

Singita



**FINAL BASIC
ASSESSMENT REPORT
FOR MULTIPLE PROJECT
ON RAVENSCOURT
257KU AND CASTLETON
260KU, SINGITA, SABI
GAME RESERVE**

PROJECT:

Final Basic Assessment Report for multiple projects at Singita, Sabi Sands Game Reserve, Bushbuckridge Local Municipality (MP325), Mpumalanga.

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1 INTRODUCTION

Emross Consulting was appointed by Singita Sabi Sands to facilitate the process of applying for environmental authorisation and to undertake a basic assessment for a number of projects on the properties Ravenscourt 257KU and Castleton 260KU in the Sabi Sands Wildtuin.

The proposed developments include a number of linear developments of varying length and a number of site developments which cover various square meterage. Individually most of the proposed developments are within the thresholds that trigger the need for environmental authorisation, but collectively these thresholds are exceeded. As the Singita group is striving to achieve good environmental governance, and Singita Sabi Sands in particular is now subjected to an annual “green audit” as per the requirements of the Sabi Sands Game Reserve, they wish to ensure compliance with all environmental requirements at the highest standard.

2 ASSESSMENT DETAILS

2.1 The Environmental Assessment Practitioner

The Environmental Assessment Practitioner (EAP) responsible for undertaking the basic assessment and compiling this report is Mr. Kevan Zunckel working on behalf of Emross Consulting (Pty) Ltd., White River, Mpumalanga. Mr Zunckel has more than 30 years of experience as an ecologist and environmental scientist with an MSc Environmental Science from the University of Cape Town and affiliation with the South African Chapter of the International Association of Impact Assessments (IAIAsa – Membership number: 2396). His contact details are as follows and his full CV is included with this report as Annex A:

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Email: kevanzunckel@gmail.com

2.2 Names and Expertise of Specialists

In consideration of the EAPs experience both as an ecologist and environmental scientist, as well as the small scale of the proposed developments and low significance of potential impacts, it was not deemed necessary to commission additional specialist studies. A heritage impact assessment was commissioned however and was undertaken by Ms Annie van Deventer-Radford. The signed Declaration of Interest by the EAP is included in this report as Annex B together with details of the specialist and their declaration of interest.

3 DESCRIPTION OF PROPOSED ACTIVITY

3.1 Locality of the Activities

The proposed developments (as described in Section 3.2) are located within the Sabi Sands Game Reserve on Ravenscourt 257KU and Castleton 260KU. The Sabi Sands Game Reserve (SSGR), it falls within the Mpumalanga Province, the Ehlanzeni District Municipality (DC32) and the Bushbuckridge Local Municipality (MP325). The 21 digit Surveyor General codes for these properties are as follows:

Final Basic Assessment Report for multiple project on Ravenscourt 257KU and Castleton 260KU, Singita, Sabi Game Reserve

Castleton 260KU, portion 2																				
T	0	K	U	0	0	0	0	0	0	0	0	0	0	2	6	0	0	0	0	2
Castleton 260KU, remainder																				
T	0	K	U	0	0	0	0	0	0	0	0	0	0	2	6	0	0	0	0	0
Ravenscourt 267KU, portion 2																				
T	0	K	U	0	0	0	0	0	0	0	0	0	2	6	7	0	0	0	0	2
Ravenscourt 267KU, remainder																				
T	0	K	U	0	0	0	0	0	0	0	0	0	2	6	7	0	0	0	0	0

Error! Reference source not found. shows the locality of the properties relative to important topographical and cadastral features. Note that the northern boundary of Ravenscourt 257KU follows the cadastres along the Sand River.

The localities of the proposed new developments are located across both properties as can be seen in **Error! Reference source not found.**. The layout of each development component superimposed on aerial images is provided in Figure 2 to Figure 5. Note that high resolution versions of these figures have been provided on a CD with this document. Greater detail is provided in the illustrations and figures provided in the text and the relevant coordinates for each of the developments are provided in the relevant sub-sections in Section 3.2.

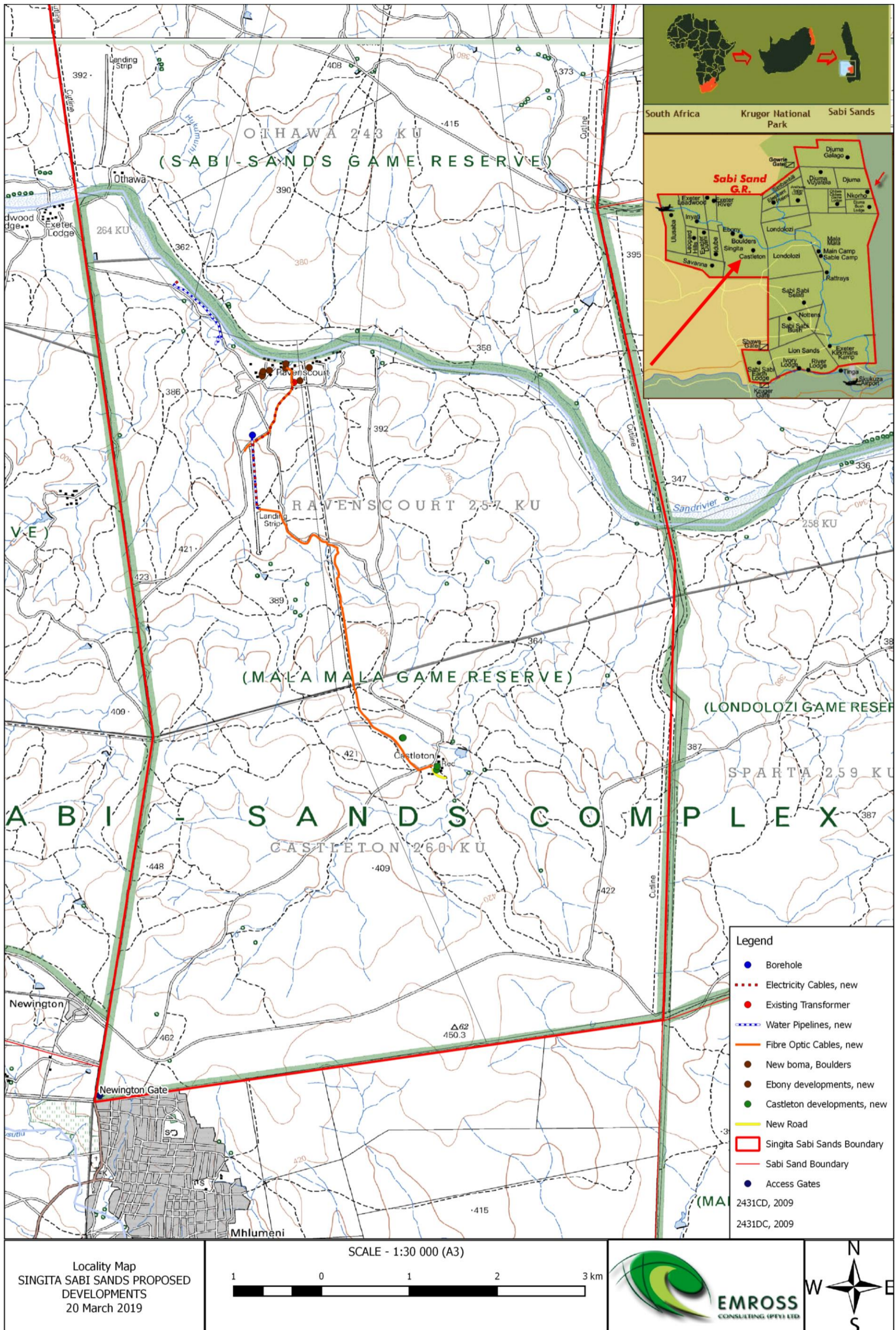


Figure 1: The locality of the proposed developments in the Singita Sabi Sands Game Reserve.

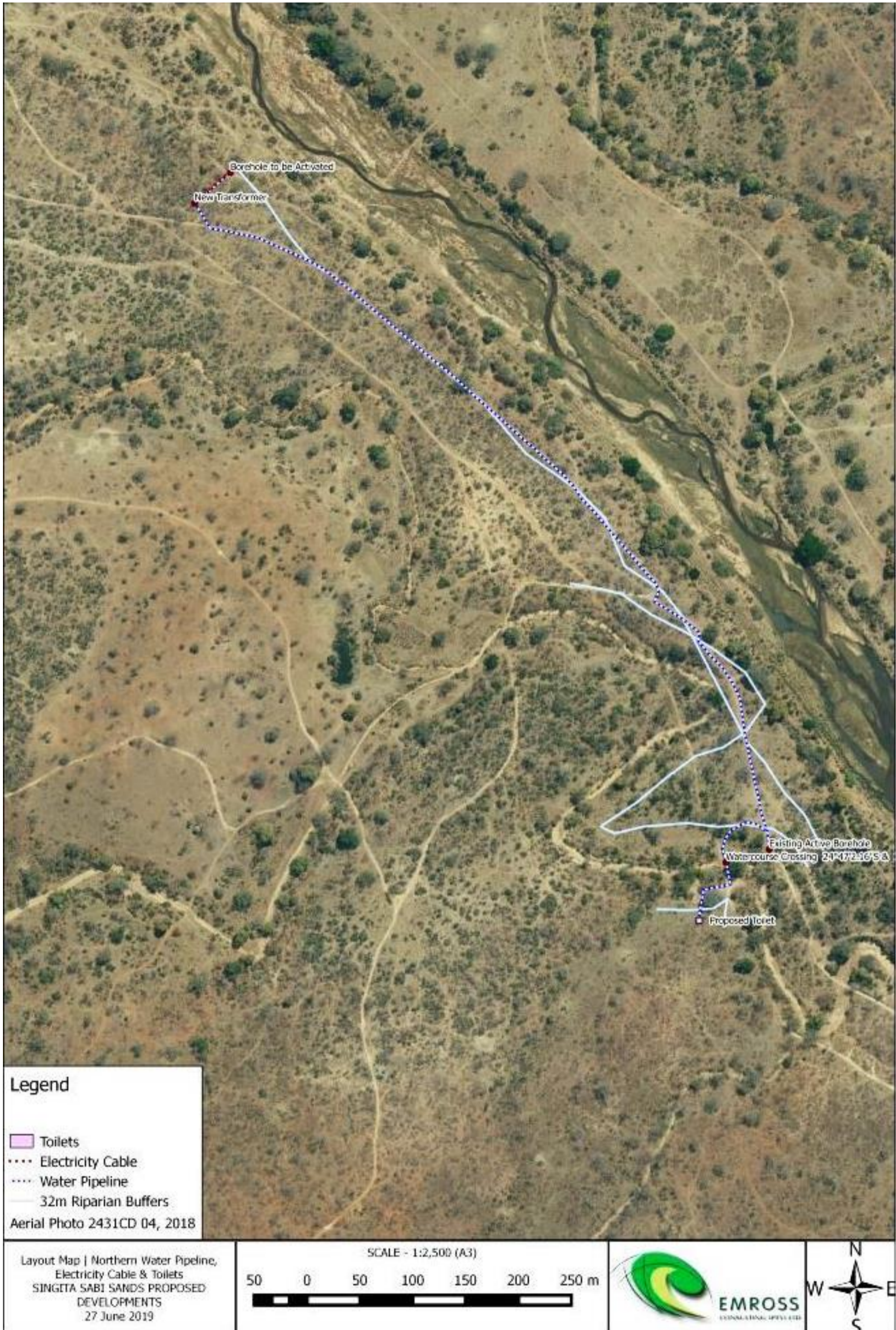


Figure 2: The localities of the components of the northern water pipeline and electricity cable

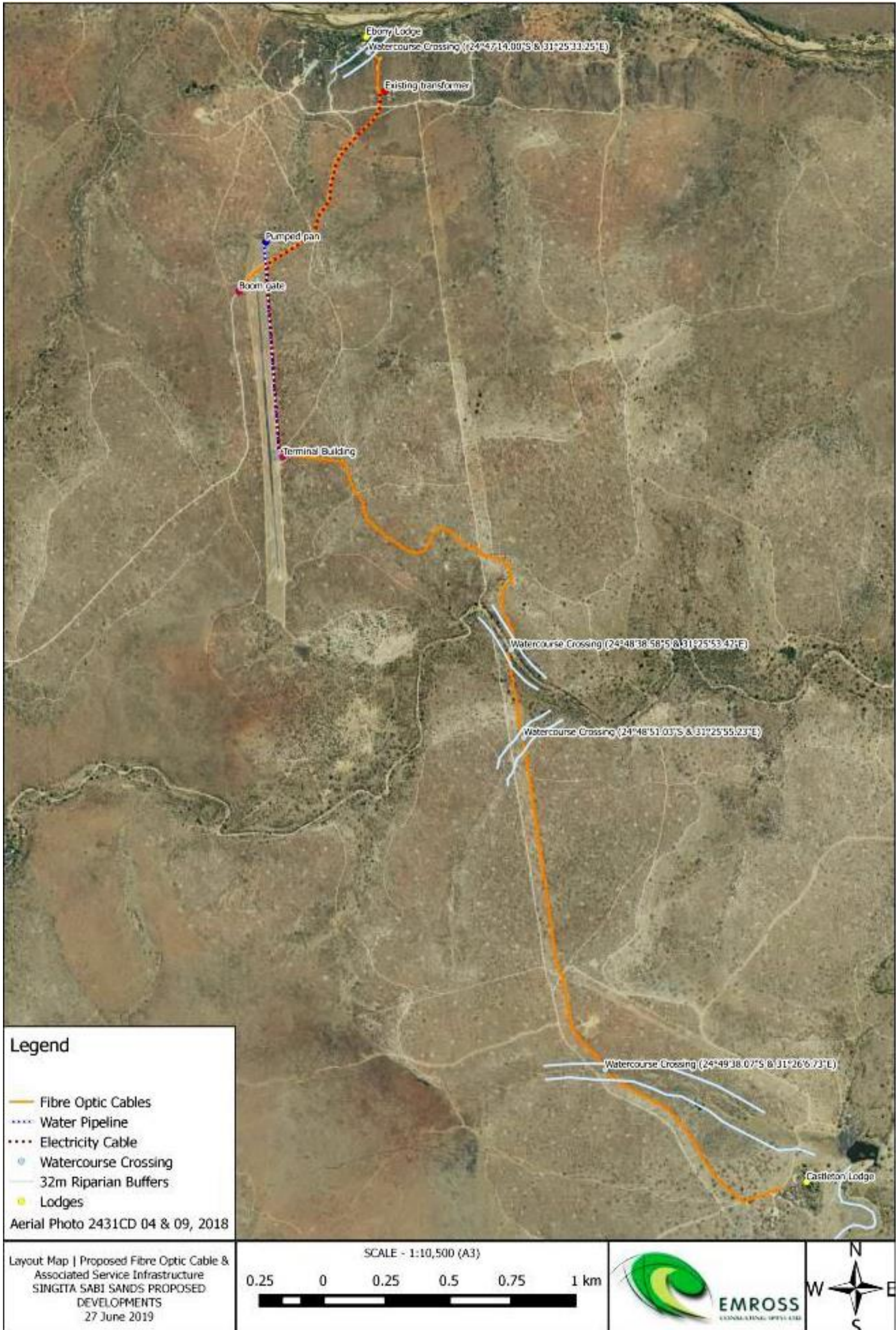


Figure 3: The locality of the route for the fibre optic cable from Castleton to Ebony.

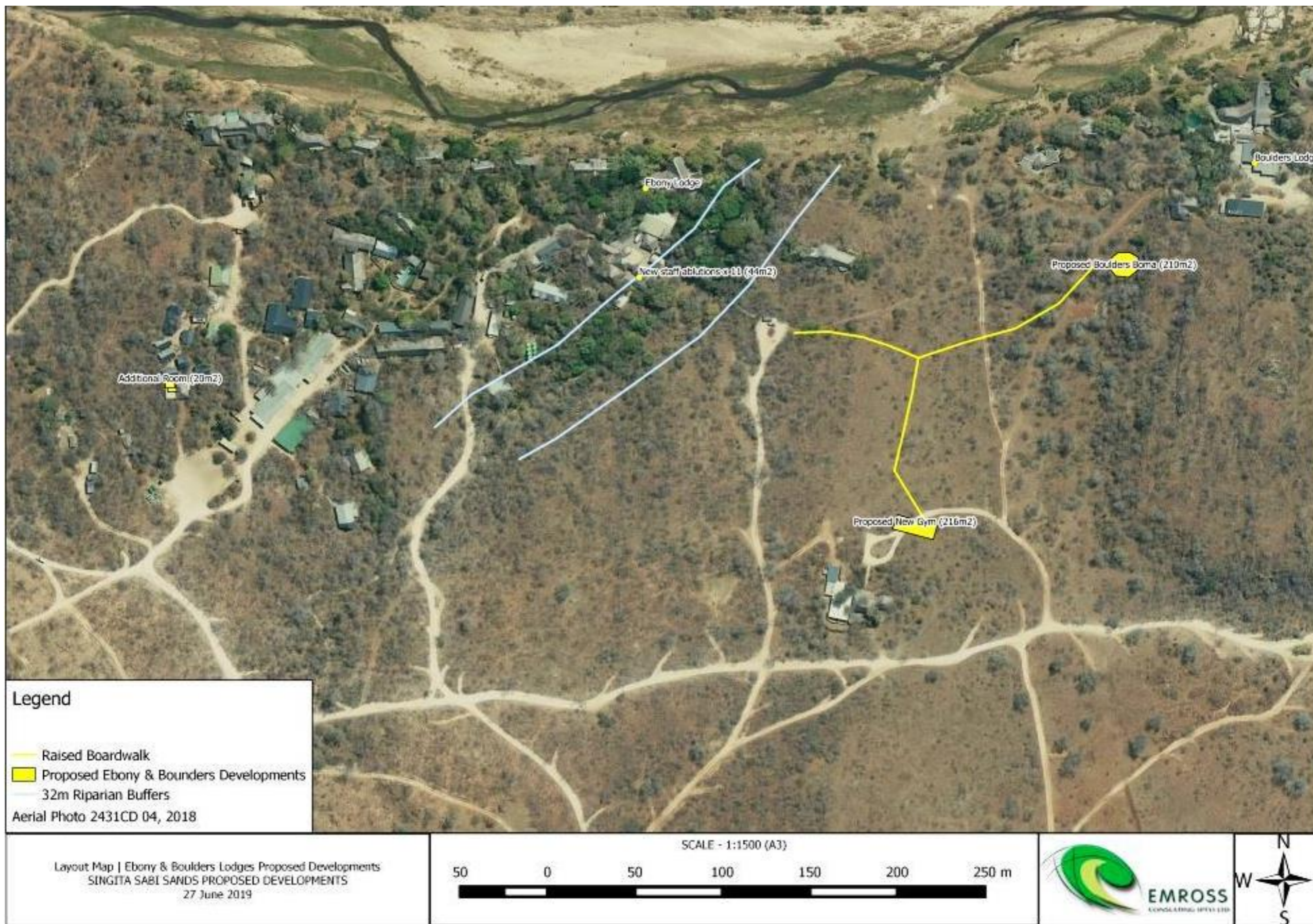


Figure 4: The localities of the development components at the Ebony and Boulders Lodges

