environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

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| | |
|---|---|
| **File Reference Number:** | |
| **Application Number:** | |
| **Date Received:** | |

Basic assessment report in terms of the Environmental Impact Assessment Regulations, 2010, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended.

**Kindly note that:**

1. This **basic assessment report** is a standard report that may be required by a competent authority in terms of the EIA Regulations, 2010 and is meant to streamline applications. Please make sure that it is the report used by the particular competent authority for the activity that is being applied for.
2. This report format is current as of **1 September 2012**. It is the responsibility of the applicant to ascertain whether subsequent versions of the form have been published or produced by the competent authority
3. The report must be typed within the spaces provided in the form. The size of the spaces provided is not necessarily indicative of the amount of information to be provided. The report is in the form of a table that can extend itself as each space is filled with typing.
4. Where applicable **tick** the boxes that are applicable in the report.
5. An incomplete report may be returned to the applicant for revision.
6. The use of "not applicable" in the report must be done with circumspection because if it is used in respect of material information that is required by the competent authority for assessing the application, it may result in the rejection of the application as provided for in the regulations.
7. This report must be handed in at offices of the relevant competent authority as determined by each authority.
8. No faxed or e-mailed reports will be accepted.
9. The signature of the EAP on the report must be an original signature.
10. The report must be compiled by an independent environmental assessment practitioner.
11. Unless protected by law, all information in the report will become public information on receipt by the competent authority. Any interested and affected party should be provided with the information contained in this report on request, during any stage of the application process.
12. A competent authority may require that for specified types of activities in defined situations only parts of this report need to be completed.
13. Should a specialist report or report on a specialised process be submitted at any stage for any part of this application, the terms of reference for such report must also be submitted.
14. Two (2) colour hard copies and one (1) electronic copy of the report must be submitted to the competent authority.
15. Shape files (.shp) for maps must be included on the electronic copy of the report submitted to the competent authority.

**ABBREVIATIONS**

| | |
|---|---|
| BAR | Basic Assessment Report |
| CBA | Critical Biodiversity Area |
| Db | Decibels |
| DEA | Department of Environmental Affairs |
| DEA&DP | Department of Environmental Affairs and Development Planning |
| DWA | Department of Water Affairs |
| EAP | Environmental Assessment Practitioner |
| ECO | Environmental Control Officer |
| EDDR | Early Detection and Rapid Response Programme |
| EIA | Environmental Impact Assessment |
| EMF | Environmental Management Framework |
| ESA | Ecological Support Area |
| GN | General Notice |
| HWC | Heritage Western Cape |
| IDP | Integrated Development Plan |
| LED | Light Emitting Diode |
| NBG | National Botanical Garden |
| NDP | National Development Plan |
| NEMA | National Environmental Management Act |
| NFEPA | National Freshwater Ecosystem Priority Area |
| NID | Notice of Intent to Develop |
| ONA | Other Natural Area |
| PSDF | Provincial Spatial Development Framework |
| SA | South Africa |
| SANBI | South African National Biodiversity Institute |
| SANS | South African National Standards Codes |
| SDF | Spatial Development Framework |
| SEC | Sillito Environmental Consulting |
| SIPS | Strategic Infrastructure Projects |
| UNESCO | United Nations Educations, Scientific and Cultural Organisation |
| WULA | Water Use License Application |

# SECTION A: ACTIVITY INFORMATION

Has a specialist been consulted to assist with the completion of this section? | **YES** | NO |

If YES, please complete the form entitled "Details of specialist and declaration of interest" for the specialist appointed and attach in Appendix I.

## 1. PROJECT DESCRIPTION

### a) Describe the project associated with the listed activities applied for

INTRODUCTION

SANBI has been allocated funds by the DEA for the period 2013/14- 2015/16 for refurbishment, upgrading, repair and maintenance of existing immovable infrastructure, vehicles and equipment as well as the construction of new infrastructure at their National Botanical Garden across the country. The DEA-funded developments will address the needs of SANBI from an administrative, research, educational and tourism perspective.

SANBI proposes to redevelop and upgrade of a 2 500m$^2$ area of the developed portion of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden for administrative purposes.

BACKGROUND

The Kirstenbosch National Botanical Garden is located off Rhodes Avenue, Cape Town, Western Cape, South Africa and was established in 1913 to promote, conserve and display the diverse flora of Southern Africa. The Kirstenbosch estate (which is classified as a nature reserve), covers 528 hectares in total. 36 hectares of this area has been cultivated and also developed to include restaurants, information and education centres, as well as buildings and infrastructure associated with SANBI operations and with the upkeep of the botanical garden.

The remainder of the garden remains natural forest and fynbos and is classified as a protected area. Kirstenbosch National Botanical Garden is situated adjacent to the Table Mountain National Park and both form part of the Cape Floristic Region Protected Area, which was proclaimed a UNESCO World Heritage Site in 2004[1].

The Head of City of Cape Town's District H (Andrew Greenwood) has confirmed that the entire Kirstenbosch National Botanical Garden falls outside of the City of Cape Town's zoning sphere and as such is not formally zoned as part of the City of Cape Town's zoning scheme.

[1] http://www.sanbi.org/garden/kirstenbosch/virtual-tour/kirstenbosch-nbg-beyond-garden

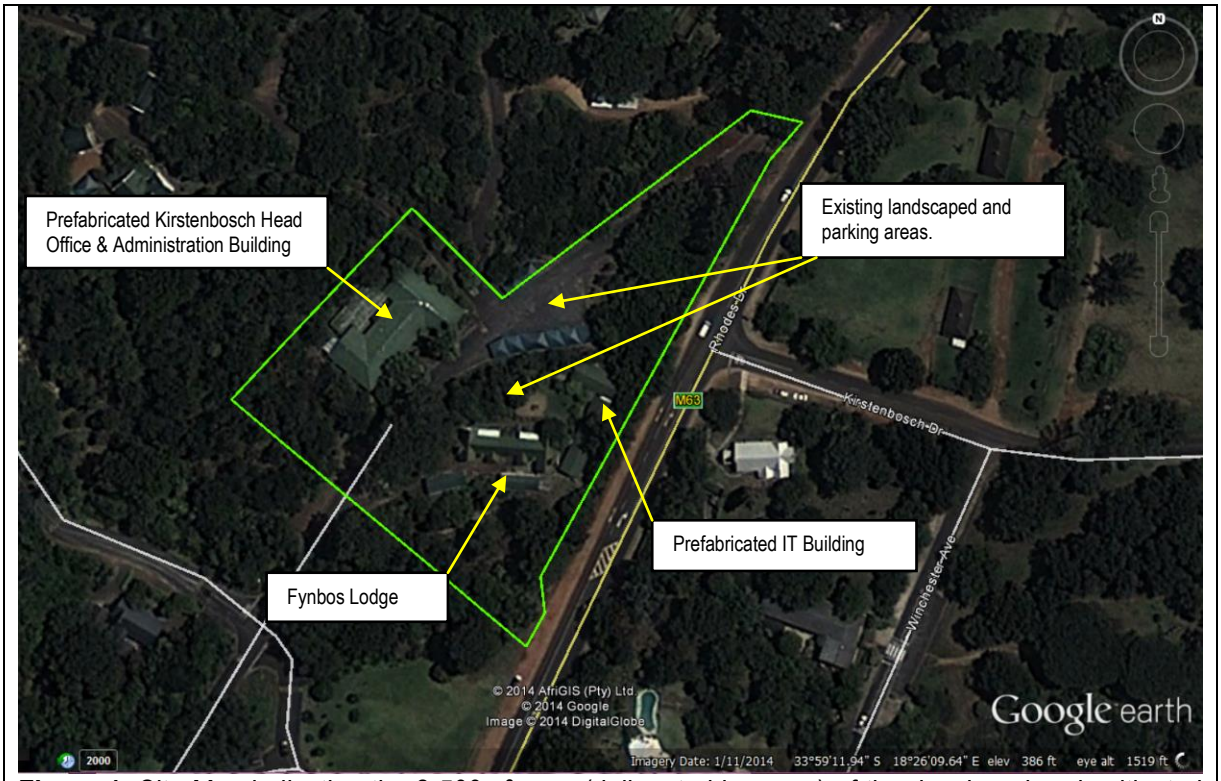


**Figure 1:** Site Map indicating the 2 500m$^2$ area (delineated in green) of the developed and cultivated portion of the Kirstenbosch National Botanical Garden proposed for redevelopment (image courtesy of Google Earth, 2014).

DEVELOPMENT PROPOSAL

The development proposal is for the redevelopment and upgrade of a 2 500m$^2$ area of the developed portion of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden. These buildings include Fynbos Lodge, which is over 60 years old, as well as the prefabricated current Kirstenbosch Head Office & Administration Building and a small prefabricated IT building. The landscaping and parking areas associated with these existing buildings will also be altered in the redevelopment.

Due to the potential heritage value of Fynbos Lodge, no structural changes will occur to the building. The existing asbestos roofing will be replaced with a visually similar material, and maintenance-type renovations will take place in the interior of the building. The prefabricated buildings will be demolished and redeveloped.

The upper catchment of the Liesbeck River is located in very close proximity to the area which is proposed to be redeveloped. The river is currently undercutting and weakening the north bank closest to the existing Fynbos Lodge. Therefore the development proposal also includes the construction of gabions along the river bank to reinforce this area. The gabions will run for approximately 20-30 metres within the existing curvature of the river. The total volume of material within the Liesbeck River to be excavated to put the gabions in place will be approximately 135m$^3$.

Freshwater specialist input has been obtained in order to inform the redevelopment and ensure that the river is not impacted on in an unacceptable manner.

**Please note:** The Department of Water Affairs confirmed in a letter dated 19$^{th}$ November 2014 that a water use authorisation (WULA) must be applied for. This is currently being compiled by SEC and will

be submitted to the Department of Water Affairs accordingly. Proof of the submission of the WULA will be included in Final BAR.

**Please refer to Appendix D for all specialist reports informing the content of this BAR.**

**b) Provide a detailed description of the listed activities associated with the project as applied for**

**Please note:** The application for the proposed development was submitted to the DEA on 12th August 2014. A reference number was received on 10th September 2014. At the time of the application submission the following activities listed under the National Environmental Management Act (NEMA) (Act No. 107 of 1998) Environmental Impact Assessment (EIA) Regulations (2010) were triggered:

| Listed activity as described in GN R.544, 545 and 546 | Description of project activity |
|---|---|
| **GN 544 Listing Notice 1: Activity 11**<br>*The construction of:*<br>*(xi) infrastructure or structures covering 50 square metres or more-*<br><br>*where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, excluding where such construction will occur behind the development setback line.* | The proposed activity will entail the redevelopment, upgrade and expansion of buildings and infrastructure within the Kirstenbosch National Botanical Garden, including expansion of some 2 500m$^2$ in extent, in an area situated in close proximity to the upper catchment of the Liesbeck River. |
| **GN 544 Listing Notice 1: Activity 18**<br>*The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-*<br><br>*(i) a watercourse but excluding where such infilling, depositing, dredging, excavation, removal or moving is:*<br><br>*(a) For maintenance purposes undertaken in accordance with a management plan agreed to by the relevant environmental authority; or*<br><br>*(b) Occurs behind the development setback line.* | The proposed activity will entail the construction of gabions along the north portion of the Liesbeck River to reinforce this area. The gabions will run for approximately 20-30 metres within the existing curvature of the river.<br><br>The total volume of material within the Liesbeck River to be excavated to put the gabions in place will be approximately 135m$^3$. |
| **GN 544 Listing Notice 1: Activity 40**<br>*The expansion of*<br>*(iii) buildings by more than 50metres square-*<br><br>*Within a watercourse or within 32 metres of a watercourse, measured from the edge of a watercourse, but excluding where such expansion occurs behind a development setback line.* | The proposed activity will entail the redevelopment and upgrade of buildings and infrastructure within the Kirstenbosch National Botanical Garden, including expansion of some 2 500m$^2$ in extent, on an area situated in close proximity to the upper catchment of the Liesbeck River. |
| **GN 546 Listing Notice 3: Activity 24**<br>*The expansion of:* | The proposed activity will entail the redevelopment and upgrade of buildings and infrastructure within the |

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|---|---|
| *(c) Buildings where the buildings will be expanded by 10 square metres or more in size-*<br><br>*Where such construction occurs within a watercourse or within 32 metres of a watercourse, measured from the edge of the watercourse, excluding where such construction will occur behind the development setback line.*<br><br>*(d) Western Cape*<br><br>*(ii) Outside urban areas, in-*<br><br>*(dd) Sites or areas identified in terms of an International Convention*<br><br>*(gg) Areas within 10 kilometres from national parks or world heritage sites or 5 kilometres away from any other protected area identified in terms of NEMPAA or from the core area of a biosphere reserve.* | Kirstenbosch National Botanical Garden, including expansion of some 2 500m$^2$ in extent, on an area situated in close proximity to the upper catchment of the Liesbeck River. The Kirstenbosch estate (which is classified as a nature reserve), is adjacent to the Table Mountain National Park and both form part of the Cape Floristic Region Protected Area, which was proclaimed a UNESCO World Heritage Site in 2004. |

The new NEMA EIA Regulations were promulgated on 8th December 2014. The proposed development now triggers the following similarly listed activities in terms of the 2014 Regulations:

| Listed activity as described in GN R.983, 984 and 985. | Description of project activity |
|---|---|
| **GN 983 Listing Notice 1: Activity 12**<br>*The development of~*<br>*(x) buildings exceeding 100 square metres in size;*<br>*(xii) infrastructure or structures with a physical footprint of 100 square metres or more;*<br><br>*Where such development occurs-*<br>*(a)Within a watercourse;*<br>*(c)if no development setback line exists, within 32 metres of a watercourse, measured from the edge of a watercourse.* | The proposed activity will entail the redevelopment, upgrade and expansion of buildings and infrastructure within the Kirstenbosch National Botanical Garden, including expansion of some 2 500m$^2$ in extent, in an area situated in close proximity to the upper catchment of the Liesbeck River.<br><br>The proposed activity will also entail the construction of gabions along the north portion of the upper catchment of the Liesbeck River to reinforce this area. |
| **GN 983 Listing Notice 1: Activity 19**<br>*The infilling or depositing of any material of more than 5 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 5 cubic metres from-*<br><br>*(i)A watercourse.* | The proposed activity will entail the construction of gabions along the north portion of the upper catchment of the Liesbeck River to reinforce this area. The gabions will run for approximately 20-30 metres within the existing curvature of the river.<br><br>The total volume of material within the Liesbeck River to be excavated to put the gabions in place will be approximately 135m$^3$. |
| **GN 983 Listing Notice 1: Activity 49**<br>The expansion of-<br><br>(iii) buildings by more than 100 square metres;<br>(v) infrastructure or structures where the physical | The proposed activity will entail the redevelopment and upgrade of buildings and infrastructure within the Kirstenbosch National Botanical Garden, including expansion of some 2 500m$^2$ in extent, on an area situated in close proximity to the upper catchment of |

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| footprint is expanded by 100 square metres or more;<br><br>Where such expansion and related operation occurs-<br>(c)if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse. | the Liesbeck River. |
| **GN 546 Listing Notice 3: Activity 14**<br>*The development of –*<br>*(x) buildings exceeding 10 square metres in size;*<br>*(xii) infrastructure or structures with a physical footprint of 10 square metres or more;*<br><br>*Where such development occurs-*<br>*(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;*<br><br>*(f) Western Cape*<br><br>*(i) Outside an urban area.*<br><br>*(cc) World Heritage Sites;*<br><br>*(ee) Sites or areas listed in terms of an International Convention* | The proposed activity will entail the redevelopment and upgrade of buildings and infrastructure within the Kirstenbosch National Botanical Garden, including expansion of some 2 500m$^2$ in extent, on an area situated in close proximity to the upper catchment of the Liesbeck River. The Kirstenbosch estate (which is classified as a nature reserve), is adjacent to the Table Mountain National Park and both form part of the Cape Floristic Region Protected Area, which was proclaimed a UNESCO World Heritage Site in 2004.<br><br>The Head of City of Cape Town's District H (Andrew Greenwood) has confirmed that the entire Kirstenbosch National Botanical Garden falls outside of the City of Cape Town's zoning sphere and as such is not formally zoned as part of the City of Cape Town's zoning scheme. |
| **GN 546 Listing Notice 3: Activity 23**<br>*The expansion of-*<br>*(x) buildings where the building is expanded by 10 square metres of more in size;*<br>*(xii) infrastructure or structures where the physical footprint is expanded by 10 square metres or more;*<br><br>*Where such development occurs-*<br>*(c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse;*<br><br>*(g) Western Cape;*<br><br>*(i) Outside urban areas in:*<br><br>*(cc) World Heritage Sites;*<br><br>*(ee) Sites or areas listed in terms of International Convention.* | The proposed activity will entail the redevelopment and upgrade of buildings and infrastructure within the Kirstenbosch National Botanical Garden, including expansion of some 2 500m$^2$ in extent, on an area situated in close proximity to the upper catchment of the Liesbeck River. The Kirstenbosch estate (which is classified as a nature reserve), is adjacent to the Table Mountain National Park and both form part of the Cape Floristic Region Protected Area, which was proclaimed a UNESCO World Heritage Site in 2004.<br><br>The Head of City of Cape Town's District H (Andrew Greenwood) has confirmed that the entire Kirstenbosch National Botanical Garden falls outside of the City of Cape Town's zoning sphere and as such is not formally zoned as part of the City of Cape Town's zoning scheme. |

In accordance with Section 53 of the Transitional Arrangements as contained in the newly promulgated NEMA EIA Regulations (2014), as only similarly listed activities are triggered under the 2014 Regulations, the application for Environmental Authorisation is being dispensed with as if the previous (2010) Regulations were never repealed. The Basic Assessment Report does however, assess the triggered activities from both the 2010 Regulations as well as the 2014 Regulations.

## 2. FEASIBLE AND REASONABLE ALTERNATIVES

***"Alternatives"***, in relation to a proposed activity, means different means of meeting the general purpose and requirements of the activity, which may include alternatives to—

(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

Describe alternatives that are considered in this application as required by Regulation 22(2) (h) of GN R.543. Alternatives should include a consideration of all possible means by which the purpose and need of the proposed activity (NOT PROJECT) could be accomplished in the specific instance taking account of the interest of the applicant in the activity. The no-go alternative must in all cases be included in the assessment phase as the baseline against which the impacts of the other alternatives are assessed.

The determination of whether site or activity (including different processes, etc.) or both is appropriate needs to be informed by the specific circumstances of the activity and its environment. After receipt of this report the, competent authority may also request the applicant to assess additional alternatives that could possibly accomplish the purpose and need of the proposed activity if it is clear that realistic alternatives have not been considered to a reasonable extent.

The identification of alternatives should be in line with the Integrated Environmental Assessment Guideline Series 11, published by the DEA in 2004. Should the alternatives include different locations and lay-outs, the co-ordinates of the different alternatives must be provided. The co-ordinates should be in degrees, minutes and seconds. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection.

### a) Site alternatives

| **Site Alternative 1 (preferred alternative)** | | |
|---|---|---|
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| There are no feasible location/site alternatives which would meet the general purpose of the application, which is to redevelop and upgrade a 2 500m$^2$ area of the developed portion of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden.<br><br>**Please note:** In light of the above, the developed portion of Farm CA875-RE of the Kirstenbosch National Botanical Garden is the preferred and only site alternative that will be evaluated. | 33° 59' 12.26"S | 18° 26' 9.28"E |
| **Site Alternative 2** | | |
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| **N/A** | N/A | N/A |
| **Site Alternative 3** | | |
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| **N/A** | N/A | N/A |

In the case of linear activities:
**N/A- There are no linear activities for the proposed development.**

| **Alternative: N/A** | **Latitude (S):** | **Longitude (E):** |
|---|---|---|
| Alternative S1 (preferred) | | |
| • Starting point of the activity | | |
| • Middle/Additional point of the activity | | |
| • End point of the activity | | |
| Alternative S2 (if any) | | |
| • Starting point of the activity | | |
| • Middle/Additional point of the activity | | |
| • End point of the activity | | |
| Alternative S3 (if any) | | |
| • Starting point of the activity | | |
| • Middle/Additional point of the activity | | |
| • End point of the activity | | |

For route alternatives that are longer than 500m, please provide an addendum with co-ordinates taken every 250 meters along the route for each alternative alignment.

In the case of an area being under application, please provide the co-ordinates of the corners of the site as indicated on the lay-out map provided in Appendix A.

**b) Lay-out alternatives**

| **Layout Alternative 1 (preferred alternative)** | | |
|---|---|---|
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| The development proposal is for the redevelopment and upgrade of a 2 500m$^2$ area of the developed portion of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden. These buildings include Fynbos Lodge, which is over 60 years old, as well as the current prefabricated Kirstenbosch Head Office & Administration Building and a small prefabricated IT building. The landscaping and parking areas associated with these existing buildings will also be altered in the redevelopment.<br><br>Alternative 1 (the preferred alternative) would entail the demolition of the existing single storey prefabricated Kirstenbosch Head Office & Administration Building and replacing it with a new upgraded 2.5 storey administration building. The new administrative building will be within the existing development footprint of the original building, will not encroach on the existing vegetation currently surrounding the existing building and will be further than 32 metres from the upper catchment of the Liesbeck River. The additional floors will allow for SANBI's administrative needs to be met without | 33° 59' 11.28"S | 18° 26' 7.56"E |

| | | |
|---|---|---|
| impacting the vegetation and sense of place of the surrounding area. In addition, the location of the new administrative building will allow for minimal impact on the existing Fynbos Lodge.<br><br>The existing single storey prefabricated IT building will be demolished along with a portion of the existing cultivated garden (of low botanical sensitivity) directly in front of that building. This area will be converted into a small parking area (with a provision for 50 cars) and landscaped appropriately in order to avoid negative visual impacts. This proposed parking area will be within 32 metres of the upper catchment of the Liesbeck River.<br><br>The Fynbos Lodge, a building over 60 years old, will undergo some interior renovations (painting, replacing of counter tops) and the asbestos roofing will be removed and replaced with a roofing of similar material and appearance.<br><br>Finally, the upper catchment of the Liesbeck River is located in very close proximity to the area which is proposed to be redeveloped. The river is currently undercutting and weakening the north bank closest to the Fynbos Lodge. Therefore the development proposal also includes bank stabilisation measures along the river bank to reinforce this area. The bank stabilisations will run for approximately 20-30metres within the existing curvature of the river. The maximum total volume of material within the Liesbeck River to be excavated to put the bank stabilisations in place will be approximately 135m$^3$.<br><br>**Please note:** The layout of Alternative 1 (preferred alternative) is considered to be the most environmentally friendly alternative as it considers the proposed development in the context of the site and the surrounding sensitive areas. As such the layout of Alternative 1 is the preferred alternative.<br><br>**Please note:** Alternative 1 (preferred alternative) is referred to "Site Option 2" in the VMA Architect's Proposed Feasibility contained in Appendix D. | | |
| **Layout Alternative 2** | | |
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| The development proposal is for the redevelopment and upgrade of a 2 500m$^2$ area of the developed portion of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden. These buildings include Fynbos Lodge, which is over 60 years old, as well as the current prefabricated Kirstenbosch Head Office and a small prefabricated IT building. The landscaping and parking areas associated with these existing buildings will also be altered in the redevelopment.<br><br>Alternative 2 is very similar to Alternative 1 (the preferred | 33° 59' 12.19"S | 18° 26' 10.24"E |

| | | |
|---|---|---|
| alternative) in the sense that the required work within the Fynbos Lodge as well that within the Liesbeck River would remain the same as mentioned above and the existing prefabricated IT and prefabricated Kirstenbosch Head Office building would be demolished.<br><br>Alternative 2 however would however also entail the removal of a larger portion of the cultivated garden (with low botanical sensitivity) directly in front of the prefabricated IT building. The area of the demolished IT building and removed cultivated garden would be replaced with a new upgraded 4 storey administration building.<br><br>The new administrative building would be located directly adjacent to Rhodes Drive, would be within 32 metres of the upper catchments of the Liesbeck River and would require a larger portion of the cultivated garden to be removed than Alternative 1 (preferred alternative). The building would also be in very close proximity to the Fynbos Lodge and as such, the new administration building would have to be constructed into an awkward shape to avoid impacting the Fynbos Lodge.<br><br>In addition, this area is only large enough to accommodate a building with a 500 $m^2$ footprint, which would be too small for the SANBI's administrative requirements.<br><br>In addition, no new parking areas would be constructed and as such, there would be a shortage of parking for the users of the new administration building.<br><br>For the reasons outlined above, the layout of Alternative 2 is not considered a reasonable or feasible alternative to address the requirements of SANBI from an administrative perspective and as such the Alternative 2 layout is <u>not preferred</u> and the impacts thereof have not been assessed further.<br><br>**Please note that Alternative 2 is referred to "Site Option 1" in the VMA Architect's Proposed Feasibility contained in Appendix D.** | | |
| **Layout Alternative 3** | | |
| Description | Lat (DDMMSS) | Long (DDMMSS) |
| **N/A** | | |

**c) Technology alternatives**

| **Technology Alternative 1 (preferred alternative)** |
|---|
| **Administration Building**<br>According to the architects, VMA Architects, the Alternative 1 (preferred alternative) will have the following technology aspects incorporated into the administration building which will improve the overall ecological footprint of the building, reduce the energy demand of the building and reduce the |

impact of the building on the surrounding area:

- The structure of the building will contain a triple volume high circulation space so that any foul air generated within the building can be extracted out the top of the building allowing the air within the building to remain fresh and the interior of the building to be kept cool. Additionally, it also allows for a large amount of natural light to define the circulation space.
- All windows will have double glazing.
- Solar panels and photovoltaic technology will be incorporated in the building to reduce the energy demand of the building.
- LED technology will be used.
- A grey water recycling system will be implemented to reduce the water demand of the proposed building.
- A rain water harvesting system will be implemented to reduce the water demand of the proposed building.
- VMA architects are also exploring alternate heating and cooling measures to further reduce the energy demand of the building.
- Additionally, while the building itself will not be a green building, elements of green building will be incorporated into the building where suitable.

