



DEPARTMENT OF HUMAN SETTLEMENTS

**CONSTRUCTION OF
MARIANRIDGE HOUSING
DEVELOPMENT**

Draft Basic Assessment Report

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DEPARTMENT OF HUMAN SETTLEMENTS
CONSTRUCTION OF MARIANRIDGE HOUSING DEVELOPMENT
DRAFT BASIC ASSESSMENT REPORT

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EXECUTIVE SUMMARY

INTRODUCTION AND PROJECT DESCRIPTION

SiVEST SA (Pty) Ltd has been appointed by Oxygen Infrastructure Solutions, on behalf of the Department of Human Settlements (DOHS), to undertake the Basic Assessment (BA) Process for the Marianridge Housing Development in line with the National Environmental Management Act, 1998 (Act 107 of 1998).

DOHS is proposing to undertake the Marianridge Housing Development. The project aims at providing 500 units in the Marianridge area. While a number of the sites identified do not require environmental approval from the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) a portion of one site, ERF 8716, requires Environmental Authorisation as a result of the sensitive Sandstone Sourveld vegetation that has been identified on site. The site is located in an urban area and is surrounded by predominantly residential areas.

The Sandstone Sourveld area of ERF 8716 that requires approval will yield 90 residential units. Each block will be 5 units of double story, 2 bedroom dwellings.

The proposed development makes use of existing infrastructure and services within an existing residential area, and is essentially an infill development that provides low income housing stock. Being located within an existing urban area will influence the nature of the proposed development and essentially tie into the surrounding urban fabric.

APPLICABILITY OF NEMA EIA REGULATIONS, 2014 (AS AMENDED IN 2017)

The following activities are applied for:

Listing Notice	Activity	Description
GNR 327, April 2017 (Listing Notice 1)	<u>Activity 27</u> The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or	ERF 8716 is approximately 2.5 ha in extent. Approximately 1 ha of the site has been identified as the sensitive Sandstone Sourveld vegetation type. This area requires development in order to meet the housing demands.

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Listing Notice	Activity	Description
	(ii) maintenance purposes undertaken in accordance with a maintenance management plan.	
GNR 324, April 2017 (Listing Notice 3)	<p><u>Activity 12</u></p> <p>The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan.</p> <p>(iv) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004;</p> <p>(xii) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;</p>	ERF 8716 is approximately 2.5 ha in extent. Approximately 1 ha of the site has been identified as the sensitive Sandstone Sourveld vegetation type. This area requires development in order to meet the housing demands.

DETAILS OF ALTERNATIVES CONSIDERED

A number of sites have been investigated for the Marianridge Housing Development. Please refer to **Appendix B** for a map of the alternatives sites previously under investigation. A table describing the alternatives and the reasons they were ultimately identified as unfeasible for development are included below.

Alternative 1	Site Description	Reason for why they are unfeasible for development
Alternative 1	ERF 7043, 7044, 7045, 7046, 7047	Site used as a playground and park for the community
Alternative 2	ERF 7051, 7052, 7053, 7054, 7055, 7056	Site used as recreational area by the community.
Alternative 3	ERF 8710	Site too steep and not suitable for development
Alternative 4	ERF 8714	Site too steep and not suitable for development
Alternative 5	ERF 6889, 6895	Site rejected by community due to safety concerns.
Alternative 6	ERF 6900	Site too steep and not suitable for development. The site is also constrained by wetland.

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In terms of the No-Go Alternative, development within the Sandstone Sourveld area of ERF 8716 would not go ahead. This area of the site, approximately 1.1 ha in size would remain undeveloped. The 90 units proposed for development on the remainder of 8716 would not be realised and the Marianridge Housing development would fall short of contributing an additional 90 units to the 412 000 top structure backlog in the eThekweni Municipality.

The no-go alternative also carries additional risk to the already isolated Sandstone sourveld area. Should development not be authorised in this area, it is likely, given the rapid expansion of informal housing in the Marianridge area, that the area would be taken over by informal housing should the area be left undeveloped. There is already evidence on site of informal demarcations with danger tape that the Vegetation Specialist noted during the site assessments. While the no-go alternative needs to be considered, it may be more beneficial to address the social need over the environmental need in this instance and provide housing and formal services to people rather than to leave the area undeveloped and at risk of being occupied by informal housing.

The benefit of the no-go alternative would be that the Sandstone Sourveld area would remain intact and formal housing would not be developed on site. However, given the isolated nature of the vegetation, and its functionality, coupled with the possibility of further informal housing encroachment, it is unsure how long the vegetation will remain in its current state.

PUBLIC PARTICIPATION PROCESS UNDERTAKEN

The Public Participation Process has been undertaken in line with Chapter 6 of the EIA Regulations 2014 (as amended 2017).

SiVEST will notify I&AP's via email of the availability of the report. Site notices will be placed around the vicinity of the site as well as at the Marianridge Library. A copy of the report will also be made available at the Marianridge Library. Registered letters will be sent to all I&APs living adjacent to the site. Adverts will be placed in The Mercury and the Highway Mail.

Registered stakeholders will be provided with a further opportunity to provide comments. The Draft BAR will be made available for a 30 day comment period. The documents will also be made available on SiVEST's website (www.sivest.co.za/Downloads.aspx) for review and comment. A copy of the DBAR report will be left at the Marianridge Library for viewing by the public.

All issues that are raised during the review period for the DBAR (this report) will be recorded and addressed by the Environmental Assessment Practitioner (EAP) in a Comments and Responses Report (C&RR) attached to the Final BAR and the Final Report will be amended, as necessary based on issues or concerns raised (to be attached as **Appendix E** of the FBAR).

The Final BAR will be submitted to the ETDEA with all comments received and responses sent during the public comment period.

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RECEIVING ENVIRONMENT

The proposed site is located in the southern part of the eThekweni Municipality, approximately 25km west of the Durban CBD. The main access is from the M1, onto Milky Way and is accessed off Crux Place.

The site is currently undeveloped and consists of approximately 1ha of sensitive Sandstone Sourveld Vegetation.

IMPACT METHODOLOGY USED

The SiVEST Impact Assessment method, dated 28 July 2017 (attached as **Appendix G**) has been utilised to assess the following potential impacts identified in the assessment phase and presented in the following sections.

The method used in this impact assessment determines significance (can be both positive and negative) of an impact by multiplying the value of the environmental system or component affected by the magnitude of the impact on that system or component (System or Component Value x Impact Magnitude).

In this method, all significant impacts on the natural or biophysical environment are assessed in terms of the overall impacts on the health of ecosystems, habitats, communities, populations and species. Thus, for example, the impact of an increase in stormwater runoff generated by a development can only be assessed in terms of the impact on the health of the affected environmental systems.

Similarly, all significant impacts on the social and socio-economic environment are assessed in terms of the overall impacts to the quality of life, health and safety of the affected population, communities and/or individuals, with the exception of impacts on resources that are assessed on their own.

IMPACTS AND RISKS IDENTIFIED FOR THE PREFERRED ALTERNATIVE

Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
Habitat loss as a result of development	Development in the Sandstone Sourveld area will result in the direct loss of the remnant Sandstone Sourveld grassland on ERF 8716 as the area would be cleared for the construction of the housing development.	There are no mitigation measures for the site, however a plant search and rescue should be undertaken and either used in the indigenous landscaping of the development site or trans located to a suitable, similar habitat off the site. A qualified botanist or horticulturalist should be involved and should work closely with eThekweni Municipality EPCPD unit to ensure the plant rescue and translocation is successful. Due to the endangered nature of the vegetation an offset can be considered.	Very High Negative Impact	Sandstone is critically endangered and it is unfortunate to lose any of it, however it is already fragmented from any other natural environment and small and isolated enough that it is not an optimally functioning ecosystem. The impact would result in minor cumulative effects.	Site	Permanent	Definite
Soil Erosion during construction phase	Construction activities expose soil to environmental factors including rainfall and wind which can result in the removal of topsoil and subsequently soil erosion.	<ul style="list-style-type: none"> Do not allow surface water or storm water to be concentrated, or to flow down cut or fill slopes without erosion protection measures being in place. Erosion control measures must be implemented in areas sensitive to erosion and where erosion has already occurred such as edges of slopes, exposed soil etc. These measures include but are not limited to - the use of sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes. Indigenous landscaping in open areas needs to be incorporated in the management plan. Where cutting to form a platform is unavoidable, a system of deep dewatering wells and permanent retaining measures are recommended. Permanent subsoil drainage around buildings and 	Low Negative Impact	Medium Cumulative Impact			

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Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
		<p>dewatering of service trenches.</p> <ul style="list-style-type: none"> Terraces should be graded to direct water runoff away from the fill edges, and small earth bunds should be constructed along the crest of fills to prevent overtopping and erosion of fill embankments. Embankments should be topsoiled and grassed/vegetated as soon after construction to limit erosion and guard against failures during heavy rainfall events. 					
Destruction of heritage resources (graves)(if present)	Should graves be found within the area of Sandstone Sourveld, the heritage resource would have to be relocated and a reburial would have to occur. This impact will only be applicable should graves be found on site. If no graves are found, this impact would not occur.	<ul style="list-style-type: none"> Public participation process that includes advertisements over a 60-day period Identify possible living descendants Suggest grave relocation as a preferred option Exhumation and grave relocation 	High Negative impact	High Cumulative Impact	Site	Permanent	Probable
Destruction of heritage resources (place of worship)	The approval of the development would mean that the person who is making an ancestral offering in the study area will have to find an alternate location in which to make the offering. This may however be a once off offering as no evidence of older offerings existed on site.	<ul style="list-style-type: none"> Signage at entrance to property with notification of intent to develop, specifically mentioning the area of ancestral offering Approaching a Ward Councillor to assist in identifying the person Find an alternative place of worship 	Low Negative Impact	Negligible Cumulative Impact	Site	Short term	Probable
Air/dust pollution during construction phase	<p>Dust could become a problem during construction, especially on windy days. This is as a result of the developments proximity to residential areas.</p> <p>Air pollution may occur in the vicinity of the site and the immediate surrounds during the construction phase as a result of:</p>	<ul style="list-style-type: none"> All exposed stockpiles must be covered with hessian sheeting when not in use or dampened by a watercart at regular interval if in use. The site must be dampened at regular intervals and more frequently during windy conditions. Exposed areas where no construction will take place must be vegetated as soon as possible. 	Low Negative Impact	Negligible cumulative Impact	Site	Short Term	Probable

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Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
	<ul style="list-style-type: none"> Exhaust fumes from heavy vehicles and machinery, in particular poorly serviced vehicles Dust from exposed surfaces and soil stockpiles picked up by wind Dust on haulage and access roads emitted into the air by construction vehicles Odours downstream of inappropriate and mismanaged chemical toilets 	<ul style="list-style-type: none"> Dust generating construction activities should be avoided during strong winds. Management (including storage, transport, handling and disposal) of hazardous substances that have the potential to become airborne during construction should be carefully managed. Un-surfaced construction roads and bare surfaces within the construction site must be regularly wetted during dry conditions. A suitable dust palliative should be applied if wetting is ineffective. Soil loads in transit should be kept covered or wetted. Servicing of vehicles must occur off site to limit gaseous emissions. Chemical toilets should be placed on site and must be maintained on a daily basis. Burning of waste is forbidden. The maximum speed limit for construction vehicles travelling on un-surfaced construction roads within the site is 25km/hour. A dust complaints register must be kept within the camp site offices for the entire construction phase. These measures are contained within the EMP and must be monitored to ensure compliance. 					
Noise pollution during construction phase	The generation of noise (from earth moving machinery, piling works etc.) during the construction phase may result in the disturbance to the neighbouring residents. Noise generated by delivery vehicles, earth moving machinery, piling works and	<ul style="list-style-type: none"> Construction activities should only take place within agreed working hours. Surrounding residents should be warned of particularly noisy activities by way of flyers and letters. A complaints register must be kept at all times. 	Low Negative Impact	Negligible cumulative Impact	Site	Short Term	Possible

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	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
	<p>the workforce have the potential to impact negatively on people living and/or working along the property boundaries and in relatively close proximity to the proposed development. The negative impacts could result in an increase in stress and frustration and associated health implications.</p> <p>Disturbance may also be caused by construction starting too early or finishing too late. However, this impact is likely to be sporadic and relatively short.</p>	<ul style="list-style-type: none"> Construction staff should be provided with training regarding noise prevention and antisocial behaviour/conduct. 					
Traffic impacts during construction phase	<p>Traffic congestion and time delays may occur in the vicinity of the access points and associated intersections during the construction phase as a result of increase in the number of heavy vehicles using the roads in the vicinity of the site. In particular, the creation of the access points will likely obstruct traffic for a few hours.</p> <p>Traffic congestion and time delays during peak hours are known to increase the stress and nuisance levels of regular users. In this case, the delays expected to increase slightly but be minimal.</p>	<ul style="list-style-type: none"> The creation of access points or any other construction activities that may cause the obstruction of traffic must not occur during peak AM and PM periods. 	Low Negative Impact	Negligible cumulative Impact	Site	Short Term	Possible
Job creation during construction phase	<p>A number of jobs (approximately 150 unskilled jobs) will be created during the construction phase of the project.</p> <p>For those unemployed in the area, the creation of short-term construction jobs would improve their economic well-being for the period of construction and may lead to</p>	<ul style="list-style-type: none"> No mitigation 	High Positive Impact	High Cumulative Impact	High	Short Term	Definite