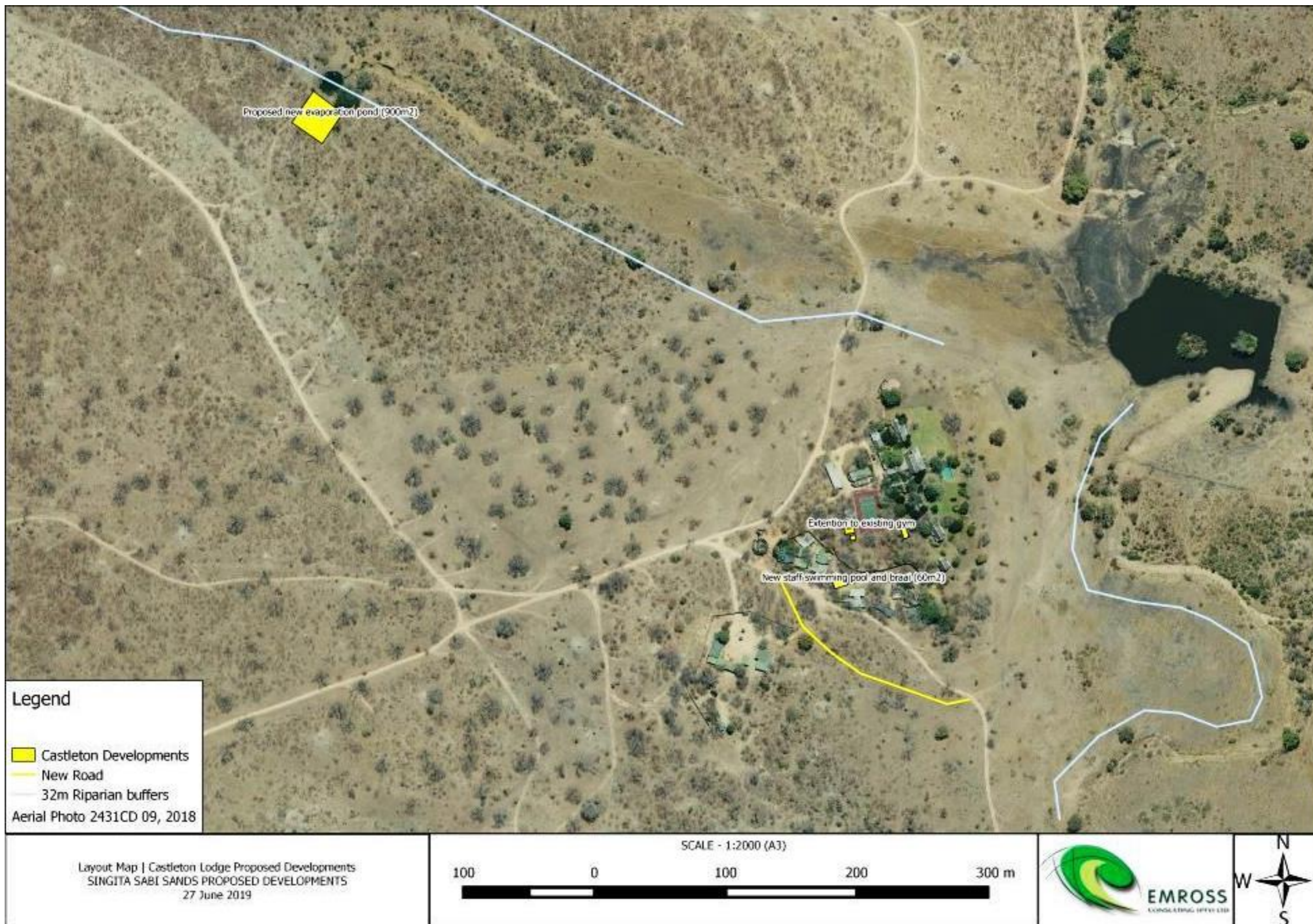


Figure 5: The localities of the development components at Castleton Lodge

3.2 Description of Proposed Developments

This Section provides a description of the proposed developments for which environmental authorisation is being sought. It is divided into two sub-Sections which deal with the linear and the site specific developments respectively. Note that in both instances there will be no need for construction staff and their vehicles and equipment to be accommodated on site.

3.2.1 Linear Developments

There are three linear developments that are described here as they occur on the properties from the north to the south. The first of these requires trenching for a water pipeline and an electricity cable that will service a new ablution facility at the bush breakfast site. The second requires trenching of approximately 7km from the Ebony to Castleton lodges and which will include in some parts both electricity and water reticulation but is primarily for a fibre optic cable. The third is the realignment of a road of 190m at the Castleton Lodge where the existing road will be rehabilitated.

3.2.1.1 Northern Water Pipeline and Electricity Cable

An existing borehole at 24°46'38.83"S and 31°24'48.05"E is to be activated to supply water to a proposed new ablution at the bush breakfast site at 24°47'3.95"S and 31°25'3.85"E as well as to augment supply to the lodges. A 30cm wide and 60cm deep trench needs to be dug from the existing borehole through untransformed indigenous vegetation to accommodate an electricity cable from a new transformer at 24°46'39.90"S and 31°24'46.86"E. The trench will also include this first section of the water pipeline up to the point where it meets an existing road at 24°46'40.78"S and 31°24'47.39"E. The total length of the trench is approximately 75m up until this point. From here the water pipeline will be laid in a trench of the same dimensions and immediately adjacent to an existing road from the previously listed coordinates to an existing borehole at 24°47'1.46"S and 31°25'6.21"E. The length of this portion of the pipeline is just less than 900m and central coordinates are 24°46'49.26"S and 31°25'0.23"E. An additional 150m of trenching will be required to take the water pipeline to the site of the proposed new ablutions at the bush breakfast site and this will also be adjacent to an existing road which crosses a non-perennial tributary of the Sand River at 24°47'2.06"S and 31°25'4.77"E.

Trenches through untransformed indigenous vegetation will be excavated by hand and will be routed to avoid any important biodiversity and/or heritage features. Trenches adjacent to the existing roads will be excavated using a back actor with a 30cm wide digging bucket. All excavations will be carried out according to the Environmental Management Plan provided in Annex C and D. Here it is specified that the top soil and sub-soil are separated for replacement back as it was taken out. It is also specified that progressive rehabilitation be carried out so that no portion of trench is left open overnight. Care will be taken to ensure that grass swards and geophytes are kept intact in the top soil sods to facilitate rapid rehabilitation.

The localities of the development components described above are illustrated in Figure 6 to Figure 9. Note that due to the electricity cable being laid in the same trench as the water pipeline, it is not visible in the illustration but is between the borehole and the new transformer.

A total of approximately 340m² of untransformed indigenous vegetation will be disturbed by these development components.

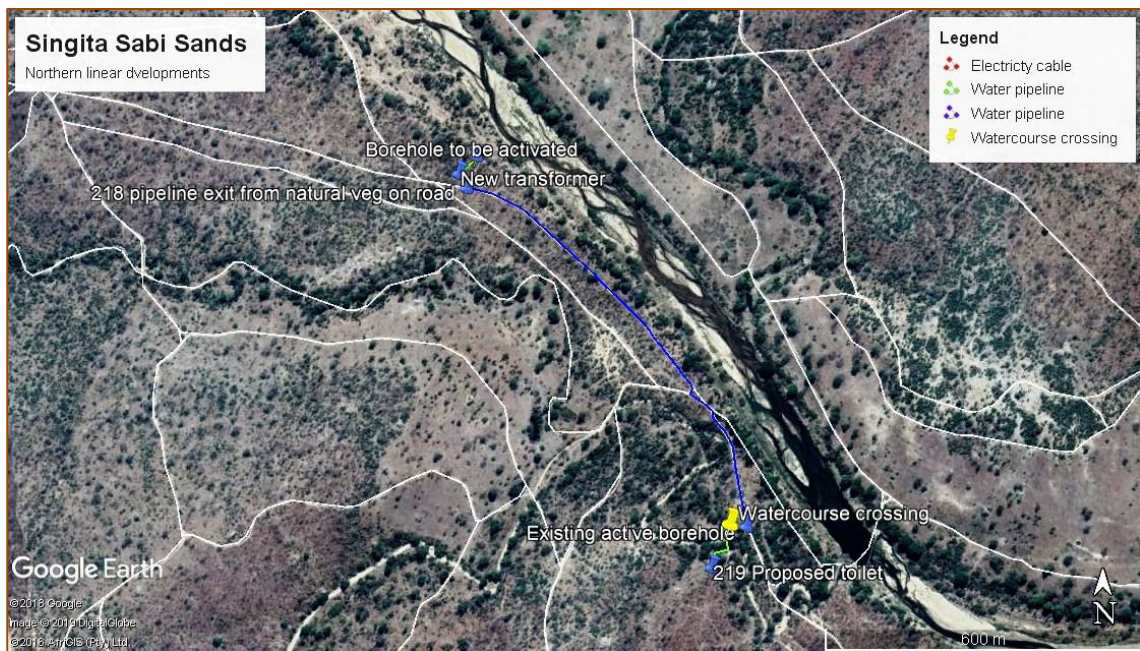


Figure 6: The position of the northern linear developments and related components on Ravenscourt 257KU.



Figure 7: The existing borehole to be activated (© K Zunckel).



Figure 8: Position for the new transformer and where the electricity cable will be trenched through untransformed indigenous vegetation (© K Zunckel).



Figure 9: The existing and active borehole at the end of the proposed new water pipeline (© K Zunckel).

3.2.1.2 Fibre Optic Cable

There are three interrelated components associated with this proposed development, i.e. the primary fibre optic cable from Ebony Lodge in the north to Castleton Lodge in the south, an electricity cable running from an existing transformer just to the south of Ebony Lodge to the terminal building on the airstrip, and a water pipeline running from a pumped pan at the northern end of the airstrip to the terminal building. These three components will all be placed in the same trench but their individual start -, mid - and end point coordinates are provided in Table 1 below. A small deviation and addition to the trench for the fibre optic cable (FOC) runs along the road at the northern end of the airstrip to a

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boom gate access control point. Illustrations of key points described here are provided in Figure 10 to Figure 14.

Table 1: The start -, mid – and end points for the three linear components related to the proposed fibre optic cable.

DEVELOPMENT COMPONENT	START POINT COORDINATES	MID POINT COORDINATES	END POINT COORDINATES
Fibre Optic Cable (6.5km)	24°47'13.92"S 31°25'34.06"E	24°48'37.92"S 31°25'53.55"E	24°49'55.05"S 31°26'31.21"E
Electricity Cable (1.8km)	24°47'19.05"S 31°25'35.66"E	24°47'40.49"S 31°25'23.33"E	24°48'9.39"S 31°25'21.35"E
Water Pipeline (900m)	24°47'40.94"S 31°25'18.58"E	24°47'55.38"S 31°25'19.80"E	24°48'9.39"S 31°25'21.35"E

From the terminal building the trench for the FOC turns due east through untransformed indigenous vegetation for approximately 230m where it joins the existing Pangolin North Road at 24°48'11.80"S and 31°25'29.79"E. The route then follows a general south easterly direction adjacent to the Pangolin North Road until it joins the Ravenscourt Road for approximately 20m from where it continues next to the Pangolin North Road for another 60m where it turns south into a tracer belt that runs parallel to the Ravenscourt Road for just more than 3km where it emerges at Castleton.

The trenching for the FOC will follow the same dimensions and approach as that described in Section 3.2.1.1 with the exception that inspection manholes will be installed approximately every 100m. These will require the trench to be enlarged slightly as per the dimensions illustrated in Figure 14.

A total of approximately 2800m² of untransformed indigenous vegetation will be disturbed by these development components.

A total of approximately 2800m² of untransformed indigenous vegetation will be disturbed by these development components.

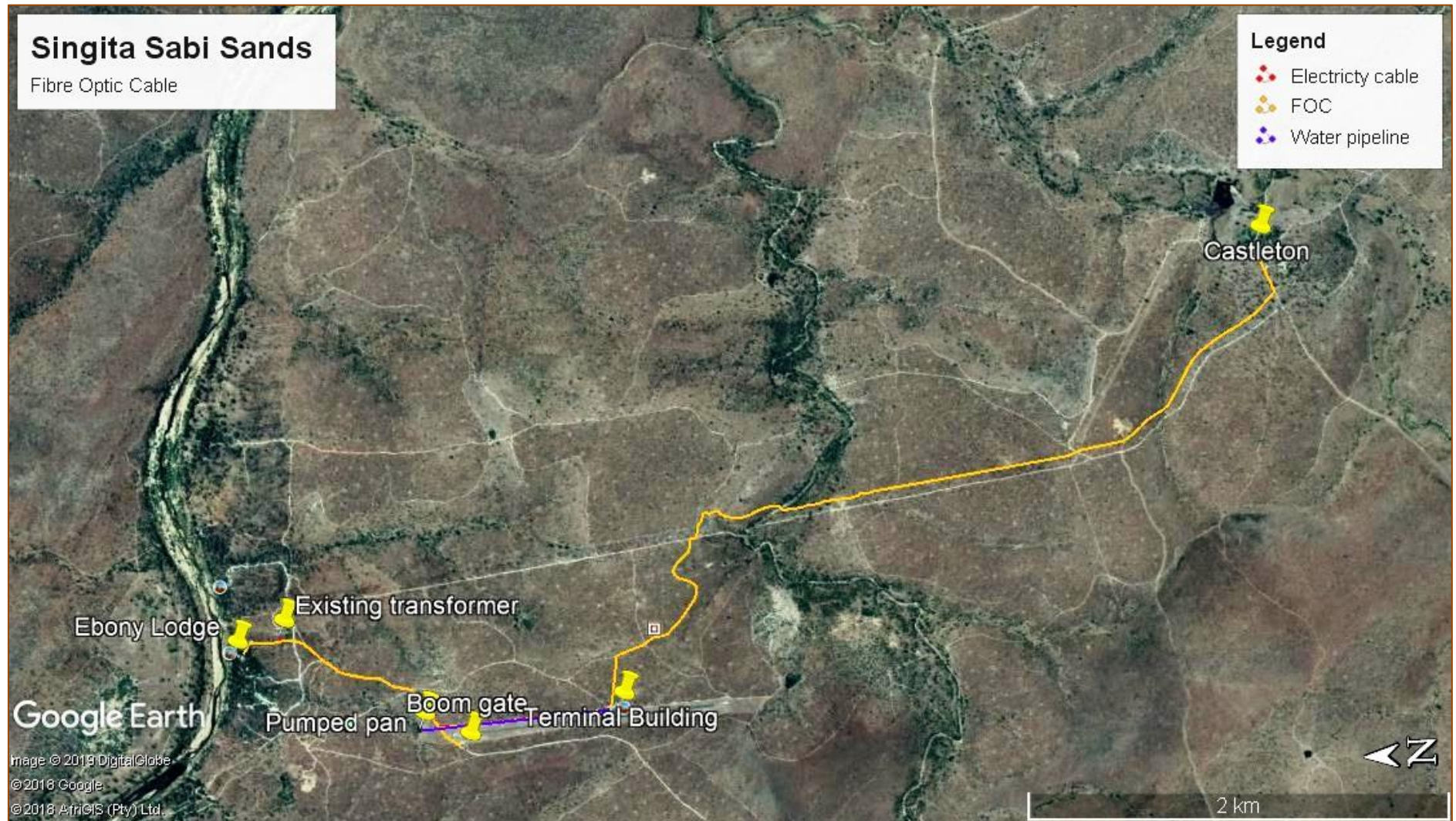


Figure 10: The FOC route from Ebony to Castleton inclusive of the electricity cable and water pipeline.



Figure 11: From left to right the existing transformer, the access road to the guest drop-off at the lodge, looking north from the junction point to the pumped pan and looking south along the eastern service road adjacent to the airstrip (© K Zunckel).



Figure 12: View to the south west from the junction point to the boom gate (© K Zunckel).



Figure 13: The view looking west from the Pangolin North Road towards the terminal building (© K Zunckel).

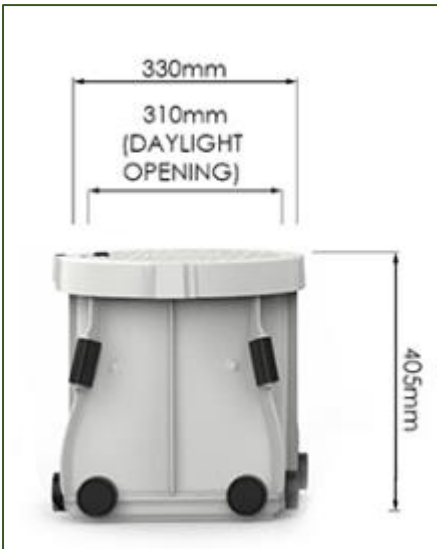


Figure 14: The design and dimensions of the manholes that will be inserted approximately every 100m into the trench for the FOC.