**Fynbos Lodge**

No technology alternatives have been assessed for the proposed upgrade of the Fynbos Lodge as no structural changes will occur to the building. The existing asbestos roofing will be replaced with a visually similar material, and maintenance-type renovations (painting, replacing of counter tops) will take place in the interior of the building.

**Parking Area**

No technology alternatives exist for the proposed upgrade of the proposed parking areas as the proposed development entails an upgrade of the existing infrastructure. Thus technology alternatives have not been assessed. Design measures in section 2 (d) below have however been assessed.

**Bank Stabilisation**

No technology alternatives exist for the proposed bank stabilisations which are proposed to be placed within the existing curvature of the Liesbeck River directly adjacent to the Fynbos Lodge. Thus technology alternatives have not been assessed. Design measures in section 2 (d) below have however been assessed.

The Alternative 1 technology alternatives are preferred by the architects, VMA Architects. In addition, due to the environmental benefits in terms of reducing the impact on the local environment, reducing demand on finite non-renewable resources and the exploration and implementation of renewable energy resources, this alternative is also considered to be the most environmentally feasible and thus is the preferred alternative.

**Technology Alternative 2**

**Administration Building**

According to the architect, VMA architects, Alternative 2 would be constructed in a very similar manner to Alternative 1 (preferred alternative) in terms of the structure of the building however the administration building would differ from Alternative 1 (preferred alternative) in the following manner:

- The building would have plain glass and no double glazing of the windows would be incorporated into the building.
- Further heating and cooling measures would not be explored.
- There would be no use of solar panels of photovoltaics.
- There would be no grey water recycling.

- There would be no rain water harvesting.

**Fynbos Lodge**
As per Alternative 1, no technology alternatives have been assessed for the proposed upgrade of the Fynbos Lodge as no structural changes will occur to the building. The existing asbestos roofing will be replaced with a visually similar material, and maintenance-type renovations (painting, replacing of counter tops) will take place in the interior of the building.

**Parking Area**
As per Alternative 1, no technology alternatives exist for the proposed upgrade of the proposed parking areas as the proposed development entails an upgrade of the existing infrastructure. Thus technology alternatives have not been assessed. Design measures in section 2 (d) below have however been assessed.

**Bank Stabilisation**
As per Alternative 1, no technology alternatives exist for the proposed bank stabilisations which are proposed to be placed within the existing curvature of the Liesbeck River directly adjacent to the Fynbos Lodge. Thus technology alternatives have not been assessed. Design measures in section 2 (d) below have however been assessed.

Despite the administration building being similar to Alternative 1 (preferred alternative), this alternative is not preferred by the architects, VMA Architects. In addition, as this alternative does not have any of the environmental benefits that are incorporated into Alternative 1 (preferred alternative) this alternative is not considered to address the development in an environmentally friendly manner and thus is not preferred As such, Alternative 2 has not been assessed further.

| **Technology Alternative 3** |
|---|
| **N/A** |

**d) Other alternatives (e.g. scheduling, demand, input, scale and design alternatives)**

| **DESIGN ALTERNATIVES** |
|---|
| **Design Alternative 1 (preferred alternative)** |
| **Administration Building**<br>According to the architects, VMA Architects, the Alternative 1 (preferred alternative) design for the administration building will have the following design features which will improve the overall ecological footprint of the building, reduce the energy demand of the building and reduce the impact of the building on the surrounding area:<br>➢ Raft foundation so that the existing development footprint can be used.<br>➢ The building will be 2.5 storey's high to reduce the negative visual impact on the surrounding area and adjacent residents through the reduced height of the building.<br>➢ The 1st floor will cantilever over the ground floor to allow for the additional footprint required by SANBI, avoid disturbing the surrounding vegetation, have a minimal structure and will also reduce the negative visual impact.<br>➢ The building will be constructed in layers to accommodate the different departments' requirements.<br>➢ The structure of the building will contain a triple volume high circulation space so that any foul air generated within the building can be extracted out the top of the building allowing the air within the building to remain fresh and the interior of the building to be kept cool. Additionally, it also allows for a large amount of natural light to define the circulation space.<br>➢ The ground level exterior will have a suspended timber deck to define the space which will soften |

the building as well as allow for an easier transition from the surrounding vegetation area to the building itself.
- The ground level interior will consist of the shared facilities and the HR Department.
- The 1st floor will house the IT, Marketing and Finance Departments.
- The 2nd floor will be for the EDRR Department (which is more researched based and requires a quieter more peaceful setting).
- The roof of the second floor will be a garden space.
- The offices will be placed on the perimeter of the building at all levels to allow for use of natural light and thus reduce the energy demand within the building.
- The building orientation will be north-south to maximise on natural light and heat.
- All windows will have double glazing.
- Solar panels and photovoltaic technology will be incorporated in the building.
- LED technology will be used.
- A grey water recycling system will be implemented.
- A rain water harvesting system will be implemented.
- VMA architects are also exploring alternate heating and cooling measures to further reduce the energy demand of the building.
- Additionally, while the building itself will not be a green building, elements of green building will be incorporated into the building where suitable.

The Alternative 1 design of the proposed administration building is preferred by the architects, VMA Architects. In addition, due to the environmental benefits in terms of reducing the impact on the local environment (particularly the local vegetation), reducing demand on finite non-renewable resources and the exploration and implementation of renewable energy resources, this option is also considered the most environmentally friendly and thus is the preferred alternative.

**Parking Area**

According to the architects, VMA Architects, the Alternative 1 (preferred alternative) for the parking area will have the following design features which consider the visual impact of the parking area and reduce the environmental and visual impact of the parking area on the surrounding area:
- The parking area will be located largely within the footprint of the existing single storey prefabricated IT building and over a small portion of the existing cultivated garden.
- The parking area will be paved in the same (Table Mountain Sandstone) or a very similar material to that of the surrounding area in order to blend in and have a minimal visual impact on the surrounding area.
- As few trees and vegetation as possible will be removed during the construction phase.
- After the parking area has been completed, the area will be landscaped to restore as much vegetation as possible and further reduce the visual impact of the parking area.
- The parking area will be constructed in such a way as to highlight the Fynbos Lodge building rather than impose on the building.
- In addition, light steel structures will be installed above the parking area to provide shade for the vehicles as well as for the people moving between the car parking area and the surrounding existing buildings.

The Alternative 1 design of the proposed parking area is preferred by the architects, VMA Architects. In addition, due to the consideration given to the surrounding vegetation, the consideration given to the potential negative impacts of the parking area and the proposed plans to appropriately landscape the surrounding area this option is also considered to be the most environmentally friendly alternative and thus the Alternative 1 design for the parking area is the preferred alternative.

**Fynbos Lodge**

No design alternatives have been assessed for the proposed upgrade of the Fynbos Lodge as no structural changes will occur to the building. The existing asbestos roofing will be replaced with a visually similar material, and maintenance-type renovations (painting, replacing of counter tops) will take place in the interior of the building.

**Bank Stabilisation: Gabions**

According to the architects, VMA Architects, and the Civil Engineers, Orrie, Welby-Solomon & Associates, the Alternative 1 (preferred alternative) for the proposed bank stabilisations will be stone gabions within the existing curvature of the Liesbeck River.

The Alternative 1 design of the proposed bank stabilization is preferred by the architects, VMA Architects as well as the Civil Engineers, Orrie, Welby-Solomon & Associates. According to the Civil Engineers, the stabilisation of the embankment utilising gabions is considered to be less invasive than the Alternative 2 design (as outlined below) Further it is the opinion of the Civil Engineers that the gabions will not necessarily require any excavation for trimming of the existing riverbed and will not pose a pollution problem. In addition, due to the consideration given to the surrounding environment and the consideration given to the potential negative visual impacts of the gabions, the Alternative 1 design for bank stabilisation is considered to be the preferred alternative.

**Stormwater**

According to the Civil Engineers, Orrie, Welby-Solomon & Associates, the Alternative 1 (preferred alternative) for the control of stormwater runoff will have the following design features which will be in accordance with the City of Cape Town Catchment Management Policy (2009):

- Permeable paving consisting of a paver usually 80mm thick, a geotextile and layers of finer stone will be used.

The Alternative 1 design for the control of stormwater runoff is preferred by the Civil Engineers, Orrie, Welby-Solomon & Associates. According to the Civil Engineers, permeable paving serves both structural and stormwater management functions by being able to handle heavy loads from vehicles as well as by reducing stormwater runoff. In addition, permeable paving has a very high infiltration rate and can both treat and store stormwater thereby reducing the impact of stormwater runoff both on the site and the surrounding area. It is the opinion of the Civil Engineers that the Alternative 1 design for the treatment of stormwater on site will be adequately met using permeable paving only. In light of this, as well as the consideration given the site and the surrounding environment, the Alternative 1 design for the control of stormwater runoff is considered to be the preferred alternative.

The Alternative 1 designs as outlined above address the needs of SANBI from an administrative perspective whilst considering the proposed development in the context of the site, the adjacent Liesbeck River and surrounding sensitive vegetation as well as from a visual impact perspective. As such, Alternative 1 is the preferred alternative.

**Design Alternative 2**

**Administration Building**

According to the architect, VMA architects, Alternative 2 would be constructed in a very similar manner to Alternative 1 (preferred alternative) in terms of the use of materials and it would still be within the existing development footprint however the building would differ from Alternative 1 (preferred alternative) in the following manner:

- No cantilevering would be incorporated into the building and as such the building would be 4 storeys high to meeting the required footprint. This would have an associated negative visual impact on the immediate site, the surrounding area as well as for the residents adjacent to the

site.
- The development footprint would be condensed resulting in less space for the various administration departments to be incorporated into the building.
- It is highly probable that excavation will be required in order to install adequate foundations to accommodate the building.
- The surrounding vegetation would have to be cut back considerably to accommodate the height of the building which would subsequently have a negative impact on the surrounding vegetated area.
- The building would have plain glass and no double glazing of the windows would be incorporated into the building.
- Further heating and cooling measures would not be explored.
- There would be no use of solar panels of photovoltaics.
- There would be no grey water recycling.
- There would be no rain water harvesting.

Despite being similar to Alternative 1 (preferred alternative) in terms of development footprint size and materials used, the Alternative 2 design of the administration building is not preferred by the architects, VMA Architects. In addition, as the Alternative 2 design does not have any of the significant environmental benefits that are considered and incorporated into Alternative 1 (preferred alternative), requires vegetation to be cut back to incorporate the building and will mostly likely result in an increased negative visual impact on the site as well as the immediate surrounding area, this alternative is not considered a reasonable alternative is thus is not preferred. As such, the Alternative 2 design for the administration building has not been assessed further.

**Parking Area**

According to the architect, VMA architects, Alternative 2 would be constructed in a very similar manner to Alternative 1 (preferred alternative) in the sense that the parking area will be located largely within the footprint of the existing single storey prefabricated IT building, over a small portion of the existing cultivated garden and the sheet metal roofing would remain the same. The parking area would differ from Alternative 1 (preferred alternative) in the following manner:

- All trees and vegetation will be removed as required to fully accommodate the parking area.
- The materials used for the paving of the parking area will be premixed tarmac.
- No landscaping or replanting of vegetation will be done after the parking area has been constructed.

Despite being similar to Alternative 1 (preferred alternative) in terms of the development footprint size and the incorporation of the sheet metal roofing, the Alternative 2 design of the parking area is not preferred by the architects, VMA Architects. In addition, as the Alternative 2 design of the parking area does not consider the visual impact, the impact on the surrounding existing vegetation, particularly the trees, or the context of the surrounding environment in terms of use of materials that have been considered in Alternative 1 (preferred alternative), the Alternative 2 design is not considered to be a reasonable alternative and is thus not preferred. As such, the Alternative 2 design for the parking area has not been assessed further.

**Fynbos Lodge**

As per Alternative 1, no design alternatives have been assessed for the proposed upgrade of the Fynbos Lodge as no structural changes will occur to the building. The existing asbestos roofing will be replaced with a visually similar material, and maintenance-type renovations will take place in the interior of the building.

**Bank Stabilisation: Concrete Retaining Walls**

According to the architects, VMA Architects, and the Civil Engineers, Orrie, Welby-Solomon & Associates, the Alternative 2 design for the proposed bank stabilisations will be hybrid reinforced concrete retaining walls. The retaining wall would be left as is and no facing of any kind would be placed on top of the retaining wall.

The Alternative 2 design of the proposed bank stabilisation is not preferred by the architects, VMA Architects, or the Civil Engineers, Orrie, Welby-Solomon & Associates. In addition, due to the fact the Alternative 2 design would not blend in with the natural surroundings and thus would have a higher negative visual impact than Alternative 1 (preferred alternative) this alternative is not considered to be reasonable and is not preferred. As such, the Alternative 2 design of the bank stabilisation has not been assessed further.

**Stormwater**

No alternative designs for the treatment and control of stormwater have been assessed for the proposed development as according to the Civil Engineers, Orrie, Welby-Solomon & Associates, the treatment of stormwater on site will be adequately met using permeable paving only (Alternative 1 design).

The Alternative 2 designs as outlined above do not consider the proposed development in the context of the site and surrounding sensitive areas or from a visual impact perspective. As such, the Alternative 2 designs are not preferred and have thus not been assessed further.

**Design Alternative 3**

**N/A**

**e) No-go alternative**

The No-Go Alternative entails "the option of not implementing the activity".

The No-Go Alternative would entail not redeveloping and upgrading a 2 500m$^2$ area of the developed portion of the cultivated garden and the buildings and infrastructure (Fynbos Lodge, which is over 60 years old, the small prefabricated IT building, the current prefabricated Kirstenbosch Head Office or the landscaping and parking areas associated with these existing buildings) within the Kirstenbosch National Botanical Garden.

This would mean that the existing prefabricated Kirstenbosch Head Office and prefabricated IT buildings would not be demolished and the existing cultivated garden (of low botanical sensitivity) would not be altered. The existing Fynbos Lodge would remain as is and would not be renovated and refurbished nor would any of the asbestos roofing be removed. The upper catchment of the Liesbeck River would not be stabilised which would mean that the river would continue to undercut and weaken the north bank directly adjacent to the Fynbos Lodge which, in time, may result in increasingly instability of the ground adjacent to the Fynbos Lodge and potential damage or even collapse of this building of significant heritage value. Finally, the new upgraded administrative building and associated parking area would not be constructed and the administrative needs of SANBI and the Kirstenbosch National Botanical Garden would not be addressed.

The No-Go alternative contains no benefit to the needs and requirements of SANBI and the Kirstenbosch National Botanical Garden in terms of administration. The No-Go alternative would also not allow for any of the other benefits associated with the preferred alternative to be realised.

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| In light of the above, the No-Go Alternative is not considered a reasonable alternative and as such is not preferred.<br><br>The impacts of the No-Go Alternative have however been assessed against Alternative 1 (preferred alternative) in Section D of this report. |

**Paragraphs 3 – 13 below should be completed for each alternative.**

## 3. PHYSICAL SIZE OF THE ACTIVITY

**a) Indicate the physical size of the preferred activity/technology as well as alternative activities/technologies (footprints):**

| **Alternative:** | **Size of the activity:** |
|---|---|
| Alternative A1[2] (preferred activity alternative) | 2 500m$^2$ |
| Alternative A2 (if any) | **N/A** |
| Alternative A3 (if any) | **N/A** |

or, for linear activities:

| **Alternative: N/A** | **Length of the activity:** |
|---|---|
| Alternative A1 (preferred activity alternative) | m |
| Alternative A2 (if any) | m |
| Alternative A3 (if any) | m |

**b) Indicate the size of the alternative sites or servitudes (within which the above footprints will occur):**

| **Alternative:** | **Size of the site/servitude:** |
|---|---|
| Alternative A1 (preferred activity alternative) | 2 500m$^2$ |
| Alternative A2 (if any) | **N/A** |
| Alternative A3 (if any) | **N/A** |

## 4. SITE ACCESS

| Does ready access to the site exist? | **YES** | NO |
|---|---|---|
| **The site can be accessed via the Kirstenbosch Main Gate off Rhodes Drive. As such, access to and from the site via the existing road network is readily available.** | | |
| If NO, what is the distance over which a new access road will be built | | m |

[2] "Alternative A.." refer to activity, process, technology or other alternatives.

Describe the type of access road planned:

| **N/A** |
|---|

Include the position of the access road on the site plan and required map, as well as an indication of the road in relation to the site.

## 5. LOCALITY MAP

An A3 locality map must be attached to the back of this document, as Appendix A. The scale of the locality map must be relevant to the size of the development (at least 1:50 000. For linear activities of more than 25 kilometres, a smaller scale e.g. 1:250 000 can be used. The scale must be indicated on the map.). The map must indicate the following:

- an accurate indication of the project site position as well as the positions of the alternative sites, if any;
- indication of all the alternatives identified;
- closest town(s;)
- road access from all major roads in the area;
- road names or numbers of all major roads as well as the roads that provide access to the site(s);
- all roads within a 1km radius of the site or alternative sites; and
- a north arrow;
- a legend; and
- locality GPS co-ordinates (Indicate the position of the activity using the latitude and longitude of the centre point of the site for each alternative site. The co-ordinates should be in degrees and decimal minutes. The minutes should have at least three decimals to ensure adequate accuracy. The projection that must be used in all cases is the WGS84 spheroid in a national or local projection).

**Please Note: Locality and Topographic Maps have been attached as part of Appendix A.**

## 6. LAYOUT/ROUTE PLAN

A detailed site or route plan(s) must be prepared for each alternative site or alternative activity. It must be attached as Appendix A to this document.

The site or route plans must indicate the following:

- the property boundaries and numbers of all the properties within 50 metres of the site;
- the current land use as well as the land use zoning of the site;
- the current land use as well as the land use zoning each of the properties adjoining the site or sites;
- the exact position of each listed activity applied for (including alternatives);
- servitude(s) indicating the purpose of the servitude;
- a legend; and
- a north arrow.

**Please Note: A Site Plan has been attached as part of Appendix A.**

## 7. SENSITIVITY MAP

The layout/route plan as indicated above must be overlain with a sensitivity map that indicates all the sensitive areas associated with the site, including, but not limited to:

- watercourses;
- the 1:100 year flood line (where available or where it is required by DWA);
- ridges;
- cultural and historical features;
- areas with indigenous vegetation (even if it is degraded or infested with alien species); and
- critical biodiversity areas.

The sensitivity map must also cover areas within 100m of the site and must be attached in Appendix A.

**Please Note: Biodiversity and Sensitivity Maps have been attached as part of Appendix A.**

## 8. SITE PHOTOGRAPHS

Colour photographs from the centre of the site must be taken in at least the eight major compass directions with a description of each photograph. Photographs must be attached under Appendix B to this report**.** It must be supplemented with additional photographs of relevant features on the site, if applicable.

**Please Note: Site Photographs have been attached as part of Appendix B.**

## 9. FACILITY ILLUSTRATION

A detailed illustration of the activity must be provided at a scale of at least 1:200 as Appendix C for activities that include structures. The illustrations must be to scale and must represent a realistic image of the planned activity. The illustration must give a representative view of the activity.

**Please Note: Detailed Sketch Plans (September 2014) of Alternative 1 (layout and design) have been attached as part of Appendix C.**

## 10. ACTIVITY MOTIVATION

Motivate and explain the need and desirability of the activity (including demand for the activity):

| **1. Is the activity permitted in terms of the property's existing land use rights?** | **YES** | NO | Please explain |
|---|---|---|---|
| Yes. The Head of City of Cape Town's District H (Andrew Greenwood) has confirmed that the entire Kirstenbosch National Botanical Garden falls outside of the City of Cape Town's zoning sphere and as such is not formally zoned as part of the City of Cape Town's zoning scheme.<br><br>As SANBI is the landowner and entity in control of the land as well as the applicant, the activity is thus permitted in terms of the existing land use rights. | | | |

| **2. Will the activity be in line with the following?** | | | |
|---|---|---|---|
| **(a) Provincial Spatial Development Framework (PSDF)** | **YES** | NO | Please explain |
| Yes. The PSDF requires the *"integration of social, economic and ecological factors into planning, decision-making and implementation so as to ensure that development serves present and future generations*"(Western Cape Provincial Spatial Development Framework, 2005).<br><br>The proposed layout and design of Alternative 1 (preferred alternative) addresses the administrative needs of SANBI and the Kirstenbosch National Botanical Garden in a manner in line with the principle set out above. | | | |
| **(b) Urban edge / Edge of Built environment for the area** | **YES** | NO | Please explain |
| Yes. The proposed site falls within the Kirstenbosch Botanical Garden itself, on the edge of the formal City of Cape Town zoning scheme. | | | |
| **(c) Integrated Development Plan (IDP) and Spatial Development Framework (SDF) of the Local Municipality (e.g. would the approval of this application compromise the integrity of the existing approved and credible municipal IDP and SDF?).** | **YES** | NO | Please explain |
| The development proposal is for the redevelopment and upgrade of a 2 500m$^2$ area of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden itself in an area not formally zoned as part of the City of Cape Town's zoning scheme.<br><br>As the proposed land use is consistent with the accepted and established land use of the site and thus will to continue to fall in line with the approved land use agreed to by the relevant environmental authorities, the proposed development will not compromise the integrity of the existing approved and credible municipal IDF and SDF. | | | |
| **(d) Approved Structure Plan of the Municipality** | **YES** | NO | Please explain |
| The development proposal is for the redevelopment and upgrade of a 2 500m$^2$ area of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden itself in an area not formally zoned as part of the City of Cape Town's zoning scheme.<br><br>The proposed development is consistent with the accepted and established land use of the site and thus will to continue to fall in line with the approved land use agreed to by the relevant environmental authorities. As such, the approval of this application will not compromise the integrity of the existing and approved Structure Plan of the Municipality. | | | |

| | | | |
|---|---|---|---|
| **(e) An Environmental Management Framework (EMF) adopted by the Department (e.g. Would the approval of this application compromise the integrity of the existing environmental management priorities for the area and if so, can it be justified in terms of sustainability considerations?)** | YES | NO | Please explain |
| The proposed developments will be in line with the existing EMF.<br><br>The development proposal is for the redevelopment and upgrade of a 2 500m$^2$ area of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden itself in an area not formally zoned as part of the City of Cape Town's zoning scheme.<br><br>As the proposed land use is consistent with the accepted and established land use of the site and will thus continue to fall in line with the approved land use agreed to by the relevant environmental authorities, the proposed development will not compromise the integrity of the existing environmental management priorities for the area.<br><br>In addition, given that the proposed development will be for the redevelopment and upgrade of existing facilities for current and future use on an existing development footprint, the proposed activity can be justified in terms of sustainability considerations. | | | |
| **(f) Any other Plans (e.g. Guide Plan)** | YES | NO | Please explain |
| **N/A** | | | |
| **3. Is the land use (associated with the activity being applied for) considered within the timeframe intended by the existing approved SDF agreed to by the relevant environmental authority (i.e. is the proposed development in line with the projects and programmes identified as priorities within the credible IDP)?** | **YES** | NO | Please explain |
| The proposed development is by nature, site specific and addresses the requirements of SANBI from an administrative perspective specifically for the existing site.<br><br>In addition, the proposed land use is consistent with the accepted and established land use of the site and will therefore will to continue to fall in line with the approved SDF agreed to by the relevant environmental authority. | | | |
| **4. Does the community/area need the activity and the associated land use concerned (is it a societal priority)? (This refers to the strategic as well as local level (e.g. development is a national priority, but within a specific local context it could be inappropriate.)** | YES | **NO** | Please explain |
| The development proposal is for the redevelopment and upgrade of a 2 500m$^2$ area of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden itself to streamline the existing administration capabilities of SANBI.<br><br>As such, whilst the public will most likely feel some benefit from the redevelopment and upgrades in terms of enhanced administrative service provision, the proposed development will be largely of benefit to the SANBI staff only. As such the proposed development is a priority for SANBI rather than the larger community. | | | |