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Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
	further employment opportunities through skills enhancement and experience. Economic well-being is generally regarded as an important contributor of individual quality of life, especially for those unemployed and struggling to make ends meet.						
Soil erosion during operational phase	The risk and potential impact of soil erosion will be high during the operational phase as well. The proposed development will result in a substantial increase in the amount of hardened surfaces, which will in turn result in an increase in the amount of surface (stormwater) runoff generated by the development footprint. With the increase in hardened surfaces, the volume and velocity of stormwater runoff will increase and therefore the risk of erosion. However, the increase in hardened surface and resultant increase in stormwater has been accounted for in the stormwater management network.	<ul style="list-style-type: none"> Surface runoff from the roads will be contained by the road crossfall and the kerbs. Road crossfalls where possible will fall towards the cut side of the roads in order to accommodate discharging of underground pipes onto the road surface through the kerb. Where this is not possible then kerbs shall be accommodated on both sides of the roads. Storm water drainage from proposed sites will be discharged on to the road kerb via a piped system from the house roofs and the excess water from the paved and unpaved areas of the property. Where the property is below the road then midblock drains with S&D servitudes shall drain these properties to the road system. Where appropriate, stormwater discharge from hardened surfaces and roofed areas should be lead to discharge via the nearest road hardening into the road stormwater system, provided this is designed to cater for runoffs. 	Low Negative Impact	High Cumulative Impact	Local area/district	Long-term	Possible
Provision of housing	The portion of land under application will provide an additional 90 units to the Marianridge Housing Development project and provide housing for a number of people. Low income,	<ul style="list-style-type: none"> No mitigation 	Very High Positive Impact	High Cumulative Impact	High	Permanent	Definite

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Environmental Aspect	Summary of Implications and Mitigation		Assessment of Environmental Impacts				
	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
	informally settled residents stand to benefit from the proposed housing project. Overall, the beneficiaries will experience a substantial improvement in the quality of their housing, municipal services and social services. This includes access to ownership of private property, electricity, flush toilets, solid waste removal and potable water. As the quality of housing and the access to basic municipal and social services is generally an important contributor to overall quality of life, it is likely that the individual beneficiaries will experience a substantial improvement in their living conditions and quality of life.						
No – go – Impacts should the Sandstone Sourveld area be excluded from development	If the development does not go ahead, the Sandstone Sourveld area will be excluded from development. However, it is evident that the vegetation will still undergo a negative impact based on the scores below.	<ul style="list-style-type: none"> A minimum 10m buffer should be implemented, so that minimal grassland is disturbed. The proposed housing for this ERF should be fenced to minimize traverse through to grassland. 	High Negative Impact	Medium Cumulative Impact	Site	Permanent	Definite
No – go – Loss of housing opportunities for future beneficiaries	If the housing project on the sensitive portion of ERF 8716 does not go ahead, the current poor housing conditions will persist in the area. Issues of unrest and frustration leading to protest action will persist as the community will continue to be very dissatisfied with the lack of formal housing in the area. It is likely that the residents constructing informal housing in the Marianridge area will inhabit the area remaining on ERF 8716. In addition, potential subsidy holders and beneficiaries will likely become extremely angry and	<ul style="list-style-type: none"> n/a 	Very High Negative Impact	High Cumulative Impact	High	Permanent	Definite

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	Potential Impacts	Mitigation	Significance after mitigation	Consequence	Extent	Duration	Probability
	frustrated because of unmet expectations. This will exacerbate their anger and frustration which could spread through many of the social networks in the area and cause unrest. This unrest is already evident on an on-going basis in the area.						

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POSITIVE AND NEGATIVE IMPACTS OF THE MARIANRIDGE HOUSING DEVELOPMENT

Impact	Pre-mitigation	Post-mitigation
Impacts on Biophysical Systems / Components during the construction phase		
Vegetation/Biodiversity Loss	Very high negative impact	High negative impact
Soil Erosion	Low negative impact	Low negative impact
Impacts to Socio-Economic Component during the construction phase		
Potential destruction of heritage resources (graves) (if present)	High negative impact	High negative impact
Destruction of heritage resources (ancestral offering)	Low negative impact	Low negative impact
Air / dust pollution	Low negative impact	Low negative impact
Noise	Low negative impact	Low negative impact
Traffic congestion	Low negative impact	Low negative impact
Job creation	High positive impact	No mitigation required
Impacts to Biophysical Systems/components during the operational phase		
Soil erosion	Medium negative impact	Low negative impact
Impacts to Socio-Economic component during the operational phase		
Provision of housing	Very high positive impact	No mitigation required
No-go Alternative		
Sandstone sourveld vegetation left undeveloped	High negative impact	No mitigation possible
Loss of housing opportunities	Very high negative impact	No mitigation possible

ENVIRONMENTAL IMPACT STATEMENT:

The development forms part of the Marianridge Housing Development. The development is an initiative to assist the city in servicing the huge backlog of housing within the Municipality. The project aims at providing 500 units in the Marianridge area. While a number of the sites identified do not require environmental approval from the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) a portion of one site, ERF 8716, requires Environmental Authorisation as a result of the sensitive Sandstone Sourveld that has been identified on site. The site is located in an urban area and is surrounded by predominantly residential areas.

According to the EThekwini Municipalities SDP, the city is currently faced with a backlog of top-structures of approximately 412 000 dwelling units. Since 1994, roughly 183 000 dwellings have been built and serviced. The pace trend for top-structure construction is 5 000 to 7 000 dwellings per annum. At the current construction pace, the city will require about half a century to deal with top-structure backlogs. The need for additional housing with the EThekwini is therefore highly important and the need to address the backlog is urgent.

The Marianridge Housing Development is an initiative that will assist eThekwini in servicing this backlog. The project as a whole aims at providing approximately 500 units in the Marianridge area. While this application is only required for approval of a portion of ERF 8716, in which 90 units of the total number will be developed, the need for housing is discussed as a whole.

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The site development plan is included in Appendix C. A total of 90 units will potentially be developed in the area identified as Sandstone Sourveld.

The following specialist studies were undertaken to determine the potential impact of the proposed project on the environment:

- Vegetation Impact Assessment;
- Wetland Impact Assessment;
- Heritage Impact Assessment;
- Traffic Impact assessment;
- Geotechnical Assessment.

As the site was identified to be in an area of high biodiversity value, a Vegetation Impact Assessment (refer Appendix F) was undertaken. The study identified approximately 1 ha of Sandstone Sourveld Vegetation on a portion of ERF 8716. While the Sandstone vegetation area is small and isolated and not functioning as it once was, it was given a significance rating of a Very High Negative Impact should it be removed as a result of the endangered nature of the vegetation. Should the development be approved the area of Sandstone Sourveld vegetation would be lost. The specialist has made recommendations for removal and replanting some of the vegetation as these plants, by their physiology and structure, are easily and successfully translocated. To ensure that the plants survive, a Translocation Plan should be compiled by a botanist or horticulturalist to ensure the protected species survive. The protected plants would require permits for their removal and translocation. The specialist concluded that the housing development would be supported should the recommendation in the report be implemented.

In line with the National Heritage Resources Act 1999 (25 of 1999), a Heritage Impact Assessment was undertaken (refer Appendix F). A survey was undertaken and the specialist requested that the area in which a potential grave site was identified be cleared to ground level to check for the presence of graves. However, as a result of the sensitive Sandstone Sourveld vegetation, this area couldn't be cleared for the specialist. As a result, the specialist has recommended that, should the project be granted Environmental Authorisation, then the area will need to be resurveyed after vegetation clearance to check for potential human graves. If human graves are located and need to be relocated, then the impact would be a High Negative Impact. However, should no graves be found there would be no impact at all. Evidence of an ancestral offering was identified on site however this was given a Low Negative Impact as this might be a once-off offering as no evidence of older offerings existed.

The Wetland Assessment identified no wetland on site or within 30m of the site. Wetland was found within 500m of the site and, in line with the Department of Water and Sanitation (DWS) requirements, DWS were consulted with. Following consultation with DWS, it was identified that no activities were triggered with regards to the National Water Act (Act No. 36 of 1998) and no further consultation was required with the Department. The Wetland Delineation Report is attached in **Appendix F**. Proof of consultation with DWS is attached in Appendix I. No impacts were identified in this regard.

In terms of the Traffic Impact Assessment (refer **Appendix F**), the area surrounding the proposed development site was characterised by low to medium density residential and religious land-uses. The proposed development was therefore determined to be compatible with the surrounding land-uses. An analysis was made on the capacity of the roads to deal with the increase in traffic volumes. All roads were identified to be able to deal with the

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increased capacity of the Marianridge Housing Development. Low traffic impacts were identified during construction the construction phase, and no traffic impacts were identified during the operational phase.

Very high positive impacts and high positive impacts were identified in terms of provision of housing and job creation. The area under application will provide an additional 90 units to the Marianridge Housing Development and approximately 150 jobs during construction. As a result of the urgent need to address the housing backlogs as well as the informal housing settlements, this development has huge positive socio-economic impacts. Informal settlements in the Marianridge area are growing at an exponential rate, as evidenced on the google earth imagery. Should the application be rejected, there is the potential for informal housing to be erected in the Sandstone Sourveld area given the current trends. Should this happen, any opportunity for vegetation removal and relocation will be lost. In addition to this, the site will be left un-serviced with no sanitation or waste services.

In terms of the No-Go Alternative, should the development be rejected, the 90 additional units will not be realized and the Marianridge Housing Development will fall short of meeting its target. A number of families will be denied formal and safe housing. The loss of housing as a result of the rejection of the application was given a very high negative impact. In terms of benefits of the no-go option, Sandstone Sourveld Grassland area would remain intact and formal housing would not be developed on site.

An article, published by Naicker *et al.* 2016 entitled "Assessing habitat fragmentation of the KwaZulu-Natal Sandstone Sourveld, a threatened ecosystem", discusses the importance of grasslands. Grasslands are amongst the most threatened habitats as a result of total habitat loss and degree of fragmentation. Grasslands provide vital ecosystem services that benefit humans both directly (provision of medicinal plants and grazing for livestock) and indirectly (sequestration of carbon for climate regulation). The grasslands host a high diversity of endemic flora and fauna species with 349 endemic Red List taxa of concern of which 180 are threatened with extinction. The KwaZulu-Natal Sandstone Sourveld ecosystem is currently classified as endangered and should therefore be conserved. The article by Naicker *et al.* 2016 states the connectivity of a landscape is vital for the persistence of species faced with habitat loss and fragmentation. However, according to the vegetation study that was undertaken, ERF 8716 is already highly fragmented and isolated and not functioning as it once was. Given the isolated nature of the vegetation, and its functionality, coupled with the possibility of further informal housing encroachment, it is unsure how long the vegetation will remain in an undisturbed state.

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CONSTRUCTION OF MARIANRIDGE HOUSING DEVELOPMENT
DRAFT BASIC ASSESSMENT REPORT

1. INTRODUCTION

SiVEST SA (Pty) Ltd has been appointed by Oxygen Infrastructure Solutions, on behalf of the Department of Human Settlements (DOHS), to undertake the Basic Assessment (BA) Process for the Marianridge Housing Development in line with the National Environmental Management Act, 1998 (Act 107 of 1998).

DOHS is proposing to undertake the Marianridge Housing Development. The project aims at providing 500 units in the Marianridge area. While a number of the sites identified do not require environmental approval from the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) a portion of one site, ERF 8716, requires Environmental Authorisation as a result of the sensitive Sandstone Sourveld vegetation that has been identified on site. The site is located in an urban area and is surrounded by predominantly residential areas.

The proposed development triggers two activities in terms of the EIA Regulations of 2014 (as amended in 2017). The listed activities triggered are discussed in Section 7.2 below.

2. PROJECT TITLE

Marianridge Housing Development.

3. DETAILS OF APPLICANT

3.1 Name and contact details of the Applicant

Name and contact details of Applicant:

Business Name of Applicant	Department of Human Settlements
Physical Address	Eagle Building, 353-363 Dr Pixley Ka Seme Street, Durban, 4001
Postal Address	Private Bag X54367, Durban
Postal Code	4001
Telephone	031 336 5300
Fax	031 336 5114
Email	Jabu.mbutho@kzndhs.gov.za

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4. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER AND SPECIALISTS

4.1 Name and contact details of the Environmental Assessment Practitioner (EAP)

Name and contact details of the EAP who prepared this report:

Table 1: Name and contact details of EAP who prepared the report

Business Name of EAP	SiVEST SA (PTY) Ltd
Physical Address	4 Pencarrow Crescent, La Lucia Ridge Office Estate
Postal Address	PO Box 1899, Umhlanga Rocks
Postal Code	4320
Telephone	031 581 1500
Fax	031 566 2371
Email	michelleg@sivest.co.za

4.2 Names and expertise of representatives of the EAP

Table 2: Names and details of the expertise of each representative of the EAP involved in the preparation of this report

Name of representative of the EAP	Educational Qualifications	Professional Affiliations	Experience (years)
Michelle Nevette	MEnvMgt. (Environmental Management)	IAIA	19
Michelle Guy	MSc (Environmental Science)	IAIA	6

CV's of SiVEST personnel is attached in **Appendix A**. The EAP declaration is attached in **Appendix A**.