Within approximately 400m moving south in the tracer belt, the FOC trench crosses a significant but non-perennial watercourse at 24°48'38.24"S and 31°25'53.56"E, another 1st order non-perennial watercourse just less than 400m further on at 24°48'50.90"S and 31°25'55.29"E, and another 1.5km further on at 24°49'37.97"S and 31°26'7.03"E. The watercourse crossings will be trenched to 1m depth and the conduit encasing the FOC will be anchored to gabions also sunk below the surface of the watercourse. These crossing

are illustrated in Figure 15 and Figure 16.

Approximately 800m further to the south east the route emerges from the tracer belt on to the main access road to Castleton at 24°49'56.50"S and 31°26'26.36"E. Figure 17 provides a view of this portion of the route looking north from this point. Here it can be seen that the tracer belt has retained its untransformed character despite the annual mowing and scarification.

The tracer belt is maintained with annual mowing and scarification but is otherwise untransformed. Trenching within this portion will thus be treated in the same way as the rest of the route in terms of the separation of top and sub-soil, the preservation of plants in the top soil sods for re-establishment, and the progressive rehabilitation leaving no part of the trench open during the night.



Figure 15: Clockwise from top left is the major watercourse looking upstream, looking to the northern access point, looking downstream and looking to the southern access point (© K Zunckel).



Figure 16: From left to right approaching the 2nd watercourse crossing from the south and looking upstream within the 3rd watercourse crossing (© K. Zunckel).



Figure 17: Looking north up the tracer belt from the point at which the FOC route emerges just before Castleton (© K Zunckel).

3.2.1.3 Road Realignment at Castleton

The road realignment at Castleton involves approximately 200 meters of twin track and the rehabilitation of the existing road as illustrated in Figure 18. The coordinates for the route of the proposed new road from the north west to south east are as follows:

- Start point: 24°49'56.25"S and 31°26'31.99"E;
- Mid-point: 24°49'58.70"S and 31°26'33.96"E; and
- End point: 24°49'59.50"S and 31°26'37.11"E.

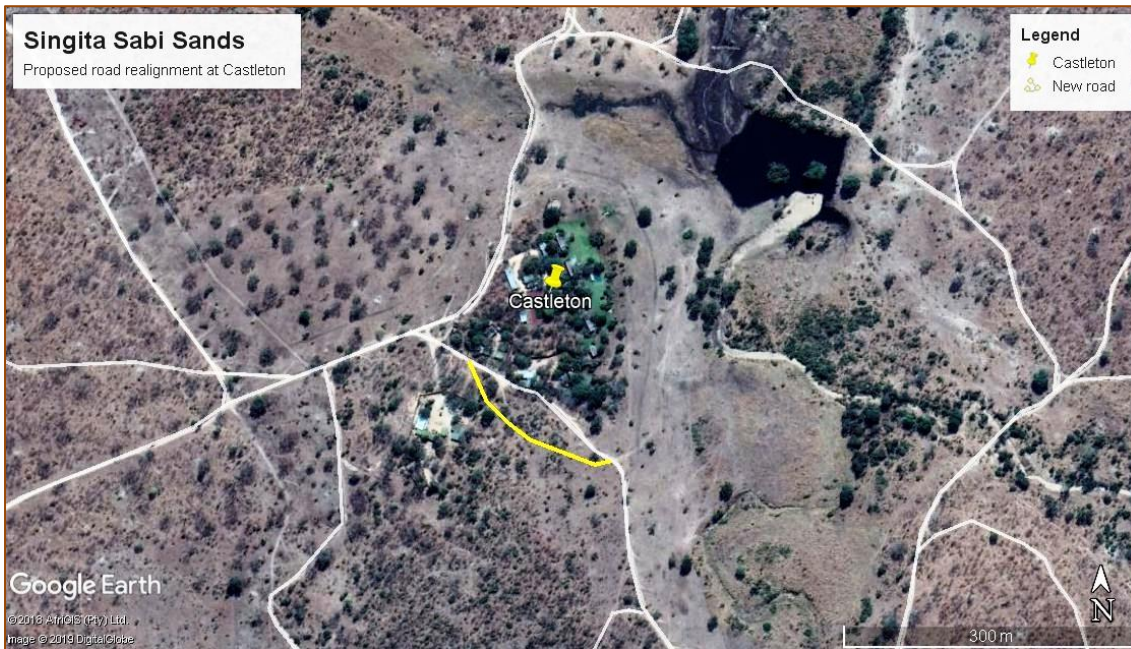


Figure 18: The proposed road realignment at Castleton.

The new road will be constructed simply by driving over the route repeatedly to create the twin tracks. The route will be carefully placed to avoid all threatened and protected plants. Where avoidance is not possible, the plants will be removed and transplanted as part of the rehabilitation of the existing road. The existing road surface will be broken up, seeded with a mix of indigenous grass seed and covered with brush.

Approximately 600m² of untransformed indigenous vegetation will be disturbed by this development, while approximately 540m² will be rehabilitated.

3.2.2 Site- specific Developments

The site-specific developments are listed and discussed according to their location from north to south.

3.2.2.1 New Ablutions at the Bush Breakfast Site

Two toilets with wash hand basins will be installed in a single block, located more than 32m from the edge of the adjacent non-perennial water course as illustrated in Figure 19 and at coordinates 24°47'3.95"S and 31°25'3.85"E. The building will be constructed of brick and mortar on a concrete slab and will be screened from the Bush Breakfast Site. Waste water will be directed via gravity to a

French drain and soak-away towards the south west and further from the water course. Water will be provided from the activated bore hole and pipeline described in Section 3.2.1.1 and will be stored in the roof of the facility.

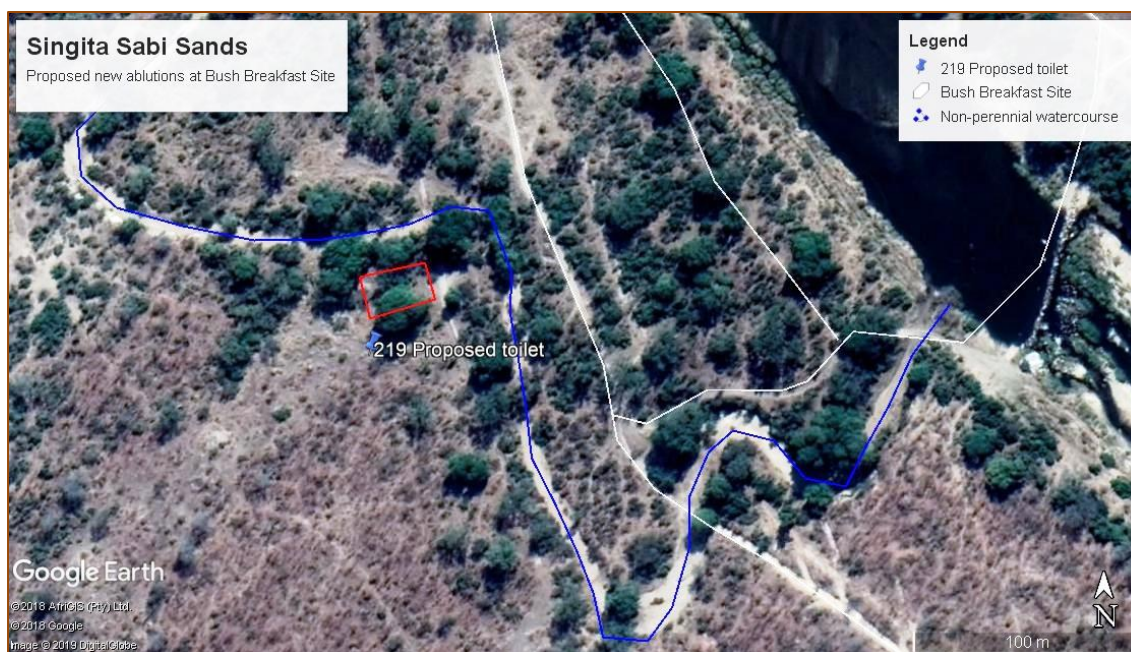


Figure 19: The locality of the proposed new ablutions at the Bush Breakfast Site to the west of the Sand River.

Approximately 10m² of untransformed indigenous vegetation will be disturbed by this development.

3.2.2.2 New Developments at Ebony and Boulders Lodges

The details related to the proposed new developments at the Ebony and Boulders Lodges are captured in Table 2 working from the west to the east. Figure 20 shows the localities of these sites relative to each other and the existing infrastructure. A total of approximately 500m² of untransformed indigenous vegetation will be disturbed by these development components.

Table 2: A summary of the proposed new developments at Ebony and Boulders Lodges

DEVELOPMENT COMPONENT	DESCRIPTION	SITE CENTRAL COORDINATES
Extension to existing staff recreation facility - Ebony	A 20m ² extension to the existing staff recreation facility will require the clearing of some undisturbed indigenous vegetation (see Figure 21).	24°47'16.92"S 31°25'22.68"E
Staff ablutions - Ebony	Eleven (11) additional staff ablation facilities varying in size from 4.04m ² to 12.33m ² and totalling 44m ² to service rooms 2 to 6, 9, 10 and 17 to 20 (see Figure 22 to Figure 24). All are within 32m of an adjacent watercourse, are in close proximity to each other and in an existing development footprint in the staff village. Waste water from the new ablutions will feed into the existing reticulation and treatment works.	24°47'13.80"S 31°25'32.16"E
New gym and raised boardwalk	The existing gym and spa are to be converted to serve as a spa only. The new gym (216m ²) is proposed to be built just to the	24°47'18.84"S 31°25'37.98"E

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DEVELOPMENT COMPONENT	DESCRIPTION	SITE CENTRAL COORDINATES
	north of the existing boutique and wine shop over the existing access road (see Figure 25 to Figure 29). The latter is to be realigned to route behind the new gym. Ablution facilities in the new gym will be plumbed into the existing reticulation. The gym will be linked to Ebony and Boulders Lodges by a raised wooden boardwalk (see Figure 29).	
New boma at Boulders Lodge	The proposed new boma will cover an area of approximately 180m ² (see Figure 30) and will include a small scullery and gas storage area, as well as a guest toilet; which together will cover another approximately 30m ² . The waste water will be plumbed into the existing reticulation and together with other services, will be secured to the new boardwalk that will link the new boma and new gym. The old boma will be decommissioned and turned into a mix of indigenous bush and gardens.	24°47'13.50"S 31°25'41.76"E



Figure 20: The proposed new developments at Ebony and Boulders Lodges



Figure 21: The area into which the existing staff recreation facility is to be extended (© K Zunckel)



Figure 22: The back of rooms 2 to 6 with the adjacent watercourse to the left (© K Zunckel)



Figure 23: The locality of the new ablutions behind rooms 17 to 20 (© K Zunckel)



Figure 24: The locality of the new ablutions for rooms 9 and 10 (© K Zunckel).

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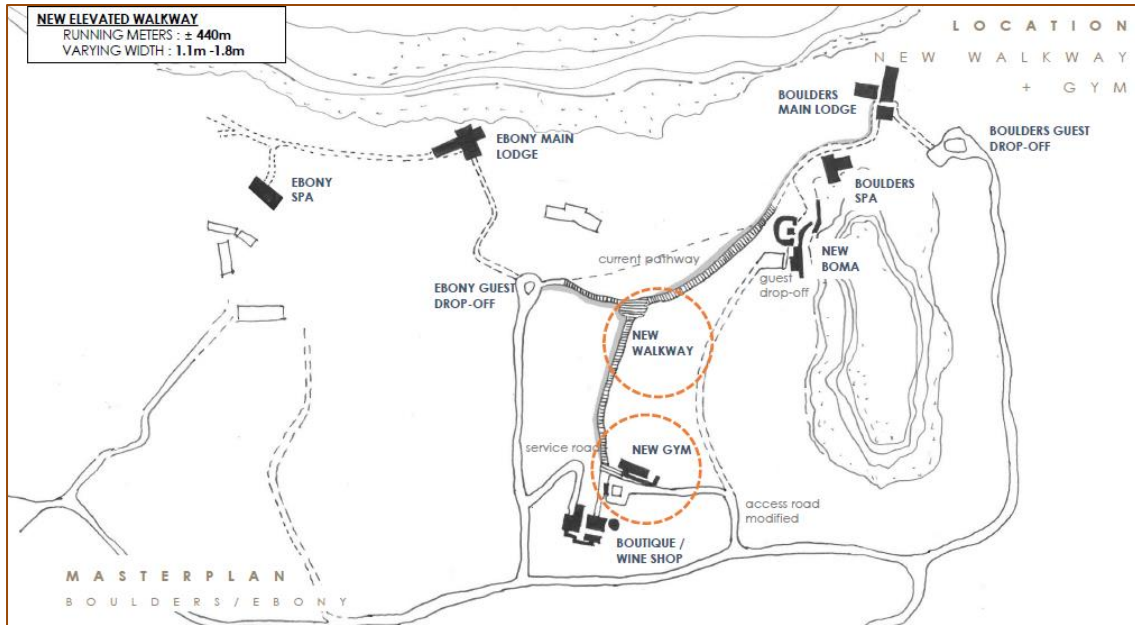


Figure 25: The locality for the proposed new gym and raised walkway



Figure 26: The proposed layout for the new gym in relation to the existing boutique and wine shop.



Figure 27: Artist's impression of the proposed new gym viewed from the north.



Figure 28: Views of the site for the proposed gym looking to the north west (top) and south east (bottom) of the existing road (© K. Zunckel).

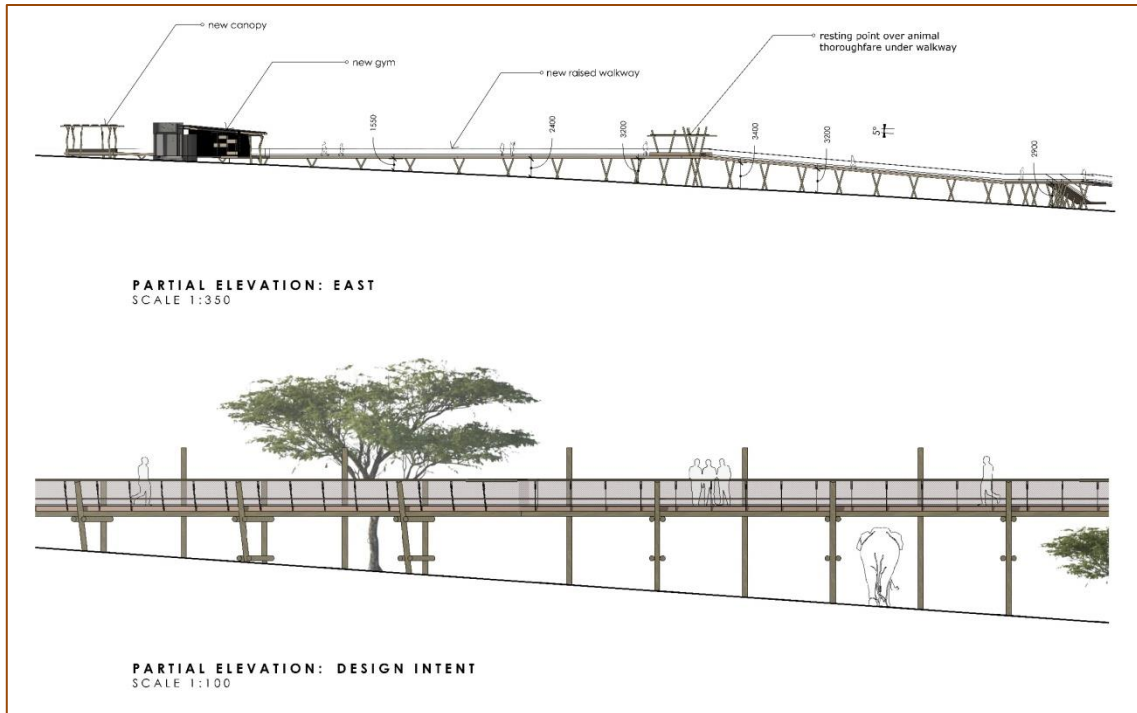


Figure 29: Artist's impression of the proposed new raised wooden boardwalk linking Ebony and Boulders Lodges via the new boma (© GAPP).

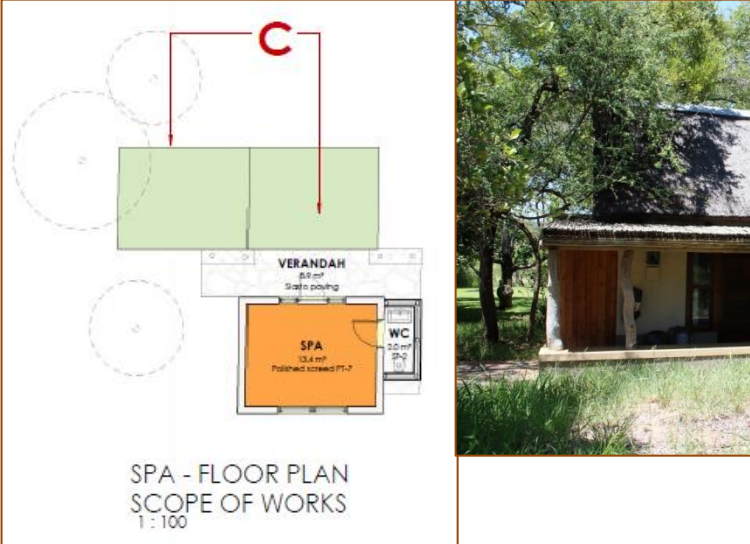


Figure 30: The site for the new boma near Boulders Lodge (© K Zunckel).

3.2.2.3 New Developments at Castleton Camp

The details related to the proposed new developments at Castleton Camp are captured in Table 3 working from the north to the south. Figure 31 shows the localities of these sites relative to each other and existing infrastructure. Some detail within the camp is missing from this illustration due to scale but is described together with the coordinates in Table 3. An area of approximately 1000m² of untransformed indigenous vegetation will be disturbed by these development components.