| | | | |
|---|---|---|---|
| **5. Are the necessary services with adequate capacity currently available (at the time of application), or must additional capacity be created to cater for the development? (Confirmation by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)** | **YES** | NO | Please explain |
| The existing infrastructure currently located at the site of the proposed development, has all the necessary services with adequate capacity in place.<br><br>As such, it is not anticipated that any additional capacity in terms of Municipal services (electricity, sewer systems) will be required. Written confirmation by the Local Municipality will be obtained confirming this. This will be included in the Final BAR.<br><br>According to the architect, VMA Architects, Kirstenbosch is "off-grid" and as such all water resources are sourced from the dam and boreholes within Kirstenbosch itself. Whilst the existing capacity of these resources is anticipated to meet the required water needs of the proposed development, Municipal water resources may be incorporated into the development as a back-up source. Written confirmation by the Local Municipality will be obtained regarding the feasibility of this. This will be included in the Final BAR. | | | |
| **6. Is this development provided for in the infrastructure planning of the municipality, and if not what will the implication be on the infrastructure planning of the municipality (priority and placement of services and opportunity costs)? (Comment by the relevant Municipality in this regard must be attached to the final Basic Assessment Report as Appendix I.)** | **YES** | NO | Please explain |
| The proposed land use is consistent with the accepted and established land use of the site and will continue to fall in line with, and thus be provided for, in the existing approved infrastructure planning of the municipality. As such, there will not be any implications on the infrastructure planning of the municipality. Written confirmation by the Local Municipality will be obtained confirming this. This will be included in the Final BAR.<br><br>Additionally, according to the architect, VMA Architects, Kirstenbosch is "off-grid" and as such all water resources are sourced from the dam and boreholes within Kirstenbosch itself. Whilst the existing capacity of these resources is anticipated to meet the required water needs of the proposed development, Municipal water resources may need to be incorporated into the development as a back-up source. Should this be the case, infrastructure planning of the Municipality will need to be considered. Written confirmation by the Local Municipality will be obtained regarding the feasibility of this. This will be included in the Final BAR. | | | |
| **7. Is this project part of a national programme to address an issue of national concern or importance?** | **YES** | NO | Please explain |
| SANBI has been allocated funds by the DEA for the period 2013/14- 2015/16 for refurbishment, upgrading, repair and maintenance of existing immovable infrastructure, vehicles and equipment as well as the construction of new infrastructure.<br><br>The DEA funded developments will address the needs of SANBI and the Kirstenbosch National Botanical Garden from administrative perspective. | | | |

| | | | |
|---|---|---|---|
| **8. Do location factors favour this land use (associated with the activity applied for) at this place? (This relates to the contextualisation of the proposed land use on this site within its broader context.)** | **YES** | NO | Please explain |
| The development proposal is for the redevelopment and upgrade of a 2 500m$^2$ area of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden itself.<br><br>Location factors favour the proposed development as it will be within the existing development footprint of the developed portion of the cultivated garden and will also remain consistent with the accepted and established land use of the site. | | | |
| **9. Is the development the best practicable environmental option for this land/site?** | **YES** | NO | Please explain |
| The proposed development is considered the best practible environmental alternative for this site as it will entail the refurbishment of the interior of the Fynbos Lodge, including the removal of all asbestos roofing, which will remove a local health risk; the stabilisation of the Liesbeck River, which will reduce the risk of damage to the Fynbos Lodge adjacent to it; and the redevelopment and upgrade of the existing buildings on the site, which will address the administrative needs of SANBI.<br><br>In addition, the proposed development will occur within the existing development footprint of the developed portion of the cultivated garden and will allow for SANBI's administrative needs to be met without impacting the local vegetation, without impacting the sense of place of the surrounding area and without impacting the local environment from an ecological and sustainable perspective. | | | |
| **10. Will the benefits of the proposed land use/development outweigh the negative impacts of it?** | **YES** | NO | Please explain |
| During the construction phase the negative impacts of the proposed development will outweigh the positive (in terms of noise, traffic, dust, freshwater and botanical impacts). These impacts however are temporary and will last for the construction phase only (short term- a period of approximately 18 months). In addition the negative impacts during this phase can also be negated should the appropriate mitigation measures be implemented in full.<br><br>During the operational phase of the proposed development, the positive impacts will outweigh the negative impacts on a long term basis.<br><br>**Please refer to Section D2 of this report for a full impact summary in this regard.** | | | |

| | | | |
|---|---|---|---|
| **11. Will the proposed land use/development set a precedent for similar activities in the area (local municipality)?** | YES | **NO** | Please explain |
| SANBI has been allocated funds by the DEA for the period 2013/14- 2015/16 for refurbishment, upgrading, repair and maintenance of existing immovable infrastructure, vehicles and equipment as well as the construction of new infrastructure at their National Botanical Garden across the country. The DEA-funded developments will address the needs of SANBI only from an administrative research and educational and tourism perspective.<br><br>The proposed development at the Kirstenbosch National Botanical Garden entails the redevelopment and upgrade of a 2 500m$^2$ area of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden itself. The proposed development is by its nature site specific and will address the needs of SANBI and the Kirstenbosch National Botanical Garden specifically from an administrative perspective.<br><br>Given that the applicant is SANBI, not the local municipality and the proposed development is in an area specifically used by the SANBI staff only, it is considered unlikely that the proposed development will set a precedent for the local municipality to undertake similar activities in the area. | | | |
| **12. Will any person's rights be negatively affected by the proposed activity/ies?** | YES | **NO** | Please explain |
| The proposed activity is by its nature site specific and will entail the redevelopment and upgrade of a 2 500m$^2$ area of the developed portion of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden itself.<br><br>The development will address the needs of SANBI and the Kirstenbosch National Botanical Garden specifically from an administrative perspective and will also be of some marginal benefit to the local community/area from an enhanced administrative capacity perspective.<br><br>In light of this, it is not anticipated that any person's rights will be negatively affected by the proposed development. | | | |
| **13. Will the proposed activity/ies compromise the "urban edge" as defined by the local municipality?** | YES | **NO** | Please explain |
| The proposed site falls within the Kirstenbosch National Botanical garden itself on the edge of the formal City of Cape Town zoning scheme and as such does not comprise the "urban edge" as defined by the local municipality. | | | |
| **14. Will the proposed activity/ies contribute to any of the 17 Strategic Integrated Projects (SIPS)?** | YES | **NO** | Please explain |
| Despite the proposed development being funded by the DEA, it does not contribute to any of the SIPS. | | | |
| **15. What will the benefits be to society in general and to the local communities?** | | | Please explain |
| During the construction phase, temporary employment opportunities will be created for the local community which in turn will improve the livelihoods of those employed for the duration of the construction phase (approximately 18 months).<br><br>In addition, the proposed development will address the needs of SANBI and the Kirstenbosch National Botanical Garden from an administration perspective in the long term and as such the SANBI staff at Kirstenbosch Botanical Garden will be positively impacted. | | | |

| **16. Any other need and desirability considerations related to the proposed activity?** | Please explain |
|---|---|
| **N/A** | |
| **17. How does the project fit into the National Development Plan for 2030?** | Please explain |
| During the construction phase, temporary employment opportunities will be created for the local community which in turn will improve the livelihoods of those employed for the duration of the construction phase (approximately 18 months).<br><br>In addition, the proposed development will address the needs of SANBI from an administration perspective in the long term and as such the SANBI staff at Kirstenbosch Botanical Garden will be positively impacted. | |
| **18. Please describe how the general objectives of Integrated Environmental Management as set out in section 23 of NEMA have been taken into account.** | |
| ➢ The development proposal has been informed by specialist input in order to determine an appropriate development design (and other appropriate mitigation measures such as No-Go areas) which minimise the impact of the development on any sensitive environmental aspects situated in the vicinity of the development<br>➢ The development site and the associated indirect, direct and cumulative impacts have been assessed and mitigated for.<br>➢ The potential environmental, social and economic aspects of the project have been identified, described, assessed and mitigated where applicable.<br>➢ The regional and provincial planning context of the proposed activity has been assessed in order to ensure that the development is not in conflict with the planning imperatives for the area.<br>➢ The NEMA EIA Regulations 2010 and the DEA's Guideline on Public Participation have been consulted for this Basic Assessment process. This means that relevant Organs of State with jurisdiction over the proposed activity will be provided with an opportunity to review and comment on the Draft and Final Basic Assessment Reports. Thus, there is an opportunity for environmental considerations to be included in decision-making by these Organs of State. | |
| **19. Please describe how the principles of environmental management as set out in section 2 of NEMA have been taken into account.** | |
| This application for Environmental Authorisation has been undertaken in accordance with the NEMA EIA Regulations 2010, the provisions of which themselves take into account the general objectives of the principles of Environmental Management in Section 2 of the NEMA as well as that of Section 23 of NEMA as outlined above. | |

## 11. APPLICABLE LEGISLATION, POLICIES AND/OR GUIDELINES

List all legislation, policies and/or guidelines of any sphere of government that are applicable to the application as contemplated in the EIA regulations, if applicable:

| Title of legislation, policy or guideline | Applicability to the project | Administering authority | Date |
|---|---|---|---|
| The National Environmental Management Act, Act No. 107 of 1998 (as amended). | This legislation was taken into account and has resulted in this environmental application to the Competent Authority. | DEA | 1998 |
| Regulations 543, 544 and 546 in terms of Chapter 5 of the NEMA, 1998 (as amended). | This legislation was taken into account and has resulted in this environmental application to the Competent Authority. | DEA | 2010 |
| Regulations 983, 984 and 985 in terms of Chapter 5 of the NEMA, 1998 (as amended) | This legislation was taken into account and has resulted in this environmental application to the Competent Authority. | DEA | 2014 |
| The National Water Act, Act No 36 of 1998 | This legislation was taken into account in considering whether the proposed activities trigger a General Authorisation (GA) or a Water Use License Application (WULA). | DWA | 1998 |
| DEA Companion to the NEMA EIA Regulations of 2010 | This policy document was taken into account in the compilation of this environmental application for consideration by the Competent Authority. This Guideline was used to guide the EAP as to the correct interpretation of the applicable listed activities. | DEA | 2010 |
| DEA&DP Guideline Document: Guideline on Alternatives, March 2013. | This policy document was taken into account in the compilation of the environmental application for consideration by the Competent Authority. This Guideline was used to guide the EAP as to the correct interpretation and application of any alternatives identified and investigated. | DEA&DP | 2013 |
| DEA&DP Guideline Document: Guideline on Public Participation, March 2013. | This policy document was taken into account in the compilation of the environmental application for consideration by the Competent Authority. This Guideline was used to guide the applicant as to the correct procedures to follow for public participation. | DEA&DP | 2013 |
| DEA&DP Guideline for determining the scope of specialist involvement in the EIA process, June 2005 | This policy document was taken into account in the compilation of the environmental application for consideration by the Competent Authority. This Guideline was used to guide the EAP as to the extent of specialist involvement in the application process. | DEA&DP | 2005 |
| The Provincial Urban Edge Guideline, December 2005 | This policy document was taken into account in the compilation of the environmental application for consideration by the Competent Authority. This Guideline was used to guide the EAP as to the correct interpretation of the Urban Edge and the impact of this on the proposed development. | DEA&DP | 2005 |
| The Western Cape Provincial Spatial Development Framework (PSDF), November 2005 | This policy document was taken into account in the compilation of the environmental application for consideration by the Competent Authority. This Guideline was used to guide the EAP as to the correct interpretation of the PSDF and the impact of this on the proposed development. | DEA&DP | 2005 |

## 12. WASTE, EFFLUENT, EMISSION AND NOISE MANAGEMENT

### a) Solid waste management

Will the activity produce solid construction waste during the construction/initiation phase?
If YES, what estimated quantity will be produced per month?

| **YES** | NO |
|---|---|
| The quantity is unknown at this stage. | |

How will the construction solid waste be disposed of (describe)?

Solid waste (likely consisting of building rubble, steel, plastics, litter) will be generated during the construction phase (which entails the demolition of the existing prefabricated Head Office and IT buildings and the construction of the new administration building and parking area). The solid waste will be divided into separate waste streams (including general and recycling), removed by a waste contractor and disposed of at an appropriate, licensed local waste management site (anticipated to be either Coastal Park Landfill in Muizenberg, Vissershok General landfill site adjacent to Morningstar or Bellville South Landfill in Bellville Industrial). The quantity of solid waste to be disposed of is unknown at this stage.

Hazardous waste (asbestos) will be generated during the refurbishments and upgrade of the Fynbos Lodge. The asbestos will be removed according to the Occupational Health and Safety, Asbestos Regulations (2001) in line with the Occupational Health and Safety Act (Act No. 85 of 1993). It will then be disposed of at Vissershok Hazardous Landfill site, an appropriate licensed local hazardous waste site. The quantity of asbestos to be removed and disposed of is unknown at this stage.

Where will the construction solid waste be disposed of (describe)?

Solid waste (likely consisting of building rubble, steel, plastics, litter) generated during the construction phase (which entails the demolition of the existing prefabricated Head Office and IT buildings and the construction of the new administration building and parking area), will be disposed of at an appropriate, licensed local waste management site (anticipated to be either Coastal Park Landfill in Muizenberg, Vissershok General landfill site adjacent to Morningstar or Bellville South Landfill in Bellville Industrial).

Hazardous waste (asbestos) generated during the refurbishments and upgrade of the Fynbos Lodge will be disposed of at Vissershok Hazardous Landfill site, an appropriate licensed local hazardous waste site.

Will the activity produce solid waste during its operational phase?
If YES, what estimated quantity will be produced per month?

| **YES** | NO |
|---|---|
| The quantity is unknown at this stage | |

How will the solid waste be disposed of (describe)?

| |
|---|
| During the operational phase of the proposed development, it is likely that general waste (e.g. food, food wrappers and containers, litter) and recyclables (paper, plastic, and cardboard) will be generated.<br><br>Whilst the method for waste disposal during the operational phase has not yet been confirmed by the applicant, given the existing waste management strategy in place at the Kirstenbosch National Botanical Garden it is likely that waste will be divided into separate waste streams with general waste being disposed of at an appropriate, licensed local waste management site (anticipated to be either Coastal Park Landfill in Muizenberg, Vissershok General landfill site adjacent to Morningstar or Bellville South Landfill in Bellville Industrial) and re-use and recycling being carried out where possible. |

If the solid waste will be disposed of into a municipal waste stream, indicate which registered landfill site will be used.

| |
|---|
| Solid waste removed by a waste contractor during the operational phase will be disposed of at an appropriate, licensed local waste management site (anticipated to be either Coastal Park Landfill in Muizenberg, Vissershok General landfill site adjacent to Morningstar or Bellville South Landfill in Bellville Industrial). |

Where will the solid waste be disposed of if it does not feed into a municipal waste stream (describe)?

| |
|---|
| N/A the solid waste will feed into the municipal waste stream as outlined above. |

*If the solid waste (construction or operational phases) will not be disposed of in a registered landfill site or be taken up in a municipal waste stream, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.*

| | | |
|---|---|---|
| Can any part of the solid waste be classified as hazardous in terms of the NEM: WA? | YES | **NO** |

**PLEASE NOTE:** According to Waste Classification and Management Regulations (2013) of the National Environmental Management: Waste Act, (Act No. 59 of 2008), asbestos is categorised as a waste that does not require classification or assessment.

If YES, inform the competent authority and request a change to an application for scoping and EIA. An application for a waste permit in terms of the NEM: WA must also be submitted with this application.

| | | |
|---|---|---|
| Is the activity that is being applied for a solid waste handling or treatment facility? | YES | **NO** |

If YES, then the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA. An application for a waste permit in terms of the NEM: WA must also be submitted with this application.

**b) Liquid effluent**

| | | |
|---|---|---|
| Will the activity produce effluent, other than normal sewage, that will be disposed of in a municipal sewage system? | YES | **NO** |

| | |
|---|---|
| If YES, what estimated quantity will be produced per month? | N/A – Only domestic sewage will be produced during the operational phase of the proposed development. This will be disposed of into the existing municipal sewage system.<br><br>The quantity is unknown at this stage. |

| | | |
|---|---|---|
| Will the activity produce any effluent that will be treated and/or disposed of on site? | YES | **NO** |

*If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.*

| | | |
|---|---|---|
| Will the activity produce effluent that will be treated and/or disposed of at another facility? | YES | **NO** |

If YES, provide the particulars of the facility: **N/A**

| | | | |
|---|---|---|---|
| **Facility name:** | | | |
| **Contact person:** | | | |
| **Postal address:** | | | |
| **Postal code:** | | | |
| **Telephone:** | | **Cell:** | |
| **E-mail:** | | **Fax:** | |

Describe the measures that will be taken to ensure the optimal reuse or recycling of waste water, if any:

The architect, VMA Architects, confirmed in a meeting dated 22nd October 2014, that grey water recycling and rain water harvesting will be incorporated into the design of the administration building.

**Please refer to Appendix E6 for a copy of the meeting minutes confirming this.**

**c) Emissions into the atmosphere**

| | | |
|---|---|---|
| Will the activity release emissions into the atmosphere other that exhaust emissions and dust associated with construction phase activities? | YES | **NO** |
| If YES, is it controlled by any legislation of any sphere of government? | YES | NO |

**N/A**

If YES, the applicant must consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

**N/A**

If NO, describe the emissions in terms of type and concentration:

**N/A**

**d) Waste permit**

| | | |
|---|---|---|
| Will any aspect of the activity produce waste that will require a waste permit in terms of the NEM: WA? | YES | **NO** |

If YES, please submit evidence that an application for a waste permit has been submitted to the competent authority

**N/A**

**e) Generation of noise**

| | | |
|---|---|---|
| Will the activity generate noise? | **YES** | NO |
| If YES, is it controlled by any legislation of any sphere of government? | YES | **NO** |

If YES, the applicant should consult with the competent authority to determine whether it is necessary to change to an application for scoping and EIA.

If NO, describe the noise in terms of type and level:

During the construction phase (which entails the demolition of the existing prefabricated Head Office and IT buildings and the construction of the new upgraded administration building and parking areas), noise generating activities (drilling, operation of machinery and welding) will occur.

The duration of the noise generating activities will be for the length of the construction phase (expected to last for a period of 18 months) and will only occur during working hours approved by the local municipality (anticipated to be 08h00 – 17h00 on weekdays only).

The noise level is however anticipated to be below 60dB and as such will comply with the South African National Standards Codes (SANS), 10103 of 2008. Appropriate noise mitigation measures will be implemented however to reduce this impact on the surrounding area.

No noise is anticipated during the operational phase of the proposed development.

**Please refer to Section D of this report as well as the Environmental Management Plan as contained in Appendix G of this report for noise mitigation measures for the construction phase of the proposed development.**

## 13. WATER USE

Please indicate the source(s) of water that will be used for the activity by ticking the appropriate box(es):

| Municipal | Water board | Groundwater | River, stream, dam or lake | **Other** | The activity will not use water |
|---|---|---|---|---|---|

| | |
|---|---|
| If water is to be extracted from groundwater, river, stream, dam, lake or any other natural feature, please indicate the volume that will be extracted per month: | **N/A** |

| | | |
|---|---|---|
| Does the activity require a water use authorisation (general authorisation or water use license) from the Department of Water Affairs?<br><br>**The Department of Water Affairs confirmed in a letter dated 19.11.14 that a water use authorisation must be applied for. This is currently being compiled by SEC and will be submitted to the Department of Water Affairs accordingly. Proof of the submission of the WULA will be included in Final BAR.** | **YES** | NO |

If YES, please provide proof that the application has been submitted to the Department of Water Affairs.

## 14. ENERGY EFFICIENCY

Describe the design measures, if any, which have been taken to ensure that the activity is energy efficient:

The architect, VMA Architects, confirmed in a meeting dated 22nd October 2014, that the following energy efficient measures will be incorporated into the building as follows:

- The building orientation will be north-south to maximise on natural light and heat.
- All windows will have double glazing.
- Solar panels and photovoltaic technology will be incorporated in the building to assist with the heating and cooling of the building to avoid the building becoming an additional load.
- LED technology will be used.
- A back-up diesel generator will be installed (it will however be decoupled to avoid noise impacts).
- In addition, a passive system for heating and cooling the building is being explored by the architects.

**Please refer to Appendix E6 for a copy of the meeting minutes confirming this.**

Describe how alternative energy sources have been taken into account or been built into the design of the activity, if any:

The architects, VMA architects confirmed in a meeting dated 22nd October 2014, that the following alternative energy sources have been taken into account and been built into the design of the administration building:

- Solar- This will be in the form of solar panels and the use of photovoltaic technology.

**Please refer to Appendix E6 for a copy of the meeting minutes confirming this.**

## SECTION B: SITE/AREA/PROPERTY DESCRIPTION

**Important notes:**

1. For linear activities (pipelines, etc) as well as activities that cover very large sites, it may be necessary to complete this section for each part of the site that has a significantly different environment. In such cases please complete copies of Section B and indicate the area, which is covered by each copy No. on the Site Plan.

Section B Copy No. (e.g. A): **N/A**

2. Paragraphs 1 - 6 below must be completed for each alternative.

3. Has a specialist been consulted to assist with the completion of this section? **YES** | NO

If YES, please complete the form entitled "Details of specialist and declaration of interest" for each specialist thus appointed and attach it in Appendix I. All specialist reports must be contained in Appendix D.

**Property description/ physical address:**

| | |
|---|---|
| **Province** | Western Cape |
| **District Municipality** | City of Cape Town Metropolitan Municipality (District H) |
| **Local Municipality** | N/A |
| **Ward Number(s)** | 68 |
| **Farm name and number** | Cape Town |
| **Portion number** | CA-875-RE |
| **SG Code** | 0 |

Where a large number of properties are involved (e.g. linear activities), please attach a full list to this application including the same information as indicated above.

**Current land-use zoning as per local municipality IDP/records:**

The Head of City of Cape Town's District H (Andrew Greenwood) has confirmed that the entire Kirstenbosch National Botanical Garden falls outside of the City of Cape Town's zoning sphere and as such is not formally zoned as part of the City of Cape Town's zoning scheme.

In instances where there is more than one current land-use zoning, please attach a list of current land use zonings that also indicate which portions each use pertains to, to this application.

Is a change of land-use or a consent use application required? YES | **NO**

## 1. GRADIENT OF THE SITE

Indicate the general gradient of the site.

**Alternative S1:**

| | | | | | | |
|---|---|---|---|---|---|---|
| Flat | **1:50 – 1:20** | 1:20 – 1:15 | 1:15 – 1:10 | 1:10 – 1:7,5 | 1:7,5 – 1:5 | Steeper than 1:5 |

**Alternative S2 (if any): N/A**

| | | | | | | |
|---|---|---|---|---|---|---|
| Flat | 1:50 – 1:20 | 1:20 – 1:15 | 1:15 – 1:10 | 1:10 – 1:7,5 | 1:7,5 – 1:5 | Steeper than 1:5 |

**Alternative S3 (if any): N/A**

| | | | | | | |
|---|---|---|---|---|---|---|
| Flat | 1:50 – 1:20 | 1:20 – 1:15 | 1:15 – 1:10 | 1:10 – 1:7,5 | 1:7,5 – 1:5 | Steeper than 1:5 |

## 2. LOCATION IN LANDSCAPE

Indicate the landform(s) that best describes the site:

| | | | | | |
|---|---|---|---|---|---|
| 2.1 Ridgeline | | 2.4 Closed valley | | 2.7 Undulating plain / low hills | **X** |
| 2.2 Plateau | | 2.5 Open valley | | 2.8 Dune | |
| 2.3 Side slope of hill/mountain | **X** | 2.6 Plain | | 2.9 Seafront | |

## 3. GROUNDWATER, SOIL AND GEOLOGICAL STABILITY OF THE SITE

Is the site(s) located on any of the following?

| | **Alternative S1:** | | **Alternative S2 (if any): N/A** | | **Alternative S3 (if any): N/A** | |
|---|---|---|---|---|---|---|
| Shallow water table (less than 1.5m deep) | YES | **NO** | YES | NO | YES | NO |
| Dolomite, sinkhole or doline areas | YES | **NO** | YES | NO | YES | NO |
| Seasonally wet soils (often close to water bodies) | YES | **NO** | YES | NO | YES | NO |
| Unstable rocky slopes or steep slopes with loose soil | YES | **NO** | YES | NO | YES | NO |
| Dispersive soils (soils that dissolve in water) | YES | **NO** | YES | NO | YES | NO |
| Soils with high clay content (clay fraction more than 40%) | YES | **NO** | YES | NO | YES | NO |
| Any other unstable soil or geological feature | YES | **NO** | YES | NO | YES | NO |
| An area sensitive to erosion | **YES** | NO | YES | NO | YES | NO |

**Please note:** According to the available 1:50 000 geological map for the site (3318CD Cape Town), the site is underlain by Tygerberg Formation of the Malmesbury Group bedrock which consists of greywacke, phyllite and quartzitic sandstone which is interbedded with lava and tuff. This is overlain by Quartenary age gritty sand and scree.