4.3 Names and expertise of the specialists

Table 3: Name and expertise of specialists

Name of representative of specialist	Position	Educational Qualifications	Experience (years)
Umlando Consulting	Heritage Study		
Gavin Anderson	Heritage Specialist	Masters of Philosophy in Archaeology/Social Psychology: 1996, UCT	24
SiVEST Environmental	Vegetation Study		
Liandra Bertolli	Vegetation Specialist	Bachelor of Science (Honours) Ecological Science: University of KwaZulu-Natal, 2009	5.5
SiVEST Environmental	Wetland Study		

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Name of representative of specialist	Position	Educational Qualifications	Experience (years)
Stephen Burton	Wetland Specialist	M.Sc. (Zoology 2006), University of KwaZulu-Natal PMB, KZN	11
Bis Consulting	Traffic Impact Assessment		
Suntika Biseswar	Traffic Specialist	BSC Civil Engineering	14
Geosure	Geotechnical Investigation		

The specialist studies and declarations are attached in **Appendix F**.

5. LOCATION OF THE ACTIVITY

5.1 21 Digit Surveyor General Code of the site

The Surveyor General code for the site is: N0FT02600000871600000.

5.2 Physical Address of the site

The site is located in the southern part of the eThekweni Municipality, approximately 25km west of the Durban CBD. The main access is from the M1, onto Milky Way and is accessed off Crux Place. The site locality is attached in **Appendix B**.

5.3 Coordinates of the site

The coordinates for the site are as follows:

Latitude: 29° 51' 42.05"S

Longitude: 30° 49' 37.74"E

6. SITE DEVELOPMENT PLAN

The Site Development Plan and sensitivity map is attached in **Appendix C**.

7. ACTIVITY INFORMATION

7.1 Project Description

The Marianridge Housing Development is an initiative to assist the city in servicing the huge backlog of housing within the Municipality. The project aims at providing 500 units in the Marianridge area. While a number of the sites identified do not require environmental approval from the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) a portion of one site, ERF 8716, requires Environmental Authorisation as a result of the sensitive Sandstone Sourveld vegetation that has been identified on site (refer **Appendix C** for a layout of the sensitivities on site).

Over the years, a number of sites have been identified in the Marianridge area for the development of the Marianridge Housing project. Marianridge falls within the jurisdiction of eThekweni Municipality, inner-west region. The site is located in an urban area and is surrounded by predominantly residential areas.

Site selection for this project has been on-going with a number of properties undergoing screening assessments to determine their development potential. However, the majority of the sites have ultimately been identified as unfeasible for the development of the Marianridge Housing Development. This is for a number of reasons ranging from zoning, biodiversity constraints, current land-use constraints as well as excessive or prohibitive slopes (making the site too expensive for development).

Of the four remaining sites that were determined to be feasible for the housing development, three do not require Environmental Authorisation (as confirmed by EDETA in correspondence dated 16 January 2018; attached in **Appendix I** as well as in further email correspondence). An area of the remaining site, ERF 8716 requires environmental approval as a result of sensitive vegetation located on the north-eastern portion of the site. ERF 8716 totals 2.51ha in size. The applicant is seeking approval for the area of ERF 8716 identified as Sandstone Sourveld (approximately 1 ha). The remainder of the site that has been identified as suitable for development, approximately 0.7 ha will be developed in the interim pending the outcome of the Environmental Authorisation for approval of the Sandstone Sourveld area.

The usable land area of ERF 8716 currently under construction will yield 55 residential units while the Sandstone Sourveld area that requires approval will yield 90 residential units. Each block will be 5 units of double story, 2 bedroom dwellings.

Internal services ie: Roads, Stormwater, Sanitation, Water, Electricity, will be constructed in terms of eThekweni Municipal Standards.

The proposed development makes use of existing infrastructure and services within an existing residential area, and is essentially an infill development that provides low income housing stock. Being located within an existing urban area will influence the nature of the proposed development and essentially tie into the surrounding urban fabric.

7.2 NEMA Listed Activities

The amended EIA Regulations promulgated under Section 24(5) of the National Environmental Management Act, Act 107 of 1998 and published in Government Notice No. R. 326 list activities which may not commence without environmental authorization from the Competent Authority. The proposed activity is identified in terms of Government Notice No. R. 327 and 324 for activities which must follow the Basic Assessment Process. The project will trigger the following listed activities:

Table 4: Listed activities triggered

Listing Notice	Activity	Description
GNR 327, April 2017 (Listing Notice 1)	<u>Activity 27</u> The clearance of an area of 1 hectares or more, but less than 20 hectares of indigenous vegetation, except where such clearance of indigenous vegetation is required for - (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	ERF 8716 is approximately 2.5 ha in extent. Approximately 1 ha of the site has been identified as the sensitive Sandstone Sourveld vegetation type. This area requires development in order to meet the housing demands.
GNR 324, April 2017 (Listing Notice 3)	<u>Activity 12</u> The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. (iv) Within any critically endangered or endangered ecosystem listed in terms of section 52 of the NEMBA or prior to the publication of such a list, within an area that has been identified as critically endangered in the National Spatial Biodiversity Assessment 2004; (xii) Sensitive areas as identified in an environmental management framework as contemplated in chapter 5 of the Act and as adopted by the competent authority;	ERF 8716 is approximately 2.5 ha in extent. Approximately 1 ha of the site has been identified as the sensitive Sandstone Sourveld vegetation type. This area requires development in order to meet the housing demands.

8. POLICY AND LEGISLATIVE CONTEXT

The relationship between the project and certain key pieces of environmental legislation is discussed in the subsections to follow.

8.1 The Constitution

The Constitution of the Republic of South Africa, Act 108 of 1996 sets the legal context in which environmental law in South Africa occurs and was formulated. All environmental aspects should be interpreted within the context of the Constitution, National Environmental Management Act 107 of 1998 and the Environment Conservation Act 73 of 1989.

The Constitution has enhanced the status of the environment by virtue of the fact that an environmental right has been established (Section 24) and because other rights created in the Bill of Rights may impact on environmental management through, for example, access to health care, food and water and social security (Section 27). An objective of local government is to provide a safe and healthy environment (Section 152) and public administration must be accountable, transparent and encourage participation (Section 195(1) (e) to (g)).

8.2 National Environmental Management Act

According to Section 2(3) of the National Environmental Management Act (NEMA) (Act No. 107 of 1998), “development must be socially, environmentally and economically sustainable”, which means the integration of these three factors into planning, implementation and decision-making so as to ensure that development serves present and future generations.

The proposed construction of the Marianridge Housing Development requires authorisation in terms of NEMA and the Basic Assessment (BA) Process is being undertaken in accordance the EIA Regulations 2014 (as amended in 2017) that consist of the following:

- Listing Notice 1 - GN No. 327 (7 April 2017);
- Listing Notice 3 – GN No 324 and;
- BA procedure - GN No. 326 (7 April 2017);

The project triggers activities under Listing Notice 1 and 3 and thus needs to be subjected to a Basic Assessment Process. The listed activities are explained in Section 7.2 above.

8.3 The National Heritage Resources Act 1999 (25 of 1999)

The National Heritage Resources Act promotes good management of the heritage resources of South Africa which are deemed to have cultural significance and to enable and encourage communities to ensure that these resources are maintained for future generations.

The aim of the Act is to introduce an integrated, three-tier system for the identification, assessment and management of national heritage resources (operating at a national, provincial and local level). This legislation makes provision for a grading system for the evaluation of heritage resources on three levels which broadly coincide with their national, provincial and local significance.

Under the legislation the South African Heritage Resources Agency (SAHRA), was established, which replaced the National Monuments Council. SAHRA is responsible for the preservation of heritage resources with exceptional qualities of special national significance (Grade I sites). A Provincial Heritage Resources Authority, established in each province, will protect Grade II heritage resources which are significance within the context of a province or region. Buildings and sites of local interest (Grade III sites) is the responsibility of local authorities as part of their planning functions.

There is extensive national legislation covering heritage and archaeological sites. Within the scope of this project, Section 38 of the NHRA (25 of 1999), states that an assessment of potential heritage resources in the development area needs to be done. For this reason, a Heritage Impact Assessment was undertaken to identify any heritage value on site. The report is attached in **Appendix F**. The report has been submitted to Amafa for review, comment and approval.

8.4 National Water Act (Act 36 of 1998)

The National Water Act of 1998 pertains to the country's water resources. Moreover, this Act regulates issues including wastewater, the pollution of water bodies and the extraction and use of water resources.

The purpose of 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:

- Meeting the basic human needs of present and future generations;
- Promoting equitable access to water;
- Redressing the results of past racial and gender discrimination;
- Promoting the efficient, sustainable and beneficial use of water in the public interest;
- Facilitating social and economic development;
- Providing for growing demand for water use;
- Protecting aquatic and associated ecosystems and their biological diversity;
- Reducing and preventing pollution and degradation of water resources;
- Meeting international obligations;
- Promoting dam safety;
- Managing floods and droughts.

And for achieving this purpose, to establish suitable institutions and to ensure that they have appropriate community, racial and gender representation.

In terms of the Marianridge Housing Project, a wetland delineation, functional assessment and risk assessment was undertaken for the site in question and it was identified by the Department of Water Affairs

that no Water Use License will be required. The report is attached in **Appendix F**. Proof of correspondence with DWS is attached in **Appendix I**.

8.5 EThekwini Municipality Spatial Development Framework

Reference is made to the eThekwini Municipality's Spatial Development Framework (SDF) 2017/2018 – 2021/2022 (Final report May 2018).

The provision of housing within the context of the eThekwini Municipality is an important issue and has been addressed in development guiding documents such as the SDF.

The SDF strives to respond to all the goals and targets within its mandate but of particular importance, amongst others, is to ensure access for all to adequate, safe and affordable housing and basic services and upgrade of slums by 2030.

Like all developing cities, the in-migration from rural areas and small towns has resulted in a rate of urbanisation and population increase that is hard to project, with a large number of new residents requiring housing and services. As a result of the increase in population in the eThekwini Municipality, a large amount of people have settled in informal settlements which are increasing at a rapid rate. As per the SDF, this requires that urgent attention be given to addressing the housing backlog (a backlog of top-structures of approximately 412 000 dwelling units) and a key spatial challenge is to identify residential opportunities on land that is well located, serviced and with good access to public transport as well as social and economic opportunities.

As a result of the municipality's housing programme being unable to secure well located land at reasonable prices, they have been forced to deliver large-scale greenfield housing projects on the periphery of existing settlements.

There is a huge backlog with regards to the provision of housing with most of the backlog being experienced by low-income households who earn less than R 3, 400 p.m. The Marianridge Housing Project aims to address the backlog of housing by supplying affordable accommodation to low income households.

8.6 Integrated Development Plan, 2017/2018

Reference is made to the eThekwini Municipality's Integrated Development Plan (IDP) 2017/2018 – 2021/2022 (Final report May 2017).

Similarly, the IDP serves as a tool for transforming local governments towards facilitation and management of development. One of the goals listed in the IDP is to promote access to equitable, appropriate and sustainable level of household infrastructure and community services and facilitate access to housing. Also on the agenda is the reduction in the backlog of housing provision within the municipality.

Like all developing world cities, the eThekwini Municipality is subject to high rates of in-migration from rural areas and small towns in KZN. This has resulted in a rate of urbanisation and population increase that is difficult to project and a large number of new residents require housing and services. African cities are

generally dynamic and have fast growing populations, with eThekweni Municipality being no different, with the majority of this growth happening on the urban periphery where it is easier to access land. With such rapid growth, city development will need to be significantly accelerated to adequately address this challenge.

The provision of housing for residents is a priority in the municipality however this is met with many constraints. The key issues related to housing include:

- High backlogs with limited funding available as it is an unfunded mandate;
- Lack of well-located land;
- Project stalled due to delays experienced in land acquisition, lack of well-located and suitable land, environmental and developmental approvals and conflicting interests, especially with adjoining communities;
- Protracted SCM processes
- Invasion of land and houses
- Delays in housing accreditation process stalling housing delivery

As a result of the constraints stated above, huge housing provision backlogs have been experienced by the city. The Marianridge Housing Development is an initiative to work towards decreasing that backlog.

9. NEED AND DESIRABILITY

According to the EThekweni Municipalities SDP, the city is currently faced with a backlog of top-structures of approximately 412 000 dwelling units. Since 1994, roughly 183 000 dwellings have been built and serviced. The pace trend for top-structure construction is 5 000 to 7 000 dwellings per annum. At the current construction pace, the city will require about half a century to deal with top-structure backlogs. The need for additional housing with the EThekweni is therefore highly important and the need to address the backlog is urgent.

The Marianridge Housing Development is an initiative that will assist eThekweni in servicing this backlog. The project as a whole aims at providing approximately 500 units in the Marianridge area. While this application is only required for approval of a portion of ERF 8716, in which 90 units of the total number will be developed, the need for housing is discussed as a whole.

In order to illustrate the need for housing within the municipality, and particular within the Marianhill/Marianridge area, a series of google earth images have been prepared. These images show the progression of informal housing in the Marianridge area occurring on the outskirts of the city as a result of the lack of formal housing. The growth of informal housing is occurring directly adjacent to the parcels identified as part of the Marianridge Housing Development. Refer to **Appendix D** for the full series of images between July 2017 and May 2018. A screenshot of only the July 2017 image and the May 2018 image has been included below for information purposes.