Table 3: A summary of the proposed new developments at Castleton Camp

DEVELOPMENT COMPONENT	DESCRIPTION	SITE CENTRAL COORDINATES
New evaporation pond	<p>Due to an increase in the volume of treated waste pumped to the existing evaporation pond, it is now over flowing. A new pond measuring 30m x 30m is proposed to be located just to the south and upslope of the existing pond, outside of the 32m buffer from the adjacent non-perennial watercourse and avoiding a large Leadwood tree (<i>Combretum imberbe</i>) (see Figure 32)</p>  <p>SPA - FLOOR PLAN SCOPE OF WORKS 1:100</p> <p>). The two ponds will be linked using gabion mattress with wing walls and laying geotextile material inside.</p>	24°49'43.63"S 31°26'19.56"E
New treatment rooms	Convert existing treatment room into a reception area and store and add two additional new treatment rooms under existing trees totalling 40m ² (see Figure 33).	24°49'55.21"S 31°26'35.51"E
Extension to existing gym and new yoga platform	Extend existing gym to create additional workout space totalling 40m ² and link new gym extension to a yoga platform under trees totalling 16m ² (see Figure 34 to Figure 38).	24°49'55.20"S 31°26'33.68"E
Staff swimming pool and braai area	A staff swimming pool and braai facility totalling approximately 60m ² within an area already disturbed so that vegetation clearance will be minimal (see Figure 39).	24°49'56.60"S 31°26'33.42"E

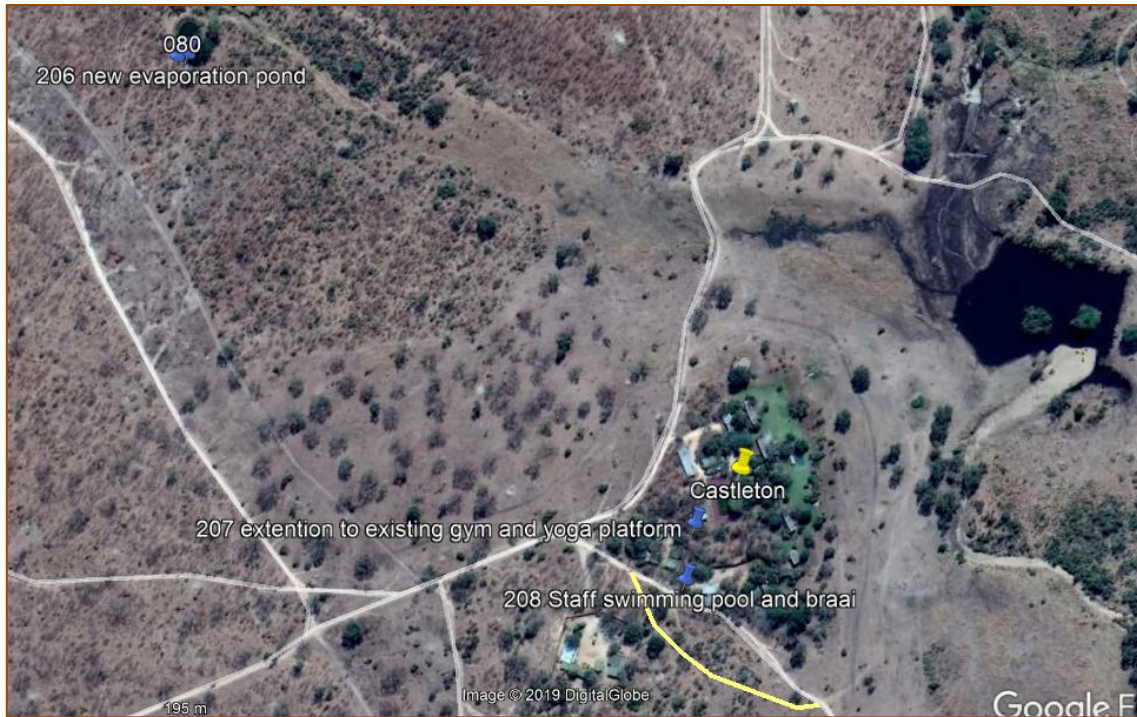


Figure 31: Castleton Camp and the locality of the various developments being proposed.



Figure 32: Looking across the existing evaporation pond up slope towards the locality of the proposed new pond (© K. Zunckel).

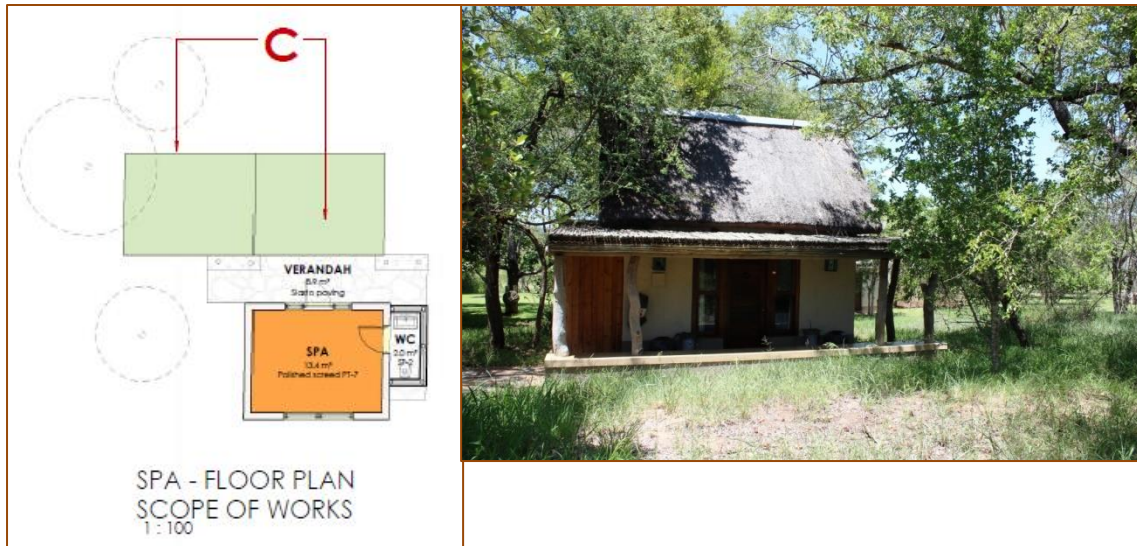


Figure 33: The floor plan showing the proposed two new treatment rooms in front of the existing spa and a front view of the spa (© K. Zunckel).



Figure 34: Front view of existing gym (© GAPP).



Figure 35: Simulated impression of the extended gym (© GAPP).

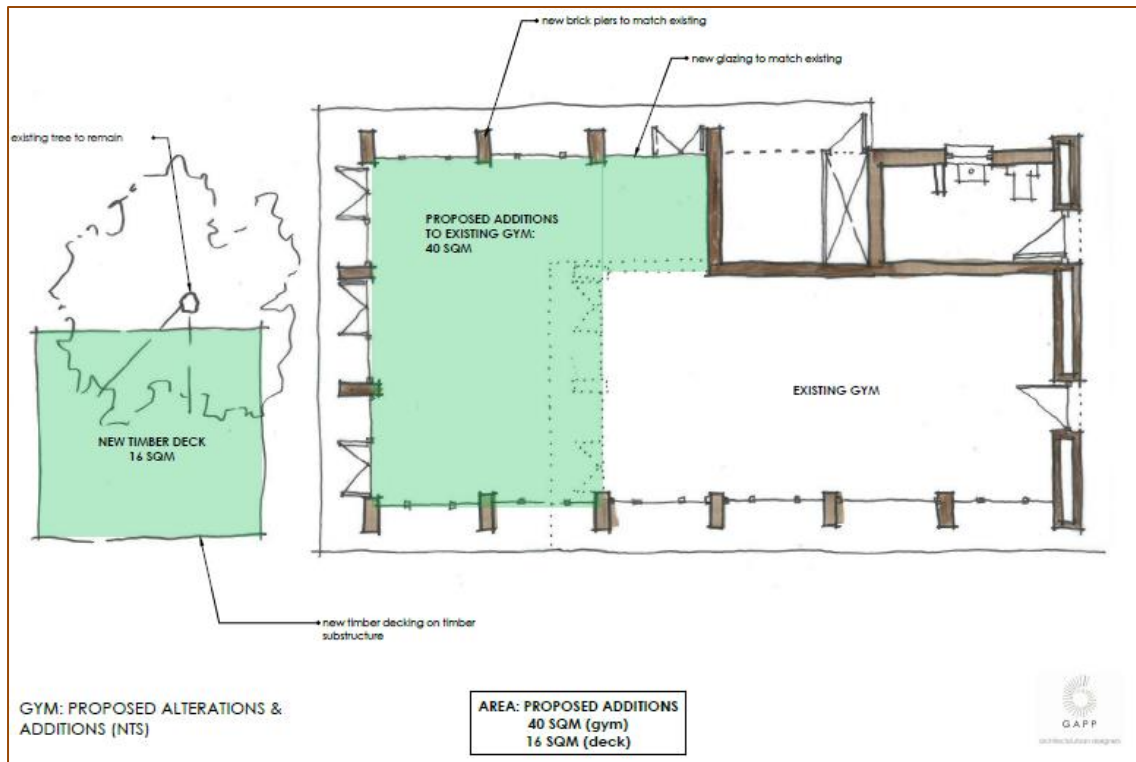


Figure 36: Plan view of proposed extension to existing gym and new yoga platform.



Figure 37: View of the existing gym from the south showing the area into which the extension and new yoga platform are proposed to be located (GAPP).



Figure 38: A simulated illustration of the extension to the existing gym and the yoga platform (© GAPP).



Figure 39: The disturbed site planned for the new staff pool and braai area (© K. Zunckel).

3.3 Method Statements

This section provides descriptions of the approach that will be taken to implement the proposed developments. This information has been put forward by the applicant and is therefore duplicated in the avoidance and mitigation measures listed in Table 10 and Table 11, as well as the EMPr provided with this document and in Annex C and D. Not all the developments have method statements but sufficient information has been provided for these in the avoidance and mitigation and the EMPrs.

3.3.1 Northern Water and Electricity Pipeline and New Ablution at Bush Breakfast Site

Trenching cable and pipeline from borehole at River road west adjacent to road following the road towards the Bush Breakfast site will be done using a TLB with a narrow backhoe bucket of 30cm wide to a depth of 600mm. The first 200 mm, the second layer of 200mm and the 3rd layer of 200mm of soil will be taken out with backhoe bucket consecutively with soil deposited on side of trench in order to replace the soil layers back in correct sequence. The trenching will go through a drainage line where the cable and pipeline will be fastened onto a gabion that will be buried at the depth of 600-800mm below the surface. The gabion will be made from fully galvanised weldmesh and the rock sourced locally on the property. The gabion will be 500mm high 500mm wide and 3000mm long.

The French drain for the waste water for the new ablutions at the Bush Breakfast site will be dug by TLB using a backhoe. The first 200mm of soil will be placed to one side to close off the French drain when complete. The waste water pipes will be laid inside the hole before rocks are laid in. The hole that was dug will be filled with rock sourced on the property to fill up the French drain. The hole will be closed off with Geotextile material and corrugated iron sheets underneath. The top layer of soil will be placed back on top of French drain for rehabilitation together with brush packing of branches on top with grass seed dispersed for grass regrowth.

The first 45 metres linking the new borehole to be activated toward River road west will be trenched by hand at 600mm deep and 300mm wide. This will take the water pipeline and the electric cable from the transformer. The first 200 mm, the second layer of 200mm and the 3rd layer of 200mm of soil will be taken out with spades and picks consecutively with soil deposited on the side of trench in order to replace the soil layers back in correct sequence.

3.3.2 Fibre Optic Cable

Trenching from Ebony lodge transformer will be by hand with pick and shovel to a depth of 600mm. It will cross through two drainage lines where there are two existing gabion structures in place that already carry a major electric cable that feeds Ebony lodge. Once it crosses over these drainage lines and gets to the Ebony access road, it will be trenched with a TLB.

Trenching for the electric and fibre-optic cables from Ebony lodge to Singita access junction Airstrip east adjacent to road following the road will be done with a TLB. From this junction the water pipeline will join and together all three services will be trenched south towards the airstrip terminal building immediately adjacent to the road.

Trenching from the airstrip building will proceed east towards the road Pangolin through the bush carrying only the fibre-optic cable and this section will be done by hand. From Pangolin road trenching will proceed adjacent to the road in a southerly direction and then east onto Pangolin north road towards Ravenscourt road using a TLB and for the rest of the route up until Castleton.

For the one major drainage line, called the Ximovanyana, that will be crossed, the fibre optic cable will be dug approximately 1.5 metres deep and will be secured onto a gabion structure before exiting onto the tracer break continuing south. The Gabion structure will be 500mm wide, 500mm high and 15-20 metres long.

Trenching will be using a TLB with a narrow backhoe bucket of 30cm wide at a depth of 600mm. FOR ALL TRENCHING the first 200 mm, the second layer of 200mm and the 3rd layer of 200mm of soil will be taken out with backhoe bucket consecutively with soil deposited on side of trench in order to replace the soil layers back in correct sequence.

3.3.3 Evaporation Pond at Castleton

A 30m x 30m area will be demarcated 32 meters away from the adjacent watercourse. The area will be above the gradient of the current oxidation dam. The TLB with operator will clear vegetation where the dam will be built, avoiding all woody and protected species. The operator will use existing soil material to push with front bucket of machine to build a dam wall of 1.5m high. Due to the nature of existing clay soil material present on site, it will be mixed with Bentonite to ensure the dam is sealed and does not leak. In the centre of the wall there will be an overflow point to flow into the current existing oxidation dam. This will be made from gabion structure which will be 1 metre wide, shaped like a channel, lined with geotextile material until it reaches the inflow point of the old dam.

3.4 Listed Activities

The activities for which environmental authorisation is being sought are captured in Table 4

Table 4: Listed activities relative to the development components

Activities under Listing Notice 1 (National Environmental Management Act 107 of 1998, GN No. 983, GG 38282 of 4 December 2014, as amended in GG 40772, GN No. 327 of 7 April 2017)	
Description of project activity	Listed Activity 19
The watercourse crossings for the linear developments associated with the water pipeline to the new toilets at the bush breakfast site and the fibre optic cable.	The infilling or depositing of any material of more than 10 cubic metres into, or the dredging, excavation, removal or moving of soil, sand, shells, shell grit, pebbles or rock of more than 10 cubic metres from a watercourse.
Activities under Listing Notice 3 (National Environmental Management Act 107 of 1998, GNR 985, GG 38282 of 4 December 2014, as amended in GG 40772, GN No. 324 of 7 April 2017)	
Description of project activity	Listed Activity 12
The trenching for the water pipelines, electric cables and fibre optic cable will require the clearance of more than 300m ² , while the accumulative area of the site specific developments will exceed this threshold as well.	The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan in Mpumalanga: iii. On land, where, at the time of the coming into effect of this Notice or thereafter such land was zoned open space, conservation or had an equivalent zoning or proclamation in terms of NEMPAA.
Listed Activity 14	
Where the trenching for the water pipelines, electricity and fibre optic cables cross watercourses, they will be secured with gabions sunk to a depth of 1m. The widths of the crossings are such that this threshold will be exceeded.	The development of (ii) infrastructure or structures with a physical footprint of 10 square metres or more; where such development occurs (a) within a watercourse and (c) if no development setback has been adopted, within 32 metres of a watercourse, measured from the edge of a watercourse, in Mpumalanga i. Outside urban areas: (aa) A protected area identified in terms of NEMPAA
Listed Activity 26	
All of the activities associated with the proposed projects accumulatively exceed the thresholds related to the clearing of indigenous vegetation and the development of infrastructure within watercourses.	Phased activities for all activities- i. Listed in this Notice and as it applies to a specific geographic area, which commenced on or after the effective date of this Notice; or ii. Similarly listed in any of the previous NEMA notices, and as it applies to a specific geographic area, which commenced on or after the effective date of such previous NEMA Notices- Where any phase of the activity was below a threshold but where a combination of the phases, including expansions or extensions, will exceed a specified threshold. All the areas as identified for the specific activities listed in this Notice.

3.5 Project Sector

The sector within which the project falls is “Services - hospitality” and “Transformation of land – indigenous vegetation” is also relevant.

4 ACTIVITY CONTEXT AND ENVIRONMENTAL FACTORS

4.1 Activity Compatibility

From a provincial perspective the Mpumalanga Spatial Development Framework (SDF) was consulted to assess the compatibility of the proposed developments with this provincial planning tool. As can be seen from the extracts from the 2014 SDF in Figure 40 below, the provincial planning recognises the SSW as a private nature reserve that is part of the Regional Spatial Development Initiative known as the Kruger to Canyon or K2C (bottom left map).

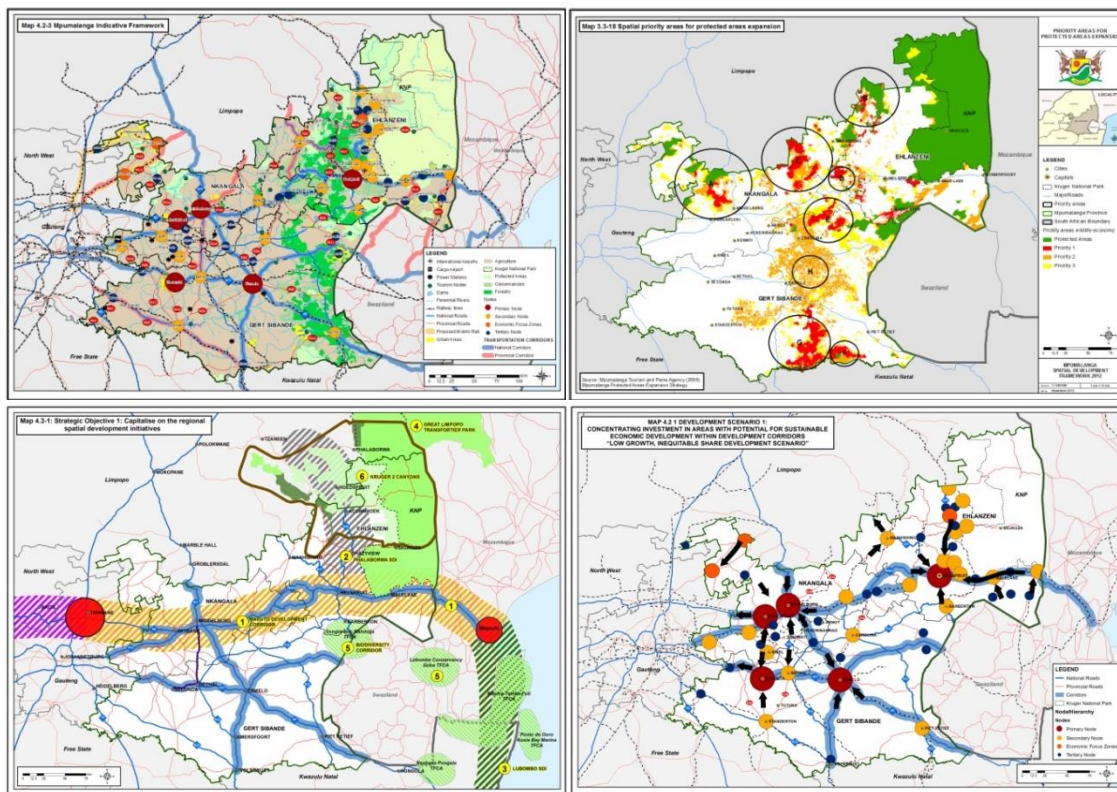


Figure 40: Extracts from the Mpumalanga Spatial Development Framework – 2014 (source: Laduma TAPP).