If you are unsure about any of the above or if you are concerned that any of the above aspects may be an issue of concern in the application, an appropriate specialist should be appointed to assist in the

completion of this section. Information in respect of the above will often be available as part of the project information or at the planning sections of local authorities. Where it exists, the 1:50 000 scale Regional Geotechnical Maps prepared by the Council for Geo Science may also be consulted.

## 4. GROUNDCOVER

Indicate the types of groundcover present on the site. The location of all identified rare or endangered species or other elements should be accurately indicated on the site plan(s).

| | | | | |
|---|---|---|---|---|
| Natural veld - good condition[E] | Natural veld with scattered aliens[E] | Natural veld with heavy alien infestation[E] | Veld dominated by alien species[E] | **Gardens** |
| Sport field | Cultivated land | **Paved surface** | **Building or other structure** | Bare soil |

**Please refer to Section 9 for a full description of the vegetation and freshwater ecosystems located on and adjacent to the site.**

If any of the boxes marked with an "[E] "is ticked, please consult an appropriate specialist to assist in the completion of this section if the environmental assessment practitioner doesn't have the necessary expertise.

## 5. SURFACE WATER

Indicate the surface water present on and or adjacent to the site and alternative sites?

| | | | |
|---|---|---|---|
| Perennial River<br>**The Liesbeck River is classified as a Perennial River and is located on the south-west border of the proposed development.** | **YES** | NO | UNSURE |
| Non-Perennial River | YES | **NO** | UNSURE |
| Permanent Wetland | YES | **NO** | UNSURE |
| Seasonal Wetland | YES | **NO** | UNSURE |
| Artificial Wetland | YES | **NO** | UNSURE |
| Estuarine / Lagoonal wetland | YES | **NO** | UNSURE |

If any of the boxes marked YES or UNSURE is ticked, please provide a description of the relevant watercourse.

**Liesbeck River:**
According to the Freshwater Impact Assessment (Freshwater Consulting Group, 2014), the proposed development is located along the upper reaches of the Liesbeck River, roughly two kilometres from its source where it flows past the entrance of the Kirstenbosch National Botanical Garden. Upstream of this point the river rises at two first order tributaries -Skeleton and Nursery streams – at an elevation of roughly 700m on the eastern slopes of Table Mountain – the 'Back Table'. These two tributaries converge at a point just upstream of the proposed development in the Kirstenbosch National Botanical Garden.

Where the river flows past the existing Kirstenbosch Head Office and Administration buildings at the entrance to the Kirstenbosch National Botanical Garden, it passes beneath two culverts where are separated by a distance of 90 metres. The first culvert (Culvert A) diverts the river beneath the entrance road to the existing administration buildings while the second (Culvert B) diverts it beneath Rhodes Drive. The existing administration and IT buildings are located between these two culverts on the northern bank of the river. The existing built structure is *c.* 10m from the river banks.

The reaches of both Skeleton and Nursery streams upstream of the proposed development are relatively pristine and rise as typical Cape Floristic Region ("CFR") mountain streams in Afromontane and riparian forest against the slopes of Table Mountain. Further downstream in the vicinity of the existing administration buildings, however, the riparian zone has been colonised by a mix of alien species including oak, pine, poplar and palms. Downstream of the first culvert, the channel banks are severely incised (down-cut). This is due to the fact that the channel cross section of the first culvert is inadequate to cope with the volume of flow routed through it and no consideration has been given to reinforcing the banks immediately downstream. As a result, the increased velocities and erosive capacity of the water channelled through the culvert has led to gully erosion, washouts and disturbances to the riparian belt between the two culverts. Despite this erosion, the bed of the river itself has stabilised and instream habitat conditions are relatively good. During high flows, however, it is likely that large amounts of sediment are mobilised from the banks causing sedimentation downstream.

(*Freshwater Ecological Assessment for the proposed establishment of a new administration building at Kirstenbosch National Botanical Garden,* (Freshwater Consulting Group, 2014).

**Please refer to the Freshwater Impact Assessment (Freshwater Consulting Group, 2014) as contained in Appendix D of this report.**

## 6. LAND USE CHARACTER OF SURROUNDING AREA

Indicate land uses and/or prominent features that currently occur within a 500m radius of the site and give description of how this influences the application or may be impacted upon by the application:

| | | |
|---|---|---|
| **Natural area** | **Dam or reservoir** | Polo fields |
| **Low density residential** | Hospital/medical centre | Filling station [H] |
| Medium density residential | School | Landfill or waste treatment site |
| High density residential | Tertiary education facility | Plantation |
| Informal residential[A] | **Church** | Agriculture |
| Retail commercial & warehousing | Old age home | **River, stream or wetland** The Liesbeck River adjacent to the site to the south-west. |

| | | |
|---|---|---|
| Light industrial | Sewage treatment plant[A] | **Nature conservation area** |
| Medium industrial [AN] | Train station or shunting yard [N] | **Mountain, koppie or ridge** |
| Heavy industrial [AN] | Railway line [N] | Museum |
| Power station | Major road (4 lanes or more) [N] | **Historical building**<br>Fynbos Lodge. |
| Office/consulting room | Airport [N] | **Protected Area**<br>Table Mountain National Park. |
| Military or police base/station/compound | Harbour | **Graveyard**<br>The grave of Harold Pearson lies within the Kirstenbosch National Botanical Garden. |
| Spoil heap or slimes dam[A] | Sport facilities | Archaeological site |
| Quarry, sand or borrow pit | Golf course | Other land uses (describe) |

If any of the boxes marked with an "[N] "are ticked, how will this impact / be impacted upon by the proposed activity?

| |
|---|
| **N/A** |

If any of the boxes marked with an "[An]" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

| |
|---|
| **N/A** |

If any of the boxes marked with an "[H]" are ticked, how will this impact / be impacted upon by the proposed activity? Specify and explain:

| |
|---|
| **N/A** |

Does the proposed site (including any alternative sites) fall within any of the following:

| | | |
|---|---|---|
| Critical Biodiversity Area (as per provincial conservation plan) | YES | **NO** |
| Core area of a protected area? | **YES** | NO |
| Buffer area of a protected area? | YES | **NO** |
| Planned expansion area of an existing protected area? | YES | **NO** |
| Existing offset area associated with a previous Environmental Authorisation? | YES | **NO** |
| Buffer area of the SKA? | YES | **NO** |

If the answer to any of these questions was YES, a map indicating the affected area must be included in Appendix A.

**Please Note: Biodiversity and Sensitivity Maps have been attached as part of Appendix A and the Botanical Assessment has been attached as part of Appendix D.**

## 7. CULTURAL/HISTORICAL FEATURES

| Are there any signs of culturally or historically significant elements, as defined in section 2 of the National Heritage Resources Act, 1999, (Act No. 25 of 1999), including Archaeological or paleontological sites, on or close (within 20m) to the site? If YES, explain: | **YES** | NO |
|---|---|---|
| | Uncertain | |

According to the Notice of Intent to Develop ("NID") (Asha Consulting, 2014) there are three sites of cultural/historical significance located on and near the site.

**Kirstenbosch National Botanical Garden**
The Kirstenbosch National Botanical Garden itself is part of the Cape Floral Region World Heritage Site. In addition, many of the main features of the garden (rockeries, paths, pools, etc) were constructed more than 60 years ago making the whole landscape of heritage significance. There will be no impact on the actual Kirstenbosch National Botanical Garden landscape however since the work to be carried out is solely within the administrative area of the property which is well screened from the Kirstenbosch National Botanical Garden and surrounds by vegetation and trees.

**Fynbos Lodge**
The Fynbos Lodge located on the site itself is a building of greater than 60 years. No structural changes will occur to the building however the interior of the building will be renovated as part of the proposed activity. A Section 34 application will be required for the renovation of the Fynbos Lodge.

**Harold Pearson Grave**
The grave of Harold Pearson lies on the property but it is far from the proposed development. Likewise, a historical graveyard lies adjacent to the small church to the east of Rhodes Drive however will also not be impacted in any way.

**Please refer to the NID (Asha Consulting, 2014) as contained within Appendix D of this report.**

If uncertain, conduct a specialist investigation by a recognised specialist in the field (archaeology or palaeontology) to establish whether there is such a feature(s) present on or close to the site. Briefly explain the findings of the specialist:

According to the NID (Asha Consulting, 2014), the only heritage resource that will be impacted in any way by the development is the Fynbos Lodge. This however will be a positive impact.

**Please refer to the NID (Asha Consulting, 2014) as contained within Appendix D of this report.**

| | YES | NO |
|---|---|---|
| Will any building or structure older than 60 years be affected in any way?<br>Is it necessary to apply for a permit in terms of the National Heritage Resources Act, 1999 (Act 25 of 1999)?<br><br>**Please note:** A Notice of Intent to Develop (Asha Consulting, 2014) was submitted to Heritage Western Cape ("HWC") on 26th September 2014. According to HWC's "Response to the Notification of Intent to Develop", no heritage resources will be affected by the proposed development and as such no further studies are required.<br><br>In an email dated 2nd October 2014 however, Andrew September of HWC confirmed that a Section 34 application will however be required for the renovation of the Fynbos Lodge.<br><br>**Please also note:** SAHRA confirmed in a letter dated 2nd February 2015 that SAHRA has no objection to the proposed demolition and development of the site.<br><br>SAHRA raised concern regarding the height of the proposed administrative building as a three storey building as the site on Rhodes Drive is located on a scenic and visually sensitive road and should therefore be treated as such. As such SHARA advised that a revision of the height, elevation and edge conditions should be considered.<br><br>The architect, VMA Architects, has revised the elevation of the building to be a building of 2.5 storeys instead of the originally proposed three storeys. The visual specialist has also confirmed in correspondence dated 6th February 2015 as well as in a visual assessment report dated 10th February 2015, that whilst the proposed development will result in a change in the visual landscape, the scenic resources of the greater area will be minimally affected and moderately affected at the local scale. If mitigation measures are implemented however, the visual impact will be low.<br><br>In addition, please also refer to Section 8 (b) "Social Impacts: Sense of Place" below which outlines in detail the anticipated visual impacts of the proposed development and highlights the visual specialist's proposed mitigation measures to reduce negative visual impacts and enhance the positive visual impacts.<br><br>**Please refer to the NID (Asha Consulting, 2014) and Visual Impact Assessment (Megan Anderson Landscape Architects, 2015) as contained in Appendix D of this report as well as HWC's response and the letter from SAHRA as contained in Appendix E of this report.** | **YES** | NO |

If YES, please provide proof that this permit application has been submitted to SAHRA or the relevant provincial authority.

## 8. SOCIO-ECONOMIC CHARACTER

### a) Local Municipality

Please provide details on the socio-economic character of the local municipality in which the proposed site(s) are situated.

**Please note:** All socio-economic information contained in Section 8a is sourced from the "*City of Cape Town - 2011 Census Suburb, Bishopscourt".*
(City of Cape Town: Strategic Development Information and GIS Department, 2013)[3].

Level of unemployment:

| Bishopscourt Labour Force Indicators | Black African | Coloured | Asian | White | Other | Total |
|---|---|---|---|---|---|---|
| **Population aged 15 to 64 years** | **168** | **63** | **66** | **768** | **21** | **1 086** |
| **Labour Force** | **138** | **51** | **39** | **507** | **18** | **753** |
| Employed | 138 | 51 | 39 | 480 | 18 | 726 |
| Unemployed | 0 | 0 | 0 | 27 | 0 | 27 |
| **Not Economically Active** | **30** | **12** | **27** | **261** | **3** | **333** |
| Discouraged Work-seekers | 0 | 0 | 0 | 0 | 0 | 0 |
| Other not economically active | 30 | 12 | 27 | 261 | 3 | 333 |
| **Rates %** | | | | | | |
| Unemployment rate | 0.00% | 0.00% | 0.00% | 5.33% | 0.00% | 3.59% |
| Labour absorption rate | 82.14% | 80.95% | 59.09% | 62.50% | 85.71% | 66.85% |
| Labour Force participation rate | 82.14% | 80.95% | 59.09% | 66.02% | 85.71% | 69.34% |

**Figure 2: Table depicting the levels of employment in the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

Economic profile of local municipality:

| Bishopscourt Population | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| | Num | % | Num | % | Num | % |
| Black African | 93 | 5.8% | 110 | 6.9% | 203 | 12.7% |
| Coloured | 24 | 1.5% | 60 | 3.7% | 84 | 5.2% |
| Asian | 51 | 3.2% | 37 | 2.3% | 88 | 5.5% |
| White | 585 | 36.5% | 601 | 37.5% | 1 186 | 74.0% |
| Other | 20 | 1.2% | 21 | 1.3% | 41 | 2.6% |
| Total | 773 | 48.3% | 829 | 51.7% | 1 602 | 100.0% |

**Figure 3: Table depicting the racial population breakdown of the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

[3] http://www.capetown.gov.za/en/stats/2011CensusSuburbs/2011_Census_CT_Suburb_Bishopscourt_Profile.pdf

| Bishopscourt Age | Black African | | Coloured | | Asian | | White | | Other | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Num | % | Num | % | Num | % | Num | % | Num | % | Num | % |
| 0 to 4 years | 7 | 3.4% | 4 | 4.7% | 7 | 8.0% | 69 | 5.8% | 6 | 13.3% | 93 | 5.8% |
| 5 to 14 years | 16 | 7.9% | 11 | 12.9% | 8 | 9.2% | 154 | 13.0% | 8 | 17.8% | 197 | 12.3% |
| 15 to 24 years | 26 | 12.8% | 10 | 11.8% | 23 | 26.4% | 161 | 13.6% | 2 | 4.4% | 222 | 13.8% |
| 25 to 64 years | 140 | 69.0% | 55 | 64.7% | 42 | 48.3% | 614 | 51.7% | 21 | 46.7% | 872 | 54.2% |
| 65 years and older | 14 | 6.9% | 5 | 5.9% | 7 | 8.0% | 190 | 16.0% | 8 | 17.8% | 224 | 13.9% |
| Total | 203 | 100.0% | 85 | 100.0% | 87 | 100.0% | 1 188 | 100.0% | 45 | 100.0% | 1 608 | 100.0% |

**Figure 4: Table depicting the breakdown of age across race in the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

| Bishopscourt Monthly Household Income | Black African | | Coloured | | Asian | | White | | Other | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Num | % | Num | % | Num | % | Num | % | Num | % | Num | % |
| No income | 9 | 11.1% | 9 | 33.3% | 0 | 0.0% | 39 | 9.5% | 3 | 25.0% | 60 | 10.8% |
| R 1 - R 1 600 | 6 | 7.4% | 3 | 11.1% | 0 | 0.0% | 9 | 2.2% | 0 | 0.0% | 18 | 3.2% |
| R 1 601 - R 3 200 | 12 | 14.8% | 0 | 0.0% | 0 | 0.0% | 9 | 2.2% | 0 | 0.0% | 21 | 3.8% |
| R 3 201 - R 6 400 | 24 | 29.6% | 3 | 11.1% | 0 | 0.0% | 18 | 4.4% | 0 | 0.0% | 45 | 8.1% |
| R 6 401 - R 12 800 | 12 | 14.8% | 3 | 11.1% | 0 | 0.0% | 18 | 4.4% | 3 | 25.0% | 36 | 6.5% |
| R 12 801 - R 25 600 | 3 | 3.7% | 3 | 11.1% | 0 | 0.0% | 42 | 10.2% | 3 | 25.0% | 51 | 9.2% |
| R 25 601 - R 51 200 | 6 | 7.4% | 0 | 0.0% | 6 | 25.0% | 75 | 18.2% | 0 | 0.0% | 87 | 15.7% |
| R 51 201 - R 102 400 | 6 | 7.4% | 3 | 11.1% | 3 | 12.5% | 99 | 24.1% | 3 | 25.0% | 114 | 20.5% |
| R 102 401 or more | 3 | 3.7% | 3 | 11.1% | 15 | 62.5% | 99 | 24.1% | 0 | 0.0% | 120 | 21.6% |
| Unspecified | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 3 | 0.7% | 0 | 0.0% | 3 | 0.5% |
| Total | 81 | 100.0% | 27 | 100.0% | 24 | 100.0% | 411 | 100.0% | 12 | 100.0% | 555 | 100.0% |

**Figure 5: Table depicting the monthly householeghold income in the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

| Bishopscourt Type of Dwelling | Black African | | Coloured | | Asian | | White | | Other | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Num | % | Num | % | Num | % | Num | % | Num | % | Num | % |
| Formal Dwelling | 72 | 94.7% | 26 | 100.0% | 22 | 100.0% | 406 | 99.3% | 13 | 100.0% | 539 | 98.7% |
| Informal dwelling / shack in backyard | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Informal dwelling / shack NOT in backyard | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Other | 4 | 5.3% | 0 | 0.0% | 0 | 0.0% | 3 | 0.7% | 0 | 0.0% | 7 | 1.3% |
| Total | 76 | 100.0% | 26 | 100.0% | 22 | 100.0% | 409 | 100.0% | 13 | 100.0% | 546 | 100.0% |

**Figure 6: Table depicting the type of dwellings in the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

| Bishopscourt Tenure Status | Black African | | Coloured | | Asian | | White | | Other | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Num | % | Num | % | Num | % | Num | % | Num | % | Num | % |
| Owned and fully paid off | 23 | 30.3% | 11 | 42.3% | 12 | 54.5% | 253 | 62.2% | 7 | 53.8% | 306 | 56.3% |
| Owned but not yet paid off | 11 | 14.5% | 5 | 19.2% | 6 | 27.3% | 98 | 24.1% | 3 | 23.1% | 123 | 22.6% |
| Rented | 3 | 3.9% | 3 | 11.5% | 2 | 9.1% | 50 | 12.3% | 3 | 23.1% | 61 | 11.2% |
| Occupied rent-free | 28 | 36.8% | 7 | 26.9% | 1 | 4.5% | 1 | 0.2% | 0 | 0.0% | 37 | 6.8% |
| Other | 11 | 14.5% | 0 | 0.0% | 1 | 4.5% | 5 | 1.2% | 0 | 0.0% | 17 | 3.1% |
| Total | 76 | 100.0% | 26 | 100.0% | 22 | 100.0% | 407 | 100.0% | 13 | 100.0% | 544 | 100.0% |

**Figure 7: Table depicting the tenure status in the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

| Bishopscourt Access to Piped Water | Black African | | Coloured | | Asian | | White | | Other | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Num | % | Num | % | Num | % | Num | % | Num | % | Num | % |
| Piped water inside dwelling | 75 | 100.0% | 27 | 100.0% | 21 | 100.0% | 405 | 99.3% | 12 | 100.0% | 540 | 99.4% |
| Piped water inside yard | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Piped water outside yard: < 200m | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Piped water outside yard: > 200m | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| No access to piped water | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 3 | 0.7% | 0 | 0.0% | 3 | 0.6% |
| Total | 75 | 100.0% | 27 | 100.0% | 21 | 100.0% | 408 | 100.0% | 12 | 100.0% | 543 | 100.0% |

**Figure 8: Table depicting the accesibility of piped water in the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

| Bishopscourt Toilet Facility | Black African | | Coloured | | Asian | | White | | Other | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Num | % | Num | % | Num | % | Num | % | Num | % | Num | % |
| Flush toilet (connected to sewerage system) | 75 | 100.0% | 27 | 100.0% | 21 | 100.0% | 405 | 99.3% | 15 | 100.0% | 543 | 99.5% |
| Flush toilet (with septic tank) | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Chemical toilet | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Pit toilet with ventilation (VIP) | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 3 | 0.7% | 0 | 0.0% | 3 | 0.5% |
| Pit toilet without ventilation | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Bucket toilet | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Other | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| None | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Total | 75 | 100.0% | 27 | 100.0% | 21 | 100.0% | 408 | 100.0% | 15 | 100.0% | 546 | 100.0% |

**Figure 9: Table depicting the accesibility to toilet facilities in the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

| Bishopscourt Refuse Disposal | Black African | | Coloured | | Asian | | White | | Other | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Num | % | Num | % | Num | % | Num | % | Num | % | Num | % |
| Removed by local authority/private company at least once a week | 75 | 100.0% | 27 | 100.0% | 24 | 100.0% | 408 | 100.0% | 12 | 100.0% | 546 | 100.0% |
| Removed by local authority/private company less often | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Communal refuse dump | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Own refuse dump | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| No rubbish disposal | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Other | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Total | 75 | 100.0% | 27 | 100.0% | 24 | 100.0% | 408 | 100.0% | 12 | 100.0% | 546 | 100.0% |

**Figure 10: Table depicting the accesibility to refuse disposal services in the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

| Bishopscourt Energy used for Lighting | Black African | | Coloured | | Asian | | White | | Other | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Num | % | Num | % | Num | % | Num | % | Num | % | Num | % |
| Electricity | 75 | 100.0% | 27 | 100.0% | 21 | 87.5% | 408 | 99.3% | 9 | 100.0% | 540 | 98.9% |
| Gas | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 3 | 0.7% | 0 | 0.0% | 3 | 0.5% |
| Paraffin | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Candles | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Solar | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| None | 0 | 0.0% | 0 | 0.0% | 3 | 12.5% | 0 | 0.0% | 0 | 0.0% | 3 | 0.5% |
| Total | 75 | 100.0% | 27 | 100.0% | 24 | 100.0% | 411 | 100.0% | 9 | 100.0% | 546 | 100.0% |

**Figure 11: Table depicting the energy usage for lighting in the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

Level of education:

| Bishopscourt Adult Education (for all aged 20+) | Black African | | Coloured | | Asian | | White | | Other | | Total | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Num | % | Num | % | Num | % | Num | % | Num | % | Num | % |
| No schooling | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% |
| Some primary | 21 | 12.5% | 21 | 36.8% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 42 | 3.6% |
| Completed primary | 6 | 3.6% | 6 | 10.5% | 0 | 0.0% | 0 | 0.0% | 0 | 0.0% | 12 | 1.0% |
| Some secondary | 42 | 25.0% | 9 | 15.8% | 12 | 18.2% | 33 | 3.9% | 0 | 0.0% | 96 | 8.2% |
| Grade 12 | 48 | 28.6% | 12 | 21.1% | 18 | 27.3% | 150 | 17.5% | 0 | 0.0% | 228 | 19.5% |
| Higher | 45 | 26.8% | 9 | 15.8% | 36 | 54.5% | 651 | 76.1% | 24 | 100.0% | 765 | 65.4% |
| Other | 6 | 3.6% | 0 | 0.0% | 0 | 0.0% | 21 | 2.5% | 0 | 0.0% | 27 | 2.3% |
| Total | 168 | 100.0% | 57 | 100.0% | 66 | 100.0% | 855 | 100.0% | 24 | 100.0% | 1 170 | 100.0% |

**Figure 12: Table depicting adult education in the suburb of Bishopscourt.**
(Table courtesy of the City of Cape Town Strategic Development Information and GIS Department accessed from the City of Cape Town website as outlined above in October 2014).

**b) Socio-economic value of the activity**

| | | |
|---|---|---|
| What is the expected capital value of the activity on completion? | According to the project manager, Amjad Hendricks (Aurecon), the total project cost will be R45 million (excluding the Fynbos Lodge upgrade). | |
| What is the expected yearly income that will be generated by or as a result of the activity? | Please note that the proposed development is not an income generating business but services in support of SANBI's continued operation. | |
| Will the activity contribute to service infrastructure? | **YES** | NO |
| Is the activity a public amenity? | YES | **NO** |
| How many new employment opportunities will be created in the development and construction phase of the activity/ies? | During the construction phase, temporary employment opportunities will be created for the local community for the duration of the construction phase (approximately 18 months).<br><br>In a meeting dated 22nd October 2014, the project manager, Amjad Hendricks (Aurecon) confirmed that work to be undertaken during the construction phase will go out to tender and as such it is unknown at this point how many employment opportunities will be created by the construction phase as this can only be confirmed following the awarding of the tender. | |
| What is the expected value of the employment opportunities during the development and construction phase? | As noted above, work to be undertaken during the construction phase will go out to tender and as such the amount of employment opportunities available is unknown at this stage. As a result of this, the expected value of employment opportunities during the development and construction phase cannot be confirmed at this point. | |
| What percentage of this will accrue to previously disadvantaged individuals? | As noted above, work to be undertaken during the construction phase will go out to tender. In a meeting dated 22nd October 2014, the project manager, Amjad Hendricks (Aurecon) confirmed that the tender will contain a provision that 50% of those employed should be local unskilled previously disadvantaged individuals. | |

| | |
|---|---|
| How many permanent new employment opportunities will be created during the operational phase of the activity? | None. According to the project manager, Amjad Hendricks (Aurecon), the proposed development will incorporate the following existing departments currently placed in temporary buildings around Kirstenbosch National Botanical Garden into one single permanent building:<br>➢ Finance;<br>➢ Human Resources;<br>➢ Information and Technology;<br>➢ Early Detection and Rapid Response Programme; and<br>➢ Marketing and Communication.<br><br>As such, no new employment opportunities will be created during the operational phase of the development as the proposed development is to accommodate the existing Kirstenbosch staff complement. |
| What is the expected current value of the employment opportunities during the first 10 years? | None. No new employment opportunities will be created during the operational phase of the development as the proposed development is to accommodate the existing Kirstenbosch staff complement. |
| What percentage of this will accrue to previously disadvantaged individuals? | None. No new employment opportunities will be created during the operational phase of the development as the proposed development is to accommodate the existing Kirstenbosch staff complement. |

**SOCIAL IMPACTS: SENSE OF PLACE**

According to the Visual Impact Assessment (Megan Anderson Landscape Architects, 2015), and additional correspondence dated 6th February 2015, the zone of visual influence of the proposed development is limited to the immediate site due to the surrounding trees.