Plate 1: Image of the project area in July 2017 taken from Google Earth



Plate 2: Image of the project area in May 2018 taken from Google Earth

As a result of the increase in informal housing in the Marianridge area (which is clearly visible on the images above), it is possible, and also quite likely, that residents will continue to informally settle on the land parcels identified as part of the Marianridge Housing Development, as well as on the area of ERF 8716 identified as Sandstone Sourveld as the urgent need for housing increases. Informal demarcations have already been identified which could indicate that residents are planning on taking up residence on the site under application.

The lack of supply of government-funded social housing in the area has led to ongoing protest action necessitating direct intervention by Hon MEC Ravi Pillay and Human Settlements and Infrastructure Committee Chairperson, Cllr Mondli Mthembu. The community has failed to understand the regulatory processes surrounding the release of land, given the vast number of informal settlements on sensitive land in the surrounding areas. Consequently, the community has threatened further protest action and expressed concerns over land invasions if their demands for around 500 units are not met. This therefore requires urgent attention.

10. MOTIVATION FOR THE DEVELOPMENT OF THE MARIANRIDGE HOUSING PROJECT

According to the SDF, the proposed site (ERF 8716) falls within an area reserved for residential purposes. It is also further identified within the 5 year planned housing projects of the municipality. The development of the housing project will in no way alter the existing amenity of the area, and it will provide an increase in families within an existing residential area. The formalization of housing within the area will also ultimately improve the level of health and general wellbeing of residents as they will be formally housed in safe accommodation. Informal housing compromises basic human needs such as water, sanitation, safe food preparation and storage as well as assisting in the rapid spread of communicable and food borne diseases (Source: Govender et al. (2011) article entitled “The Impact of Densification by Means of Informal Shacks in the Backyards of Low-Cost Houses).

The area is well serviced by public transport, which is seen as one of the key aspects that favour low-cost housing developments. Development of the housing project will be in keeping with the IDP and SDP and will contribute in meeting the housing demands within eThekweni Municipality as well as the needs of low income households.

The development of the site is regarded as a greenfield development, as the site is currently vacant and undeveloped. While development of greenfield sites is not optimal, the lack of available land at an affordable price means that this is in some cases unavoidable. Development of greenfield sites has been identified in the cities SDF as a means to provide much needed housing. Development of greenfield sites is not optimal for a number of reasons, including the following:

- They generally have a higher biodiversity value than brownfield sites
- They are generally considered to be more pristine environments with natural habitats
- They are easier to rehabilitate
- They generally form important ecological corridors and linkages for the movement of animals

A number of alternative sites were identified and investigated before the municipality made the decision to pursue housing on the site in question. The site alternatives will be discussed further in Section 11 below.

Should no development take place on the site in question, it is likely that, over time, the sensitive areas of ERF 8716 will be taken over by informal housing in line with the current trends experienced in the area. It

is important to remember and consider that the need and desirability of any development must be considered in terms of ecological sustainability as well as the promotion of justifiable economic and social resources. When one considers the ecological sustainability of ERF 8716 one can argue that it is not ecologically sustainable. The Vegetation Report states that while the Endangered Sandstone Sourveld is minimally disturbed it is also small and isolated and not functioning as it once was. If the vegetation is not functioning as it once was, the sustainability of the vegetation type in its current location is not likely without interventions to safeguard it. Given the current economic climate, funding for these types of interventions is not likely to be made available. Should development not go ahead, the area of Sandstone Sourveld vegetation would be left in complete isolation and would possibly be subject to impacts such as dumping and backyard sprawl from the developed areas of ERF 8716 or land invasion.

Should the development be approved, there is the possibility of relocating the protected species within the Sandstone Sourveld area to other sites in a better condition and with better viability. The vegetation specialist has stated that the plants, by their physiology and structure, are easily and successfully translocated. This opportunity will not present itself if the site is left undeveloped and open to potential squatter invasion.

Development of the remainder of the sites not requiring environmental approval is already underway as approval is not required. A study undertaken by Govender *et al.* (2011) entitled "The Impact of Densification by Means of Informal Shacks in the Backyards of Low-Cost Houses on the Environment and Service Delivery in Cape Town, South Africa" investigated the strain imposed on municipal services by informal densification of unofficial backyard shacks.

A consequence of the housing backlog in South Africa is that many people live in informal dwellings. The study conducted by Govender *et al.* (2011) in which 1080 people were surveyed in 4 subsidized low cost housing communities in Cape Town explored the reality that informal dwellings were eventually constructed next to more formal but low-cost dwellings and then exploited by the residents living in the units. Illegal electrical connections were established which posed increased fire risks. A high proportion of the main home owners did not pay for water but sold water to the backyard dwellers. It was also identified that municipal water and sewerage systems and solid waste disposal cannot cope with the increased population density and poor sanitation behaviour of the inhabitants of the informal settlements. There is the potential for the same scenario at the Marianridge site.

Should the Sandstone Sourveld area be left undeveloped there is the chance that informal housing will be constructed on the remaining vegetation and illegal connections will be made for electricity. There could also be improper waste and sewage disposal which could contribute to environmental pollution.

11. DETAILS OF ALTERNATIVES CONSIDERED

11.1 Site alternatives

A number of sites have been investigated for the Marianridge Housing Development.

Please refer to **Appendix B** for a map of the alternatives sites previously under investigation. A table describing the alternatives and the reasons they were ultimately identified as unfeasible for development are included below.

Alternative 1	Site Description	Reason for why they are unfeasible for development
Alternative 1	ERF 7043, 7044, 7045, 7046, 7047	Site used as a playground and park for the community
Alternative 2	ERF 7051, 7052, 7053, 7054, 7055, 7056	Site used as a recreational area by the community
Alternative 3	ERF 8710	Site too steep and not suitable for development
Alternative 4	ERF 8714	Site too steep and not suitable for development
Alternative 5	ERF 6889, 6895	Site rejected by the community due to proximity to rail station and resultant safety concerns.
Alternative 6	ERF 6900	Site too steep and not suitable for development. The site is also constrained by wetland.

11.2 No-go alternative

In terms of the No-Go Alternative, development within the Sandstone Sourveld area of ERF 8716 would not go ahead. This area of the site, approximately 1.1 ha in size would remain undeveloped. The 90 units proposed for development on the remainder of 8716 would not be realised and the Marianridge Housing development would fall short of contributing an additional 90 units to the 412 000 top structure backlog in the eThekweni Municipality.

The benefit of the no-go alternative would be that the Sandstone Sourveld Grassland area would remain intact and formal housing would not be developed on site. An article, published by Naicker *et al.* 2016 entitled “Assessing habitat fragmentation of the KwaZulu-Natal Sandstone Sourveld, a threatened ecosystem”, discusses the importance of grasslands. Grasslands are amongst the most threatened habitats as a result of total habitat loss and degree of fragmentation. Grasslands provide vital ecosystem services that benefit humans both directly (provision of medicinal plants and grazing for livestock) and indirectly (sequestration of carbon for climate regulation). The grasslands host a high diversity of endemic flora and fauna species with 349 endemic Red List taxa of concern of which 180 are threatened with extinction. The KwaZulu-Natal Sandstone Sourveld ecosystem is currently classified as endangered and should therefore be conserved. The article by Naicker *et al.* 2016 states the connectivity of a landscape is vital for the persistence of species faced with habitat loss and fragmentation. However, according to the vegetation study that was undertaken, ERF 8716 is already highly fragmented and isolated and not functioning as it once was. There is a chance that Sandstone Sourveld vegetation on ERF 8716 will not persist given the impacts currently threatening it.

The no-go alternative also carries additional risk to the already isolated Sandstone sourveld area. Should development not be authorised in this area, it is likely, given the rapid expansion of informal housing in the Marianridge area evident in the Google Earth imagery above, that the area would be taken over with informal housing should the area be left undeveloped. There is already evidence on site of informal

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demarcations with danger tape that the Vegetation Specialist noted during the site assessments. While the no-go alternative needs to be considered, it may not carry much weight given that the area may be cleared by the public for informal housing. It may be more beneficial to address the social need over the environmental need in this instance and provide housing and formal services to people rather than to leave the area undeveloped and at risk of being occupied by informal housing.

As stated previously, development of the 55 units outside of the Sandstone Sourveld area will go ahead irrespective of the outcome of the Environmental Authorisation process currently underway for the Sandstone Sourveld portion of ERF 8716.

12. DESCRIPTION OF THE PHYSICAL ENVIRONMENT

12.1 Geographical

The Marianridge Housing Project is located in the Marianheights area of the Pinetown District in the eThekweni Municipality, approximately 25km west of the Durban CBD. The main access is from the M1, onto Milky Way and is accessed off Crux Place.

A layout of the suburbs can be seen in **Appendix B** the site identified in yellow.

12.2 Climate

The Marianridge area normally receives about 762mm of rain per year, with most rainfall occurring mainly during mid-summer. The area receives the lowest rainfall (12mm) in June and the highest (110mm) in January. The average midday temperatures for the area range from 21.6°C in July to 26.8°C in February. The region is coldest during July when the mercury drops to 8.7°C on average during the night.

12.3 Geology and Soils

A Geotechnical Investigation was undertaken by Geosure (Pty) Ltd in July 2013. The report has been attached in **Appendix F**.

The geotechnical investigation identified that the site is located on a hillside. The hillside was identified as initially gentle to slightly convex, elevated, satisfactory drained slopes (less than 6°) in the upper northern site layout, becoming moderately steep to steep (approximately 7° to greater than 18°) over the southern portion of the hillside. Surrounding the site are developed townships with existing houses, roads and municipal services.

The Geotechnical investigation identified that the site is underlain by sandstone, small pebble conglomerate with subordinate siltstone and mudstone from the Natal Group. These sedimentary rocks have been intruded by dolerite dykes and / or inclined soils. Although dolerite was not observed during the investigation, dolerite intrusions into the sedimentary sequence within the site is not inconceivable.

The following subsoil horizons were generally described as:

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- Layer 1; Fill – Combination of dark greyish brown, very loose to loose, clayey gravelly sand, with domestic waste and/or sandstone fragments (imported unsorted granular material of poor quality). Fill materials are generally stockpiled on surface.
- Layer 2; Colluvium (transported) – Dark greyish brown, loose, slightly gravelly to clayey sand, with occasional sandstone cobbles, deposited by gravitational processes.
- Layer 3; Residual Sandstone – Dark brown to purple brown, occasionally becoming dark pinkish brown, medium dense, clayey silty sand to slightly gravelly, silty sand, with occasional ferruginised sandstone corestones.
- Layer 4; Residual Sandstone – Olive brown, blotched grey and yellowish orange stiff, sandy clay.
- Layer 5; Weathered bedrock – Pinkish brown to rusty brown stained and blotched orange, completely to highly weathered, extremely soft rock arkose sandstone.

The sandy soil layers 2 and 3, in particular the loose to medium dense and/or weakly cohesive profiles are known to be highly erodible. Instability along sidewalls of excavations is also typical.

No known landslides were noted on site at the time of investigation. Although not observed, small localised landslides within the steep slopes cannot be ruled out. The site is considered for the most part to be stable in their present conformation and are not expected to be adversely affected by the proposed development, provided that all due caution is exercised during construction. In this regard, the following limits and precautions are advised for the site:

- Development of areas steeper than 1 vertical in 3 horizontal (>18°) will present practical engineering and costing challenges for low income RDP housing. Low income development along slopes steeper than 18° are thus generally not considered feasible and should either not be planned or alternatively limited in extent.
- The bedrock appears to generally dip in an easterly direction. Easterly - facing cut slopes should thus be restricted in extent and additional measures might be required to ensure the stability of these cuttings.
- Good site drainage, including provision of stormwater control facilities such as retention structures, interceptors, subsoil drainage and similar such measures, is strongly advised to reduce concentrated overland flows.
- Saturation of loose, semi-cohesive sands, making up layers 2 and 3 can cause liquefaction of these sands resulting in downslope earthflows. The risk of this phenomenon generally increases along terrain sloping at 1V:4H (14°) or steeper and along flatter slopes with a risk of perched groundwater, e.g. gulley terrain.

- The stability of the site is expected to be altered by earthworks operations. It is important therefore to ensure that the engineering design of the development promotes stable development in the long term.
- If the sandstone bedding planes and other subordinate joints combine unfavourably with proposed cut faces on slopes, slope failures could result, particularly where clay gouge and water seepage is present along bedding planes. The combination of clay gouge filled joints and high hydrostatic forces induced by rainwater could give rise to slope stability problems even on relatively flat bedding dips of between 7 and 14 degrees. It should be noted that while no problematic areas were identified in the inspection pits put down during the fieldwork phase, it is possible that localised, potentially unstable areas can become exposed during development, i.e. during earthworks. It is important to allow for onsite inspections and evaluations by an experienced engineering geologist/geotechnical engineer so that stability problems can be timeously identified and remedied.

12.4 Watercourses

A Wetland Delineation and Impact Assessment was undertaken in September 2017 by SiVEST SA (Pty) Ltd to determine if any watercourse or wetland areas would be affected by the proposed development.

The Wetland Assessment identified no wetland on site or within 30m of the site. Wetland was found within 500m of the site and, in line with the Department of Water and Sanitation (DWS) requirements, DWS were consulted with. Following consultation with DWS, it was identified that no activities were triggered with regards to the National Water Act (Act No. 36 of 1998) and no further consultation was required with the Department. The Wetland Delineation Report is attached in **Appendix F**. Proof of consultation with DWS is attached in **Appendix I**.