It may be concluded therefore that the proposed developments are not in conflict with the Mpumalanga SDF.

At a finer scale the proposed developments are compatible with the Purpose of the SSW which according to the draft Management Plan for the SSW for the period 2019 to 2029 the Purpose is (SSW, 2019):

“To conserve and maintain biodiversity, whilst providing opportunities for sustainable ecotourism and meaningful socio-economic contributions for internal and external stakeholders.”

In regards to the proposed developments they are aimed at enhancing the capacity of Singita Sabi Sands to deliver the high-end nature-based tourism product they offer, and as such, to keep their operation competitive and able to meet the demands of the market. It is in the interest of Singita Sabi Sands to ensure that the proposed developments do not detract from the nature-based experience they offer to their guests and therefore also to ensure that they are compatible.

4.2 Site Descriptions

The biophysical features that are unique to each of the proposed development sites are captured in Table 6. Otherwise there are a number of these that are common and these are discussed below. Additional information is provided in relation to the aspects covered in the table but at a broader scale and to provide further context. This information has been extracted from SSW Management Plan (SSW, 2019).

4.2.1 Climate

The climatic conditions characteristic of Singita Sabi Sands may be described as semi-arid. Precipitation occurs predominantly as summer thunder showers with occasional light winter rain when cold fronts penetrate deeply into the country. Summer temperatures range between 18° C and 45° C while winter temperatures range between 8° C and 23° C. A south to north rainfall gradient exists in the SSW with the long-term annual averages been 620mm and 570mm respectively. With Singita Sabi Sands being located roughly in the centre of the SSW and having a longitudinal orientation, this gradient is also applicable.

Typical of semi-arid environments, precipitation is erratic with oscillating period of above and below average rainfall being recorded. Variations range between 248 mm (1991/1992) during drought years to 1147mm (2000/2001) for very wet years with flooding conditions. From a management perspective these extreme oscillations require a dynamic and adaptive approach to ensure that natural responses are simulated and encouraged.

4.2.2 Topography

The topography of Singita Sabi Sands is gently undulating with moderately dissected and rounded hill country, rising above the floor of the Sand River valley. The Sand River is a dominant feature in the area. It forms the norther boundary at an altitude of just more than 366masl, flowing in a south easterly direction to exit the property after dropping 36m over a distance of approximately 9km. The highest elevation on Singita Sabi Sands is approximately 465masl in the south western corner of the property and the lowest is approximately 334masl at the point at which the Sand River crosses the north eastern boundary.

4.2.3 Geology and Soils

The following description of the geology and soils is a direct extract from the SSW Management Plan as it applies to Singita Sabi Sands:

The geomorphology of the eastern parts of Southern Africa and particularly the Lowveld regions, the Kruger National Park and the SSW Protected Area have been directly affected by the large-scale geographical processes which have taken place in South Africa. Due to this, the geological structures and differences in resistance to weathering by different rock types and formations have greatly influenced the current landscape morphology (Venter & Bristow, 1986). The Lowveld is predominantly underlain by the basement gneisses and granites. Using Walraven (Walraven, 1989) the overall area of the SSW Protected Area can be described as follows: A central band runs from close to the eastern boundary to the western boundary and is dominated by medium to coarse grained, sphene-bearing

tonalite. Forming an approximate U-shape around the latter is a series classified as quartz-microcline-plagioclase-biotite migmatite and gneiss with mafic and ultra-mafic xenoliths. Local re-crystallisation occurs in the south of the reserve where the Sabie River borders the reserve. A tongue of light grey, medium grained biotite gneiss with coarse grained quartz veldspar leucosomes traverses the area from the north-eastern corner of the reserve (Exeter) through the northern sections of the reserve through to the west to areas adjoining the Kruger National Park. The north-eastern sections of the reserve are classified as grey to pale brown, medium- to coarse grained quartz-feldspar-biotite gneiss with subordinate mafic to ultramafic xenoliths.

In some areas where gabbro and dolerite intrusions strike through, the landscape features are flatter areas of relief (Venter & Bristow, 1986). Within these areas are underlying granophyric quartz gabbro (Sabi Sand Granophyre) which dominates the central and eastern sections of the southern reserve area. The origin of these rocks is unclear, but it may be that the Sabi Sand Granophyre represents some marginal interaction facies between the surrounding Nelspruit suite and gabbroic rocks which formerly overlay the granophyre, but which have been removed by erosion. In a narrow band in the eastern and central areas of the reserve, in a band through the south and west, we find what is termed Timbavati Gabbro, a medium- to coarse-grained gabbro, olivine gabbro and quartz gabbro. These are basic rocks with an irregular outcrop pattern distinguished by a clearly recognizable vegetation type. A very prominent dyke, consisting of fine to medium grained, hybridized gabbro, with abundant inclusions of acid rocks and protrudes prominently above the flat topography formed by the granite and gneiss. In the SSW Protected Area, it stretches in a narrow band from the west and central boundary on the reserve through to the neighbouring Mala Mala adjoining the Kruger National Park (Peel & Stalmans, 2010).

Soil is defined as a natural mass of unconsolidated natural material which can support functional ecosystems within protected areas. This represents a critical resource and through its intrinsic properties delivers critical ecosystem services to the ecosystems in which it is found. Within the SSW Protected Area, there is a strong correlation between the geology and soils of the Protected Area. In the SSW Protected Area, the soils occur in distinctive catenary sequences on granitoid rocks. Their formation is a result of the following processes:

- a. The mobilisation and eluviation of clay particles and soluble weathering products from porous soils in upland positions by rain water;
- b. The lateral downward transportation of these components under the influence of gravitation to foot slope positions, where they are redeposited to form impermeable clay horizons. At this point the ground water is forced to the surface, thus forming waterlogged zones (seepage lines) during the rainy season which follow the contours (Venter, 1986). Thus, a general catenary sequence from crest to valley bottom, determined by the sequence of soil complexes (i.e. sandy, hydromorphic, duplex and alluvial) and associated vegetation composition, is repeated regularly across the hills and valleys.

Although these catenary sequences associated with granite-gneiss is representative of the area, the presence of gabbro intrusions and dolerite dikes causes a marked change in soil patterns. These

metamorphic units generally weather into clayey structured fertile soils which differ from the normal granite-gneiss pattern (Peel & Stalmans, 2010).

4.2.4 Hydrology and Artificial Water Provision

The main hydrological feature of Singita Sabi Sands is the Sand River. This river has its source in the foothills of the Drakensberg escarpment to the west and is an important tributary of the Sabie River which forms part of the southern boundary of the SSW. The property is then bisected by a 3rd order non-perennial tributary of the Sands River that drains most of it and enters the Sand River at the north eastern corner of the property.

According to the SSW Management Plan, the Sand River is considered to be “moderately modified” from the perspective of its Present Ecological State (PES). This means that a loss and change of natural habitat and biota have occurred but the basic ecosystem functions are still predominantly unchanged.

In addition to this non-perennial watercourse are ephemeral pans, i.e. natural depressions that temporarily hold water in the wet season. These occur throughout the property and represent important water sources as well as a diversification of habitat.

Due to the non-perennial nature of the natural water on Singita Sabi Sands, a number of artificial water sources have been developed and maintained as a water source for wildlife and human consumption. Water for human consumption is primarily provided from boreholes.

4.2.5 Vegetation Types

A broad description of the vegetation types as per the SSW Management Plan is provided here as it is also applicable to Singita Sabi Sands:

At a very coarse level, the SSW Protected Area falls within the one biome and one bioregion: The Savanna Biome, and the Lowveld Bioregion. The SSW Protected Area falls mainly within the Granite Lowveld (SVI 3) vegetation type, occurring at altitudes of about 250 - 700 m and is characterised by tall shrubland with few trees to moderately dense low woodland on the deep sandy uplands with *Terminalia sericea*, *Combretum zeyheri* and *C. apiculatum*, and with a ground layer including *Pogonarthria squarrosa*, *Tricholaena monachne* and *Eragrostis rigidior* (Mucina & Rutherford, Reprint 2011). The equivalent vegetation types as described by Acocks (Acocks, 1975) are Arid Lowveld (Veld Type 11) and Lowveld (Veld Type 10). According to Low and Rebelo’s classification (Low & Rebelo, 1996), the reserve comprises of Mixed Lowveld Bushveld (Type 19) and Sour Lowveld Bushveld (Type 21).

These vegetation types have provided the basis from which an accurate and easily recognised framework for the habitat delineation within the SSW has been possible. The habitat or finer scale vegetation types relevant to Singita Sabi Sands are listed below and their spatial distribution across the property was used to determine the finer scale vegetation types for each of the proposed development sites.

- *Acacia nigrescens/ Sclerocarya birrea/ Dalbergia melanoxylon/ Pterocarpus rotundifolius* sparse to open woodland;

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- *Euclea divinorum/ Pappaea capensis/ Spirostachys africana/ Pyrostria hystrix* sparse to dense woodland mosaic;
- *Sclerocarya birrea/ Combretum apiculatum/ Combretum zeyheri* open to closed woodland;
- *Sclerocarya birrea/ Terminalia sericea* open to closed woodland;
- *Sclerocarya birrea/ Terminalia sericea/ Combretum apiculatum* open to closed woodland; and
- Remaining 12 minor vegetation types.

4.2.6 Fauna

As an open system within the SSW, and the Great Limpopo Transfrontier Conservation Area, the full suite of fauna associated with this semi-arid savanna may be encountered at all of these sites. This would exclude aquatic fauna as all the sites are terrestrial. An indication of the fauna that occurs in the SSW is provided in Table 5.

Table 5: A broad indication of the fauna that occurs in the SSW and Singita Sabi Sands.

PHYLUM	TOTAL NUMBER SPECIES RECORDED	CONSERVATION STATUS (IUCN RED LIST)	
		Species	Status
Birds	266	Western Red-footed falcon Cape Vulture Lappet-faced Vulture Tawny Eagle Martial Eagle White-breasted Cormorant	Near threatened Vulnerable Vulnerable Vulnerable Vulnerable Protected
Amphibians	24	Lowveld bullfrog Mottled shovel-nosed frog	Near threatened Near threatened
Mammals	41 large 34 small	Cheetah African Elephant Pangolin African Lion Tsessebe White Rhinoceros Black Rhinoceros	Vulnerable Vulnerable Vulnerable Globally vulnerable Endangered Near threatened Near threatened
Fish	33	Shortfin barb Smallscale yellowfish	Near threatened Protected
Reptiles	55		

4.2.7 Ecological Functionality

Each of the sites are part of an open system and as such ecological dynamics are encouraged to functions naturally. Where necessary, management interventions are implemented to simulate natural ecosystem functionality. Therefore all of the sites of proposed development may be considered as having relatively unaltered ecological functionality.

4.2.8 Cultural / Historical Features

Three sites of archaeological potential were identified during the physical survey phase of the project, two Stone Age sites and one potential Early Iron Age site. Due to the nature of the Stone Age site, it is recommended that these sites might be impacted on once the developer has applied for a Destruction Permit from SAHRA. Due to the uncertain nature of the Early Iron Age site, it is recommended that an archaeologist with Iron Age experience attend to a watching brief during any ground breaking activities when the gym is extended, and the yoga platform is erected. A series of

augering tests is also suggested before ground breaking commences. This will assist in establishing if there are any sub surface archaeological deposits.

Table 6: Fine scale biophysical features of the proposed development sites

Activity	Elevations (masl) and gradient (%) (north - south or west to east)	Landscape position	Soil types	Rivers and wetlands	Vegetation cover
Linear Developments					
Northern Water Pipeline and Electricity Cable	364 and 357 0.8%	Valley bottom	Glenrosa, Clovelly, Swartland and Mayo	The Sand River flows parallel to the route of the proposed pipeline approximately a minimum of 60m to the north east. To the southern end of the route it passes between the Sand River and a non-perennial tributary to the west. Although in close proximity to both watercourses at this point, the route is adjacent to an existing road and outside of the riparian zones of both. There are no wetlands related to the proposed pipeline route.	<i>Sclerocarya birrea/Terminalia sericea</i> open to closed woodland
Fibre Optic Cable	365 to 394 0.45%	Predominantly on the crest but dropping to valley bottoms at watercourse crossings	Glenrosa and Clovelly	Being mostly on the crest of the landscape the association with watercourses are limited to three crossings of non-perennial tributaries of the Sand River. There are no wetlands associated with the route of the fibre optic cable.	<i>Sclerocarya birrea/Terminalia sericea</i> open to closed woodland
Road Realignment at Castleton	394 to 387 3.6%	Mid-slope	Glenrosa and Clovelly	The closest watercourse is 120, away from the south eastern end of the proposed new road and there are no wetlands in proximity to the route.	<i>Sclerocarya birrea/Terminalia sericea</i> open to closed woodland
Site-specific Developments					
New ablutions at bush breakfast site	360masl	Bottom lands	Arcadia, Bonheim, Mayo	A non-perennial tributary of the Sand River is located 35m to the north and 45m to the east of the proposed site. There are no wetlands within 100m of the site.	<i>Acacia nigrescens/ Sclerocarya birrea/ Dalbergia melanoxylon/ Pterocarpus</i>

Activity	Elevations (masl) and gradient (%) (north - south or west to east)	Landscape position	Soil types	Rivers and wetlands	Vegetation cover
					<i>rotundifolius</i> sparse to open woodland
New Developments at Ebony and Boulders Lodges					
New Lapa	377 masl	Mid-slope	Arcadia, Bonheim, Mayo	The Sabi Sands River is 230m to the north and there are no wetlands within 100m of the site.	<i>Acacia nigrescens/ Sclerocarya birrea/ Dalbergia melanoxylon/ Pterocarpus rotundifolius</i> sparse to open woodland
Additional staff accommodation x 3	374 masl	Mid-slope	Arcadia, Bonheim, Mayo	The Sabi Sands River is 130m to the north and there are no wetlands within 100m of the site.	<i>Acacia nigrescens/ Sclerocarya birrea/ Dalbergia melanoxylon/ Pterocarpus rotundifolius</i> sparse to open woodland
Staff ablutions	366 masl	Bottom lands	Arcadia, Bonheim, Mayo	The Sabi Sands River is 80m to the north and a non-perennial watercourse is 10m to the east at the closest point. There are no wetlands within 100m of the sites.	<i>Acacia nigrescens/ Sclerocarya birrea/ Dalbergia melanoxylon/ Pterocarpus rotundifolius</i> sparse to open woodland
New gym and raised walkway	372 masl	Mid-slope	Glenrosa and Clovelly	The closest watercourse is the Sabi River which is 230m to the north and there are no wetlands within 100m of the site.	<i>Sclerocarya birrea/ Terminalia sericea</i> open to closed woodland
New boma	367 masl	Mid-slope	Glenrosa and	The closest watercourse is the Sabi River which is	<i>Sclerocarya birrea/</i>

Activity	Elevations (masl) and gradient (%) (north - south or west to east)	Landscape position	Soil types	Rivers and wetlands	Vegetation cover
			Clovelly	95m to the north and there are no wetlands within 100m of the site.	<i>Terminalia sericea</i> open to closed woodland
New Developments at Castleton Lodge					
New evaporation pond	394 m	Mid-slope	Glenrosa and Clovelly	A non-perennial watercourse is 38m to the north east and there are no wetlands within 100m of the site	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> open to closed woodland
New treatment rooms	389 m	Mid-slope	Glenrosa and Clovelly	A non-perennial watercourse is 140m to the east of the site and there are no wetlands within 100m.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> open to closed woodland
Expansion to gym and new yoga platform	392 m	Mid-slope	Glenrosa and Clovelly	A non-perennial watercourse is 200m to the east of the site and there are no wetlands within 100m.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> open to closed woodland
Staff swimming pool and braai area	392 m	Mid-slope	Glenrosa and Clovelly	A non-perennial watercourse is 210m to the east of the site and there are no wetlands within 100m.	<i>Sclerocarya birrea</i> / <i>Terminalia sericea</i> open to closed woodland

5 LEGAL AND POLICY FRAMEWORK

A comprehensive view of policy and legislation relevant to the proposed developments is provided in Table 7 together with an indication of how the proposed developments are compliant and responsive to these.