While there will be a change to the visual environmental through the construction of a new 2.5 storey administration building, on the footprint of the existing building, this could be a positive improvement to the visual scene at the site depending on the building materials and external finishes and the retention of all the tress.

The proposed parking area could potentially be a negative minor visual impact as it will result in a greater paved area with less greenery in the form of tress and lawns.

Other potential visual impacts will be possible additional night lighting and associated light spill onto Rhodes Drive.

While the developments will result in a change in the visual landscape, the scenic resources of the greater area will be minimally affected and moderately affected at the local scale. If mitigation measures are implemented however, the visual impact will be low.

Mitigation measures should include the retention of the wooded area around new the upgraded administration building, appropriate hard and soft landscaping of the proposed parking development, which must play a dual role as the forecourt of the Fynbos Lodge building, and limited external lighting on the administration building.

"*Visual Statement: SANBI New Buildings at the Kirstenbosch Botanical Garden, Cape Town"* (Megan Anderson Landscape Architects, 2015).

**Please refer to the Visual Impact Assessment (Megan Anderson Landscape Architects, 2015) as contained in Appendix D of this report.**

## 9. BIODIVERSITY

Please note: The Department may request specialist input/studies depending on the nature of the biodiversity occurring on the site and potential impact(s) of the proposed activity/ies. To assist with the identification of the biodiversity occurring on site and the ecosystem status consult http://bgis.sanbi.org or BGIShelp@sanbi.org. Information is also available on compact disc (cd) from the Biodiversity-GIS Unit, Ph (021) 799 8698. This information may be updated from time to time and it is the applicant/ EAP's responsibility to ensure that the latest version is used. A map of the relevant biodiversity information (including an indication of the habitat conditions as per (b) below) and must be provided as an overlay map to the property/site plan as Appendix D to this report.

**a) Indicate the applicable biodiversity planning categories of all areas on site and indicate the reason(s) provided in the biodiversity plan for the selection of the specific area as part of the specific category)**

| Systematic Biodiversity Planning Category | If CBA or ESA, indicate the reason(s) for its selection in biodiversity plan |
|---|---|

| | | | | |
|---|---|---|---|---|
| Critical Biodiversity Area (CBA) | Ecological Support Area (ESA) | **Other Natural Area (ONA)** | No Natural Area Remaining (NNR) | The entire Kirstenbosch estate (which is classified as a nature reserve), is adjacent to the Table Mountain National Park and both form part of the Cape Floristic Region Protected Area, which was proclaimed a UNESCO World Heritage Site in 2004. |
| | | | | |
| | | | | |

**b) Indicate and describe the habitat condition on site**

| **Habitat Condition** | **Percentage of habitat condition class (adding up to 100%)** | **Description and additional Comments and Observations (including additional insight into condition, e.g. poor land management practises, presence of quarries, grazing, harvesting regimes etc).** |
|---|---|---|
| Natural | 0% | |
| Near Natural (includes areas with low to moderate level of alien invasive plants) | 20% | According to the Kirstenbosch Botanical Assessment (Nick Helme, Botanical Surveys, 2014), the vegetated areas on site consist of a mix of locally indigenous, natural vegetation, and a "smorgasbord" of planted species, many of which are not locally indigenous. Two patches of vegetation of Medium botanical sensitivity were mapped on site which together covers about 20% of the site and support the least modified natural vegetation on site.<br><br>These areas will not be impacted by the proposed development as all development will take place within the area of Low botanical sensitivity described below. |
| Degraded (includes areas heavily invaded by alien plants) | 0% | |
| Transformed (includes cultivation, dams, urban, plantation, roads, etc) | 80% | According to the Kirstenbosch Botanical Assessment (Nick Helme Botanical Surveys, 2014), the areas that are currently developed (roads, parking areas, buildings, pathways) and that are currently planted garden or lawns are all of Low botanical conservation value. These areas make up about 80% of the site/study area. |

**c) Complete the table to indicate:**

(i) the type of vegetation, including its ecosystem status, present on the site; and

(ii) whether an aquatic ecosystem is present on site.

<table>
<tr><th colspan="2">Terrestrial Ecosystems</th><th colspan="6">Aquatic Ecosystems</th></tr>
<tr><td rowspan="4">Ecosystem threat status as per the National Environmental Management: Biodiversity Act (Act No. 10 of 2004)</td><td>Critical<br>➢ Peninsula Granite Fynbos</td><td colspan="3">Wetland (including RIVERS, depressions, channelled and unchanneled wetlands, flats, seeps pans, and artificial wetlands)</td><td colspan="2">Estuary</td><td colspan="2">Coastline</td></tr>
<tr><td>Endangered</td><td colspan="3" rowspan="2"></td><td colspan="2" rowspan="2"></td><td colspan="2" rowspan="2"></td></tr>
<tr><td>Vulnerable</td></tr>
<tr><td>Least Threatened<br>➢ Southern Afrotemperate Forest</td><td>YES<br>The upper catchment of the Liesbeck River is located adjacent to the site on the south-west border.</td><td>NO</td><td>UNSURE</td><td>YES</td><td>NO</td><td>YES</td><td>NO</td></tr>
</table>

**d) Please provide a description of the vegetation type and/or aquatic ecosystem present on site, including any important biodiversity features/information identified on site (e.g. threatened species and special habitats)**

**Botanical:**

According to the Kirstenbosch Botanical Assessment (Nick Helme Botanical Surveys, 2014), and the South Africa Vegetation Map (Mucina & Rutherford 2006) the original natural vegetation throughout the study area is Peninsula Granite Fynbos, with Southern Afrotemperate Forest patches higher up the mountain, about 600m to the west.

According to the Kirstenbosch Botanical Assessment (Nick Helme Botanical Surveys, 2014), the vegetated areas on site consist of a mix of locally indigenous, natural vegetation, and a "smorgasbord" of planted species, many of which are not locally indigenous. There are very large stone pines along the road, which are exotic although only mildly invasive.

There are many alien invasive species present on the site, including *Acacia elata, Hypochaeris radicata* (dandelion), *Commelina* sp*., Pennisetum clandestinum* (kikuyu grass), *Plantago lanceolata* (ribwort), *Vinca major* (periwinkle) and *Hedera* sp. (ivy).

Planted, non-locally indigenous species include *Ficus* sp., *Strelitzia* sp., *Searsia lancea* (karee), *Cussonia* sp. (cabbage tree), *Plectranthus* spp., *Dietes* sp., *Aloe arborescens*, *Asparagus* spp., *Crassula* sp., *Rhoicissus digitata* (wild grape), *Portulacaria afra* (spekboom), *Hypoestes aristata* (ribbon flower), *Barleria* sp., *Tecomaria* sp., *Quercus robur* (oak), *Eragrostis curvula, Senecio triqueter, Pelargonium* sp., *Psychotria* sp. and *Coleonema pulchellum*.

Locally indigenous species noted include *Celtis africana* (white stinkwood), *Kiggelaria africana* (wild peach), *Brabejum stellatifolium* (wild almond), *Oxalis pes-caprae, Searsia lucida* (blink taaibos), *S. tomentosa, Virgilia oroboides* (keurboom), *Myrsine africana, Chasmanthe aethiopica* (cobraflower), *Stenotaphrum secundatum* (buffalo grass), *Cassine peragua* (saffronwood), *Euryops pectinatus, Salvia africana-caerulea, Cotyledon orbiculata*, *Diospyros whyteana* (bladder nut), *Olea europaea* ssp. *africana* (wild olive), *Polygala myrtifolia, Clutia pulchella, Gymnosporia buxifolia* (pendoring), *Podalyria calyptrata* (keurtjie), *Apodytes dimidiata* (white pear), *Asparagus scandens, Canthium inerme, Knowltonia vesicatoria, Passerina corymbosa* (gonna) and *Aristea major*. These are all widespread and common species.

No plants of Species of Conservation Concern were recorded and none are likely to occur in viable or significant populations in the study area.

(*Botanical Assessment of proposed development area at Kirstenbosch National Botanical Garden, Nick Helme Botanical Surveys, 2014*).

**Please refer to Appendix D for the Botanical Impact Assessment (Nick Helme Botanical Surveys, 2014).**

**Freshwater Ecosystems**

According to the Freshwater Impact Assessment (Freshwater Consulting Group, 2014) the Present Ecological State ("PES"), of the riparian zone upstream of Culvert A is geomorphically stable, but dominated by alien tree species, whereas the riparian zone immediately adjacent to the proposed parking area (between Culvert A and B) is severely degraded by both alien plant species, as well as by down-cutting and gully erosion as a result of elevated water velocities through Culvert A, exacerbated by the absence of erosion mitigation measures. Despite these changes, the bed of the river itself has stabilised and instream habitat conditions are relatively good both upstream and downstream of Culvert A. Downstream of Culvert A instream habitat conditions are largely natural whereas the riparian zone is largely modified.

The water quality in the potentially affected river reach, both upstream and downstream of Culvert A, is considered to be slightly to moderately impacted mainly due to the use of organic material and fertilizer in the Kirstenbosch National Botanical Garden. Runoff of nutrient-enriched water is likely to elevate the nutrient concentrations in the river and possibly the concentration of Total Dissolved Solids, relative to the presumed natural state.

A total of 13 aquatic invertebrate families were recorded instream at the site just upstream of Culvert A. Five of these taxa have a high SASS5 sensitivity score including notonemourid stoneflies and teloganodid mayflies which suggests that habitat and water quality conditions are relatively good. Please see Table 2 as contained in the Freshwater Impact Assessment for a full list of aquatic invertebrate taxa present in the river adjacent to the proposed development site.

The portion of the river adjacent to the proposed development site is considered to be in a Fair/Good ecological condition. This rating is consistent with the expectation that the river is moderately impacted by development in and around Kirstenbosch National Botanical Garden and is in agreement with the PES results stated above.

The Ecological Importance and Sensitivity ("EIS"), of the aquatic ecosystems associated with the portion of the Liesbeck River adjacent to the site affected by the proposed development was assessed according to the procedures recommended for rivers by the Department of Water Affairs. The biotic importance and sensitivity of the aquatic ecosystem (i.e. the presence /absence of rare, unique or endangered biota, species sensitivity and richness) was considered to be low overall but moderate to high for the instream component of the river, mainly due to the confirmed occurrence of the Cape Galaxius fish species. The importance and sensitivity of the habitat (abiotic) ecosystem components was rated as moderate overall and high for the instream component.

Finally, in terms of the National Freshwater Ecosystem Priority Areas ("NFEPA") project, the Liesbeck River and its tributaries are listed as a Fish Support Area.

(*Freshwater Ecological Assessment for the proposed establishment of a new administration building at Kirstenbosch National Botanical Garden,* Freshwater Consulting Group, 2014).

**Please refer to Appendix D for the Freshwater Impact Assessment (Freshwater Consulting Group, 2014).**

# SECTION C: PUBLIC PARTICIPATION

## 1. ADVERTISEMENT AND NOTICE

| | | |
|---|---|---|
| **Publication name** | To be inserted with The Final BAR | |
| **Date published** | To be inserted with The Final BAR | |
| **Site notice position** | **Latitude** | **Longitude** |
| | To be inserted with The Final BAR | To be inserted with The Final BAR |
| **Date placed** | To be inserted with The Final BAR | |

Include proof of the placement of the relevant advertisements and notices in Appendix E1.

**PLEASE NOTE:** The initial notification period will take place at the same time as the Draft Basic Assessment Report (this report) is released for public comment. Proof of all public participation activities undertaken will be included in the Final Basic Assessment Report in due course.

## 2. DETERMINATION OF APPROPRIATE MEASURES

Provide details of the measures taken to include all potential I&APs as required by Regulation 54(2) (e) and 54(7) of GN R.543.

Key stakeholders (other than organs of state) identified in terms of Regulation 54(2) (b) of GN R.543:

| **Title, Name and Surname** | **Affiliation/ key stakeholder status** | **Contact details (tel number or e-mail address)** |
|---|---|---|
| Elizabeth Brunette | Ward Councillor | 082 823 6584<br>Elizabeth.Brunette@capetown.gov.za |
| N/A | Bishopscourt Village Residents Association | info@bvra.org.za |
| N/A | Fernwood Residents Association | moirlin@iafrica.com |
| Ms. E Pugh | Claremont Public Library | 021 671 6993<br>Claremont.library@capetown.gov.za |
| Garth Hewitt | Peoples Post Newspaper Bishopscourt | 021 910 6520<br>ghewitt@media24.com |

Include proof that the key stakeholder received written notification of the proposed activities as Appendix E2. This proof may include any of the following:

- e-mail delivery reports;
- registered mail receipts;
- courier waybills;
- signed acknowledgements of receipt; and/or
- or any other proof as agreed upon by the competent authority.

**Please note:** The initial notification period will take place at the same time as the Draft Basic Assessment Report (this report) is released for public comment. Proof of all public participation activities undertaken will be included in the Final Basic Assessment Report in due course.

## 3. ISSUES RAISED BY INTERESTED AND AFFECTED PARTIES

| Summary of main issues raised by I&APs | Summary of response from EAP |
|---|---|
| To be inserted with The Final BAR | |

## 4. COMMENTS AND RESPONSE REPORT

The practitioner must record all comments received from I&APs and respond to each comment before the Draft BAR is submitted. The comments and responses must be captured in a comments and response report as prescribed in the EIA regulations and be attached to the Final BAR as Appendix E3.

**PLEASE NOTE:** This information will be inserted with the Final BAR.

## 5. AUTHORITY PARTICIPATION

Authorities and organs of state identified as key stakeholders:

| Authority/Organ of State | Contact person (Title, Name and Surname) | Tel No | Fax No | e-mail | Postal address |
|---|---|---|---|---|---|
| National Department of Environmental Affairs | Ms Mmatlala Rabothata | 012 399 9372 | N/A | mrabothata@environment.gov.za | Environment House 473 Steve Biko (C/o Steve Biko St & Soutpansberg Rd) Arcadia Pretoria 0083 |
| Department of Environmental Affairs and Development Planning: Land Management (Region 2) | Eldon van Boom | 021 483 5829 | 021 483 4372 | Eldon.VanBoom@westerncape.gov.za | Private Bag X9086 Cape Town 8000 |
| Department of Water Affairs | Derril Daniels | 021 941 6189 | 021 941 6107 | danielsd@dwa.gov.za | Private Bag x16 Sanlamhof 7532 |
| City of Cape Town Municipality: (District H) | Andrew Greenwood | 021 710 8050 | 021 710 8002 | Andrew.Greenwood@capetown.gov.za | Private bag X5 Plumstead 7801 |
| Heritage Western Cape | Andrew Hall | 021 483 9543 | 021 483 9842 | hwc@pgwc.gov.za | Protea Assurance Building Green Market Square Cape Town 8000 |

| | | | | | |
|---|---|---|---|---|---|
| Cape Nature | Catherine Knowles | 021 483 0118/0121 | 086 556 7764 | cknowles@capenature.co.za | Private Bag X29 Gatesville 7766 |

Include proof that the Authorities and Organs of State received written notification of the proposed activities as appendix E4.

**PLEASE NOTE:** This information will be inserted with the Final BAR.

In the case of renewable energy projects, Eskom and the SKA Project Office must be included in the list of Organs of State.

## 6. CONSULTATION WITH OTHER STAKEHOLDERS

Note that, for any activities (linear or other) where deviation from the public participation requirements may be appropriate, the person conducting the public participation process may deviate from the requirements of that sub-regulation to the extent and in the manner as may be agreed to by the competent authority.

Proof of any such agreement must be provided, where applicable. Application for any deviation from the regulations relating to the public participation process must be submitted prior to the commencement of the public participation process.

A list of registered I&APs must be included as appendix E5.

**PLEASE NOTE:** This information will be inserted with the Final BAR.

Copies of any correspondence and minutes of any meetings held must be included in Appendix E6.

**PLEASE NOTE:** A copy of the meeting minutes and presentation for a project meeting held on 14th May 2014 regarding the proposed development as well as a project meeting held on 22nd October 2014 has been included as part of Appendix E6 in this report.

## SECTION D: IMPACT ASSESSMENT

The assessment of impacts must adhere to the minimum requirements in the EIA Regulations, 2010, and should take applicable official guidelines into account. The issues raised by interested and affected parties should also be addressed in the assessment of impacts.

**Methodology and rating Scale used to determine the impacts of the proposed development:**

| Criteria | Rating Scale | Description |
|---|---|---|
| **Nature** | Positive | A description of the impact related to the proposed development |
| | Negative | |
| **Extent** | Site | The impact will affect the site / proposed development area only. |
| | Local | The impact will affect the site, the adjacent properties and the immediate surrounding area. |
| | Regional | The impact will affect the municipal area. |
| | Provincial | The impact will affect the provincial area. |
| | National | The impact will affect more than three provinces |
| **Duration** | Temporary | The impact of the proposed development will last between 0-6 months |
| | Short term | The impact of the proposed development will last between 6- 18 months. |
| | Medium term | The impact of the proposed development will last between 18 months and 5 years. |
| | Long term | The impact of the proposed development will last between 5 to 10 years. |
| | Permanent | The impact will be ongoing for the lifespan of the proposed development. |
| **Severity** | Low | Where the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected |
| | Moderate | Where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are moderately affected |
| | High | Where natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected. |
| **Potential for impact on irreplaceable resources** | No | No irreplaceable resources will be impacted. |
| | Yes | Irreplaceable resources will be impacted. |
| **Consequence** | Extremely detrimental | A combination of extent, duration, severity and the potential for impact on irreplaceable resources |
| | Highly detrimental | |
| | Moderately detrimental | |
| | Slightly detrimental | |
| | Negligible | |
| | Slightly beneficial | |
| | Moderately beneficial | |
| | Highly beneficial | |
| | Extremely beneficial | |
| **Probability (the likelihood of the impact occurring)** | Improbable | It is highly unlikely or less than 50 % likely that an impact will occur. |
| | Probable | It is between 50 and 70 % certain that the impact will occur. |
| | Definite | It is more than 75 % certain that the impact will occur or it is definite that the impact will occur. |
| **Significance** | Very High (Negative) | A function of Consequence and Probability |
| | High (Negative) | |
| | Moderate (Negative) | |
| | Low (Negative) | |
| | Neutral | |
| | Low (Positive) | |
| | Moderate (Positive) | |
| | High (Positive) | |
| | Very High (Positive) | |

## 1. IMPACTS THAT MAY RESULT FROM THE PLANNING AND DESIGN, CONSTRUCTION, OPERATIONAL, DECOMMISSIONING AND CLOSURE PHASES AS WELL AS PROPOSED MANAGEMENT OF IDENTIFIED IMPACTS AND PROPOSED MITIGATION MEASURES

Provide a summary and anticipated significance of the potential direct, indirect and cumulative impacts that are likely to occur as a result of the planning and design phase, construction phase, operational phase, decommissioning and closure phase, including impacts relating to the choice of site/activity/technology alternatives as well as the mitigation measures that may eliminate or reduce the potential impacts listed. This impact assessment must be applied to all the identified alternatives to the activities identified in Section A (2) of this report.