12.5 Vegetation

A Vegetation Impact Assessment was undertaken in September 2017 by SiVEST SA (Pty) Ltd. Please note that the report was originally written for a number of sites that ultimately didn't require Environmental Authorisation. The report was then updated in 2018 to show information pertaining to ERF 8716 only (only the mapping illustrates other parcels which are not subject to a Basic Assessment application). The updated report has been included in **Appendix F**.

The vegetation report identified that Durban Metropolitan Open Space System (DMOSS) was identified on ERF 8716. (Please note that ERF 8716 was previously not identified as DMOSS, however has been updated to DMOSS in the new eThekwin data). DMOSS is a system of open spaces that incorporates areas of high biodiversity value linked together in a viable network of open spaces. The vegetation report identified that very little of the total combined area of ERF 8716 was found to be in an undisturbed state. Approximately 1ha of ERF 8716 was found to exhibit typical Sandstone Sourveld species composition.

ERF 8716 is degraded with low ecological value despite being mapped as DMOSS. This mapping could be based on vegetation that existed historically in the area or as a result of coarse desktop mapping programmes. As stated above, approximately 1 ha of the site exhibits characteristics of critically

endangered KZN Sandstone Sourveld species composition. The remainder of the site is very disturbed due to historical platforming, illegal dumping, overgrazing and high levels of invasive alien species.

The Sandstone Sourveld grassland portion, although disturbed by litter and informal paths made by people or livestock, housed a diverse species composition that is indicative of sandstone grassland. The ERF has also been informally demarcated for housing. This could point to the community's interest in occupying the parcels for informal housing.

A biodiversity assessment was undertaken on site. 'Biodiversity noteworthiness' and 'functional integrity and sustainability' of the vegetation on ERF 8716 was rated. In terms of biodiversity noteworthiness of the vegetation, the score received was 2.8 which indicates Moderately High Biodiversity. This is primarily due to the presence of Sandstone Grassland on site.

The functional integrity and sustainability speaks to the impact of the proposed activity on the receiving environment. It also talks to the likelihood that it will be significant and whether there are significant mitigation and or amelioration measures. The functional integrity and viability value of the vegetation on site scored 0.8 (Low integrity and viability), which is attributed to the isolated status, transformation from natural and size of area. The final biodiversity maintenance score of the site is 1.8 (low).

Overall ERF 8716 is degraded, further emphasized in the biodiversity assessment described above. After assessing the proposed site, it is the opinion of the plant ecologist that although ERF 8716 scored a Low Biodiversity Maintenance score, a portion of approximately 1ha is made up of endangered Sandstone Grassland. While the remainder of the site has undergone negative impacts, the relatively minimally disturbed Endangered Sandstone Sourveld should ideally not be disturbed due to its endangered status. However, it is small and isolated and not functioning as it once was.

If the Sandstone portion of the site is not to be developed, a minimum 10m buffer should be implemented, so that minimal grassland is disturbed. The remainder of the housing on this ERF should be fenced to minimize any impacts to the grassland area.

Should the site be developed, the specialist has recommended that an offset plan is considered and complied by a qualified rehabilitation specialist. All protected species should be collected by a horticulturalist or similar and removed and transplanted to a suitable location. These plants, by their physiology and structure, are easily and successfully translocated. To ensure that the plants survive, a Translocation Plan should be compiled by a botanist or horticulturalist to ensure the protected species survive. The protected plants would require permits for their removal and translocation.

Recommendations have been made in the vegetation report outlining the methods to increase the survival rate of the plants should they be removed to another location and replanted. The specialist concluded that the housing development would be supported should the recommendation in the report be implemented.

13. DESCRIPTION OF THE SOCIO- ECONOMIC ENVIRONMENT

13.1 General Socio-Economic Characteristics of the Area

Reference is made to the eThekweni Municipality IDP 2017-2018, the eThekweni Municipality's Spatial Development Framework (SDF) 2017/2018 – 2021/2022, as well as the Socio Economic Study and Market Analysis (attached in **Appendix F**).

eThekweni Municipality is located on the east coast of South Africa in the Province of KwaZulu-Natal (KZN). The municipality spans an area of approximately 2555km² and is home to approximately 3.6 million people in 2016. It consists of a diverse society which faces social, economic, environmental, and governance challenges.

In 2001, the population of eThekweni was 3.09 million and has grown at an average annual percentage of 1.13% per annum to reach 3.44 million in 2011. The Municipality is forecast to grow by 175 000 between 2016 and 2020 when the population total will be approximately 3.85 million.

According to the StatsSA Forecast 2016, the eThekweni population is young with 63% of the population below the age of 35 years. Individuals within the 0-14 years old group comprises 29% and the 15-34 age group 33% of the population. The 35-59 age group comprises 28% and those over 60 represent 9 % of the population. The economically active age group from 15-59 years include 62% of the population.

Like all developing world cities, the eThekweni Municipality is subject to high rates of in-migration from rural areas and small towns in KZN. This has resulted in a rate of urbanisation and population increase that is difficult to project and a large number of new residents require housing and services. African cities are generally dynamic and have fast growing populations, with eThekweni' Municipality being no different, with the majority of this growth happening on the urban periphery where it is easier to access land. With such rapid growth, city development will need to be significantly accelerated to adequately address this challenge.

13.2 Traffic

BIS Consulting was appointed to undertake a Traffic Impact Assessment in February 2018 for all the properties in the Marianridge Housing Development (ERF8724, 8716, 8726 and 6900). As stated throughout the report, while the assessment was undertaken for a number of properties, Environmental Authorisation is required for a portion of ERF 8716 only.

The aim of the traffic study was to investigate the traffic impact of the proposed development on the existing transportation network and to make comments on the traffic circulation, access arrangements and parking provision within the development site.

The area surrounding the proposed development site is characterised by low to medium density residential and religious land-uses. The proposed development will therefore be compatible with the surrounding land-uses.

The development area was identified to be well served on a wider and local scale by a number of roads. In order to determine the road operating conditions on the surrounding network, a number of intersections were analysed due to the close proximity of the intersections to the proposed development.

These include:

- Central Drive – A Class 5 two-lane, two-way 7 m wide access ring road that runs north off Milky Way.
- Hiles Place – A Class 5 two-lane, two-way 6.5 m wide access road that runs east to west off Central Drive.
- Cross Street – A Class 5 two-lane, two-way 5 m wide access road that runs east to west off Central Drive.
- Halley Place – A Class 5 two-lane, two-way 5 m wide access road that runs north off Cross Street.
- Star Place – A Class 5 two-lane, two-way 4.5 m wide access road that runs north to south.
- John Rose Drive – A Class 5 two-lane, two-way 5.5 m wide access road that runs east to west off Central Drive.
- Milky Way – A Class 2 two-lane, two-way Urban Arterial road that runs east to west linking to the M1 in the east.
- Pluto Drive - A Class 5 two-lane, two-way 5.5 m wide access road that runs south off Milky Way.
- Mercury Crescent – A Class 5 two-lane, two-way 5.5 m wide access ring road.
- Leo Place – A Class 5 two-lane, two-way 5.5 m wide access road.

An analysis was made on the capacity of the roads to deal with the increase in traffic volumes. The following was the outcome of the capacity analysis:

- Cross Street - capacity of this section of the road is 260 vehicles/hour. Traffic counts with the addition of the development volumes showed morning peak traffic volumes at 246 vehicles/hour and evening peak traffic volumes at 248 vehicles/hour. Based on the traffic counts, the anticipated volumes along Cross Street fall below the calculated capacity of 260 vehicles/hour.
- Star Place – capacity of this section of the road is 200 vehicles/hour. Traffic counts with the addition of the development volumes showed morning peak traffic volumes at 120 vehicles per hour and evening peak traffic volumes at 115 vehicles/hour. Based on the traffic counts, the anticipated volumes along Star Place fall below the calculated capacity of 200 vehicles/hour.
- John Ross Drive - capacity of this section of the road is 320 vehicles/hour. Traffic counts with the addition of the development volumes showed morning peak traffic volumes at 41 vehicles per hour and evening peak traffic volumes at 36 vehicles/hour. Based on the traffic counts, the anticipated volumes along John Rose Drive fall below the calculated capacity of 320 vehicles/hour.
- Mercury Crescent - capacity of this section of the road is 500 vehicles/hour. Traffic counts with the addition of the development volumes showed morning peak traffic volumes at 416 vehicles per hour and evening peak traffic volumes at 130 vehicles/hour. Based on the traffic counts, the anticipated volumes along Mercury Crescent fall below the calculated capacity of 500 vehicles/hour.

Buses and minibus taxis were observed picking up and dropping off passengers along Milky Way, in close proximity to the Development Sites. Milky way is a major Public Transport Corridor. There are public transport stops at the Milky Way/Central Drive intersection, along either direction of Milky Way. All developments are located within a 500m radius of these Public Transport Stops.

There are 1.5 m sidewalks along the eastern edge of Central Drive, along the eastern edge of Pluto Drive, along the northern edge of Mercury Crescent and along both edges of Milky Way. There are no pedestrian sidewalks provided along Cross Street, Star Place or John Ross Drive. A pedestrian sidewalk was deemed necessary for these roads. However, an analysis was undertaken to determine the need/warrant for pedestrian sidewalks. The warrant assessment ultimately concluded that pedestrian sidewalks along Cross Street, Star Place and John Ross Drive will not be required.

The traffic assessment considered the impact of the development on the surrounding road network for both 2018 and 2023 traffic volumes.

13.3 Cultural/Historical Environment

A Heritage Survey of the proposed site was undertaken by Umlando Consulting in August 2018.

A desktop assessment was undertaken initially which identified that no national monuments, battlefields, or historical cemeteries were known to occur in the area. A study of the aerial photography from 1937 indicated that one settlement was identified within ERF 8716 which could possibly have human graves.

A Palaeontological Impact Assessment was undertaken which identified that the study area falls in an area of low palaeontological sensitivity. No further mitigation is required in this regard however if any fossils are identified during construction then Amafa KZN would need to be contacted.

A field survey was undertaken of the property in question. No artefacts were found in the area and this would be indicative of the study area in general. The specialist requested that the area in which the settlement was identified in the 1937 aerial photography be cleared to ground level to check for the presence of graves. However, as a result of the sensitive Sandstone Sourveld vegetation this area couldn't be cleared for the specialist. As a result, the specialist has recommended that, should the project be granted Environmental Authorisation, then the area will need to be resurveyed after vegetation clearance to check for potential human graves. If human graves are located, then specific procedures will need to be followed.

Should human graves be identified then Amafa KZN and SAPS need to be informed immediately. The area will need to be cordoned off with at least a 10m buffer. The process of grave removal is complex and involves consultation, advertisements, several permits and reburial.

In addition to the potential human graves, it was identified that someone is making an ancestral offering in the Sandstone Sourveld area. The offering includes alcohol, sugar, coco-cola, iJuba and some food. This is considered a heritage resource. This might be a once-off offering as no evidence of older offerings existed. The mitigation for this is difficult as it is not a formal or planned activity. The specialist suggested that a notice be placed at the entrance to the property as per regular EIA notifications. The notice should

include a statement that if anyone is using the area for ancestral worship and they object to development they should contact SiVEST and/or the Ward Councillor.

To conclude, the heritage survey did not observe any archaeological sites, nor was the area paleontologically sensitive. Due to the possibility of graves on ERF 8716, if permission to build is granted then the area will need to be cleared and resurveyed prior to construction. If no graves are identified, the area must be monitored during construction.

14. PUBLIC PARTICIPATION PROCESS

The Public Participation Process has been undertaken in line with Chapter 6 of the EIA Regulations 2014 (as amended 2017).

The following process was undertaken as part of the Public Participation Process:

14.1 Notification of Interested and Affected Parties (I&AP's)

I&AP's and key stakeholders will be notified via email of the availability of the report.

14.2 Site Notices

Site notices will be placed around the vicinity of the site as well as at the Marianridge Library. A copy of the report will also be placed at the Marianridge Library for viewing by the public.

14.3 Advertisements

A Zulu advert will be placed in the Isolozwe and an English advert will be The Mercury.

14.4 Summary of the issues raised by Interested and Affected Parties to date

To be included following the PPP process.

14.5 Draft Basic Assessment Report

Interested and affected persons (I&AP's) will be afforded a thirty (30) day comment period from the date of notification and receipt of the DBAR to provide comment on the DBAR. A register will be opened and will be attached to the final report. This will include the names, contact details and addresses of all people who submitted written comments, all people who requested their names be placed on the register as well as all organs of state which have jurisdiction in respect of the activity. A comments and response report will be drafted and attached to the final report.

15. IMPACTS AND RISKS IDENTIFIED FOR THE PREFERRED ALTERNATIVE

The SiVEST Impact Assessment method, dated 28 July 2017 (**attached as Appendix G**) has been utilised to assess the following potential impacts identified in the assessment phase and presented in the following sections.

The method used in this impact assessment determines significance (can be both positive and negative) of an impact by multiplying the value of the environmental system or component affected by the magnitude of the impact on that system or component (System or Component Value x Impact Magnitude).

In this method, all significant impacts on the natural or biophysical environment are assessed in terms of the overall impacts on the health of ecosystems, habitats, communities, populations and species. Thus, for example, the impact of an increase in stormwater runoff generated by a development can only be assessed in terms of the impact on the health of the affected environmental systems.

Similarly, all significant impacts on the social and socio-economic environment are assessed in terms of the overall impacts to the quality of life, health and safety of the affected population, communities and/or individuals, with the exception of impacts on resources that are assessed on their own.