Table 7: A list of relevant legislation and policy

Title of legislation, policy or guideline	Purpose of the legislation and applicability to the project	Administering authority	Proposed activity compliance/response
Constitution of Republic of South Africa (108 of 1996):	This is the fundamental law of South Africa, setting out the Bill of Rights as well as the relationship of various government structures to each other. “Everyone has the right – (a) to an environment that is not harmful to health or well-being; and (b) to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that – a. prevent pollution; b. promote conservation; and c. secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.	National Government	The proposed activities have been conceptualised, designed and planned in respect of meeting these constitutional requirements in that all recommended mitigation actions will be implemented and frequently monitored ensuring that any pollution risks are avoided and addressed and that conservation is promoted. Both construction and operational phases will happen within the limits of sustainability.
Conservation of Agricultural Resources (Act 43 of 1983):	The purpose of the Conservation of Agricultural Resources Act No. 43 of 1983 (CARA) is to provide for control over the utilisation of the natural agricultural resources of the Republic in order to promote the conservation of the soil, the water sources and the vegetation and the combating of weeds and invader plants.	National Department of Agriculture (DAFF)	Mitigation measures are in place to ensure that no impacts on soil and water occur during the construction and operational phases of the proposed developments, and the need to address potential weed infestations is also noted in the EMP.
National Environmental Management: Protected Areas Act (Act No. 57 of 2003):	The Act provides for the protection and conservation of ecologically viable areas representative of South Africa’s biological diversity and its natural landscapes and seascapes; for the establishment of a national register of all national, provincial and local protected areas; for the management of those areas in accordance with national norms and standards; for intergovernmental co-operation and public consultation in matters concerning protected areas, and for matters in connection therewith. The proposed developments fall within a proclaimed Protected Area in terms of this Act, and will therefore be subject to the provisions of this Act. Specifically including the following: <ul style="list-style-type: none"> • Regulations for the proper administration of special nature reserves, national parks and world heritage sites, published under Government Notice R1061, In Government Gazette 28181, dated 28 October 2005. • Norms and standards for the management of protected areas, 	Department of Environmental Affairs	The proposed developments are nested within and are controlled by the SSW Management Association. As a proclaimed private nature reserve, the SSW ensure that the development fits within the relevant legal and policy frameworks for the SSW as per their Standard Operating Procedures, Management Plan and Landowner Co-management Agreements.

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Title of legislation, policy or guideline	Purpose of the legislation and applicability to the project	Administering authority	Proposed activity compliance/respon se
	published under Government Notice R382, In Government Gazette 399878, dated 31 March 2016.		
National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004):	The objects of the National Environmental Management: Biodiversity Act 10 of 2004 (NEMBA) are to provide for the management and conservation of biological diversity within South Africa and of the components of such biological diversity; to give effect to ratified international agreements that are binding on South Africa; and to ensure the protection of the ecosystem as a whole, including species that are not targeted for exploitation.	Department of Environmental Affairs	As much of the proposed development is located on existing infrastructure and brown field sites there are limited biodiversity concerns. However, their locality within Singita Sabi Sands has highlighted the potential impact on the natural environment and relevant mitigation measures have been recommended to ensure that these impacts remain insignificant.
National Spatial Biodiversity Assessment:	The National Spatial Biodiversity Assessment (NSBA) classifies areas as worthy of protection based on their biophysical characteristics, which are ranked according to priority levels. The proposed development sites are located in the Granite Lowveld, which is ranked as vulnerable with a conservation target of 19%. and some 17% statutorily conserved in the Kruger National Park. It also falls within an areas zoned as Limited and Intensive Development Zones as per the Singita Sabi Sands Management Plan for 2019 to 2029.	Department of Environmental Affairs and SANBI	The localities and types of proposed developments are compatible thus ensuring that the requirements of the NSBA are not compromised.
National Forests Act, 1998 (Act no 84 of 1998):	The purposes of the National Forests Act No. 84 of 1998 (NFA) are, inter alia, to promote the sustainable management and development of forests for the benefit of all and to enact special measures for the protection of certain forests and trees. The minister may declare any tree, group of trees, woodland or species to be protected trees, groups of trees and species (Section 12) or a particular forest to be a "natural forest" (Section 7). Specified activities in respect of these areas or trees are prohibited by the NFA. Protected trees require permits to move, or damage them.	Department of Agriculture, Forestry and Fisheries	All protected species of trees and shrubs will be avoided in all of the proposed developments.
National Heritage Resources Act 25 of 1999	The National Heritage Resources Act legislates the necessity for cultural and heritage impact assessment in areas earmarked for development, which exceed 0.5 hectares (ha) and where linear developments exceed 300 metres in length. In this regard, the proposed development site are be subject to engagement with the South African Heritage Resources Agency (SAHRA). Potential impact on cultural heritage, paleontological or archaeological resources through excavation activities or disturbance, whilst unlikely, will need to be monitored.	South African Heritage Resources Agency (SAHRA)	Destruction permits will be required to allow development in the Stone Age sites and a Watching Brief will be applied for the potential Early Iron Age site.
The National Water Act, (Act No. 36 of 1998)	The purpose of the National Water Act 36 of 1998 (NWA) is to ensure that the nation's water resources are protected, used, developed, managed and controlled in ways that ensure that the	Department of Water and Sanitation through the	Some of the proposed activities will trigger the need for a Water Use Licence.

Title of legislation, policy or guideline	Purpose of the legislation and applicability to the project	Administering authority	Proposed activity compliance/respon se
	integrity of water resources are protected.		
National Environmental Management Waste Act 59 of 2008	The National Environmental Management: Waste Act (NEMWA) was primarily enacted to reform the law regulating waste management in order to protect health and the environment by providing reasonable measures for the prevention of pollution and ecological degradation and for securing ecologically sustainable development.	Department of Environmental Affairs	Waste generation volumes are insignificant but will be completely absorbed into the waste management infrastructure on Singita Sabi Sands.
Occupational Health and Safety Act, 1993 (Act No. 85 of 1993):	The purpose of this Act is to provide for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery; the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with, the activities of persons at work. The proposed development will therefore be subject to this Act during the construction and operational phases of the project.	National Department of Labour	The EMPr speaks to these aspects for the construction phase and Singita Sabi Sands has provided commitments to meeting these requirements in both construction and operation.
DEA Integrated Environmental Management Information Series	IEM is a key instrument of NEMA and provides the overarching framework for the integration of environmental assessment and management principles into environmental decision-making. The aim of the information series is to provide general information on techniques, tools and processes for environmental assessment and Management.	Department of Environmental Affairs	These guidelines have been applied in the assessment of the proposed development and its potential impacts on the natural, social and economic environment.

6 PUBLIC AND AUTHORITY PARTICIPATION

6.1 Public Participation

Public involvement in this impact assessment process was facilitated through the actions listed below. Evidence of these actions can be seen in Annex E:

- Site notices in A3 format were posted at the Newington and Shaw's entrance gates to the SSW on 14 December 2018 and remained there for approximately three months.
- Notice of intention to apply for environmental authorisation was placed in and published by the Mpumalanga News on Thursday 13 December 2018 and the Lowvelder on Friday 14 December 2018.
- Notification was sent to all immediate neighbours via email with a Background Information Document (BID) attached, on 22 December 2018.
- All registered Interested and Affected Parties and immediate neighbours were notified of an amendment to the application on 1 March 2019. A copy of the BID is provided with this report as Annex F.
- All registered Interested and Affected Parties and immediate neighbours were sent copies of the Draft Basic Assessment Report for review and comment on 22 May 2019.

The contacts database for registered I&APs is provided in Table 8.

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Table 8: Contact database for registered I&APs

FIRST NAME	SURNAME	AFFILIATION	ADDRESS	PHONE	EMAIL
Riaan	Fourie	SSW MA (ECO)	Portion 4 of Lisbon 297 KU Shaws Gate	0664803861	eco@sabisand.co.za
David	Powrie	SSW-MA (Warden)		079 946 7433	warden@sabisand.co.za
Iain	Olivier	SSW-MA (HOD of Conservation)		078 804 0347	ecologist@sabisand.co.za
Tom	Robson	Immediate neighbour	Othawa 243KU		j.moyles@sturrockandrobson.com

Considering the low level of interest expressed by the public in the proposed developments it was deemed unnecessary to hold a public meeting. Note that one comment was forthcoming from an immediate neighbour.

Comments received and responses provided are included in the Comment and Response Report included as Annex H.

6.2 Authority Participation

A pre-application meeting was held telephonically with Ms Robyn Luyt of the Mpumalanga Department of Agriculture, Rural Development, Land & Environmental Affairs, ENVIRONMENTAL IMPACT MANAGEMENT (Ehlanzeni District), on 20 November 2018. Minutes of this meeting are included with this report as Annex G.

Hard copies of the Draft and Final Basic Assessment Reports were distributed to the following authorities on 21 May 2019 and 1 July 2019 respectively:

- SANParks
- Inkomati Usuthu Catchment Management Agency
- Mpumalanga Tourism and Parks Agency
- District and Local Municipalities (Ehlanzeni and Bushbuck Ridge)
- SSW Management Authority

Comments received and responses provided are included in the Comment and Response Report included as Annex H.

7 NEED AND DESIRABILITY

The following narratives were provided by the applicant and are presented here per development component.

7.1 Guest Toilet at Bush Breakfast Site (Big Black)

There used to be a permanent toilet there and we are using this area as our permanent bush dinner sight-not to impact on other areas. However, when we do full camp bush functions there needs to be a toilet. (I'm not sure why the toilet was removed?) It needs to be attached to the system, to allow for the toilet to function properly. It just needs to be simple and can be hidden from the road.

Of course, from a guest point of view this is a nice luxury to have and fits into our 5-star standard.

Big Black is our bush dinner/function site of choice. We have limited the areas we use for bush functions as to lessen the impact on the environment. We are currently using a portable toilet which, firstly, is not up to a standard that we, Singita, maintain. A permanent toilet which provides a decent ablution area to guests and staff will be more in line with Singita values (it will be far more sanitary). This will add to the likelihood of guests returning to Singita Sabi Sand for years to come and Singita being able to keep the very high staff to guest ratio that we currently have (roughly 4 to 1). Secondly, the hauling of the portable toilet up and down uses extra fuel and adds to carbon emissions. The chemicals used in the portable toilet, which are not as environmentally friendly as we would like, would be cut out. The portable toilet also uses a lot of water to operate as well as to clean after each time it is used.

The building of a permanent toilet facility will also provide jobs to the local community, as we employ local building companies.

7.2 Norther Water Pipeline

During test results of this borehole, it tested the strongest and have the best water quality on the property, the reason for the activation of the existing borehole, to have backup water and also to rotate between boreholes so that can rest and no overuse our borehole.

7.3 Fibre Optic Cable

We will be able to install a camera at the boom gate, thus from a security camera we can monitor who is coming/going and accurate record keeping along with visual evidence. There is therefore a security component, the fibre improves operational efficiency as well as improved security in this remote location.

Due to the remoteness of the location in terms of fire, safety and risk, we need strong, stable, consistent means of communication with Castleton. This would include reporting of unusual observations (e.g. gun shots) for active response (e.g. activating the anti-poaching operations).

The reason for the fibre between Ebony lodge, airstrip and Castleton is to get stable and faster communications between the lodges for security, hand held radios, phone and data purposes. The current system is at maximum capacity and not stable at all. Over and above the reasons mentioned, it will also enable us to better manage the internet access for the guest and make their internet experience at Castleton way better. The fibre link at the airstrip will help with the link back to the K9 site which is of utmost importance that they have a stable internet connection. We will also be able to link up the main handheld radio tower so that we can get better and more stable data through put, so that the radio communication between Castleton, Airstrip, K9 and Ebony lodge will be improved. The security system at Castleton can also be monitored from Ebony increasing the security.

7.4 Extension to Existing Staff Receptions Facility

The decision to upgrade the staff entertainment area (fondly known as "The Zoo") has been made due to the age and visible "run down" look of the facility. Upgrade will be done on the current foundation with a small additional foundation to be laid to increase the size of the building.

7.5 New Ablution Facilities

All tracker and waitron staff rooms were built as a block of individual rooms, with combined ablutions blocks each for men and women. It is important that we give dignity to our staff by not having to share joint ablution facilities, as well as enhance safety for staff requiring bathroom facilities during the night in an area with frequent leopard and hyena activity. The intention in building the new staff blocks is to build rooms for the trackers that include an en-suite. We then move the trackers into these new rooms, which frees up some other rooms that will be converted into en-suite ablutions for existing staff rooms. There are not, however enough rooms freed up, which is the reason for building additional staff bathrooms onto the existing staff rooms. Socio-economic benefits = social (giving upgraded, dignified accommodation to local staff) & from an economic perspective we use a local community builder for all staff accommodation which has positive economic benefits to the community.

We have, where possible, built ablutions inside rooms and done potential upgrades internally / by utilising existing structures, however due to the existing structures having been built 25+ years ago, there are certain limitations. We cannot use alternative sites for the bathrooms as they need to be built onto existing structures. For the new buildings we considered sites with minimal bush & trees to alleviate need for excessive bush clearing; also, the new buildings are in an area already containing buildings so the additional impact for plumbing / electrical / access is minimised.

7.6 New Guest Gym and Raised Wooden Boardwalk

Currently, at Boulders, we have the gym and spa combined in one area. As Wellness in general is becoming a way of life for many of our guests, these facilities are being used more and more. Building a new gym area will provide guests with a better work out experience. It will incorporate areas for a variety of activities such as yoga, stretching, cardio and machine exercises. All of this is greatly in demand!

It will also allow for the existing gym/spa to be a complete treatment area in which we can accommodate more guests at any one time. We often have to turn down treatments because we don't have enough space, even though we have enough spa therapists to accommodate the bookings.

The raised wooden boardwalk has been put forward by the design team as an element that will allow the safe movement of guests and staff while allowing large mammals to move unhindered under the boardwalk.

7.7 New Boma

We are very tight for space at Boulders Back of House (BOH) area. We have no designated area for guest vehicles to park and it often becomes very cluttered and is frankly a hazard. This same space is our assembly point in case of an emergency. Moving the boma to the proposed site will not only create a new, exciting a vibrant space for guests to enjoy outdoor dining, but it will also open up space BOH. The old boma area can be used as a car park for guest vehicles.

-Aesthetically, the new boma would be a massive improvement from what we use currently. It will be more open, user friendly and allow us to really create an unforgettable experience for guests through impressive open fire cooking and entertainment in the form and choirs, dancers and storytellers. It will

also allow for guides to close down directly at Boma dinner, not having to walk through the lodge first, creating a WOW effect on arrival.

As Boulders is situated between the river and a large, rocky outcrop, there is nowhere else within the existing building area for a new boma to be created. This will also tie in with the walkway linking the lodge and the proposed new gym.

Overall, all these proposed additions will greatly enhance the experience for both guests and staff alike, improving the chances of Singita continuing to be a world-renowned safari destination and provide many jobs for local people, reduce the use of vehicles for transport of people and cut down on carbon emissions.

7.8 Castleton Projects

7.8.1 Evaporation Pond

The volume of waste-water that has been sent from Castleton to the current oxidation dam in the past was sufficient for the dam to handle. Due to the increase in the number of visitors staying frequency and the number of staffs living on and off site also increasing, the current oxidation dam cannot handle the volume. It is of utmost importance that we add another oxidation dam above the current oxidation dam to allow for the increased volume of waste-water. This extra volume allows for the needed storage capacity of waste-water and to allow no discharge of waste water into the environment.

7.8.2 Road Realignment

There is a currently a 2-track road that runs in south easterly direction on south side of Castleton. The road is currently just an access road for utility vehicles to access the staff village and then to move between the Camp and the workshop. -The objective is to build a 192-metre-long road which will be 3 metres wide. The road would become the new access road and replace the existing road. By building the new road 35 metre away from the existing road would allow the management to mow a firebreak on south side of camp. Currently the camp has no mowed firebreak on south side and makes this area vulnerable to oncoming fires and ability to do back-burning. The camp has a mowed firebreak on eastern and northern side and the workshop setup already provides a firebreak. The road will also give the living on-site staff privacy as staff members have been feeling the current road leaves no personal space with work utility vehicles and heavy machinery moving a few metres from their room.

7.8.3 New Treatment Rooms, Expanded Gym and Yoga Platform

As described in 7.9.1 above, the volume of guests being accommodated at Castleton is increasing and more space is required to supply these ancillary services.

7.8.4 Staff Swimming Pool and Braai Area

This is a relatively standard feature provided to the staff of tourism lodges in the SSW. Castleton lacks these facilities at the moment and with increased numbers of staff being accommodated at this lodge, the demand for such facilities has increased.

8 AUTHORISATION TIME FRAMES

8.1 Validity Period

All of the proposed developments are planned to be completed within the mandatory five (5) year validity period ascribed to an environmental authorisation, assuming that this is granted. In fact the applicant is anxious to receive a decision as soon as possible as camp closures have been scheduled for a month from mid-September 2019 to allow for these developments to be implemented.

8.2 Activity Schedule

Considering the small scale of each of the proposed developments a detailed activity schedule is not provided. If they are authorised they will be completed as soon as possible.

8.3 Compliance Monitoring

8.3.1 Development Phase

All of the proposed activities will be subjected to continuous compliance monitoring by the Ravenscourt Ranch Manager and contractors will be held accountable for adhering to the EMPr through the signing of a contract committing to such. The Environmental Compliance Officer (ECO) for the SSW will carry out frequent inspections to audit compliance and an independent ECO will be appointed by Singita Sabi Sands to oversee the process and to facilitate reporting to the relevant compliance official/s in the Mpumalanga Department of Agriculture, Rural Development, Land & Environmental Affairs. The latter will happen no less than monthly and will begin prior to the commencement of any of the activities and will continue until all rehabilitation work is completed and clearly successful.

8.3.2 Operational Phase

The SSW and the individual property owners within it have recently instituted an annual "Green Audit" which has been developed and is implemented by an independent environmental auditor. Included within the Green Audits is assessment against compliance with all relevant environmental and natural resource management legislation. Land owners and their managers are expected to keep records of all permits, licences and authorisations; against which activities and developments are audited.

9 CONSIDERATION OF ALTERNATIVES

Where alternatives have been considered they are discussed below. Where they are not discussed it is because there were no alternatives and the proposed localities, uses and technologies are preferred.

9.1 Alternative Routes or Sites

9.1.1 Northern Water Pipeline and Guest Toilet and Bush Breakfast Site

The original alignment of the water pipeline was along a track closer to the Sand River, but the preferred alignment is along an adjacent track just to the west and further from the river.

The original site for the new guest toilet at the Bush Breakfast site was next to a large termitarium and Jackal Berry Tree closer to the non-perennial watercourse. However, the preferred site is further

away from the watercourse which will allow on-site disposal and treatment of waste water outside of the buffer for the watercourse.

