professional experience of 65 years. Our Team Includes: Guillaume Nel, Dietmar de Klerk; Renier Kapp; Alizna Jacobs; Christoff Dippenaar; Jo-Anne Nel, Theo Domms, Euonell Grundling, Hein Grobelaar and Mvuyisi Qotyiwe. We also have a team of well experienced landscapers. Our office is situated at 45 Fabriek Street in Paarl, in the Western Cape.

The multi-disciplinary structure of **GNEC** produces a steadfast and holistic approach to environmental management and landscaping, enabling **GNEC** to fully function in the multi-disciplinary structure of the environmental management field. In addition to the expertise offered by this team, **GNEC** has built up a relationship with well experienced and acknowledged specialists who forms part of our assessment teams as required. These specialists include, but are not limited to botanical, freshwater, soils/agricultural, visual, archaeological, heritage, social, stakeholder engagement; noise and fauna [and avi-fauna] specialists.

GNEC strives to keep abreast of the latest movement in the international environmental field through personal development initiatives and research. GNEC is also committed to local empowerment by skills education.

GNEC's approach to the integrated assessment of the economic, social and biophysical environments aids us in creating a better tomorrow though innovative thinking and the promotion of sustainable development.

GNEC's strive is to:

- undertake assessments, develop strategies, plans and programmes to assist both the private and public sectors in responding to environmental legislation in a responsible and sustainable manner
- guide our clients in development and planning within the framework of international best practice.

We are involved in the Planning, Implementation and Rehabilitation of various projects.

Our range of services includes, but is not limited to the following:

- Environmental Impact Assessments (including Basic Assessments);
- Waste Management License Applications;
- Environmental Management Plans and Programmes;
- Environmental Control Officer (ECO) site supervision;
- Law Compliance Audits and Monitoring;
- Landscape Design and Contracting;
- Environmental Baseline/Risk and Constraints Analysis;
- Mining and Industry Related Applications and monitoring.

VISION

GNEC'S VISION IS TO CREATE A LONG TERM RELATIONSHIP WITH OUR CLIENTS THROUGH PROFESSIONALISM AND CREATIVE THINKING THAT SUIT THEIR SPECIFIC NEEDS AND THEIR TYPE OF INDUSTRY, THEREBY ENSURING SUSTAINABLE AND RESPONSIBLE DEVELOPMENT

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guillaume@gnec.co.za

ADDENDUM B – PUBLIC PARTICIPATION

ADDENDUM B-1 SCOPING & EIA PHASE

ADDENDUM B-1.1 SCOPING PHASE – 1ST DRAFT

ADDENDUM B-1.1.1: Proof of Registration Letters to Registered I&Aps

ADDENDUM B-1.1.2: Proof of Letter Drops (Knock & Drop)

ADDENDUM B-1.1.3: Site Notice Text & Proof

ADDENDUM B-1.1.4: Example of Initial Notification to Key Stakeholders

ADDENDUM B-1.1.5: Initial Comments

ADDENDUM B-1.1.6: Newspaper Advert Example and Proof

ADDENDUM B-1.1.7: BID & Invitation to Participate

ADDENDUM B-1.2 2ND DRAFT SCOPING PHASE

ADDENDUM B-1.2.1: Proof of Registration Letters to Registered I&Aps

ADDENDUM B-1.2.2: Proof of Letter Drops (Knock & Drop)

ADDENDUM B-1.2.3: Site Notice Text & Proof

ADDENDUM B-1.2.4: Example of Initial Notification to Key Stakeholders

ADDENDUM B-1.2.5: Final Comments

ADDENDUM B-2: EIA PHASE

ADDENDUM B-2.1: Example Of Notification to Key stakeholders

ADDENDUM C DEA&DP CORRESPONDENCE

ADDENDUM C-1: Acknowledgement of Receipt & Acceptance of Application

ADDENDUM C-2: Proof of Submitting and Final Scoping & Acknowledgement of Receipt

ADDENDUM C-3: Acceptance of Final Scoping Report

ADDENDUM C-4: Proof of Submitting the Water Use License Application

ADDENDUM D CONFIRMATION OF THE AVAILABILITY OF SERVICES

ADDENDUM E: CONSENT/APPROVALS AND ROD'S FROM AUTHORITIES

ADDENDUM F: SPECIALIST ASSESSMENTS

ADDENDUM F-1: Freshwater Assessment

ADDENDUM F-2: Archaeological Assessment

ADDENDUM F-3.1: Botanical Baseline Assessment

ADDENDUM F-3.2: Botanical Verification Report

ADDENDUM F-4 Visual Impact Assessment

ADDENDUM F-5: Heritage Impact Assessment

ADDENDUM F-6: Traffic Impact Assessment

ADDENDUM F-7: Flood Line Assessment

ADDENDUM F-8: Engineering Services Report

ADDENDUM F-9: Storm water Management Plan

ADDENDUM F-10 Geotechnical Assessment

ADDENDUM G: LAYOUT ALTERNATIVES ASSESSED DURING THE PROCESS

ADDENDUM G-1: Layout 1 (Alternative 4)

ADDENDUM G-2: Layout 2 (Alternative 5)

ADDENDUM G-3: Layout 3A (Alternative 2)

ADDENDUM G-4: Layout 3B (Alternative 3)

ADDENDUM G-5 Layout 4 (Alternative 1)

ADDENDUM G-6 Layout 5 (Preferred Alternative)

ADDENDUM H: TYPICAL HOUSING TYPOLOGY