The following impacts have been identified:

15.1 Impacts on Biophysical Systems / Components during the construction phase

15.1.1 Vegetation/Biodiversity loss

Development in the Sandstone Sourveld area will result in the direct loss of the remnant Sandstone Sourveld grassland on ERF 8716 as the area would be cleared for the construction of the housing development.

Environmental parameter	Remnant Sandstone Grassland (Habitat loss as a result of development)
Extent	Site
Probability	Definite
Reversibility	Irreversible – However, the Sandstone Grassland is small and isolated, and already fragmented from other natural environment such that it is not optimally functioning ecosystem.
Irreplaceable loss of resources	Complete loss of resource – as the site will be developed, either full or partially, the area is already relatively small and isolated, and as such, is not functioning as it once would have been. Thus the impact will result in complete loss of resources, either immediately due to being developed over or eventually, as the Grassland is ecologically not viable to persist naturally and would require intensive ecological management to thrive.

Environmental parameter	Remnant Sandstone Grassland (Habitat loss as a result of development)	
Duration	Permanent	
Cumulative effect	High cumulative impact - Sandstone is critically endangered and it is unfortunate to lose any of it, however it is already fragmented from any other natural environment and small and isolated enough that it is not an optimally functioning ecosystem. The impact would result in minor cumulative effects.	
intensity/magnitude	Very high - Impact affects the continued viability of the Sandstone Grassland existence as a whole. Any disturbance to the endangered grassland directly or indirectly negatively affects the quality, use, integrity and functionality of the vegetation type permanently and is irreversibly impaired (system collapse). Rehabilitation and remediation is impossible. Biodiversity offsets may be an option to help conserve Sandstone Grassland elsewhere in the Province.	
Significance Rating	Very High Negative Impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	1
Probability	4	4
Reversibility	4	4
Irreplaceable loss	4	3
Duration	4	4
Cumulative effect	4	2
Intensity/magnitude	4	4
Significance rating	-84 (very high negative impact)	-72 (high negative impact)
Mitigation measures	There are no mitigation measures for the site, however a plant search and rescue should be undertaken and either used in the indigenous landscaping of the development site or trans located to a suitable, similar habitat off the site. A qualified botanist or horticulturalist should be involved and should work closely with eThekweni Municipality EPCPD unit to ensure the plant rescue and translocation is successful. Due to the endangered nature of the vegetation an offset can be considered.	

15.1.2 Soil Erosion

Construction activities expose soil to environmental factors including rainfall and wind which can result in the removal of topsoil and subsequently soil erosion.

Environmental parameter	Soil erosion	
Extent	Local area/district	
Probability	Probable	
Reversibility	Partly reversible	
Irreplaceable loss of resources	Marginal loss of resources	
Duration	Short term	
Cumulative effect	Medium cumulative impact	
Intensity/magnitude	Medium	
Significance Rating	Low negative impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	1
Probability	3	1
Reversibility	2	1
Irreplaceable loss	2	1
Duration	1	1
Cumulative effect	3	1
Intensity/magnitude	2	1
Significance rating	-26 low negative impact	-6 low negative impact
Mitigation measures	<ul style="list-style-type: none"> Do not allow surface water or storm water to be concentrated, or to flow down cut or fill slopes without erosion protection measures being in place. Erosion control measures must be implemented in areas sensitive to erosion and where erosion has already occurred such as edges of slopes, exposed soil etc. These measures include but are not limited to - the use of sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes. Indigenous landscaping in open areas needs to be incorporated in the management plan. Where cutting to form a platform is unavoidable, a system of deep dewatering wells and permanent retaining measures are recommended. 	

Environmental parameter	Soil erosion
	<ul style="list-style-type: none"> • Permanent subsoil drainage around buildings and dewatering of service trenches. • Terraces should be graded to direct water runoff away from the fill edges, and small earth bunds should be constructed along the crest of fills to prevent overtopping and erosion of fill embankments. • Embankments should be topsoiled and grassed/vegetated as soon after construction to limit erosion and guard against failures during heavy rainfall events.

15.2 Impacts to Socio-Economic Components during Construction Phase

15.2.1 Heritage

15.2.1.1 Destruction of heritage resources (graves) (if present)

Should graves be found within the area of Sandstone Sourveld, the heritage resource would have to be relocated and a reburial would have to occur. This impact will only be applicable should graves be found on site. If no graves are found, this impact would not occur.

Environmental parameter	Destruction of heritage Resources (graves)	
Extent	Site	
Probability	Probable	
Reversibility	Barely reversible	
Irreplaceable loss of resources	Significant loss of resources	
Duration	Permanent	
Cumulative effect	High cumulative impact	
Intensity/magnitude	High intensity	
Significance Rating	High negative impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	1
Probability	2	2
Reversibility	4	3
Irreplaceable loss	4	3
Duration	4	3
Cumulative effect	4	3

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Environmental parameter	Destruction of heritage Resources (graves)	
Intensity/magnitude	3	3
Significance rating	-57 (high negative impact)	-54 (high negative impact)
Mitigation measures	<ul style="list-style-type: none"> Public participation process that includes advertisements over a 60 day period Identify possible living descendants Suggest grave relocation as a preferred option Exhumation and grave relocation 	

15.2.1.2 Destruction of heritage resources (place of worship)

The approval of the development would mean that the person who is making an ancestral offering in the study area will have to find an alternate location in which to make the offering. This may however be a once off offering as no evidence of older offerings existed on site.

Environmental parameter	Destruction of heritage Resources (ancestral offering)	
Extent	Site	
Probability	Probable	
Reversibility	Completely reversible	
Irreplaceable loss of resources	Marginal loss of resources	
Duration	Short term	
Cumulative effect	Negligible cumulative impact	
Intensity/magnitude	Low intensity	
Significance Rating	Low negative impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	1
Probability	2	1
Reversibility	1	1
Irreplaceable loss	2	1
Duration	1	1
Cumulative effect	1	1
Intensity/magnitude	1	1
Significance rating	-8 (low negative impact)	-6 (low negative impact)
Mitigation measures	<ul style="list-style-type: none"> Signage at entrance to property with notification of intent to develop, specifically mentioning the area of ancestral offering Approaching a Ward Councillor to assist in identifying the person 	

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Environmental parameter	Destruction of heritage Resources (ancestral offering)
	<ul style="list-style-type: none"> Find an alternative place of worship

15.2.2 Air / Dust pollution

Dust could become a problem during construction, especially on windy days. This is as a result of the developments proximity to residential areas.

Air pollution may occur in the vicinity of the site and the immediate surrounds during the construction phase as a result of:

- Exhaust fumes from heavy vehicles and machinery, in particular poorly serviced vehicles
- Dust from exposed surfaces and soil stockpiles picked up by wind
- Dust on haulage and access roads emitted into the air by construction vehicles
- Odours downstream of inappropriate and mismanaged chemical toilets

Environmental parameter	Dust pollution (for neighboring residents)	
Extent	Site	
Probability	Probable	
Reversibility	Completely reversible	
Irreplaceable loss of resources	No loss of resource	
Duration	Short term	
Cumulative effect	Negligible cumulative impact	
Intensity/magnitude	Low	
Significance Rating	Low negative impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	1
Probability	3	2
Reversibility	1	1
Irreplaceable loss	1	1
Duration	1	1
Cumulative effect	1	1
Intensity/magnitude	2	2
Significance rating	-16 low negative impact	-14 low negative impact
Mitigation measures	<ul style="list-style-type: none"> All exposed stockpiles must be covered with hessian sheeting when not in use or dampened by a watercart at regular interval if in use. The site must be dampened at regular intervals and more frequently during windy conditions. 	

Environmental parameter	Dust pollution (for neighboring residents)
	<ul style="list-style-type: none"> • Exposed areas where no construction will take place must be vegetated as soon as possible. • Dust generating construction activities should be avoided during strong winds. • Management (including storage, transport, handling and disposal) of hazardous substances that have the potential to become airborne during construction should be carefully managed. • Un-surfaced construction roads and bare surfaces within the construction site must be regularly wetted during dry conditions. A suitable dust palliative should be applied if wetting is ineffective. • Soil loads in transit should be kept covered or wetted. • Servicing of vehicles must occur off site to limit gaseous emissions. • Chemical toilets should be placed on site and must be maintained on a daily basis. • Burning of waste is forbidden. • The maximum speed limit for construction vehicles travelling on un-surfaced construction roads within the site is 25km/hour. • A dust complaints register must be kept within the camp site offices for the entire construction phase. • These measures are contained within the EMP and must be monitored to ensure compliance.

15.2.3 Noise

The generation of noise (from earth moving machinery, piling works etc.) during the construction phase may result in the disturbance to the neighbouring residents. Noise generated by delivery vehicles, earth moving machinery, piling works and the workforce have the potential to impact negatively on people living and/or working along the property boundaries and in relatively close proximity to the proposed development. The negative impacts could result in an increase in stress and frustration and associated health implications.

Disturbance may also be caused by construction starting too early or finishing too late. However, this impact is likely to be sporadic and relatively short.

Environmental parameter	Noise	
Extent	Site	
Probability	Possible	
Reversibility	Partly Reversible	
Irreplaceable loss of resources	No loss of resources	
Duration	Short term	
Cumulative effect	Negligible cumulative impact	
Intensity/magnitude	Low	
Significance Rating	Low negative impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	1
Probability	2	1
Reversibility	2	2
Irreplaceable loss	1	1
Duration	1	1
Cumulative effect	1	1
Intensity/magnitude	1	1
Significance rating	-8 low negative impact	-7 low negative impact
Mitigation measures	<ul style="list-style-type: none"> • Construction activities should only take place within agreed working hours. • Surrounding residents should be warned of particularly noisy activities by way of flyers and letters. • A complaints register must be kept at all times. • Construction staff should be provided with training regarding noise prevention and antisocial behaviour/conduct. 	

15.2.4 Traffic

Traffic congestion and time delays may occur in the vicinity of the access points and associated intersections during the construction phase as a result of increase in the number of heavy vehicles using the roads in the vicinity of the site. In particular, the creation of the access points will likely obstruct traffic for a few hours.

Traffic congestion and time delays during peak hours are known to increase the stress and nuisance levels of regular users. In this case, the delays expected to increase slightly but be minimal.

Environmental parameter	Traffic	
Extent	Site	
Probability	Possible	
Reversibility	Completely reversible	
Irreplaceable loss of resources	No loss of resources	
Duration	Short term	
Cumulative effect	Negligible cumulative impact	
Intensity/magnitude	Medium	
Significance Rating	Low negative impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	1
Probability	3	2
Reversibility	1	1
Irreplaceable loss	1	1
Duration	1	1
Cumulative effect	1	1
Intensity/magnitude	2	1
Significance rating	-16 low negative impact	-7 low negative impact
Mitigation measures	<ul style="list-style-type: none"> The creation of access points or any other construction activities that may cause the obstruction of traffic must not occur during peak AM and PM periods. 	

15.2.5 Job creation

A number of jobs (approximately 150 unskilled jobs) will be created during the construction phase of the project.

For those unemployed in the area, the creation of short-term construction jobs would improve their economic well-being for the period of construction and may lead to further employment opportunities through skills enhancement and experience. Economic well-being is generally regarded as an important contributor of individual quality of life, especially for those unemployed and struggling to make ends meet.

Parameter	Job creation during the construction phase
Extent	High
Probability	Definite
Social value	High
Importance to Quality of Life	Very high
Duration	Short term
Cumulative effect	High cumulative impact

Parameter	Job creation during the construction phase	
Intensity/Magnitude	High	
Significance Rating	High Positive Impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	4	n/a
Probability	4	n/a
Social value	4	n/a
Importance to Quality of Life	4	n/a
Duration	1	n/a
Cumulative effect	4	n/a
Intensity/Magnitude	3	n/a
Significance rating	63 high positive impact	n/a
Mitigation measures	The construction process will target 30% local labour and sub-contractor involvement.	

15.3 Impacts to Biophysical Systems / Components during the operational phase

15.3.1 Soil Erosion

The risk and potential impact of soil erosion will be high during the operational phase as well. The proposed development will result in a substantial increase in the amount of hardened surfaces, which will in turn result in an increase in the amount of surface (stormwater) runoff generated by the development footprint. With the increase in hardened surfaces, the volume and velocity of stormwater runoff will increase and therefore the risk of erosion. However, the increase in hardened surface and resultant increase in stormwater has been accounted for in the stormwater management network.

Environmental parameter	Soil erosion	
Extent	Local area/district	
Probability	Possible	
Reversibility	Completely reversible	
Irreplaceable loss of resources	Marginal loss of resources	
Duration	Long term	
Cumulative effect	High cumulative impact	
Intensity/magnitude	High	
Significance Rating	Medium negative impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	2	1
Probability	2	1
Reversibility	1	1

Environmental parameter	Soil erosion	
Irreplaceable loss	2	1
Duration	3	3
Cumulative effect	4	2
Intensity/magnitude	3	2
Significance rating	-42 medium negative impact	-18 low negative impact
Mitigation measures	<ul style="list-style-type: none"> • Surface runoff from the roads will be contained by the road crossfall and the kerbs. Road crossfalls where possible will fall towards the cut side of the roads in order to accommodate discharging of underground pipes onto the road surface through the kerb. Where this is not possible then kerbs shall be accommodated on both sides of the roads. • Storm water drainage from proposed sites will be discharged on to the road kerb via a piped system from the house roofs and the excess water from the paved and unpaved areas of the property. Where the property is below the road then midblock drains with S&D servitudes shall drain these properties to the road system. • Where appropriate, stormwater discharge from hardened surfaces and roofed areas should be lead to discharge via the nearest road hardening into the road stormwater system, provided this is designed to cater for runoffs. 	