9.1.2 Fibre Optic Cable

An alternative alignment was considered as the centre of existing roads and tracks, but this was not possible due to the need for regular inspection covers to be installed. As these would be at surface level, road maintenance would interfere with the covers. The preferred route is thus immediately adjacent to existing roads and tracks wherever possible with the shortest possible portions through untransformed indigenous vegetation.

9.2 Alternative Uses for the Site

This aspect is not relevant as this process is being driven by a focus on the proposed uses.

9.3 Alternative Technologies

This aspect is not relevant to most of the proposed developments as the technologies selected follow best practice, meet legal requirements and are designed to fit within the natural environment.

9.3.1 New Guest Toilet at Bush Breakfast Site

As far as the new ablutions at the Bush Breakfast site the current portable toilet that is used is not guest friendly and also needs to be driven to the sight on a daily basis. It is also not the 5-star standard offered by Singita Sabi Sands.

9.3.2 New Evaporation Pond for Castleton

There are alternatives to build other systems but they are potentially problematic due to location. Systems like bio box, lilypond and reedbeds have been looked at. These systems are designed to reuse waste water and due to the nature of the operation, it is not the best to use at the moment until the plumbing is totally reconfigured to handle this.

10 ANALYSIS OF POTENTIAL IMPACTS

10.1 Assessment Method

This section provides a discussion on the potential impacts of the preferred alternatives and the no-go option, and an indication of their significance through superimposing all phases of the proposed developments, as described in Section 3, on the environmental aspects of the receiving environment as described in Section 4.2. The assessment considers the socio-economic, biophysical, visual/aesthetic and cultural heritage aspects of the receiving environment. In addition to this is an indication of the extent to which these impacts may be avoided or mitigated. It will be shown that as all potential impacts may be successfully avoided or mitigated, no offsets will be required and no fatal flaws were identified. The assessment has considered all of the proposed developments in one as the potential impacts are not unique but generally common to the sites and routes. Where uniquenesses exist, these have been highlighted in the assessment.

It is noted that environmental impact assessment processes call for the assessment of all the phases of a proposed development, i.e. planning, pre-construction, construction, operation and

decommissioning. In the case of these proposed developments it is only the construction and operational phases that are considered relevant for this assessment. The relatively small scale of these proposed developments and the fact that they are planned within and in compatibility with the SSW Management Plan deems the need to assess the planning and pre-construction phases unnecessary.

The detailed analysis of potential impacts was guided by the scoring allocations as listed in Table 9 and explained in detail in Annex I. Impacts that retain a post-mitigation score higher than 40, i.e. those colour coded from yellow to red, would be recognised as potential fatal flaws that could render the proposed development environmentally unsustainable, and/or which may require further detailed specialist studies.

Potential impacts have been considered according to the development and operational phases of the proposed development as described in Section 3.2 and for the proposed developments and the no-go option. As there are no plans for decommissioning, assessment of this phase has not been carried out. The outcome of this process is captured in Table 10 and Table 11. Note that the tables were originally configured to address negative impacts but have been adapted to include positive impacts as well. Where these have been listed, the scoring for 'mitigation efficiency' has been applied conversely in order to cater for the positive effect of the enhancement recommendation. The colour code is also adapted here where only green is used to retain the denoting of a positive impact. In the assessment of the no-go option no mitigating measures have been included as these will not be applicable if nothing is done. The potential impact scores therefore remain the same before and after mitigation.

The tables have been completed by the EAP on the basis of their understanding of both the development proposals and the values and features of the receiving environment. This understanding has been generated through the interrogation of relevant documents and reports (mostly referenced in this report), site visits in October 2018 and again in February 2019. Consideration of comments received from registered I&APs and relevant authorities also influenced this understanding. A heritage impact assessment was commissioned for this assessment and the findings and recommendations have been integrated into this report (see Section 4.2.8, 10.2.1 and Annex J).

Table 9: Impact assessment score allocation guide.

PRE-MITIGATION						POST-MITIGATION	
Extent	Duration	Intensity	Probability	Weighting factor (WF)	Significance rating (SR) ¹	Mitigation efficiency (ME)	Mitigated aspects (MA) ²
Site 1	Short term (0-3 years) 1	Low 1	Unlikely 1	Low 1	Low 0-19	High 0.2	Low 0-19
Local 2	Short to medium (3-5 years) 2		Possible 2	Medium low 2	Medium low 20-39	Medium High 0.4	Medium low 20-39

¹ Significance Rating (without mitigation) = SUM (Extent, Duration, Intensity, Probability) * Weighting Factor

² Significance Rating (with mitigation) = Significance Rating (without mitigation) * Mitigation Efficiency

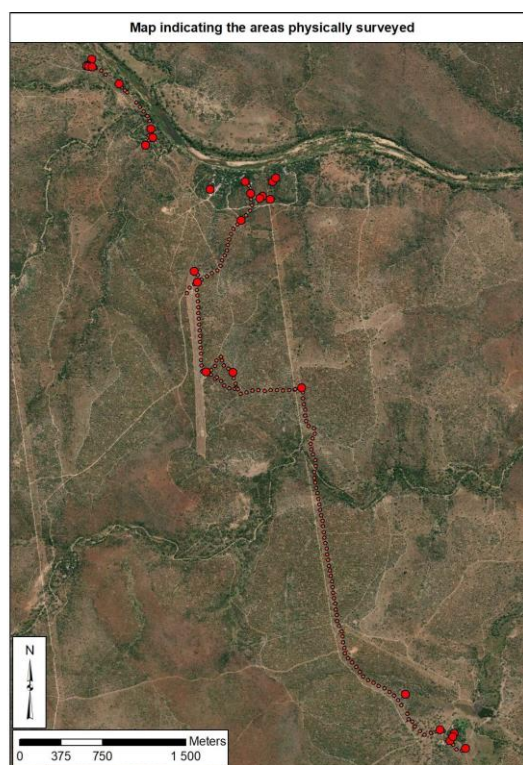
PRE-MITIGATION					POST-MITIGATION		
Extent	Duration	Intensity	Probability	Weighting factor (WF)	Significance rating (SR) ¹	Mitigation efficiency (ME)	Mitigated aspects (MA) ²
<i>Regional</i> 3	<i>Medium term (5-10 years)</i> 3	<i>Medium</i> 3	<i>Likely</i> 3	<i>Medium</i> 3	<i>Medium</i> 40-59	Medium 0.6	<i>Medium</i> 40-59
<i>National</i> 4	<i>Long term (10-30 years)</i> 4		<i>Highly Likely</i> 4	<i>Medium High</i> 4	<i>Medium High</i> 60-79	Medium low 0.8	<i>Medium High</i> 60-79
<i>International</i> 5	<i>Permanent (>30 years)</i> 5	<i>High</i> 5	<i>Definite</i> 5	<i>High</i> 5	<i>High</i> 80-100	Low 1.0	<i>High</i> 80-100

10.2 Specialist Findings and Recommendations in terms of Potential Impacts

10.2.1 Cultural Heritage Impact Assessment

The cultural heritage specialist visited the proposed development sites at the end of May 2019 and the heritage assessment included the following steps:

- **Literature review** - A survey of available literature was undertaken in order to place the development area in an archaeological and historical context. The sources utilized in this regard are indicated in the bibliography. The South African Heritage Resources Information System (SAHRIS) was consulted to find out if any known sites occur within the footprint of the proposed development or its proximity.
- **Field Survey** - The field assessment section of the study is conducted according to generally accepted HIA practices and aimed at locating all possible objects, sites and features of heritage significance in the area of the proposed development. The location/position of all sites, features and objects is determined by means of a Global Positioning System (GPS) where possible, while detailed photographs are also taken where needed. There were no limiting factors. The survey took one person 13 hours to complete. The Figure alongside shows the tracks of the areas surveyed.
- **Documentation** - All sites, objects, features and structures identified are documented according to a general set of minimum standards. Co-ordinates of individual localities are determined by means of the Global Positioning System (GPS). The information is added to the description in order to facilitate the identification of each locality.



As stated in Section 4.2.8, no significant heritage sites were found with the exception of two Stone Age sites and one potential Early Iron Age site. Due to the nature of the Stone Age site, it is recommended that these sites might be impacted on once the developer has applied for a Destruction Permit from SAHRA. Due to the uncertain nature of the Early Iron Age site, it is recommended that an archaeologist with Iron Age experience attend to a watching brief during any ground breaking activities when the gym is extended, and the yoga platform is erected. A series of augering tests is also suggested before ground breaking commences. This will assist in establishing if there are any sub surface archaeological deposits.

10.3 Construction Phase of Proposed Developments

Table 10: Potential environmental impacts and recommended mitigation measures for the proposed developments during the Construction Phase.

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
SOCIO-ECONOMIC										
A direct impact will be the employment of external contractors to undertake the developments and who employ local people to assist with the work. In addition to this will be local suppliers of goods and services associated with the developments	n/a	3	1	1	5	3	30	H: 1	H: 1	30
BIOPHYSICAL										
The loss of biodiversity from the vegetation cleared from the road construction and trenching, as well as the specific site developments.	In all instances important biodiversity features such as protected plants and termitaria will be avoided. In addition to this, the strips cleared by trenching will be rehabilitated with brush packs and indigenous grass seed. Plant rescue will also be implemented for each of the development sites and routes where rescued plants will be used for progressive rehabilitation.	1	1	3	5	3	30	0.6		18
The loss of ecosystem functionality through the disturbance of the development routes and sites.	As above with an emphasis on progressive rehabilitation with disturbed areas being rehabilitated as soon as possible after the disturbances and keeping the disturbances to a minimum to facilitate progressive rehabilitation.	2	3	2	5	3	36	0.8		28.8
Disturbance caused by noise and the movement of people, machinery and vehicles that may impact on the movement of fauna.	Access to be limited to the immediate development footprints with no movement outside of this allowed. Vehicles and machinery to be well serviced include exhaust dampers and dis-engaged reverse signals. All communications on site to be kept to a minimum with no unnecessary shouting or raised voices and no singing and music allowed. Development activities are to be restricted to daylight hours.	2	3	4	5	3	42	0.6		25.2

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
The creation of dust that settles on adjacent vegetation and decreases its palatability to grazing and browsing fauna.	Where it is apparent that dust is being created the working surface should be kept damp and any vegetation that has become unpalatable due to dust settling on it should be sprayed clean. Development site should also be screened with dense shade cloth in order to contain as much of the impact on site as possible.	2	1	3	5	2	22	0.4		8.8
Potential soil erosion caused by the removal of the vegetation cover, removal of soil and compaction of the surface. This includes the potential for additional sediments entering watercourses.	Undertake the activity during the dry season, rehabilitate exposed surfaces as soon as possible after disturbances and where the surfaces are permanently exposed ensure that appropriate anti-erosion mechanisms are in place.	2	2	3	5	3	36	0.6		21.6
The introduction of invasive alien plants from contractor's equipment and vehicles as well as the opening of ground cover and the disturbance of soil making the areas vulnerable to infestations. Note that the SSW Management Plan highlights that invasive alien plants are an increasing threat to the area as a whole and every effort is required to ensure that the disturbances caused by the developments do not exacerbate the situation.	All current infestations must be cleared before developments are initiated, contractor vehicles must be checked before entering the area, i.e. at Newington Gate, to ensure that they are clean and are not carrying soil in from outside, disturbed areas must be rehabilitated progressively throughout the development processes, and the areas must be monitored regularly after completion of the works to ensure that there are no new infestations.	2	4	3	3	5	60	0.4		24
The presence of external contractors poses the threat of poaching of both plants and animals.	Ensure that contractors and their staff are well informed of the codes of conduct for working in a protected area as this relates to the illegal removal of plants and animals, ensure that this aspect is included in the contractors contract, maintain a presence during all developments to ensure that all movements are monitored and restricted to the development footprints, and ensure that the officials at the APU and Newington Gate are aware of external contractors movements and the need to be vigilant in regards to this potential impact.	2	1	5	3	5	55	0.4		22

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
Potential pollution of the immediate environment through the introduction of solid and liquid waste from contractors and their workers.	Ensure that the contractors are aware of and sign an agreement to ensure that there will be no littering what-so-ever and that sufficient and well maintained mobile ablution facilities are provided on site. Access to existing ablution facilities must be made available where possible. All waste is to be separated and stored on site during the day and removed at the end of the day and on a daily basis.	2	1	3	3	3	27	0.4		10.8
VISUAL / AESTHETIC										
The clearing of vegetation, exposure of soil and construction activities may be a visual intrusion to neighbouring properties and land users, particularly the new gym and raised wooden walkway for Ebony and Boulders lodges.	Limit the development areas and related activities to the immediate footprint and ensure that the works are carried out during daylight hours only thus preventing the need for lights. Ensure that the number of vehicles used and the size of the contract team are kept to the minimum required to get the works done as soon as possible. Ensure that surrounding vegetation, especially well established trees and shrubs are kept in place to screen construction activities. Where natural screening is not available, ensure that dense shade cloth is erected to provide screening of the activities. Ensure that the design and placement of the new gym and raised walkway takes careful consideration of the potential visual impact to the neighbour to the north west.	2	5	3	3	5	90	0.4		36
HERITAGE										
Clearing of vegetation cover and earth works may unearth archaeological material, particularly at the site of the construction of the new Spa at Castleton.	Implementation of 'chance find' procedure and a 'watching brief' as specified in the HIA.	1	1	3	3	3	24	H: 0.2		4.8

10.4 Operational Phase of Proposed Developments

Table 11: Potential environmental impacts and recommended mitigation measures for the proposed developments during the Operational Phase.

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
SOCIO-ECONOMIC										
As an indirect impact the developments will ensure the viability of the visitor experience and the economic model that is Singita Sabi Sands and therefore retain its capacity to employ local people in its operations.	n/a	3	5	2	5	2	30	H: 1	H: 1	30
BIOPHYSICAL										
The loss of biodiversity from the vegetation cleared under the proposed developments and where rehabilitation is not possible.	Ensure that the rehabilitation of all the trenching is successful and that any protected plants and geophytes that were in the path of the trenches, road and development sites are used in the rehabilitation of all disturbed areas.	1	5	2	5	3	39	0.4		15.6
The loss of ecosystem functionality in relation to the developments.	As above.	2	5	2	5	3	45	0.4		18
Disturbance of fauna due to movement and noise associated with the site developments, the new road at Castleton and the raised walkway.	Ensure that all users of the development sites are aware of and respect their locality in a protected area and behave accordingly. An exception may be the boma in which cultural activities	1	5	1	3	3	30	0.4		12
Potential soil erosion caused by the addition of impermeable surfaces. This includes the potential for additional sediments entering watercourses.	Ensure that anti-erosion structures are in place such as stone packs under eaves to prevent driplines from forming, monitor the rehabilitated trenches and road condition regularly and implement maintenance and repairs as soon as this may be required.	2	5	1	3	3	33	0.4		13.2
The proliferation of invasive alien plants on disturbed sites.	Ensure that all development sites are monitored regularly and if and when invasive alien plants appear, they must be removed with the most efficient means appropriate to the species involved.	2	5	3	4	5	70	0.4		28

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
VISUAL / AESTHETIC										
The proposed new gym and raised walkway for Ebony and Boulders may be visible from the neighbouring property to the north west.	No exposed lighting may be used on these structures and their use at night should be limited. All lighting must be aimed down and be screened. Movement sensors must be installed to ensure that any lighting is switched on only when needed and is automatically switched off again when no further movement is detected.	2	5	3	5	5	75	0.4		30

10.5 Assessment of the No-go Option for the Proposed Developments

Table 12: Assessment of the No-go Option for the Proposed Developments

POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES		EXTENT	DURATION	INTENSITY	PROBABILITY	WEIGHTING FACTOR	SIGNIFICANCE RATING	MITIGATION EFFICIENCY	ENHANCEMENT POTENTIAL	MITIGATED ASPECTS
IMPACT	MITIGATION / ENHANCEMENT									
SOCIO-ECONOMIC										
Employment options will not be realised either in the short- or long-term.		2	3	2	5	2	24			
BIOPHYSICAL										
None of the negative biophysical impacts will occur.		2	5	2	5	3	42	H: 1	H: 1	42
VISUAL / AESTHETIC										
No visual impacts will occur.		2	5	2	5	3	42	H: 1	H: 1	42
HERITAGE										
No heritage impacts will occur but there will be lost opportunities for unearthing relics of archaeological value.		1	5	1	3	2	20			

10.6 Cumulative Impacts

The primary reason for this impact assessment has been because of the accumulative impacts of the proposed developments, i.e. individually they have not triggered the need for an impact assessment, but accumulatively their coverage has exceeded thresholds as detailed in Section 3.3.

11 ENVIRONMENTAL IMPACT STATEMENT

11.1 Summary of Key Findings

Of the 11 potential impacts identified for the construction phase four are of significance before mitigation, but all of them are rendered insignificant post mitigation.

Of the seven potential impacts identified for the operational phase three are of significance before mitigation, but all of them are rendered insignificant post mitigation.

The aspect of greatest potential impact is related to potential visual impact as per the closest neighbour who is 3km to the north west of the proposed site for the new gym and raised walkway between the Ebony and Boulders Lodges. With careful planning and sensitive design the potential visual impact of these features may be successfully mitigated during both construction and operation.

11.2 Sensitivity Maps

A series of Google Earth images have been used to highlight the proximity of watercourses and wherever these occur in relation to the proposed developments.

11.2.1 Northern Water Pipeline, Electricity Cable and New Ablutions

The sensitivities related to these development components are the riparian zone on the south western bank of the Sand River and the crossing of a non-perennial watercourse at the Bush Breakfast site as illustrated in Figure 2.

11.2.2 Proposed Developments at the Ebony and Boulders Lodges

The sensitivities related to the development components at the Ebony and Boulders lodges are the Sand River and its riparian zone on its southern bank, and a non-perennial tributary to the east of Ebony Lodge. These features are illustrated in Figure 4.

11.2.3 The Fibre Optic Cable and Related Trenching

The sensitivities related to the route for the fibre optic cable, water pipeline and electricity cable are four non-perennial watercourse crossings as illustrated in Figure 3.