**Alternative 1 (preferred alternative):**

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| **CONSTRUCTION PHASE IMPACTS**<br><br>This phase refers to the demolition of the existing prefabricated Head Office and IT buildings and the construction of the new administration building and parking area within the developed portion of Farm CA875-RE of the Kirstenbosch National Botanical Garden. According to the project manager, Amjad Hendricks (Aurecon), the length of the construction phase is anticipated to be approximately 18 months. | | | |
| **Air Quality Impacts: Dust.** | ***Direct impacts***<br>The construction phase will involve the following dust generating activities:<br>➢ Demolition of the existing prefabricated Kirstenbosch Head Office building and prefabricated IT building;<br>➢ Clearing of a portion of the cultivated garden to make space for the proposed parking area;<br>➢ Excavation activities prior to the construction of the new administration building;<br>➢ Construction of the new administration building;<br>➢ Construction of the new parking area; and<br>➢ Storage of construction materials (sand) on site. | The extent of the impact will be local. The duration of the impact will be short term. The impact will cease once the construction phase is over.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Negligible. | Mitigation of potential dust impacts include:<br>➢ The use of water bowsers;<br>➢ Wetting down the site;<br>➢ Erection of shade netting to prevent off site dust migration;<br>➢ Covering construction materials (sand) with weighted down shade cloth or a similar material; and<br>➢ Regular manual sweeping of the surrounding roads and sidewalks. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>None. | N/A | N/A |
| **Traffic Impacts.** | ***Direct impacts:***<br>Increase in construction vehicles moving to and from the site resulting in an increase in traffic on Rhodes Drive adjacent to | The extent of the impact will be local. The duration of the impact will be short term and will cease once the construction phase is over. | Proposed mitigation measures include:<br>➢ The contractor must provide a traffic marshal for situations where construction traffic may impede normal traffic flows on |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | the site and the main internal access road within Kirstenbosch National Botanical Garden itself. | Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Negligible. | Rhodes Drive adjacent to the site and the main internal access road within Kirstenbosch National Botanical Garden itself.<br>➢ All vehicles will be legally compliant.<br>➢ All drivers will be competent and in possession of an appropriate valid driver's license.<br>➢ All vehicles travelling on site will adhere to the specified speed limits.<br>➢ The movement of all vehicles will be controlled such that they remain on designated routes.<br>➢ No member of the workforce will be permitted to drive a vehicle under the influence of alcohol or narcotic substances.<br>➢ Should there be any abnormal traffic loads as a consequence of the construction phase activities, the local municipality and relevant traffic authorities should be notified. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>The proposed activity will have a cumulative impact on the surrounding roads, particularly on Rhodes Drive as there is traffic on Rhodes Drive with existing associated traffic impacts. | The extent of the impact will be local. The duration of the impact will be short term and will cease once the construction phase is over.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Negligible. | Measures to mitigate against cumulative traffic impacts can only be controlled on and adjacent to the site and as such the proposed mitigation measures outlined above still apply. |
| **Noise Impacts.** | ***Direct impacts:***<br>Increase in noise levels up to 60dB in an otherwise quiet area (associated with the construction vehicles as well as the equipment which will be utilised for the construction phase of the project) and subsequent disturbance of the surrounding residents and landowners as well as the users of the Kirstenbosch National Botanical Garden. | The extent of the impact will be local. The duration will be short term and will only occur during working hours approved by the Local Municipality (anticipated to be 08h00- 17h00 on weekdays only). The impact will cease once the construction phase is over.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Negligible. | Proposed mitigation measures include:<br>➢ Prior to the commencement of work on site, all on site personnel should undergo training or have an information session regarding appropriate noise levels.<br>➢ The construction contractor must use modern equipment, which produces the least noise.<br>➢ Any unavoidably noisy equipment must be identified and located in an area where it has least impact.<br>➢ The use of noise shielding screens must be considered and the operation of such machinery restricted to when it is actually required.<br>➢ No noise generating work is to |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | | | be conducted outside of normal working hours as approved by the local authority. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>None. | N/A | N/A |
| **Social Impacts: Income and Employment** | ***Direct impacts:***<br>The construction activities will have a small scale impact on local employment and income opportunities for local construction workers and subsequent improvement in the livelihoods of all those employed as well as their dependents. | The extent of the impact will be confined to the site itself. The duration of the impact will be short term and will cease once the construction phase is over.<br><br>Significance:<br>Low (Positive). | The impact is considered a positive and therefore no mitigation measures are required. |
| | ***Indirect impacts:***<br>Improvement in local economic activity for the duration of the proposed development. | The extent of the impact will be local. The duration of the impact will be short term and will cease once the construction phase is over.<br><br>Significance:<br>Low (Positive). | The impact is considered a positive and therefore no mitigation measures are required. |
| | ***Cumulative impacts:***<br>The benefits on local employment opportunities are considered cumulative as the surrounding area (Kirstenbosch National Botanical Garden administration, research and horticulture departments) are considered an additional source of employment. | The extent of the impact will be local. The duration of the impact will be short term and will cease once the construction phase is over.<br><br>Significance:<br>Low (Positive). | The impact is considered a positive and therefore no mitigation measures are required. |
| **Visual Impacts** | ***Direct impacts:***<br>The construction vehicles, machinery and construction camp as well as the construction materials located on site will have a minor visual impact on the surrounding environment. | The extent of the impact will be local. The duration of the impact will be short term and will cease once the construction phase is over.<br><br>Significance prior to mitigation:<br>Very Low (Negative).<br><br>Significance post mitigation:<br>Negligible. | Proposed mitigation measures include:<br>➢ Screening of the site during construction activities.<br>➢ Management of the placement of vehicles, construction camp and materials placed on site. Vehicles can be parked in one specific area whilst materials placed on site can be placed in neat piles in specified sections of the site prior to use.<br>➢ Construction materials stored on the site prior to their use and waste stored on the site prior to removal should be kept in neat, separate piles to ensure good housekeeping at all times.<br>➢ Should any lighting be required by the Contractor, it should be aimed at the area to be lit on site |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | | | and the over spillage must be kept to a minimum. |
| | ***Indirect impacts:*** Temporary loss of sense of place. | The extent of the impact will be local. The duration of the impact will be short term and will cease once the construction phase is over.<br><br>Significance prior to mitigation:<br>Very Low (Negative).<br><br>Significance post mitigation:<br>Negligible. | Measures to mitigate indirect visual impacts can only be controlled on and adjacent to the site and as such the proposed mitigation measures outlined above still apply. |
| | ***Cumulative impacts:*** None. | N/A | N/A |
| **Health and Safety Risk: Removal of Asbestos Roofing from the Fynbos Lodge** | ***Direct impacts:*** Inhalation of asbestos fibres during the incorrect removal of the asbestos roof tiles from the Fynbos Lodge and subsequent long term health risks (particularly asbestosis, mesothelioma and lung cancer). | The extent of the impact will be site specific and only affect the appointed contractor(s) allocated to remove the material. The duration of the impact risk will be temporary for the duration of the removal of the asbestos roofing.<br><br>Significance prior to mitigation:<br>High (Negative).<br><br>Significance post mitigation:<br>Low (Negative). | The measures contained in the Occupational Health and Safety Act (Act No. 85 of 1993) Asbestos Regulation (2001) must be adhered to at all times including but not limited to the following:<br>➢ An employer shall, before any employee is exposed or may be exposed to asbestos dust, after consultation with the health and safety committee established for that section of the workplace, ensure that the employee is adequately and comprehensively informed and trained;<br>➢ The asbestos must be prevented from becoming air borne;<br>➢ All areas where asbestos removal work will be carried out should be sealed off and access should be restricted;<br>➢ Personal protective equipment and clothing including a single-use respirator must be worn at all times; and<br>➢ Monitoring equipment must be worn to measure personal exposure to asbestos during the removal phase. |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** None. | N/A | N/A |
| **Heritage Impacts: Fynbos Lodge** | ***Direct impacts:*** According to the Notice of Intent to Develop (Asha Consulting, 2014), the only heritage resource that will be impacted is a structure greater than 60 years of age (Fynbos Lodge). | The extent of the impact will confined to the interior of the Fynbos Lodge itself only. The duration of the impact permanent once completed.<br><br>Significance:<br>Low (Positive). | The impact is considered a positive and therefore no mitigation measures are required. |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | This will be as a result of the internal renovations and refurbishments planned for this building (re-painting, removal of the asbestos roof and replacing it with a similar material and replacing internal infrastructures such as counter tops). | | |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** None. | N/A | N/A |
| **Botanical Impacts: Disturbance or loss of natural and partly natural cover.** | ***Direct impacts:*** According to the Botanical Assessment (Nick Helme Botanical Surveys, 2014), despite the majority of construction taking place in areas that are currently built, hardened or lawn, disturbance or loss of natural or partly natural (including the cultivated garden area) will occur (although less than 0.2ha) during the construction phase activities. | The extent of the impact will be confined to the construction site and site perimeter. The duration of the impact will be temporary to permanent.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Neutral. | Proposed mitigation measures as outlined in the Botanical Assessment Report (Nick Helme Botanical Surveys, 2014) are as follows:<br>➢ All alien invasive vegetation (excluding the only mildly invasive stone pines *Pinus pinea* which are a feature of the area) within the study area should be felled and/or removed.<br>➢ The area should be monitored for alien invasive vegetation for one year after construction.<br>➢ Suitable locally indigenous plant species should be planted in all areas requiring rehabilitation after construction is over.<br>➢ The Medium sensitivity areas indicated in Figure 2 of the Botanical Assessment attached as part of **Appendix D** should not be disturbed during construction. |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** None. | N/A | N/A |
| **Freshwater Ecology Impacts: Disturbance and loss of riparian vegetation.** | ***Direct impacts:*** According to the Freshwater Ecological Assessment (Freshwater Consulting Group, 2014), during the construction phase there will be disturbance to and loss of terrestrial and riparian vegetation as a result of soil compaction, excavations, trampling by construction personnel, and movement and storage of materials and machinery on site. | The extent of the impact will be site specific. The duration will be short term.<br><br>Significance prior to mitigation: Low (Negative)<br><br>Significance post mitigation: Very Low (Negative) | Mitigation measures proposed by the freshwater specialist include:<br>➢ No construction activities should be undertaken within 10 metres of the outer edge of the river channel except when the river stabilisation work is being done.<br>➢ Danger tape should be used to demarcate no-go areas within the recommended 10 metre buffer.<br>➢ All equipment and materials storage areas should be located at a minimum distance of 10 metres from the riparian edge of the Liesbeck River. |
| | ***Indirect impacts:*** | The extent of the impact will | Measures to mitigate indirect |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | As a consequence of the above impact, it is likely that there will be mobilisation of sediments into the river channel and increased sediment load downstream.<br><br>The risk of erosion and sedimentation will be greater during the high flow (winter) season. | be local. The duration will be short term.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Very Low (Negative). | freshwater ecology impacts can only be controlled on and adjacent to the site and as such the proposed mitigation measures outlined above still apply. |
| | ***Cumulative impacts:***<br>None. | N/A | N/A |
| **Freshwater Ecology Impacts: Degradation and pollution of the Liesbeck River and associated aquatic habitat.** | ***Direct impacts:***<br>According to the Freshwater Ecological Assessment (Freshwater Consulting Group, 2014), during the construction phase, waste materials and rubble generated by earth-moving and excavation as well as waste materials produced by work camps may end up in the river or along the riparian corridor resulting in the degradation and pollution of the Liesbeck River and the associated aquatic habitat. | The extent of the impact will be site specific. The duration of the impact will be short term for the duration of the construction phase activities.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Very Low (Negative). | Mitigation measures proposed by the freshwater specialist include:<br>➢ All rubble and other waste generated on the construction site should be removed from the site and disposed of at a recognised waste management facility.<br>➢ The river corridor (including the recommended 10 metre buffer area) must be inspected by the site manager and cleared of all waste on a daily basis.<br>➢ The Environmental Compliance Officer (ECO) must check whether there is any waste along the river corridor during every site inspection. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>None. | N/A | N/A |
| **Freshwater Ecology Impacts: Contamination of river and riparian corridor.** | ***Direct impacts:***<br>According to the Freshwater Ecological Assessment (Freshwater Consulting Group, 2014), during the construction phase, bitumen, fuels, oils, cement slurry and other related construction materials will very likely be utilised on site.<br><br>If these come into contact with the adjacent freshwater resources, these materials will degrade water quality in the Liesbeck River and pose an ecological hazard to aquatic communities downstream. | The extent of the impact will be local. The duration will be short term.<br><br>Significance prior to mitigation:<br>Moderate (Negative).<br><br>Significance post mitigation: Very Low (Negative). | Mitigation measures proposed by the freshwater specialist include:<br>➢ Proper management of these materials is essential to minimalize the risk of contamination.<br>➢ All environmentally hazardous materials including, but not limited to, bitumen, fuels, oils and cement slurry should be managed in such a way that they are not able to contaminate the river through direct spills or stormwater runoff.<br>➢ No bitumen, fuels, oils, cement, cement slurry, or any other environmentally hazardous materials should be stored within 10 metres of the riparian edge.<br>➢ Operators must manage and contain cement slurry, and remove and dispose of excess materials from the vicinity of the |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | | | riparian corridor.<br>➢ All spills should be reported immediately and workers should be instructed to store, transport and use hazardous materials in ways that minimise the risk of spills. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>None. | N/A | N/A |
| **Freshwater Ecology Impacts: Impacts associated with installation of gabions along river bank.** | ***Direct impacts:***<br>According to the Freshwater Ecological Assessment (Freshwater Consulting Group, 2014), the following negative construction phase impacts on the Liesbeck River ecosystem could occur when the gabions are installed along the river bank:<br>➢ Sedimentation of river and knock-on effects to aquatic biota, especially when the initial excavation work is carried out along the base of the river bank.<br>➢ Disruption of spawning of Cape Galaxius Fish in the Liesbeck River downstream of the construction site (the spawning period for this fish species complex is typically from spring to mid-summer).<br>➢ Localised alteration of flows and sediment loads in the river at and immediately downstream of the construction site, due to the presumed temporary isolation of an instream work area within the river when the initial work in the river is conducted and the pumping of water from this area back into the river.<br>➢ Physical disturbance to instream and riparian habitat, as a result of construction activities | The extent of the impact will be local. The duration will be short term for the duration of the construction and installation of the gabions.<br><br>Significance prior to mitigation: High (Negative).<br><br>Significance post mitigation: Low (Negative). | Mitigation measures proposed by the freshwater specialist include:<br>➢ When the initial work is undertaken (i.e. excavation of the river bed and bank), the work area should be isolated from the rest of the stream for the duration of this phase of work (e.g. using sandbags) and the isolated work area should be kept as dry as possible by pumping water out of this area.<br>➢ The sediment-laden water that is pumped from the isolated work area must not be discharged directly back into the river, but rather over land adjacent to the river where there can be some infiltration and settlement. This will reduce the sediment load in the water and the velocity at which the water enters the river.<br>➢ A temporary permeable barrier to trap sediments should be placed across the river immediately downstream of the work area (and downstream of the point at which the water that is pumped from the work area re-enters the river). This temporary barrier can be constructed using sand bags and/or gabion baskets, wrapped with geotextile fabric.<br>➢ The work that is required to be carried out in the river itself should be undertaken between the beginning of January and the end of March, during the low-flow season and when the spawning period for the Cape Galaxius fish species (spring to mid-summer) should be over.<br>➢ If any work is to be carried out in the river during spring or early summer, when Cape Galaxius are potentially spawning downstream of the site, then |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | taking place in the river.<br>➢ Physical damage to river embankments and riparian vegetation through the storage of construction materials (including rocks) and/or equipment in these areas.<br>➢ Damage to riparian areas through the dumping of excavated material and spoil.<br>➢ Pollution of the river through leakage of fuels, oils, etc. from construction machinery, or through the runoff of cement and cement slurry from the construction area.<br>➢ Generation of litter and other waste material (e.g. wire off-cuts from the construction of the proposed gabion baskets) in the river channel itself and along the river banks.<br>➢ Increased disturbance of aquatic and semi-aquatic fauna, due to noise and the presence of a construction team with their machinery in and adjacent to the river. | | more stringent sediment control measures and more frequent monitoring by an ECO will be required.<br>➢ No construction material (e.g. rocks) or excavated spoil material should be stockpiled in the river channel, on the river banks or in the riparian zone of the river.<br>➢ All litter and other waste generated during installation (including wire off-cuts from the construction of the gabion baskets) should be immediately removed from the river channel and banks.<br>➢ Avoid the use of noisy machinery (as far as possible), minimise the amount of time spent working in the river, and only allow workers into the river when they need to be in there to complete specific tasks.<br>➢ All other recommended freshwater ecology mitigation measures for the general construction work on the site (as outlined above) should be properly implemented.<br>➢ The construction area and the section of the stream adjacent to and downstream of this should be inspected on a regular (at least weekly) basis by the ECO for signs of disturbance, sedimentation and pollution when the gabion installation work is being undertaken. If signs of disturbance, sedimentation or pollution are noted, immediate action should be taken to remedy the situation and, if necessary, a freshwater ecologist should be consulted for advice on the most suitable remediation measures.<br>➢ If the ECO observes any incident while the gabions are being installed that results in a visually significant negative impact on the ecological condition of the river (or is informed of such an incident), a stop-works instruction should be issued, and the incident should be immediately reported to the Department of Water & Sanitation (DWS) (Compliance |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | | | and Enforcement Unit) and to the City of Cape Town (Environmental Compliance Unit, Environmental Resource Management Department).<br>➢ Ensure that the mesh size of the baskets is small enough in relation to the size of the stones to be used in the baskets, so that stones do not wash out of the baskets and compromise the structural integrity of the stabilisation measures.<br>➢ Ensure that there is good supervision and quality control during the construction and installation of the gabion baskets. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>None. | N/A | N/A |
| **OPERATIONAL PHASE IMPACTS**<br><br>This phase refers to the day to day use and operation and use of the new upgraded and expanded administration building and parking areas. | | | |
| **Visual Impacts: Change in Visual Character as a result of the proposed administration building.** | ***Direct impacts:***<br>According to the Visual Impact Assessment (Megan Anderson Landscape Architects, 2015), there will be a change in the visual character of the area as a result of the construction of the new upgraded administration building in place of the existing prefabricated Kirstenbosch head Office. | The spatial/geographical area of influence of the visual impact will be local (i.e. limited to the immediate surroundings) and the predicted lifespan of the visual impact will be long-term (i.e. the lifespan of the project).<br><br>Significance prior to mitigation: Medium (Negative)<br><br>Significance post mitigation: Low (Positive). | Proposed mitigation measures include:<br>➢ Retention of wooded area and vegetated areas around the new administration building. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>None. | N/A | N/A |
| **Visual Impacts: Change in Visual Character as a result of the proposed parking area.** | ***Direct impacts:***<br>According to the Visual Impact Assessment (Megan Anderson Landscape Architects , 2015), there will be a change in the visual character of the area as a result of a portion of the cultivated garden being replaced with a car parking area. | The spatial/geographical area of influence of the visual impact will be local (i.e. limited to the immediate surroundings) and the predicted lifespan of the visual impact will be long-term (i.e. the lifespan of the project).<br><br>Significance prior to mitigation:<br>Medium (Negative). | Proposed mitigation measures include:<br>➢ Appropriate hard and soft landscaping of the proposed parking development. |

| Activity | Impact summary | Significance | Proposed mitigation |
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| | | Significance post mitigation: Very Low (Negative). | |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** None. | N/A | N/A |
| **Visual Impacts: Night Lighting.** | ***Direct impacts:*** According to the Visual Impact Assessment (Megan Anderson Landscape Architects , 2015) whilst the larger administration building will mainly be used during the day, additional night lighting may be required which may spill onto Rhodes Drive resulting in minor visual disturbance to motorists driving past the site at night. | The spatial/geographical area of influence of the visual impact will be local and the duration of the impact will be long term.<br><br>Significance prior to mitigation: Medium (Negative).<br><br>Significance post mitigation: Low (Negative). | Proposed mitigation measures include:<br>➢ No or very limited street/parking lighting;<br>➢ Keeping street/parking lighting to low level lighting; and<br>➢ Limiting external lighting on the administration building. |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** The impact is considered cumulative as the surrounding areas adjacent to the site are developed with associated night lighting (i.e. adjacent residential areas). | The spatial/geographical area of influence of the visual impact will be local. The duration of the impacts will be long term.<br><br>Significance prior to mitigation: Medium (Negative).<br><br>Significance post mitigation: Low (Negative). | Measures to mitigate cumulative visual impacts can only be controlled on the site and as such the proposed mitigation measures outlined above still apply. |
| **Botanical Impacts: Alien Plant Invasion** | ***Direct impacts:*** According to the Botanical Assessment (Nick Helme Botanical Surveys, 2014), the operational phase impact may include some minor alien plant invasion. | The extent of the impact will be confined to the site itself. The duration of the impact will be medium term (between 1 – 5years).<br><br>Significance prior to mitigation: Very Low (Negative).<br><br>Significance post mitigation: Low (Positive). | Proposed mitigation measures as outlined in the Botanical Assessment Report (Nick Helme Botanical Surveys, 2014) are as follows:<br>➢ The area should be monitored for alien invasive vegetation for one year after construction.<br>➢ Suitable locally indigenous plant species should be planted in all areas requiring rehabilitation after construction is over. |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** The impact can be considered cumulative as there is already a mix of indigenous and alien vegetation located both on and around the site. | The extent of the impact will be confined to the site itself. The duration of the impact will be medium term (between 1 – 5years).<br><br>Significance prior to mitigation: Very Low (Negative).<br><br>Significance post mitigation: | Measures to mitigate against cumulative operational phase related botanical impacts can only be controlled on site and as such, the proposed mitigation measures outlined above still apply. |

| Activity | Impact summary | Significance | Proposed mitigation |
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| | | Low (Positive). | |
| **Socio-economic impacts: Building size and subsequent capacity for administration function.** | ***Direct impacts:*** The administration building will incorporate the IT, Human Resources/Finance, Marketing and Communications Directorate, Shared Facilities Department and the Early Detection and Rapid Response Programme Units into one building resulting in streamlining of SANBI administration at Kirstenbosch National Botanical Garden. | The spatial/ geographical area of influence of the impact will be local throughout the Kirstenbosch National Botanical Garden. The duration of the impact will be permanent.<br><br>Significance: High (Positive). | The impact is considered a positive and therefore no mitigation measures are required. |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** None. | N/A | N/A |
| **Freshwater Impacts: Hydrological and water quality impacts of stormwater runoff as a result of increased catchment hardening.** | ***Direct impacts:*** According to the Freshwater Ecological Assessment (Freshwater Consulting Group, 2014), as a result of the increase in the extent of hardened surfaces and in the number of cars that will need to be accommodated in the new parking area there will be an increase in the amount of runoff during rainfall events and subsequent risk of pollutants entering aquatic systems. | The extent of the impact will be local. The duration will be long term but reversible.<br><br>Significance prior to mitigation:<br>Moderate (Negative).<br><br>Significance post mitigation:<br>Very Low (Negative). | Mitigation measures proposed by the freshwater specialist include:<br>➢ Ensure that the permeable paving is regularly brushed and vacuumed (at least twice a year) to ensure that it retains its permeability, and immediately replace any paving blocks that are cracked or broken.<br>➢ Include a litter trap and a sediment trap (sump) at the outlet of all stormwater drainage systems, and maintain these regularly. |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** According to the Freshwater Ecological Assessment (Freshwater Consulting Group, 2014), the impact is considered to be cumulative as the surrounding roads (Rhodes Drive in particular) as well as the adjacent residential areas and associated driveways also have a large amount of hardened surfacing. | The extent of the impact will be local. The duration will be long term but reversible.<br><br>Significance prior to mitigation:<br>Low (Negative).<br><br>Significance post mitigation:<br>Very Low (Negative). | Measures to mitigate against cumulative operational phase related hydrological and water quality impacts can only be controlled on site and as such, the proposed mitigation measures outlined above still apply. |
| **Freshwater Impacts: Reduced erosion of river banks and** | ***Direct impacts:*** According to the Freshwater Ecological Assessment (Freshwater Consulting Group, 2014), | The extent of the impact will be regional. The duration will be long term but not permanent unless mitigation/ maintenance measures are | Mitigation/ maintenance measures proposed by the freshwater specialist include:<br>➢ Ensure that the mesh size of the baskets is small enough in |

| Activity | Impact summary | Significance | Proposed mitigation |
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| **improved dissipation of high flows.** | the installation of the gabions will lead to stabilisation of a section of the river bank which will reduce the ongoing erosion of the bank. This will allow for better dissipation and absorption of high flows as well as reduced sedimentation downstream. | implemented.<br><br>Significance prior to mitigation/ maintenance:<br>Low (Positive).<br><br>Significance post mitigation/ maintenance:<br>Moderate (Positive). | relation to the size of the stones to be used in the baskets, so that stones do not wash out of the baskets and compromise the structural integrity of the stabilisation measures.<br>➢ Ensure that there is good supervision and quality control during the construction, installation and maintenance of the gabion baskets.<br>➢ Conduct regular inspections and ongoing maintenance of the gabion baskets. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>None | N/A | N/A |
| **Heritage Impacts: Impacts of the Gabions on the Fynbos Lodge** | ***Direct impacts:***<br>According to the Freshwater Ecological Assessment (Freshwater Consulting Group, 2014), the installation of the gabions will lead to stabilisation of the section of the river bank along which the Fynbos Lodge is located. This will reduce the ongoing erosion of the bank and remove the risk of the increasingly instability of the ground adjacent to the Fynbos Lodge and the subsequent potential risk of damage or even collapse of this building of significant heritage value. | The extent of the impact will be site specific. The duration will be long term but not permanent unless migration/ maintenance measures are implemented.<br><br>Significance:<br>Moderate (Positive). | The impact is considered a positive and therefore no mitigation measures other than those outlined above for the maintenance of the gabions are required. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>None | N/A | N/A |
| **Potential impacts on local municipal energy budget.** | ***Direct impacts:***<br>The proposed development incorporates energy efficient measures that will reduce the new administration building's demand on the local municipal budget. | The extent of the impact would be regional. The duration of the impact would be permanent.<br><br>Significance:<br>Low (Positive). | N/A This impact is considered to be a positive. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>It is not known whether the impact is cumulative as it is unknown whether the surrounding land users also incorporate energy efficiency measures into | N/A | N/A |

| Activity | Impact summary | Significance | Proposed mitigation |
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| | their properties. | | |
| **Potential impacts on local water resources.** | ***Direct impacts:*** The proposed development incorporates optimal reuse and recycling of water measures that will reduce the new administration building's demand on local water resources. | The extent of the impact would be regional. The duration of the impact would be permanent.<br><br>Significance:<br>Low (Positive). | N/A This impact is considered to be a positive. |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** It is not known whether the impact is cumulative as it is unknown whether the surrounding land users also incorporate water reuse and recycling measures into their properties. | N/A | N/A |
| **DECOMMISSIONING PHASE**<br><br>This phase refers to the future decommissioning and demolition of the proposed Kirstenbosch administration building, the parking area and landscaped areas within the developed portion of Farm CA875-RE of the Kirstenbosch National Botanical Garden. This phase also refers to the decommissioning of the contractor camp.<br><br>Please note: As the Fynbos Lodge is considered to be a building of significant heritage status, it is not anticipated that this building will be decommissioned. As such, this section does not include measures for the decommissioning of the Fynbos Lodge or the bank stabilisation (gabions) within the Liesbeck River. | | | |
| **Air Quality Impacts: Dust.** | ***Direct impacts*** The decommissioning phase will involve the following dust generating activities:<br>➢ Demolition of the administration building, parking area and landscaped areas; and<br>➢ Breaking down and removal of the Contractor camp; | The extent of the impact will be local. The duration of the impact will be temporary. The impact will cease once the decommissioning phase is over.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Negligible. | Mitigation of potential dust impacts include:<br>➢ The use of water bowsers;<br>➢ Wetting down the site;<br>➢ Erection of shade netting to prevent off site dust migration; and<br>➢ Regular manual sweeping of the surrounding roads and sidewalks. |
| | ***Indirect impacts:*** None | N/A | N/A |
| | ***Cumulative impacts:*** None | N/A | N/A |
| **Traffic Impacts.** | ***Direct impacts:*** Increase in decommissioning related vehicles moving to and from the site resulting in an increase in traffic on Rhodes Drive adjacent to the site and the main internal access road within Kirstenbosch National Botanical Garden itself. | The extent of the impact will be local. The duration of the impact will be temporary and will cease once the decommissioning phase is over.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Negligible. | Proposed mitigation measures include:<br>➢ The contractor must provide a traffic marshal for situations where decommissioning vehicle related traffic may impede normal traffic flows on Rhodes Drive adjacent to the site and the main internal access road within Kirstenbosch National Botanical Garden itself.<br>➢ All vehicles will be legally compliant.<br>➢ All drivers will be competent and |