15.4 Impacts to Socio-Economic Components during operation phase

15.4.1 Provision of housing

The portion of land under application will provide an additional 90 units to the Marianridge Housing Development project and provide housing for a number of people. Low income, informally settled residents stand to benefit from the proposed housing project. Overall, the beneficiaries will experience a substantial improvement in the quality of their housing, municipal services and social services. This includes access to ownership of private property, electricity, flush toilets, solid waste removal and potable water. As the quality of housing and the access to basic municipal and social services is generally an important contributor to overall quality of life, it is likely that the individual beneficiaries will experience a substantial improvement in their living conditions and quality of life.

Parameter	Provision of housing	
Extent	High	
Probability	Definite	
Social value	Very High	
Importance to Quality of Life	Very High	
Duration	Permanent	
Cumulative effect	High cumulative impact	
Intensity/Magnitude	Very High	
Significance Rating	Very high positive impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	3	n/a
Probability	4	n/a
Social value	4	n/a
Importance to Quality of Life	4	n/a
Duration	4	n/a
Cumulative effect	4	n/a
Intensity/Magnitude	4	n/a
Significance rating	92 very high positive impact	n/a
Mitigation measures	n/a	

15.5 No-go alternative

15.5.1 Impact on Sandstone Sourveld Vegetation should the area be fenced off and excluded from development

If the development does not go ahead, the Sandstone Sourveld area will be excluded from development. However, it is evident that the vegetation will still undergo a negative impact based on the scores below.

Environmental parameter	Remnant Sandstone Grassland
Extent	Site
Probability	Definite
Reversibility	Irreversible
Irreplaceable loss of resources	Significant loss of resources
Duration	Permanent
Cumulative effect	Medium cumulative impact

Intensity/magnitude	Very high	
Significance Rating	High negative Impact	
	Pre-mitigation impact rating	Post mitigation impact rating
Extent	1	n/a
Probability	4	n/a
Reversibility	4	n/a
Irreplaceable loss	3	n/a
Duration	4	n/a
Cumulative effect	3	n/a
Intensity/magnitude	4	n/a
Significance rating	-57 (negative medium impact)	n/a
Mitigation measures	<ul style="list-style-type: none"> • A minimum 10m buffer should be implemented, so that minimal grassland is disturbed. • The proposed housing for this ERF should be fenced to minimize traverse through to grassland. 	

15.5.2 Loss of housing opportunities and impact on future beneficiaries

If the housing project on the sensitive portion of ERF 8716 does not go ahead, the current poor housing conditions will persist in the area. Issues of unrest and frustration leading to protest action will persist as the community will continue to be very dissatisfied with the lack of formal housing in the area. It is likely that the residents constructing informal housing in the Marianridge area will inhabit the area remaining on ERF 8716. In addition, potential subsidy holders and beneficiaries will likely become extremely angry and frustrated because of unmet expectations. This will exacerbate their anger and frustration which could spread through many of the social networks in the area and cause unrest. This unrest is already evident on an on-going basis in the area.

Parameter	Loss of housing opportunities	
Extent	High	
Probability	Definite	
Social value	Very High	
Importance to Quality of Life	Very High	
Duration	Permanent	
Cumulative effect	High cumulative impact	
Intensity/Magnitude	Very High	
Significance Rating	Very high negative impact	
	Pre-mitigation impact rating	Post mitigation impact rating

Parameter	Loss of housing opportunities	
Extent	3	n/a
Probability	3	n/a
Social value	4	n/a
Importance to Quality of Life	4	n/a
Duration	4	n/a
Cumulative effect	4	n/a
Intensity/Magnitude	4	n/a
Significance rating	88 very high negative impact	
Mitigation measures	n/a	

16. POSITIVE AND NEGATIVE IMPACTS OF THE MARIANRIDGE HOUSING DEVELOPMENT

A summary of the impacts pre-mitigation and post-mitigation are provided below:

Impact	Pre-mitigation	Post-mitigation
Impacts on Biophysical Systems / Components during the construction phase		
Vegetation/Biodiversity Loss	Very high negative impact	High negative impact
Soil Erosion	Low negative impact	Low negative impact
Impacts to Socio-Economic Component during the construction phase		
Potential destruction of heritage resources (graves) (if present)	High negative impact	High negative impact
Destruction of heritage resources (ancestral offering)	Low negative impact	Low negative impact
Air / dust pollution	Low negative impact	Low negative impact
Noise	Low negative impact	Low negative impact
Traffic congestion	Low negative impact	Low negative impact
Job creation	High positive impact	No mitigation required
Impacts to Biophysical Systems/components during the operational phase		
Soil erosion	Medium negative impact	Low negative impact
Impacts to Socio-Economic component during the operational phase		
Provision of housing	Very high positive impact	No mitigation required
No-go Alternative		
Sandstone sourveld vegetation left undeveloped	High negative impact	No mitigation possible
Loss of housing opportunities	Very high negative impact	No mitigation possible

16.1 Mitigation measures

Refer to section 15 above. Specialist studies have informed the environmental issues and risks identified by the development. The assessment of each issue is included in Section 15 above and mitigation measures are provided for each impact identified.

17. SUMMARY OF SPECIALIST REPORTS

Environ. Parameter	Summary of major findings	Impact management measures
Wetland	<p>The Wetland Assessment identified no wetland on site or within 30m of the site. Wetland was found within 500m of the site and, in line with the Department of Water and Sanitation (DWS) requirements, DWS were consulted with. Following consultation with DWS, it was identified that no activities were triggered with regards to the National Water Act (Act No. 36 of 1998) and no further consultation was required with the Department.</p>	No mitigation required
Vegetation	<p>The vegetation report identified that Durban Metropolitan Open Space System (DMOSS) was identified on ERF 8716. DMOSS is a system of open spaces that incorporates areas of high biodiversity value linked together in a viable network of open spaces. The vegetation report identified that very little of the total combined area of ERF 8716 was found to be in an undisturbed state. Approximately 1ha of ERF 8716 was found to exhibit typical Sandstone Sourveld species composition.</p> <p>ERF 8716 is degraded with low ecological value despite being mapped as DMOSS. This mapping could be based on vegetation that existed historically in the area or as a result of coarse desktop mapping programmes. As stated above, approximately 1 ha of the site exhibits characteristics of critically endangered KZN Sandstone Sourveld species composition. The remainder of the site is very disturbed due to historical platforming, illegal dumping, overgrazing and high levels of invasive alien species.</p>	<p>If development occurs, the Sandstone Sourveld vegetation will be lost.</p> <p>Should the full site be developed, all protected species should be collected by a horticulturalist or similar and removed and transplanted to a suitable location. These plants, by their physiology and structure, are easily and successfully translocated. It is recommended that an offset plan is considered and complied by a qualified rehabilitation specialist.</p> <p>To ensure that the plants survive, a Translocation Plan should be compiled by a botanist or horticulturalist to ensure the protected species survive. The protected plants would require permits for their removal and translocation.</p> <p>If the Sandstone Sourveld would be retained, a minimum 10m buffer should be implemented, so that minimal grassland is disturbed. The proposed housing for this ERF should be fenced to minimize traverse through to grassland.</p>
Traffic	<p>The area surrounding the proposed development site is characterised by low to medium density residential and religious land-uses. The proposed development will therefore be compatible with the surrounding land-uses.</p> <p>An analysis was made on the capacity of the roads to deal with the increase in traffic volumes. All roads were identified to be able to deal with the increased capacity of the Marianridge Housing Development.</p>	Mitigation measures are included under Section 15.2.4

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Environ. Parameter	Summary of major findings	Impact management measures
	<p>Buses and minibus taxis were observed picking up and dropping off passengers along Milky Way, in close proximity to the Development Sites. Milky way is a major Public Transport Corridor. There are public transport stops at the Milky Way/Central Drive intersection, along either direction of Milky Way. All developments are located within a 500m radius of these Public Transport Stops.</p> <p>There are 1.5 m sidewalks along the eastern edge of Central Drive, along the eastern edge of Pluto Drive, along the northern edge of Mercury Crescent and along both edges of Milky Way. There are no pedestrian sidewalks provided along Cross Street, Star Place or John Ross Drive. A pedestrian sidewalk was deemed necessary for these roads. However, an analysis was undertaken to determine the need/warrant for pedestrian sidewalks. The warrant assessment ultimately concluded that pedestrian sidewalks along Cross Street, Star Place and John Ross Drive will not be required.</p>	
Geotechnical	<p>No known landslides were noted on site at the time of investigation. Although not observed, small localized landslides within the steep slopes cannot be ruled out. The site is considered for the most part to be stable in their present conformation and are not expected to be adversely affected by the proposed development, provided that all due caution is exercised during construction.</p>	<p>Development of areas steeper than 1 vertical in 3 horizontal (>18°) will present practical engineering and costing challenges for low income RDP housing. Low income development along slopes steeper than 18° are thus generally not considered feasible and should either not be planned or alternatively limited in extent.</p> <p>The bedrock appears to generally dip in an easterly direction. Easterly - facing cut slopes should thus be restricted in extent and additional measures might be required to ensure the stability of these cuttings.</p> <p>Good site drainage, including provision of stormwater control facilities such as retention structures, interceptors, subsoil drainage and similar such measures, is strongly advised to reduce concentrated overland flows.</p> <p>Saturation of loose, semi-cohesive sands, making up layers 2 and 3 can cause liquefaction of these sands resulting in downslope earthflows. The risk of this phenomenon generally increases along terrain sloping at 1V:4H (14°) or steeper and along flatter slopes with a risk of perched groundwater, e.g. gully terrain.</p>

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Environ. Parameter	Summary of major findings	Impact management measures
		<p>The stability of the site is expected to be altered by earthworks operations. It is important therefore to ensure that the engineering design of the development promotes stable development in the long term.</p> <p>If the sandstone bedding planes and other subordinate joints combine unfavourably with proposed cut faces on slopes, slope failures could result, particularly where clay gouge and water seepage is present along bedding planes. The combination of clay gouge filled joints and high hydrostatic forces induced by rainwater could give rise to slope stability problems even on relatively flat bedding dips of between 7 and 14 degrees. It should be noted that while no problematic areas were identified in the inspection pits put down during the fieldwork phase, it is possible that localised, potentially unstable areas can become exposed during development, i.e. during earthworks. It is important to allow for onsite inspections and evaluations by an experienced engineering geologist/geotechnical engineer so that stability problems can be timeously identified and remedied.</p>
Heritage	<p>It was identified that someone is making an ancestral offering in the Sandstone Sourveld area. The offering includes alcohol, sugar, coca-cola, iJuba and some food. This is considered a heritage resources. This might be a once-off offering as no evidence of older offerings existed. The mitigation for this is difficult as it is not a formal or planned activity. The specialist suggested that a notice be placed at the entrance to the property as per regular EIA notifications. The notice should include a statement that if anyone is using the area for ancestral worship and they object to development they should contact SiVEST and/or the Ward Councillor.</p> <p>To conclude, the heritage survey did not observe any archaeological sites, nor was the area paleontologically sensitive. Due to the possibility of graves on ERF 8716, if permission to build is granted then the area will need to be cleared and resurveyed prior to construction. If no graves are identified, the area must be monitored during construction.</p>	Mitigation measures are included under Section 15.2.1

18. ENVIRONMENTAL IMPACT STATEMENT

The development forms part of the Marianridge Housing Development. The development is an initiative to assist the city in servicing the huge backlog of housing within the Municipality. The project aims at providing 500 units in the Marianridge area. While a number of the sites identified do not require environmental approval from the Department of Economic Development, Tourism and Environmental Affairs (EDTEA) a portion of one site, ERF 8716, requires Environmental Authorisation as a result of the sensitive Sandstone Sourveld that has been identified on site. The site is located in an urban area and is surrounded by predominantly residential areas.

According to the EThekweni Municipalities SDP, the city is currently faced with a backlog of top-structures of approximately 412 000 dwelling units. Since 1994, roughly 183 000 dwellings have been built and serviced. The pace trend for top-structure construction is 5 000 to 7 000 dwellings per annum. At the current construction pace, the city will require about half a century to deal with top-structure backlogs. The need for additional housing with the EThekweni is therefore highly important and the need to address the backlog is urgent.

The Marianridge Housing Development is an initiative that will assist eThekweni in servicing this backlog. The project as a whole aims at providing approximately 500 units in the Marianridge area. While this application is only required for approval of a portion of ERF 8716, in which 90 units of the total number will be developed, the need for housing is discussed as a whole. As stated previously, development of the 55 units outside of the Sandstone Sourveld area will go ahead irrespective of the outcome of the Environmental Authorisation process currently underway for the Sandstone Sourveld portion of ERF 8716.

The site development plan is included below. A total of 90 units will potentially be developed in the area identified as Sandstone Sourveld.

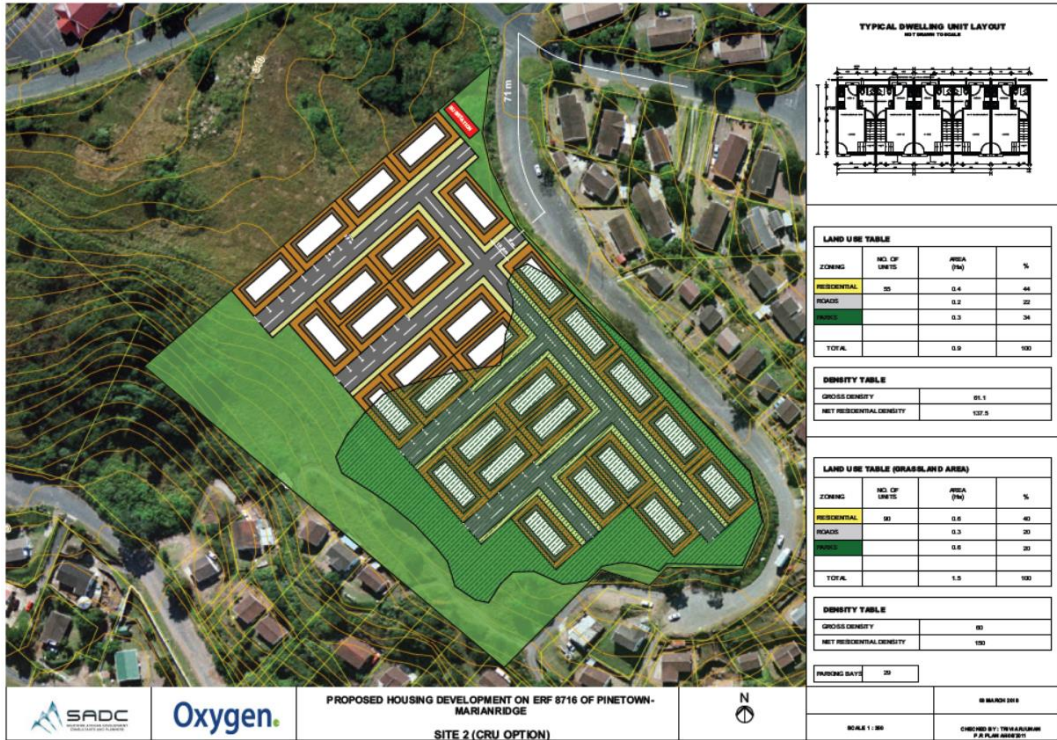


Figure 1: Site Development Plan



Figure 2: Sensitivity Map

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The following specialist studies were undertaken to determine the potential impact of the proposed project on the environment:

- Vegetation Impact Assessment;
- Wetland Impact Assessment;
- Heritage Impact Assessment;
- Traffic Impact assessment;
- Geotechnical Assessment.

The main findings of the specialist studies are included in Section 17 above.

As the site was identified to be in an area of high biodiversity value, a Vegetation Impact Assessment (refer **Appendix F**) was undertaken. The study identified approximately 1 ha of Sandstone Sourveld Vegetation on a portion of ERF 8716. While the Sandstone vegetation area is small and isolated and not functioning as it once was, it was given a significance rating of a Very High Negative Impact should it be removed as a result of the endangered nature of the vegetation. Should the development be approved the area of Sandstone Sourveld vegetation would be lost. The specialist has made recommendations for removal and replanting some of the vegetation as these plants, by their physiology and structure, are easily and successfully translocated. To ensure that the plants survive, a Translocation Plan should be compiled by a botanist or horticulturalist to ensure the protected species survive. The protected plants would require permits for their removal and translocation. The specialist concluded that the housing development would be supported should the recommendation in the report be implemented.

In line with the National Heritage Resources Act 1999 (25 of 1999), a Heritage Impact Assessment was undertaken (refer **Appendix F**). A survey was undertaken and the specialist requested that the area in which a potential grave site was identified be cleared to ground level to check for the presence of graves. However, as a result of the sensitive Sandstone Sourveld vegetation this area couldn't be cleared for the specialist. As a result, the specialist has recommended that, should the project be granted Environmental Authorisation, then the area will need to be resurveyed after vegetation clearance to check for potential human graves. If human graves are located and need to be relocated, then the impact would be a High Negative Impact. However, should no graves be found there would be no impact at all. Evidence of an ancestral offering was identified on site however this was given a Low Negative Impact as this might be a once-off offering as no evidence of older offerings existed.

The Wetland Assessment identified no wetland on site or within 30m of the site. Wetland was found within 500m of the site and, in line with the Department of Water and Sanitation (DWS) requirements, DWS were consulted with. Following consultation with DWS, it was identified that no activities were triggered with regards to the National Water Act (Act No. 36 of 1998) and no further consultation was required with the Department. The Wetland Delineation Report is attached in **Appendix F**. Proof of consultation with DWS is attached in **Appendix I**. No impacts were identified in this regard.

In terms of the Traffic Impact Assessment (refer **Appendix F**), the area surrounding the proposed development site was characterised by low to medium density residential and religious land-uses. The proposed development was therefore determined to be compatible with the surrounding land-uses. An analysis was made on the capacity of the roads to deal with the increase in traffic volumes. All roads were

identified to be able to deal with the increased capacity of the Marianridge Housing Development. Low traffic impacts were identified during construction the construction phase, and no traffic impacts were identified during the operational phase.

Very high positive impacts and high positive impacts were identified in terms of provision of housing and job creation. The area under application will provide an additional 90 units to the Marianridge Housing Development and approximately 150 jobs during construction. As a result of the urgent need to address the housing backlogs as well as the informal housing settlements, this development has huge positive socio-economic impacts. Informal settlements in the Marnaridge area are growing at an exponential rate, as evidenced on the google earth imagery. Should the application be rejected, there is the potential for informal housing to be erected in the Sandstone Sourveld area given the current trends. Should this happen, any opportunity for vegetation removal and relocation will be lost. In addition to this, the site will be left un-serviced with no sanitation or waste services.

In terms of the No-Go Alternative, should the development be rejected, the 90 additional units will not be realized and the Marianridge Housing Development will fall short of meeting its target. A number of families will be denied formal and safe housing. The loss of housing as a result of the rejection of the application was given a very high negative impact. In terms of benefits of the no-go option, the only benefit identified was that the Sandstone Sourveld vegetation would not be cleared for development. However, given the isolated nature of the vegetation, and its functionality, coupled with the possibility of further informal housing encroachment, it is unsure how long the vegetation will remain in an undisturbed state.

The following provides a summary of the positive and negative impacts associated with the proposed project:

Impact	Pre-mitigation	Post-mitigation
Impacts on Biophysical Systems / Components during the construction phase		
Vegetation/Biodiversity Loss	Very high negative impact	High negative impact
Soil Erosion	Low negative impact	Low negative impact
Impacts to Socio-Economic Component during the construction phase		
Potential destruction of heritage resources (graves) (if present)	High negative impact	High negative impact
Destruction of heritage resources (ancestral offering)	Low negative impact	Low negative impact
Air / dust pollution	Low negative impact	Low negative impact
Noise	Low negative impact	Low negative impact
Traffic congestion	Low negative impact	Low negative impact
Job creation	High positive impact	No mitigation required
Impacts to Biophysical Systems/components during the operational phase		
Soil erosion	Medium negative impact	Low negative impact
Impacts to Socio-Economic component during the operational phase		
Provision of housing	Very high positive impact	No mitigation required
No-go Alternative		

Impact	Pre-mitigation	Post-mitigation
Sandstone sourveld vegetation left undeveloped	High negative impact	No mitigation possible
Loss of housing opportunities	Very high negative impact	No mitigation possible

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19. ENVIRONMENTAL MANAGEMENT PROGRAMME (EMPR) AND CONDITIONS TO BE INCLUDED IN ENVIRONMENTAL AUTHORISATION (EA)

Mitigation measures from the specialist studies have been included in the EMP that is attached in **Appendix H**.

Taking into account the potential negative and significant positive impacts that the proposed development could have on the social and biophysical environment, it is the opinion of the EAP that the proposed development should be authorised subject to the following conditions of authorisation:

- All of the mitigation measures identified in this BA Report must be made conditions of the authorisation.
- It is important that all of the listed mitigation measures are costed for in the construction phase financial planning and budget so that the contractor and/or developer cannot give financial budget constraints as reasons for non-compliance.
- The construction EMP must be approved by the EDTEA prior to construction commencing.
- An independent Environmental Control Officer (ECO) must be appointed by the applicant to monitor the implementation of the construction EMP. The ECO should undertake monthly site inspections and compile a monthly environmental audit report.

The following recommendations of the specialist studies should be included in the EA:

Vegetation

- A Translocation Plan should be compiled by a botanist or horticulturalist to ensure the protected species survive.
- All protected species should be collected by a horticulturalist or similar and removed and transplanted to a suitable location.
- Permits must be obtained for removal and translocation of protected plants.

Note: An Offset Plan has been recommended for consideration by the Vegetation Specialist for the Sandstone Sourveld area. As a result of the isolated nature of the vegetation and the fact that it is not functioning as it once was, coupled with budgetary constraints, the EAP has not included this as a recommendation provided the Translocation Plan is compiled and the protected plants are removed and replanted in a suitable area.

Heritage

- Due to the possibility of graves on ERF 8716, the area must be cleared and resurveyed by Heritage Specialist prior to construction.
- Should human graves be identified then Amafa KZN and SAPS need to be informed immediately. The area will need to be cordoned off with at least a 10m buffer.
- The necessary protocols should be followed in the event of graves being found on site.

Soil erosion

- Do not allow surface water or storm water to be concentrated, or to flow down cut or fill slopes without erosion protection measures being in place.

- Erosion control measures must be implemented in areas sensitive to erosion and where erosion has already occurred such as edges of slopes, exposed soil etc. These measures include but are not limited to - the use of sand bags, hessian sheets, silt fences, retention or replacement of vegetation and geotextiles such as soil cells which must be used in the protection of slopes.
- Indigenous landscaping in open areas needs to be incorporated in the management plan.
- Where cutting to form a platform is unavoidable, a system of deep dewatering wells and permanent retaining measures are recommended.
- Permanent subsoil drainage around buildings and dewatering of service trenches.
- Terraces should be graded to direct water runoff away from the fill edges, and small earth bunds should be constructed along the crest of fills to prevent overtopping and erosion of fill embankments.
- Embankments should be topsoiled and grassed/vegetated as soon after construction to limit erosion and guard against failures during heavy rainfall events.

Air Quality

- All exposed stockpiles must be covered with hessian sheeting when not in use or dampened by a watercart at regular interval if in use.
- The site must be dampened at regular intervals and more frequently during windy conditions.
- Exposed areas where no construction will take place must be vegetated as soon as possible.
- Dust generating construction activities should be avoided during strong winds.
- Management (including storage, transport, handling and disposal) of hazardous substances that have the potential to become airborne during construction should be carefully managed.
- Un-surfaced construction roads and bare surfaces within the construction site must be regularly wetted during dry conditions. A suitable dust palliative should be applied if wetting is ineffective.
- Soil loads in transit should be kept covered or wetted.
- Servicing of vehicles must occur off site to limit gaseous emissions.
- Chemical toilets should be placed on site and must be maintained on a daily basis.
- Burning of waste is forbidden.
- The maximum speed limit for construction vehicles travelling on un-surfaced construction roads within the site is 25km/hour.
- A dust complaints register must be kept within the camp site offices for the entire construction phase.
- These measures are contained within the EMP and must be monitored to ensure compliance.

Noise

- Construction activities should only take place within agreed working hours.
- Surrounding residents should be warned of particularly noisy activities by way of flyers and letters.
- A complaints register must be kept at all times.
- Construction staff should be provided with training regarding noise prevention and antisocial behaviour/conduct.

20. UNCERTAINTIES, ASSUMPTIONS AND GAPS IN KNOWLEDGE

The assessment has been based by SiVEST on information sourced and provided by the Applicant, site visits conducted, specialist findings and the application of the SiVEST assessment criteria. The EAP is of the opinion that the assessment method applied is acceptable. SiVEST assumes that:

- All the information provided by the Applicant is accurate and unbiased.
- The available data, including Topocadastral maps, Orthophotographs, geological maps and Google Earth images, are reasonably accurate.
- All information contained in the specialist studies provided is accurate and unbiased.
- It is not always possible to involve all Interested and/or Affected Parties (I&APs) individually, however, every effort has/is been made to involve as many interested parties as possible. It is also assumed that individuals representing various associations or parties convey the necessary information to these associations / parties.
- It is not possible to determine the actual degree of the impact that the development will have on the immediate environment without some level of uncertainties. Actual impacts can only be determined following construction and/or operation commences.

21. AUTHORISATION OF MARIANRIDGE HOUSING DEVELOPMENT

We request that the Department authorizes the development. While it is acknowledged that a small and isolated area of Sandstone Sourveld vegetation will be lost, the specialist has confirmed that the area is not functioning as it once was and is disconnected. In addition to this, the site is already under threat to informal housing. There is the opportunity to relocate some of the vegetation and protected plants to a more suitable location before the vegetation is lost altogether. Furthermore, the additional 90 units of houses will contribute to addressing the massive backlog of housing, the need for which has been clearly identified. The development furthermore forms part the Municipalities IDP and SDF and the area has been identified for housing for this purpose.

Conditions to be included in the Environmental Authorisation are listed in Section 19 above.

The environmental authorization should be valid for a period of 5 years. It is anticipated that the construction period will commence during January 2020.



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