| Activity | Impact summary | Significance | Proposed mitigation |
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| | | | in possession of an appropriate valid driver's license.<br>➢ All vehicles travelling on site will adhere to the specified speed limits.<br>➢ The movement of all vehicles will be controlled such that they remain on designated routes.<br>➢ No member of the workforce will be permitted to drive a vehicle under the influence of alcohol or narcotic substances.<br>➢ Should there be any abnormal traffic loads as a consequence of the decommissioning phase activities, the local municipality and relevant traffic authorities should be notified. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>The decommissioning activities will have a cumulative impact on the surrounding roads, particularly on Rhodes Drive as there is traffic on Rhodes Drive with existing associated traffic impacts. | The extent of the impact will be local. The duration of the impact will be temporary and will cease once the decommissioning phase is over.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Negligible. | Measures to mitigate against cumulative traffic impacts can only be controlled on and adjacent to the site and as such the proposed mitigation measures outlined above still apply. |
| **Noise Impacts.** | ***Direct impacts:***<br>Increase in noise levels up to 60dB in an otherwise quiet area (associated with the decommissioning related vehicles as well as the equipment which will be utilised for the decommissioning phase of the project) and subsequent disturbance of the surrounding residents and landowners as well as the users of the Kirstenbosch National Botanical Garden. | The extent of the impact will be local. The duration will be temporary and will only occur during working hours approved by the Local Municipality (anticipated to be 08h00- 17h00 on weekdays only). The impact will cease once the decommissioning phase is over.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Negligible. | Proposed mitigation measures include:<br>➢ Prior to the commencement of decommissioning activities on site, all on site personnel should undergo training or have an information session regarding appropriate noise levels.<br>➢ The decommissioning contractor must use modern equipment, which produces the least noise.<br>➢ Any unavoidably noisy equipment must be identified and located in an area where it has least impact.<br>➢ The use of noise shielding screens must be considered and the operation of such machinery restricted to when it is actually required.<br>➢ No noise generating work is to be conducted outside of normal working hours as approved by the local authority. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:*** | | |

| Activity | Impact summary | Significance | Proposed mitigation |
|---|---|---|---|
| | None. | N/A | N/A |
| **Social Impacts: Income and Employment** | ***Direct impacts:*** The decommissioning activities will have a small scale impact on local employment and income opportunities for local workers and subsequent improvement in the livelihoods of all those employed as well as their dependents. | The extent of the impact will be confined to the site itself. The duration of the impact will be temporary and will cease once the decommissioning phase is over.<br><br>Significance:<br>Low (Positive). | The impact is considered a positive and therefore no mitigation measures are required. |
| | ***Indirect impacts:*** Improvement in local economic activity for the duration of the decommissioning activities. | The extent of the impact will be confined to the site itself. The duration of the impact will be temporary and will cease once the decommissioning phase is over.<br><br>Significance:<br>Low (Positive). | The impact is considered a positive and therefore no mitigation measures are required. |
| | ***Cumulative impacts:*** The benefits on local employment opportunities are considered cumulative as the surrounding area (Kirstenbosch National Botanical Garden administration, research and horticulture departments) are an additional source of employment. | The extent of the impact will be local. The duration of the impact will be temporary and will cease once the decommissioning phase is over.<br><br>Significance:<br>Low (Positive). | The impact is considered a positive and therefore no mitigation measures are required. |
| **Visual Impacts.** | ***Direct impacts:*** The decommissioning related vehicles, machinery and Contractor camp as well as the decommissioning related materials located on site will have a minor visual impact on the surrounding environment. | The extent of the impact will be local. The duration of the impact will be short term and will cease once the decommissioning phase is over.<br><br>Significance prior to mitigation:<br>Very Low (Negative).<br><br>Significance post mitigation:<br>Negligible. | Proposed mitigation measures include:<br>➢ Screening of the site during decommissioning activities.<br>➢ Management of the placement of vehicles, Contractor camp and materials placed on site. Vehicles can be parked in one specific area whilst materials placed on site can be placed in neat piles in specified sections of the site prior to use.<br>➢ Materials stored on the site prior to their use and waste stored on the site prior to removal should be kept in neat, separate piles to ensure good housekeeping at all times.<br>➢ Should any lighting be required by the Contractor, it should be aimed at the area to be lit on site and the over spillage must be kept to a minimum. |
| | ***Indirect impacts:*** Temporary loss of sense of place. | The extent of the impact will be local. The duration of the impact will be short term and | Measures to mitigate indirect visual impacts can only be controlled on and adjacent to the site and as such |

| Activity | Impact summary | Significance | Proposed mitigation |
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| | | will cease once the decommissioning phase is over.<br><br>Significance prior to mitigation:<br>Very Low (Negative).<br><br>Significance post mitigation:<br>Negligible. | the proposed mitigation measures outlined above still apply. |
| | ***Cumulative impacts:***<br>None | N/A | N/A |
| **Botanical Impacts: Disturbance or loss of natural and partly natural cover.** | ***Direct impacts:***<br>Despite the majority of the buildings and infrastructure being placed within areas that are currently built, hardened or lawn, disturbance or loss of natural or partly natural (including the cultivated garden area) will likely occur (although less than 0.2ha) during the decommissioning phase activities. | The extent of the impact will be confined to the decommissioning site and site perimeter. The duration of the impact if it occurs will be temporary to permanent.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Neutral. | Proposed mitigation measures as outlined in the Botanical Assessment Report (Nick Helme Botanical Surveys, 2014) are as follows:<br>➢ All alien invasive vegetation (excluding the only mildly invasive stone pines *Pinus pinea* which are a feature of the area) within the study area should be felled and/or removed.<br>➢ The area should be monitored for alien invasive vegetation for one year after decommissioning.<br>➢ Suitable locally indigenous plant species should be planted in all areas requiring rehabilitation after the decommissioning activities are over.<br>➢ The Medium sensitivity areas indicated in Figure 2 of the Botanical Assessment attached as part of **Appendix D** should not be disturbed during the decommissioning activities. |
| | ***Indirect impacts:***<br>None. | N/A | N/A |
| | ***Cumulative impacts:***<br>None. | N/A | N/A |
| **Freshwater Ecology Impacts: Disturbance and loss of riparian vegetation.** | ***Direct impacts:***<br>During the decommissioning phase there will most likely be disturbance to and loss of terrestrial and riparian vegetation as a result of soil compaction, excavations, trampling by decommissioning personnel, and movement and storage of materials and machinery on site. | The extent of the impact will be site specific. The duration will be short term.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Very Low (Negative). | Mitigation measures proposed by the freshwater specialist include:<br>➢ No decommissioning related activities should be undertaken within 10 metres of the outer edge of the river channel.<br>➢ Danger tape should be used to demarcate no-go areas within the recommended 10 metre buffer.<br>➢ All equipment and materials storage areas should be located at a minimum distance of 10 metres from the riparian edge of the Liesbeck River. |
| | ***Indirect impacts:***<br>As a consequence of the above impact, it is likely that there will be mobilisation of | The extent of the impact will be local. The duration will be short term. | Measures to mitigate indirect freshwater ecology impacts can only be controlled on and adjacent to the site and as such the proposed |

| Activity | Impact summary | Significance | Proposed mitigation |
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| | sediments into the river channel and increased sediment load downstream.<br><br>The risk of erosion and sedimentation will be greater during the high flow (winter) season. | Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Very Low (Negative). | mitigation measures outlined above still apply. |
| | ***Cumulative impacts:*** None. | N/A | N/A |
| **Freshwater Ecology Impacts: Degradation of the Liesbeck River and associated aquatic habitat.** | ***Direct impacts:*** During the decommissioning phase, waste materials and rubble generated by earth-moving and excavation as well as waste materials produced by work camps may end up in the river or along the riparian corridor resulting in the degradation and pollution of the Liesbeck River and the associated aquatic habitat. | The extent of the impact will be site specific. The duration of the impact will be short term for the duration of the decommissioning phase activities.<br><br>Significance prior to mitigation: Low (Negative).<br><br>Significance post mitigation: Very Low (Negative). | Mitigation measures proposed by the freshwater specialist include:<br>➢ All rubble and other waste generated during decommissioning activities should be removed from the site and disposed of at a recognised waste management facility.<br>➢ The river corridor (including the recommended 10 metre buffer area) must be inspected by the site manager and cleared of all waste on a daily basis.<br>➢ The Environmental Compliance Officer (ECO) must check whether there is any waste along the river corridor during every site inspection. |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** None. | N/A | N/A |
| **Freshwater Ecology Impacts: Contamination of river and riparian corridor.** | ***Direct impacts:*** During the decommissioning phase, bitumen, fuels, oils and other related materials will likely be utilised on site.<br><br>If these come into contact with the adjacent freshwater resources, these materials will degrade the water quality in the Liesbeck River and pose an ecological hazard to aquatic communities downstream. | The extent of the impact will be local. The duration will be short term.<br><br>Significance prior to mitigation: Moderate (Negative).<br><br>Significance post mitigation: Very Low (Negative). | Mitigation measures proposed by the freshwater specialist include:<br>➢ Proper management of these materials is essential to minimalize the risk of contamination.<br>➢ All environmentally hazardous materials including, but not limited to, bitumen, fuels and oils should be managed in such a way that they are not able to contaminate the river through direct spills or stormwater runoff.<br>➢ No bitumen, fuels or oils or any other environmentally hazardous materials should be stored within 10 metres of the riparian edge.<br>➢ All spills should be reported immediately and workers should be instructed to store, transport and use hazardous materials in ways that minimise the risk of spills. |
| | ***Indirect impacts:*** None. | N/A | N/A |
| | ***Cumulative impacts:*** | N/A | N/A |

| Activity | Impact summary | Significance | Proposed mitigation |
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| | None. | | |

| Alternative 2 |
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| Section A (2) (b) (c) and (d) address the assessment of the Alternative 2 layout and corresponding technology and design aspects.<br><br>The Alternative 2 layout of the proposed administrative building and parking area does not adequately address the requirements of SANBI from an administrative perspective. Furthermore, the Alternative 2 technology and design aspects do not consider the proposed development in the context of the site and surrounding sensitive areas, or from a visual impact perspective and do not have any of the environmental benefits associated with Alternative 1 (preferred Alternative).<br><br>In addition, Alternative 2 is not preferred by the architects, VMA Architects.<br><br>In light of this, the Alternative 2 layout, technology and design aspects are not considered reasonable or feasible and are not preferred. As such, the Alternative 2 layout and associated technology and design aspects have not been assessed further and the impacts have therefore not been assessed. |

| Alternative 3 |
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| **N/A** |

| Activity | Impact summary | Significance |
|---|---|---|
| **NO-GO ALTERNATIVE** | | |
| **Heritage Impact: Fynbos Lodge.** | ***Direct impacts:***<br>The interior of the existing Fynbos Lodge would remain unchanged as the building would not be renovated or upgraded. This would mean that the interior of this building would not be re-painted, the internal structures (counter tops) would not be replaced and the asbestos roofing would not be removed and replaced. | The extent of the impact is local to the interior of the Fynbos Lodge itself. The duration of the impact will be long-term with increasing degradation of the interior of the Fynbos Lodge over the course of time<br><br>Significance: Low (Negative). |
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>None. | None. |
| **Heritage Impact: No stabilisation of the banks of the Liesbeck River.** | ***Direct impacts:***<br>The upper catchment of the Liesbeck River would not be stabilised which would mean that the river would continue to undercut and weaken the north bank directly adjacent to the Fynbos Lodge which, in time, may result in increasingly instability of the ground adjacent to the Fynbos Lodge and potential damage or even collapse of this building of significant heritage value. | The extent of the impact is site specific to the area of the Fynbos Lodge. The duration of the impact will be permanent once it occurs.<br><br>Significance: High (Negative). |
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>None. | None. |
| **Health Impact: Continued presence of Asbestos within the roof of the Fynbos** | ***Direct impacts:***<br>Potential health risk to any individuals coming into contact with or disturbing the asbestos contained within the roof of the Fynbos Lodge. | The extent of the impact is site specific confined to area of the Fynbos Lodge only and would only affect those who disturb the asbestos sections of the roof.<br><br>The duration of the impact will be |

| Activity | Impact summary | Significance |
|---|---|---|
| **Lodge.** | | temporary if asbestos exposure was brief however the impact has the risk of being long term or permanent if exposure is prolonged.<br><br>Significance: High (Negative). |
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>None. | None. |
| **Visual Impact: Prefabricated IT building and administration building remaining on site.** | ***Direct impacts:***<br>Visual impact as a result of the existing prefabricated IT building and prefabricated Kirstenbosch Head Office remaining in operation at the site. | The extent of the impact is local to area of site. The duration of the impact will be long-term.<br><br>Significance: Low (Negative). |
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>None. | None. |
| **Visual Impact: Night lighting.** | ***Direct impacts:***<br>Occasional night lighting used as and when required which spills onto Rhodes Drive resulting in minor visual disturbance to motorists driving past the site at night. | The extent of the impact is local to area of site. The duration of the impact will be long-term.<br><br>Significance: Low (Negative). |
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>The impact is considered cumulative as the surrounding areas adjacent to the site are developed with associated night lighting (i.e. adjacent residential areas). | None. |
| **Visual Impact: Cultivated Garden remaining intact and in place.** | ***Direct impacts:***<br>The existing cultivated garden (of low botanical sensitivity) would remain undisturbed and in place. | The extent of the impact is local to area of site. The duration of the impact will be long-term.<br><br>Significance: Low (Positive). |
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>None. | None. |
| **Botanical: Cultivated Garden remaining intact and in place.** | ***Direct impacts:***<br>The existing cultivated garden (of low botanical sensitivity) would remain undisturbed and in place. | The extent of the impact is local to area of site. The duration of the impact will be long-term.<br><br>Significance: Neutral. |
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>None. | None. |
| **Botanical Impact: Invasive Alien Vegetation Control.** | ***Direct impacts:***<br>Should the proposed development not go ahead, there would be no additional invasive alien vegetation control on and around the site. | The extent of the impact is local to area of site. The duration of the impact will be long-term -permanent.<br><br>Significance: Low (Negative). |
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>None. | None. |

| Activity | Impact summary | Significance |
|---|---|---|
| **Socio-Economic: SANBI** | ***Direct impacts:*** The administrative functions of SANBI would remain separated resulting in continued difficulty in streamlining SANBI's administrative functioning and SANBI's socio-economic needs remaining unaddressed. | The extent of the impact is local to the Kirstenbosch National Botanical Garden. The duration of the impact will be long-term.<br><br>Significance: Moderate (Negative). |
| | ***Indirect impacts:*** None. | None. |
| | ***Cumulative impacts:*** None. | None. |
| **Freshwater Ecology: No potential disturbance or loss of riparian vegetation.** | ***Direct impacts:*** Should the construction activities not take place, there would be no risk of disturbance to or loss of the riparian vegetation in and along the Liesbeck River adjacent to the site. | The extent of the impact is local to the Kirstenbosch National Botanical Garden. The duration of the impact will be long-term.<br><br>Significance: Low (Positive). |
| | ***Indirect impacts:*** None. | None. |
| | ***Cumulative impacts:*** None. | None. |
| **Freshwater Ecology: No potential degradation or pollution of the Liesbeck River.** | ***Direct impacts:*** Should the construction activities not take place, there would be no risk of construction waste (rubble, plastic and other general waste) ending up in the river. | The extent of the impact is local to the Kirstenbosch National Botanical Garden. The duration of the impact will be long-term.<br><br>Significance: Low (Positive). |
| | ***Indirect impacts:*** None. | None. |
| | ***Cumulative impacts:*** None. | None. |
| **Freshwater Ecology: No potential contamination of the Liesbeck River and associated riparian vegetation.** | ***Direct impacts:*** Should the construction activities not take place, there would be no risk of construction related materials such as bitumen, fuel, oil, cement and cement slurry entering the river. | The extent of the impact is local to the Kirstenbosch National Botanical Garden. The duration of the impact will be long-term.<br><br>Significance: Low (Positive). |
| | ***Indirect impacts:*** None. | None. |
| | ***Cumulative impacts:*** None. | None. |
| **Freshwater Ecology: No potential impacts associated with the construction of the gabions within the existing curvature of the Liesbeck River.** | ***Direct impacts:*** Should the construction activities not take place, there would be no risk of increased sedimentation in the river, no disruption of the fish spawning, no localised alteration of the river flow, no disturbance to the riparian habitat, no damage to the river embankments, no pollution of the river and no general disturbance to the aquatic flora and fauna. | The extent of the impact is local to the Kirstenbosch National Botanical Garden. The duration of the impact will be long-term.<br><br>Significance: Low (Positive). |
| | ***Indirect impacts:*** None. | None. |
| | ***Cumulative impacts:*** None. | None. |
| **Freshwater Ecology: No reduction in the erosion of the banks of** | ***Direct impacts:*** Should the construction activities not take place, there would be no stabilisation of the Liesbeck River banks and no subsequent erosion control resulting in continued low absorption of sediment downstream. | The extent of the impact is local to the Kirstenbosch National Botanical Garden and surrounding area. The duration of the impact will be long- term. |

| Activity | Impact summary | Significance |
|---|---|---|
| **the Liesbeck River.** | | Significance: Low (Negative). |
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>None. | None. |
| **Freshwater Ecology: Stormwater runoff.** | ***Direct impacts:***<br>Should the proposed development not take place, there would not be an increase in surface hardening and associated increase in stormwater runoff. | The extent of the impact is local to the Kirstenbosch National Botanical Garden. The duration of the impact will be long-term.<br><br>Significance: Low (Positive). |
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>None. | None. |
| **No reduction in demand on local municipal energy budget.** | ***Direct impacts:***<br>The existing Kirstenbosch Head Office and Administration building would remain in place and as such no additional energy efficient measures would be realised. Thus, instead of the reduction in energy demand that would be realised with the construction of the new administration building, the existing building's current energy demand would remain the same. | The extent of the impact would be regional. The duration would be permanent.<br><br>Significance:<br>Low (Negative). |
| | ***Indirect impacts:***<br>None. | N/A |
| | ***Cumulative impacts:***<br>It is not known whether the impact is cumulative as it is unknown whether the surrounding land users incorporate energy efficiency measures into their properties. | N/A |
| **No reduction in demand on the local water resources.** | ***Direct impacts:***<br>The existing Kirstenbosch Head Office and Administration building would remain in place and as such no additional water reuse and recycling measures would be realised. As such, no possibility for reduction in water usage would be realised and the existing building's water demand would remain the same. | The extent of the impact would be regional. The duration of the impact would be permanent.<br><br>Significance:<br>Low (Negative). |
| | ***Indirect impacts:***<br>None. | N/A |
| | ***Cumulative impacts:***<br>It is not known whether the impact is cumulative as it is unknown whether the surrounding land users incorporate water reuse and recycling measures into their properties. | N/A |
| **No additional temporary construction phase impacts** | ***Direct impacts:***<br>(Low) Positive Impacts<br>➢ No temporary air quality impacts within the vicinity of the site.<br>➢ No temporary increase in traffic on and adjacent to the site.<br>➢ No temporary increase in noise impacts on the site.<br>➢ No temporary increase in construction related visual impacts.<br><br>(Low) Negative Impacts:<br>➢ No temporary increase in income and employment opportunities for local construction workers. | Continuation with the status quo of the site remaining as it is as a result of no construction phase activities occurring on site.<br><br>Significance: See direct impacts |

| Activity | Impact summary | Significance |
|---|---|---|
| | ***Indirect impacts:***<br>None. | None. |
| | ***Cumulative impacts:***<br>None. | None. |

A complete impact assessment in terms of Regulation 22(2) (i) of GN R.543 must be included as Appendix F.

**Please note:** A complete assessment of all anticipated impacts, significance ratings and proposed mitigations measures for the construction phase and operational phase as well as the potential future decommissioning phase for Alternative 1 (preferred alternative) as well as the No-Go Alternative has been attached as Appendix F.

## 2. ENVIRONMENTAL IMPACT STATEMENT

Taking the assessment of potential impacts into account, please provide an environmental impact statement that summarises the impact that the proposed activity and its alternatives may have on the environment after the management and mitigation of impacts have been taken into account, with specific reference to types of impact, duration of impacts, likelihood of potential impacts actually occurring and the significance of impacts.

**Alternative A (preferred alternative)**

**Summary of the preferred alternative:**

The development proposal is for the redevelopment and upgrade of a 2 500m$^2$ area of the developed portion of the cultivated garden, including buildings and infrastructure within the Kirstenbosch National Botanical Garden. These buildings include Fynbos Lodge, which is over 60 years old, as well as the current prefabricated Kirstenbosch Head Office & Administration Building and a small prefabricated IT building. The landscaping and parking areas associated with these existing buildings will also be altered in the redevelopment.

Alternative 1 (the preferred alternative) entails the demolition of the existing single storey prefabricated Kirstenbosch Head Office & Administration Building and replacing it with a new upgraded 2.5 storey administration building. The existing single storey prefabricated IT building will be demolished along with a portion of the existing cultivated garden (of low botanical sensitivity) directly in front of that building. This area will be converted into a small parking area (with a provision for 50 cars) and landscaped appropriately in avoid negative visual impacts. Fynbos Lodge will undergo some interior renovations (painting, replacing of counter tops) and the asbestos roofing will be removed and replaced with a roofing of similar material and appearance. The upper catchment of the Liesbeck River is located in very close proximity to the area which is proposed to be redeveloped. The river is currently undercutting and weakening the north bank closest to the Fynbos Lodge. Therefore the development proposal also includes bank stabilisation measures along the river bank to reinforce this area.

**Summary of Construction Phase Impacts**

*Positive Impacts*

- Temporary increase in small scale local employment and income opportunities for local construction workers and a subsequent improvement in the livelihoods of the employees as well as their dependents.

- Interior renovations and upgrades to Fynbos Lodge (including painting and replacing of counter tops).
- Replacement of asbestos roofing of Fynbos Lodge with a roofing of similar material and appearance.
- Removal of alien vegetation on and immediately adjacent to the site.

*Negative Impacts*

- Temporary increase in minor negative construction phase impacts including dust, traffic, noise and visual impacts.
- Temporary increase in human health risk during the removal of the asbestos roof tiles from the Fynbos Lodge.
- According to the Botanical Impact Assessment (Nick Helme Botanical Surveys), there will be a temporary disturbance to or loss of natural or partly natural (including the cultivated garden) areas.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there will be a temporary disturbance to or loss of riparian vegetation.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there will be a temporary risk of waste materials and rubble entering Liesbeck River resulting in the potential degradation and pollution of the Liesbeck River and associated aquatic habitat.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there will be a temporary risk of construction materials such as bitumen, fuels, oils, cement and cement slurry entering the Liesbeck River resulting in a potential risk of contamination of the Liesbeck River and degradation of water quality downstream.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there will be a temporary increased risk of sedimentation in the river, disruption of fish spawning, localised alteration of the river flow, disturbance of the riparian environment, damage to the river embankments, pollution of the river and general disturbance to the aquatic flora and fauna as a result of the construction of the gabions.

**Summary of Operational Phase Impacts**

*Positive Impacts*

- According to the Visual Impact Assessment (Megan Anderson Landscape Architects), there will be an improvement in the visual character of the area as a result of the construction of the new upgraded administration building in place of the existing prefabricated Kirstenbosch Head Office.
- Streamlining of the SANBI administration at Kirstenbosch National Botanical Garden as a result of the IT, Human Resources/Finance Departments, Marketing and Communications Directorate, Shared Facilities Department and the Early Detection and Rapid Response Programme Unit being housed in one building.
- According to the architects, VMA architects, the Alternative 1 (preferred alternative) design incorporates measures (orientation of the building, double glazing of the windows, use of solar panels, LED and photovoltaic technology) that will enhance the energy efficiency of the new administration building thereby reducing the building's cumulative impact on the local municipal energy budget.
- According to the architects, VMA architects, the Alternative 1 (preferred alternative) design incorporates measures into the new administration building that will ensure optimal reuse and recycling of water (grey water recycling and rain water harvesting), thereby reducing the new administrations building's cumulative impact on local water resources.
- According to the Civil Engineers (Orrie, Welby-Solomon & Associates), stabilisation of the bank of the Liesbeck River closest to the existing Fynbos Lodge will result in the removal of risk of

continued undercutting adjacent to Fynbos Lodge and a subsequent removal of the risk of damage to or collapse of the building which is of significant heritage value.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there will be a reduction in ongoing erosion as a result of the bank stabilisation measures which will allow for better dissipation, better absorption of high flows and a decrease in sedimentation downstream.
- Alien vegetation monitoring will occur for a year after the completion of the construction phase.

*Negative Impacts*
- According to the Visual Impact Assessment (Megan Anderson Landscape Architects), there will be minor negative visual impact of the area as a result of a portion of the cultivated garden being replaced with a car park.
- According to the Visual Impact Assessment (Megan Anderson Landscape Architects), there will be, there could be potential night lighting impacts should the administration building need to be utilised at night resulting in minor visual disturbance to motorists driving past the site at night on Rhodes Drive.
- According to the Botanical Impact Assessment (Nick Helme Botanical Surveys), alien plant invasion may occur as a result of soil disturbance.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there will be an increase in the amount of runoff during rainfall events and subsequent increased risk of pollutants entering the freshwater system as a result of the increase in the extent of the hardened surfaces.

**Summary of Decommissioning Phase Impacts**

*Positive Impacts*
- Temporary increase in small scale local employment and income opportunities for local workers and a subsequent improvement in the livelihoods of the employees as well as their dependents as a result of the future decommissioning of the proposed development.

*Negative Impacts*
- Temporary increase in negative decommissioning phase impacts including dust, traffic, noise and minor visual impacts.
- According to the Botanical Impact Assessment (Nick Helme Botanical Surveys), there will be disturbance to or loss of natural or partly natural (including the remainder of the cultivated garden) areas on and adjacent to the site during the decommissioning phase.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there will be a temporary disturbance to or loss of riparian vegetation.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there will be a temporary risk of waste materials and rubble entering Liesbeck River resulting in the potential degradation and pollution of the Liesbeck River and associated aquatic habitat.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there will be a temporary risk of decommissioning materials such as bitumen, fuels and oils entering the Liesbeck River resulting in a potential risk of contamination of the Liesbeck River and degradation of water quality downstream.

| **Impacts:** | **Significance Rating** | |
|---|---|---|
| | **Without Mitigation** | **With Mitigation** |
| **Construction Phase** | | |
| Air Quality:<br>Dust. | Low (Negative). | Negligible. |
| Traffic. | Low (Negative). | Negligible. |

| | | |
|---|---|---|
| Noise. | Low (Negative). | Negligible. |
| Socio-Economic:<br>Income and Employment. | Low (Positive). | Low (Positive). |
| Visual. | Very Low (Negative). | Negligible. |
| Health and Safety:<br>Asbestos Removal. | High (Negative). | Low (Negative). |
| Heritage Impacts:<br>Refurbishments to the Fynbos Lodge. | Low (Positive). | Low (Positive). |
| Botanical:<br>Disturbance or loss of natural and partly natural cover. | Low (Negative). | Neutral. |
| Freshwater Ecology:<br>Disturbance or loss of riparian vegetation. | Low (Negative). | Very Low (Negative). |
| Freshwater Ecology:<br>Degradation and pollution of the Liesbeck River through inadequate waste management. | Low (Negative). | Very Low (Negative). |
| Freshwater Ecology:<br>Contamination of the Liesbeck River. | Moderate (Negative). | Very Low (Negative). |
| Freshwater Ecology:<br>Bank Stabilisation Construction. | High (Negative). | Low (Negative). |
| **Operational Phase** | | |
| Visual:<br>Change in visual character of the site as a result of placement of administration building. | Moderate (Negative). | Low (Positive). |
| Visual:<br>Change in visual character of the site as a result of placement of car park. | Moderate (Negative). | Low (Negative). |
| Visual:<br>Additional Night Lighting. | Moderate (Negative). | Low (Negative). |
| Botanical:<br>Alien Plant Invasion. | Very Low (Negative). | Low (Positive). |
| Socio-economic impacts:<br>Building size and subsequent capacity for administration function. | High (Positive). | High (Positive). |
| Freshwater Impacts:<br>Hydrological and water quality impacts as a result of surface hardening. | Moderate (Negative). | Low (Negative). |
| Freshwater Impacts:<br>Reduced erosion of the river banks. | Low (Positive). | Moderate (Positive). |
| Heritage Impacts:<br>Bank stabilisation adjacent to Fynbos Lodge. | Moderate (Positive). | Moderate (Positive). |
| Energy Efficiency<br>Reduction in energy demand on the local municipal energy budget. | Low (Positive). | Low (Positive). |
| Water Usage: | Low (Positive). | Low (Positive). |

| | | |
|---|---|---|
| Reduction in use of local water resources. | | |
| **Decommissioning Phase** | | |
| Air Quality:<br>Dust. | Low (Negative). | Negligible. |
| Traffic. | Low (Negative). | Negligible. |
| Noise. | Low (Negative). | Negligible. |
| Socio-Economic:<br>Income and Employment. | Low (Positive). | Low (Positive). |
| Visual. | Very Low (Negative). | Negligible. |
| Botanical:<br>Disturbance or loss of natural and partly natural cover. | Low (Negative). | Neutral. |
| Freshwater Ecology:<br>Disturbance or loss of riparian vegetation. | Low (Negative). | Very Low (Negative). |
| Freshwater Ecology:<br>Degradation and pollution of the Liesbeck River through inadequate waste management. | Low (Negative). | Very Low (Negative). |
| Freshwater Ecology:<br>Contamination of the Liesbeck River. | Moderate (Negative). | Very Low (Negative). |

**Alternative B**

Section A (2) (b) (c) and (d) address the assessment of the Alternative 2 layout and corresponding technology and design aspects.

The Alternative 2 layout of the proposed administrative building and parking area does not adequately address the requirements of SANBI from an administrative perspective. Furthermore, the Alternative 2 technology and design aspects do not consider the proposed development in the context of the site and surrounding sensitive areas or from a visual impact perspective and do not have any of the environmental benefits associated with Alternative 1 (preferred Alternative).

In addition, Alternative 2 is not preferred by the architects, VMA Architects.

In light of this, the Alternative 2 layout, technology and design aspects are not considered reasonable or feasible and are not preferred. As such, the Alternative 2 layout and associated technology and design aspects have not been assessed further and the impacts have therefore not been assessed.

**Alternative C**

**N/A**

**No-go alternative (compulsory)**

**Summary of the No-Go Alternative:**
The No-Go Alternative entails "the alternative of not implementing the activity."

The No-Go Alternative would entail not redeveloping and upgrading a 2 500m$^2$ area of the developed portion of the cultivated garden, including buildings (Fynbos Lodge, which is over 60 years old, as

well as the current prefabricated Kirstenbosch Head Office & Administration Building and a small prefabricated IT building) and infrastructure (the landscaped and parking areas associated with these existing buildings) within the Kirstenbosch National Botanical Garden.

This would mean that the existing prefabricated Kirstenbosch Head Office & Administration Building would not be demolished and replaced with a new upgraded 2.5 storey administration building. The existing prefabricated IT building would not be demolished along with a small portion of the existing cultivated garden (low botanical sensitivity) to be converted into a small parking area with appropriate landscaping. The existing Fynbos Lodge would remain as is and would not be renovated and refurbished nor would any of the asbestos roofing be removed and replaced. The upper catchment of the Liesbeck River would not be stabilised which would mean that the river would continue to undercut and weaken the north bank directly adjacent to the Fynbos Lodge which, in time, may result in increasingly instability of the ground adjacent to the Fynbos Lodge and potential damage or even collapse of this building of significant heritage value. Finally, the new upgraded administrative building and associated parking area would not be constructed and the administrative needs of SANBI and the Kirstenbosch National Botanical Garden would not be addressed.

**Summary of No-Go Alternative Impacts:**

*Positive Impacts*

- According to the Visual Impact Assessment (Megan Anderson Landscape Architects), the existing cultivated garden (of low botanical sensitivity) would remain undisturbed and in place resulting in the continuation of a minor positive visual impact in the area.
- According to the Visual Impact Assessment (Megan Anderson Landscape Architects), there would be no potential additional night lighting in the area resulting in an additional visual disturbance to motorists driving past the site at night.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there would be no temporary disturbance to or loss of riparian vegetation.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there would be no temporary risk of waste materials and rubble entering Liesbeck River resulting in the potential degradation and pollution of the Liesbeck River and associated aquatic habitat.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there would be no temporary risk of construction materials such as bitumen, fuels, oils, cement and cement slurry entering the Liesbeck River resulting in a potential risk of contamination of the Liesbeck River and degradation of water quality downstream.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there would be no temporary increased risk of sedimentation in the river, disruption of fish spawning, localised alteration of the river flow, disturbance of the riparian environment, damage to the river embankments, pollution of the river and general disturbance to the aquatic flora and fauna as a result of the construction of the gabions.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there would be no increase in the amount of runoff during rainfall events and subsequent increased risk of pollutants entering the freshwater system as a result of the increase in the extent of the hardened surfaces.
- No additional temporary construction phase impacts (dust, traffic, noise and visual).

*Neutral*

- According to the Botanical Impact Assessment (Nick Helme Botanical Surveys), there would be no disturbance to or loss of natural or partly natural (including the remainder of the cultivated garden) areas on and adjacent to the site.

*Negative Impacts*

- The interior of the existing Fynbos Lodge would remain unchanged as the building would not be refurbished or upgraded.
- The existing Kirstenbosch Head Office and Administration building would remain in place and as such no additional energy efficient measures would be realised. Thus, instead of the reduction in energy demand that would be realised with the construction of the new administration building, the existing building's current energy demand would remain the same.
- The existing Kirstenbosch Head Office and Administration building would remain in place and as such no additional water reuse and recycling measures would be realised. As such, no possibility for reduction in water usage would be realised and the existing building's water demand would remain the same. No replacement of asbestos roofing of Fynbos Lodge with a roofing of similar material and appearance.
- No removal of a potential health risk to any individuals coming into contact with or disturbing the asbestos contained within the roof of the Fynbos Lodge.
- According to the Civil Engineers (Orrie, Welby-Solomon & Associates), the upper catchment of the Liesbeck River would not be stabilised which would mean that the river would continue to undercut and weaken the north bank directly adjacent to the Fynbos Lodge which, in time, may result in increasingly instability of the ground adjacent to the Fynbos Lodge and potential damage or even collapse of this building of significant heritage value.
- According to the Visual Impact Assessment (Megan Anderson Landscape Architects), there would be no improvement in the visual character of the area as a result of not constructing the new upgraded administration building to replace the existing prefabricated Kirstenbosch Head Office.
- According to the Visual Impact Assessment (Megan Anderson Landscape Architects), there would be the continuation of occasional night lighting used as and when required which spills onto Rhodes Drive resulting in minor visual disturbance to motorists driving past the site at night.
- According to the Botanical Impact Assessment (Nick Helme Botanical Surveys), no additional invasive alien vegetation control on and around the site.
- The administrative functions of SANBI would remain separated resulting in continued difficulty in streamlining SANBI's administrative functioning and SANBI's socio-economic needs remaining unaddressed.
- According to the Freshwater Impact Assessment (Freshwater Consulting Group), there would be no reduction in ongoing erosion as a result of the bank stabilisation measures which will allow for better dissipation, better absorption of high flows and a decrease in sedimentation downstream.
- No additional temporary socio-economic impacts (temporary income and employment opportunities for local construction workers).

| **Impacts:** | **Significance Rating** |
|---|---|
| **No-Go Alternative** | |
| Heritage Impact:<br>No upgrades to the Fynbos Lodge. | Low (Negative). |
| Heritage Impact:<br>No stabilisation of the Liesbeck River. | High (Negative). |
| Health Impact:<br>Continued presence of asbestos within the roof of Fynbos Lodge. | High (Negative). |
| Visual Impact:<br>IT and Head Office building remaining on site in operation. | Low (Negative). |

| | |
|---|---|
| Visual:<br>Continued night lighting from the existing administration building. | Low (Negative) |
| Visual:<br>Cultivated garden remaining in place. | Low (Positive). |
| Botanical:<br>Cultivated garden remaining in place. | Neutral. |
| Botanical:<br>No additional invasive alien vegetation control. | Low (Negative) |
| Socio-Economic Impacts:<br>SANBI administrative functions remaining the same. | Moderate (Negative). |
| Socio-Economic:<br>No source of additional income and employment. | Low (Negative). |
| Freshwater Ecology:<br>No disturbance or loss of riparian vegetation. | Low (Positive). |
| Freshwater Ecology:<br>No degradation and pollution of the Liesbeck River through inadequate construction waste management. | Low (Positive). |
| Freshwater Ecology:<br>No contamination of the Liesbeck River. | Low (Positive). |
| Freshwater Ecology:<br>Reduced erosion through bank stabilisation. | Low (Negative). |
| Freshwater Ecology:<br>No additional stormwater runoff. | Low (Positive). |
| Energy Efficiency<br>No reduction in energy demand on the local municipal energy budget. | Low (Negative). |
| Water Usage:<br>No reduction in use of local water resources. | Low (Negative). |
| Air Quality:<br>No temporary increases in dust. | Low (Positive). |
| No temporary increases in traffic. | Low (Positive). |
| No temporary increases in noise. | Low (Positive). |
| No temporary increases in construction related visual impacts. | Low (Positive). |

With regards to the need and desirability of the proposed development, the No-Go alternative contains no benefit to the needs and requirements of the Kirstenbosch Botanical Garden in that it would not realize the administrative benefits required by SANBI nor any of the other benefits associated with the Alternative 1 (preferred alternative).

The No-Go alternative is therefore not considered a reasonable or feasible alternative for the proposed activity and as such is not preferred.

## SECTION E. RECOMMENDATION OF PRACTITIONER

| Is the information contained in this report and the documentation attached hereto sufficient to make a decision in respect of the activity applied for (in the view of the environmental assessment practitioner)? | **YES** | NO |
|---|---|---|

If "NO", indicate the aspects that should be assessed further as part of a Scoping and EIA process before a decision can be made (list the aspects that require further assessment).

**N/A**

If "YES", please list any recommended conditions, including mitigation measures that should be considered for inclusion in any authorisation that may be granted by the competent authority in respect of the application.

***Architect***

The recommendations as contained in the Proposed Feasibility Study for a New Administration Building, Parking Facility and Refurbishments of the Fynbos Lodge at Kirstenbosch National Botanical Garden (VMA Architects, 2014), are listed as follows:

- The site of the existing prefabricated Kirstenbosch Head Office is the recommended as the site for the new administration building as it is a geometrically regular site, more than 32 metres from the centre line of the Liesbeck River, situated in a quiet location, suited as a corner building, has a good orientation, the existing footprint can accommodate the required size of the proposed administration building, and it allows for minimal impact on the Fynbos Lodge and surrounding sensitive vegetated and adjacent riparian area;
- The site of the existing prefabricated IT building and its surroundings is recommended as the preferred site for the parking facility for the SANBI employees (50 cars);
- Fynbos Lodge should be restored and modified as per the relevant heritage guidelines; and
- The banks to the south of the Fynbos Lodge on the Liesbeck River should be stabilised using gabions, utilising Table Mountain Sandstone as material.

***Civil Engineers***

The recommendations and mitigation measures as contained in Stormwater Management Plan for the proposed developments at Kirstenbosch Botanical Garden (Orrie, Welby-Solomon & Associates, 2014), are listed as follows:

- The stormwater discharge should be detained in the permeable paving of the roads and parking area.
- The permeable paving should also serve as the stormwater quality treatment of the runoff.
- Gabions to be used to stabilise the existing embankment of the river; for the section in close proximity to the existing building.

***Freshwater***

The recommendations and mitigation measures as contained in the Freshwater Ecological Assessment of the Proposed Development Area at Kirstenbosch Botanical Garden (Freshwater Consulting Group, 2014), are listed as follows:

- No construction activities should be undertaken within 10 metres of the outer edge of the river channel except when the river stabilisation work is being done.
- Danger tape should be used to demarcate no-go areas within the recommended 10 metre buffer.
- All equipment and materials storage areas should be located at a minimum distance of 10 metres from the riparian edge of the Liesbeck River.
- All rubble and other waste generated on the construction site should be removed from the site and disposed of at a recognised waste management facility.

- The river corridor (including the recommended 10 metre buffer area) must be inspected by the site manager and cleared of all waste on a daily basis.
- The Environmental Compliance Officer (ECO) must check whether there is any waste along the river corridor during every site inspection.
- Proper management of these materials is essential to minimalize the risk of contamination.
- All environmentally hazardous materials including, but not limited to, bitumen, fuels, oils and cement slurry should be managed in such a way that they are not able to contaminate the river through direct spills or stormwater runoff.
- No bitumen, fuels, oils, cement, cement slurry, or any other environmentally hazardous materials should be stored within 10 metres of the riparian edge.
- Operators must manage and contain cement slurry, and remove and dispose of excess materials from the vicinity of the riparian corridor.
- All spills should be reported immediately and workers should be instructed to store, transport and use hazardous materials in ways that minimise the risk of spills.
- When the initial work is undertaken (i.e. excavation of the river bed and bank), the work area should be isolated from the rest of the stream for the duration of this phase of work (e.g. using sandbags) and the isolated work area should be kept as dry as possible by pumping water out of this area.
- The sediment-laden water that is pumped from the isolated work area must not be discharged directly back into the river, but rather over land adjacent to the river where there can be some infiltration and settlement. This will reduce the sediment load in the water and the velocity at which the water enters the river.
- A temporary permeable barrier to trap sediments should be placed across the river immediately downstream of the work area (and downstream of the point at which the water that is pumped from the work area re-enters the river). This temporary barrier can be constructed using sand bags and/or gabion baskets, wrapped with geotextile fabric.
- The work that is required to be carried out in the river itself should be undertaken between the beginning of January and the end of March, during the low-flow season and when the spawning period for the Cape Galaxius fish species (spring to mid-summer) should be over.
- If any work is to be carried out in the river during spring or early summer, when Cape Galaxius are potentially spawning downstream of the site, then more stringent sediment control measures and more frequent monitoring by an ECO will be required.
- No construction material (e.g. rocks) or excavated spoil material should be stockpiled in the river channel, on the river banks or in the riparian zone of the river.
- All litter and other waste generated during installation (including wire off-cuts from the construction of the gabion baskets) should be immediately removed from the river channel and banks.
- Avoid the use of noisy machinery (as far as possible), minimise the amount of time spent working in the river, and only allow workers into the river when they need to be in there to complete specific tasks.
- The construction area and the section of the stream adjacent to and downstream of this should be inspected on a regular (at least weekly) basis by the ECO for signs of disturbance, sedimentation and pollution when the gabion installation work is being undertaken. If signs of disturbance, sedimentation or pollution are noted, immediate action should be taken to remedy the situation and, if necessary, a freshwater ecologist should be consulted for advice on the most suitable remediation measures.
- If the ECO observes any incident while the gabions are being installed that results in a visually significant negative impact on the ecological condition of the river (or is informed of such an incident), a stop-works instruction should be issued, and the incident should be immediately reported to the Department of Water & Sanitation (DWS) (Compliance and Enforcement Unit) and

to the City of Cape Town (Environmental Compliance Unit, Environmental Resource Management Department).

- Ensure that the mesh size of the baskets is small enough in relation to the size of the stones to be used in the baskets, so that stones do not wash out of the baskets and compromise the structural integrity of the stabilisation measures.
- Ensure that there is good supervision and quality control during the construction and installation of the gabion baskets.
- Conduct regular inspections and ongoing maintenance of the gabion baskets.
- Ensure that the permeable paving is regularly brushed and vacuumed (at least twice a year) to ensure that it retains its permeability, and immediately replace any paving blocks that are cracked or broken.
- Include a litter trap and a sediment trap (sump) at the outlet of all stormwater drainage systems, and maintain these regularly.
- All other recommended freshwater ecology mitigation measures for the general construction work on the site (as outlined above) should be properly implemented.

***Botanical***

The recommendations and mitigation measures as contained in the Botanical Assessment of the Proposed Development Area at Kirstenbosch Botanical Garden (Nick Helme Botanical Surveys, 2014), are listed as follows:

- All alien invasive vegetation (excluding the only mildly invasive stone pines *Pinus pinea*, which are a feature of the area) within the study area should be felled and/or removed during the construction phase, and the area should be monitored for alien invasive vegetation for one year after construction;
- Suitable locally indigenous plant species should be planted in all areas requiring rehabilitation after construction is over; and
- The medium sensitivity areas outlined in the Botanical Assessment should not be disturbed during construction.

***Heritage***

A Notice of Intent to Develop (Asha Consulting, 2014) was submitted to Heritage Western Cape ("HWC") on 26th September 2014. According to HWC's "Response to the Notification of Intent to Develop", no heritage resources will be affected by the proposed development and as such no further studies are required.

In an email dated 2nd October 2014, Andrew September of HWC confirmed that a Section 34 application will be required however for the renovation of the Fynbos Lodge.

SAHRA confirmed in a letter dated 2nd February 2014, that SAHRA has no objection to the proposed demolition and development of the site.

SAHRA raised concern regarding the height of the proposed administrative building as a three storey building, as the site on Rhodes Drive is located on a scenic and visually sensitive road and should therefore be treated as such. As such SHARA advised that a revision of the height, elevation and edge conditions should be considered.

The architect, VMA Architects has revised the elevation of the building to be a building of 2.5 storeys instead of the originally proposed three storeys. The visual specialist has also confirmed in correspondence dated 6th February 2015that whilst the proposed development will result in a change in the visual landscape, the scenic resources of the greater area will be minimally affected and

moderately affected at the local scale. If mitigation measures are implemented however, the visual impact will be low.

***Visual***

The recommendations and mitigation measures as contained in the Visual Statement: SANBI New Buildings at the Kirstenbosch Botanical Garden, Cape Town (Megan Anderson Landscape Architects, 2015) are listed as follows:

- The wooded area around the new Administration building should be retained as far as possible;
- Appropriate hard and soft landscaping of the proposed parking development should be implemented;
- There should be no or limited street/parking lighting;
- Street/parking lighting if required should be kept to low level lighting only;
- There should be limited external lighting on the buildings; and
- A landscape architect should be appointed to ensure the development area retains its natural qualities and that the paving and planting interventions are appropriate.

***EAP***

In the EAP's professional opinion, it is recommended that Alternative 1 (preferred alternative 1) is authorised.

Should the proposed development be authorised, the EAP recommends that the above mentioned mitigation measures as proposed by the relevant specialists be implemented and that the mitigation measures as contained in the Specialists Reports contained in Appendix D and in the Environmental Management Plan as contained in Appendix G are implemented in full to avoid all potentially negative environmental impacts and enhance all potentially positive impacts.

| Is an EMPr attached? | **YES** | NO |
|---|---|---|

The EMPr must be attached as Appendix G.

The details of the EAP who compiled the BAR and the expertise of the EAP to perform the Basic Assessment process must be included as Appendix H.

If any specialist reports were used during the compilation of this BAR, please attach the declaration of interest for each specialist in Appendix I.

Any other information relevant to this application and not previously included must be attached in Appendix J.

_____

NAME OF EAP

_____ _____

SIGNATURE OF EAP DATE

**SECTION F: APPENDIXES**

The following appendixes are attached:

Appendix A: Maps
- Site Map
- Locality Map
- Topographic Map
- Proposed Development Area
- SANBI National Landcover Map
- SANBI National Protected Areas Map
- SANBI National Threatened Ecosystems Map
- SANBI National Vegetation Map

Appendix B: Photographs
- Site photo page including photographs taken during a site visit undertaken April 2014.

Appendix C: Facility illustration(s)
- Existing site layout (April 2014)
- Sketch designs (combined) for proposed parking and administration areas (September 2014)

Appendix D: Specialist reports (including terms of reference and associated appendices)
- "*Proposed Activities at Kirstenbosch National Botanical Garden"* (VMA Architects, 2014);
- "*Stage 1 Report: Proposed Feasibility Study for a new Administration Building, Parking Facility and Refurbishments of the Fynbos Lodge at Kirstenbosch National Botanical Garden*" (VMA Architects, 2014);
- "*Botanical Assessment of the Proposed Development Area at Kirstenbosch Botanical Garden"* (Nick Helme Botanical Surveys, 2014);
- *"Notification of Intent to Develop"* (Asha Consulting, 2014);
- *"Notification of Intent to Develop- Supporting Documents"* (Asha Consulting, 2014);
- "*Visual Statement: SANBI New Buildings at the Kirstenbosch Botanical Garden, Cape Town"* (Megan Anderson Landscape Architects, 2015); and
- *"Freshwater Ecological Assessment for the Proposed Establishment of a new Administration Building at Kirstenbosch National Botanical Garden" (*Freshwater Consulting Group, 2014*).*
- *"Annexures for the Freshwater Ecological Assessment"* (Freshwater Consulting Group, 2014)

Appendix E: Public Participation
Please note that the required full public participation will be implemented into the Final Basic Assessment Report as the initial notification phase will take place concurrently with the release of the DEA Draft BAR for the proposed activity:
- E1 Proof of placement of relevant adverts
- E2 Key Stakeholder Notification
- E3 Comments and Responses
- E4 Written Notification to Authorities and Organs of State
- E5 List of Interested and Affected Parties
- E6 Copies of Correspondence and Meetings

FINAL VERSIONS TO BE INSERTED WITH THE FINAL BAR

Appendix F: Impact Assessment

- Description and assessment of the significance of impacts prior to and after mitigation for the construction and operational phases of both Alternatives as well as the No-Go Alternative.

Appendix G: Environmental Management Programme (EMPr)

- Lifecycle Environmental Management Plan (Sillito Environmental Consulting, February 2015)

Appendix H: Details of EAP and expertise

- Details of the EAP, Adrian Sillito, and relevant expertise

Appendix I: Specialist's declaration of interest
Signed declaration of interest from the following specialists:

- Nicholas Helme (Botanical Specialist from Nick Helme Botanical Surveys)
- Jayson Orton (Heritage Specialist from Asha Consulting)
- Megan Anderson (Visual and Landscape Specialist from Megan Anderson Landscape Architects)
- Dean Ollis (Freshwater Specialist from Freshwater Consulting Group)

Appendix J: Additional Information
None