11.2.4 Proposed Developments at Castleton

The proximity of the non-perennial watercourse to the proposed new evaporation pond at Castleton is the only aspect of sensitivity as illustrated in Figure 5.

12 ASSUMPTIONS AND LIMITATIONS

The Basic Assessment Report has been prepared on the strengths of the information available, from site visits and that provided by the applicant and other relevant sources at the time of the assessment.

Comments and inputs from I&APs were carefully considered. Topographical, soil and vegetation maps; and the SSW Management Plan were consulted. The assumptions made and any constraints faced did not obviously have any restrictive or negative implications on the study.

In undertaking this investigation and compiling the Basic Assessment Report, the following has been assumed:

- The information provided by the client is accurate;
- The scope of this investigation is limited to assessing the environmental impacts associated with the construction and operation of the proposed developments described in Section 3; and
- Should the project be authorised, the applicant will integrate all recommendations and mitigation measures outlined in the BA, the EMPr and the conditions of environmental authorisation into the detailed design and construction contract specifications of the proposed projects.

There is a high level of confidence in the accuracy of the information provided, sourced and gathered and that the resultant assessment has produced recommendations that are appropriate and that will ensure the sustainability of the proposed development.

13 RECOMMENDATION AND CONDITIONS OF AUTHORISATION

It is recommended that the proposed developments as described in Section 3.2 and the listed activities as presented in Section 3.3 be granted environmental authorisation. The conditions of authorisation are all the mitigation measures listed in Sections 10.3 and 10.4 which need to be strictly adhered to within the context of the compliance monitoring recommendations in Section 8.3, as well as adherence to the stand-alone EMPr and the EMPs in Annexes C and D.

14 CONCLUSION

In conclusion it may be stated that the potential negative impacts of the proposed developments assessed in this report may all be avoided or sufficiently mitigated. As such the proposed developments are compatible with the natural, social and economic components of the SSW environment and are supported.

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**ANNEX A: FULL CURRICULUM VITAE OF KEVAN ZUNCKEL:
ENVIRONMENTAL ASSESMENT PRACTITIONER**

ANNEX B: SIGNED DECLARATIONS OF INTEREST BY EAP AND SPECIALISTS AND SPECIALIST CVs

ANNEX C: ENVIRONMENTAL MANAGEMENT PLAN FOR ROAD CONSTRUCTION AND MAINTENANCE

CONSTRUCTION AND MAINTENANCE OF ROADS

1. SCOPE

The scope of this Environmental Management Plan (EMP) is to set a protocol for addressing environmental issues, in connection with road management, to ensure that appropriate controls and audits are implemented to prevent potential environmental damage and to mitigate any impacts that may occur.

2. AGREEMENT

It is important to note that the EMP is to be read as a contract between the Contractor and Singita Sabi Sands. It is therefore crucial that the Contractor is supplied with a copy of the EMP (or access to this through a web link) and it is made clear that failure to adhere to its requirements may lead to penalties levied against the Contractor.

It is also noted that any damage caused by the Contractor to areas outside the construction site, is to be compensated for, repaired or replaced at the Contractor's expense, to the satisfaction of the Singita Sabi Sands Management in accordance with the Contractors penalty schedule as listed in Appendix 2. The Ravenscourt Ranch Manager may institute contractual measurements to ascertain that Contractors adhere to the environmental obligations agreed upon. Penalties for non-compliance are enforced and Construction staff must adhere to any Codes of Conduct supplied and requirements of the Sabi Sands Game Reserve.

The Contractor will be required to sign each page of this EMP as an acceptance of the conditions stipulated. Singita Sabi Sands looks to maintaining a fair, ethical and transparent working environment. Disagreements and grievance structures are in place and should any disagreements or issues arise, these can be managed through the existing company grievance procedures.

It is preferable to all parties that a reasonable attempt be made to resolve issues through open discussion, and if necessary, with a neutral party present.

3. RESPONSIBLE PERSON

The Ravenscourt Ranch Manager, acting in the capacity as Singita Sabi Sands' Environmental Officer (here after referred to as Ravenscourt Ranch Manager), is appointed by Company Board of Directors to ensure full compliance with the requirements of this Environmental Management Plan (EMP). The Ravenscourt Ranch Manager should be familiar with the contents of this document and requirements of Singita Sabi Sands and the Sabi Sands Game Reserve.

The primary role of the Environmental Control Officer is to act as quality controller regarding all environmental concerns. In this respect, the Ravenscourt Ranch Manager is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advise on incidental issues that arise.

The Ravenscourt Ranch Manager will keep a written record in the form of compliance reports during the construction phase to monitor compliance and general progress. These compliance reports must be kept on file for possible future inspection.

The Ravenscourt Ranch Manager may at any time institute action against a contractor due to non-compliance with the EMP.

The Ravenscourt Ranch Manager will be responsible for the training of Contractors in terms of conveying the contents of this EMP and associated policy and Codes of Conduct to them through an induction / training session.

Comment: The regulations under NEMA change periodically and not all roads will necessarily require an EIA. Any new roads planned should be evaluated against the current regulations to see if they trigger a listed activity and require environmental authorisation.

Particular care should be considered with regards regulations pertaining to watercourses.

4. DEFINITIONS

Incident: An event resulting in temporary or permanent cumulative or immediate adverse effects on the environment, eg an oil or chemical spillage, or release of refrigerant gas. Typically, the spill of more than 1 litre of petrol or diesel or oil or paint would constitute an incident

Natural vegetation: All existing vegetation species, indigenous or otherwise, of trees, shrubs, ground cover, grasses and all other plants found growing on the site.

Rehabilitation: Making the land useful again after a disturbance. It involves the recovery of natural ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydrologically stable landscapes that support the natural ecosystem mosaic.

Topsoil: The upper soil profile irrespective of the fertility appearance, structure, agriculture potential, fertility and composition of the soil, usually containing organic material and which is colour specific.

Humps: Compacted placed across the roadway at any angle to aid rapid drainage of water from the roadway. Humps are usually at least a meter wide or more and 300mm high.

Windrow: A line of material (soil or other road material) alongside the road, often created by grading.

Table drains: A 'V' or trapezoidal shaped open drain located immediately adjacent to the edge of a road.

Flood Mild: The result of a local or catchment based rainfall event that leads to increased river flow, but not to the extent that it surpasses the 1:50 year floodline.

Flood Severe: Any increased river flow above the 1:50 year flood line.

5. INCIDENT REGISTER AND REPORTING

An incident register will be kept on site at all times and completed/updated by the Contractor on a daily basis. All incidents must be recorded in the register. The register is available to Singita Sabi Sands management for audit inspections.

All incidents must be reported to the Ravenscourt Ranch Manager, and the responsible Contractor will sign the logging of the incident, to ensure that the information contained in the register is correct. The register must contain the date, time and place of the incident that took place. Remedial measure taken must also be mentioned in the logbook. Refer to Appendix 1, for an example of the site incident register.

6. ROADS MANAGEMENT

All road management should be based on the requirements identified by the Ravenscourt Ranch Manager. Each road section should be assessed for drainage and road standard requirements prior to any earth works being undertaken. Minimum standard is dry weather 4WD access for all roads.

6.1 ROAD MAINTENANCE

All roads should be assessed at least annually and a maintenance program developed with a costing and priority ranking. Where possible, less used tracks will not be graded and retain the 'middlemannetje'.

Any gravel for a road must be obtained from a licensed borrow pit.

Road camber and drainage should be sufficient to minimise erosion and maintenance requirements. Methods to achieve this is dealt with in greater depth in the sections below.

6.2 NEW ROADS LESS THAN 4 METERS WIDE

New roads must be planned with care and receive approval from SSW EXCO prior to development. The following information must be submitted to EXCO for any new road:

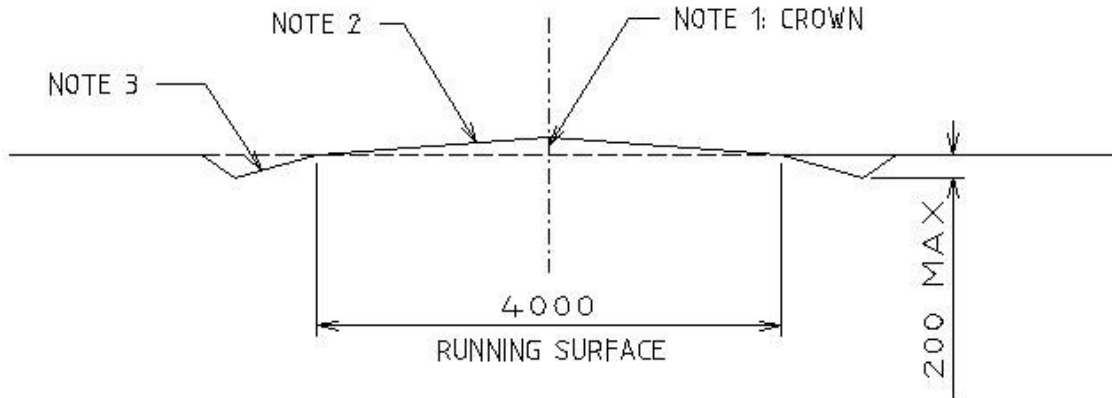
- Purpose
- Soils and plant communities that will be traversed
- Maintenance requirements
- Source of gravel (if any)
- Alternatives considered

Road alignment should avoid areas with high erosion potential (slope and soil) as well as seep and drainage lines where possible.

Roads may require environmental authorisation and it is advisable to check with a specialist before commencing the project.

6.3 FORMATION PROFILES

6.3.1 Crowned Surface Formation



Note (1) Normally 0.3m above natural surface after consolidation

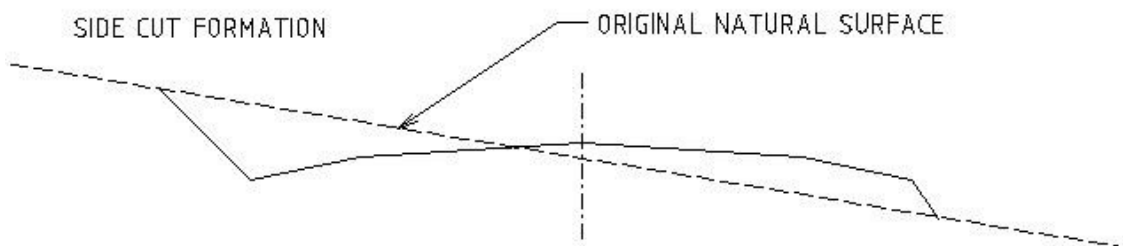
Note (2) Nominal design crossfall of 5% after consolidation ie. \approx 7% unconsolidated

Note (3) Nominal shoulder batter of 1:5

Crowned Surface Formation

- Is suitable for tracks where water can be shed from both sides of the formation
- May be used in other situations in conjunction with suitable cross road drainage techniques (see Section 7.5.)
- May require down road drainage (see Section 7.6.)

6.3.2 Crowned Side Cut and fill Formation.

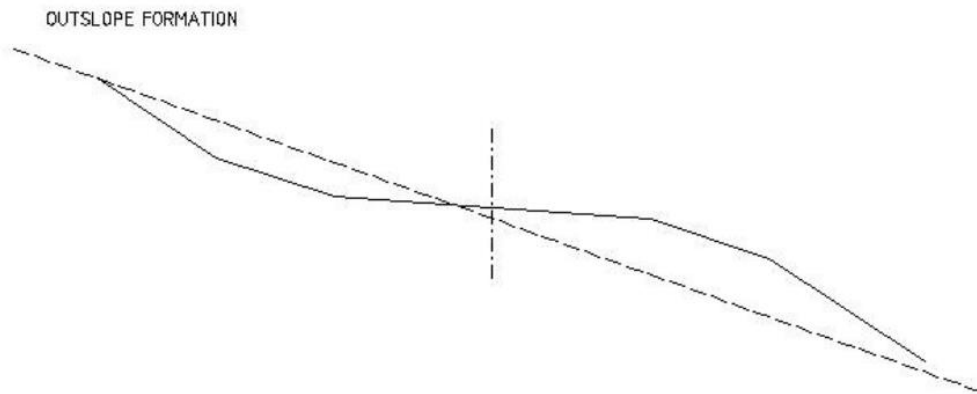


Notes and dimensions as per 6.1.1

Crowned Side Cut and fill formation

- Suitable for smaller lengths of side cut where water can be shed from the confined water table further down the road eg at ridge top saddle.
- May be used in limited situations for longer runs if used in conjunction with acceptable cross drainage techniques (see Section 7.5).

6.3.3 OUTSLOPE FORMATION



(Notes placed as per 6.1.1)

Note (1) Normally 0.3m above natural surface after consolidation

Note (2) Nominal design crossfall of 5% after consolidation ie. \approx 7% unconsolidated

Note (3) Nominal shoulder batter of 1:5 (20%)

Outslope Formation

- Suitable for longer lengths of side cut where water cannot be shed from the confined shoulder of the road except across the running surface
- This design profile should be used in conjunction with approved cross drainage techniques (see Section 7.6).

7 STORM-WATER MANAGEMENT/ ROAD DRAINAGE

In order to avoid damage to roads and drainage areas, any surface water must be led off the road as soon as possible and with as low a velocity as possible.

The following approaches should be used as prescribed.

7.1. BERMS

- Berms are rills of excess or unsuitable road material windrowed on to the side of the worked area.
- Any berm must be discontinuous. Breaks must be opened at intervals of less than 20m.
- Any drainage must extend through the berm
- Berms may be placed on the uphill side of workings; especially in locations suitable for outslope track formation (See Section 6.1.3). Where possible they should be incorporated into the track shoulder.

7.2. ANGLED HUMP SPACING

Angled humps constructed across the road collect water on the road and disperse it either on both sides or on one side, depending on the local topography. Water flow should be intercepted and dispersed from the road into drains at safe locations at least every 0.5 metres of vertical fall of the track.

It is acknowledged that soil type and other local factors on site may vary the ideal from this specification. This specification is to be used as an appropriate requirement for red soils; any variation to this standard must be authorised by the Ravenscourt Ranch Manager. Humps should be at least 0.3m high and compacted.

7.3 TURNOUTS OR MITRE DRAINS

Turnouts generally:

- Should be as short as possible whilst achieving the desired result. This will be dependent on soils, permeability and terrain.
- Should be terminated in as wide (level – 2 to 5%) a discharge as is practical.
- Should run at approximate 1.5% grade (shallow slope to slow water velocity)
- Should extend as far as is required to prevent discharged water from flowing back to the road further down the slope.

- Must discharge onto stable areas of undisturbed vegetation and not onto fill slopes, exposed soils or directly into a water course.
- Be constructed with a grader or suitable blade.

7.4. CROSS ROAD DRAINAGE TECHNIQUES

7.4.1. CULVERTS

A culvert is defined as any pipe box or arch construction used for cross road drainage that is covered and below the surface of the road. Culverts are only to be installed at the express and written instructions of the Ravenscourt Ranch Manager and where other options are not practical.

Existing culverts are to be preserved and culvert heads left in a clean and functional condition.

If existing culverts are damaged during maintenance, the location and extent of damage is to be recorded in writing and relayed to the Ravenscourt Ranch Manager within 24 hrs.

7.4.2 INVERTS

Inverts are man-made or naturally occurring open topped depressions in the surface of the roadway which allow for concentrated cross road drainage. These are often utilised where local topography is appropriate.

7.4.3 CROSS FLOW RUN-OFF HUMPS

These structures are used to invert water across the road and are used in areas where the topography is very uniform.

Locating Cross Flow Humps

Placement of cross flow Humps requires care and planning. They should be constructed at critical points where there is:

- A significant change of grade
- A significant change of road direction
- A significant point of overland flow concentration
- A safe stable discharge point.

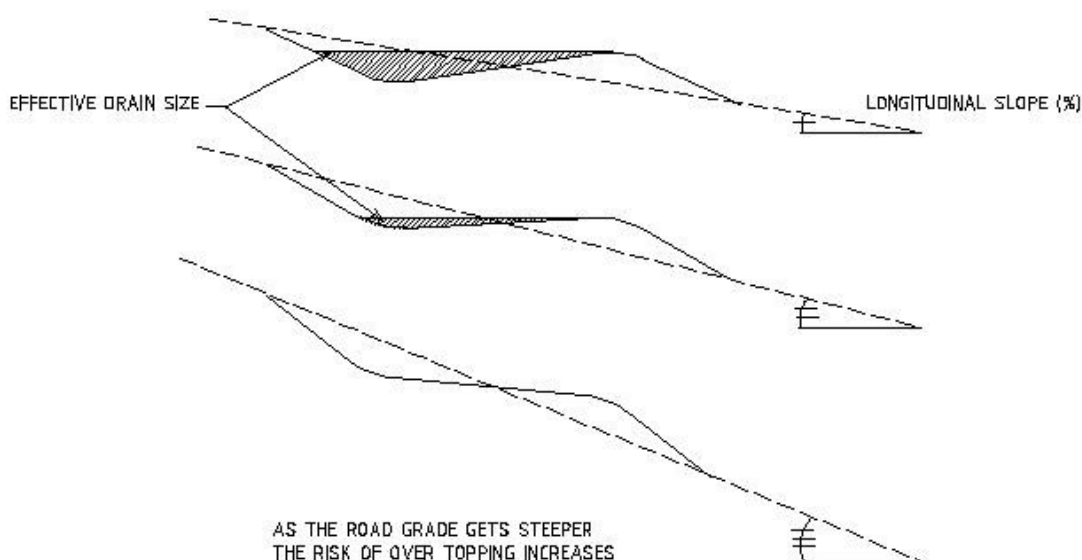
After these key points are located, additional Cross Flow Humps will need to be constructed so as to remain within the minimum specification of 0.5 metres of vertical fall. (see spacing of access track drainage Section 7.2.).

Dimensions Of Cross Flow Humps.

Humps must be easily trafficable and must drain water across the road without scouring, ponding or overtopping.

They should be ≈ 0.3 to 0.6m high (unconsolidated) and be compacted for a minimum of 2 metres on both top & bottom sides of the mound.

As the longitudinal slope (grade) increases so too does the risk of overtopping. A corresponding degree of care with construction is warranted to preclude any risk of the structure failing.



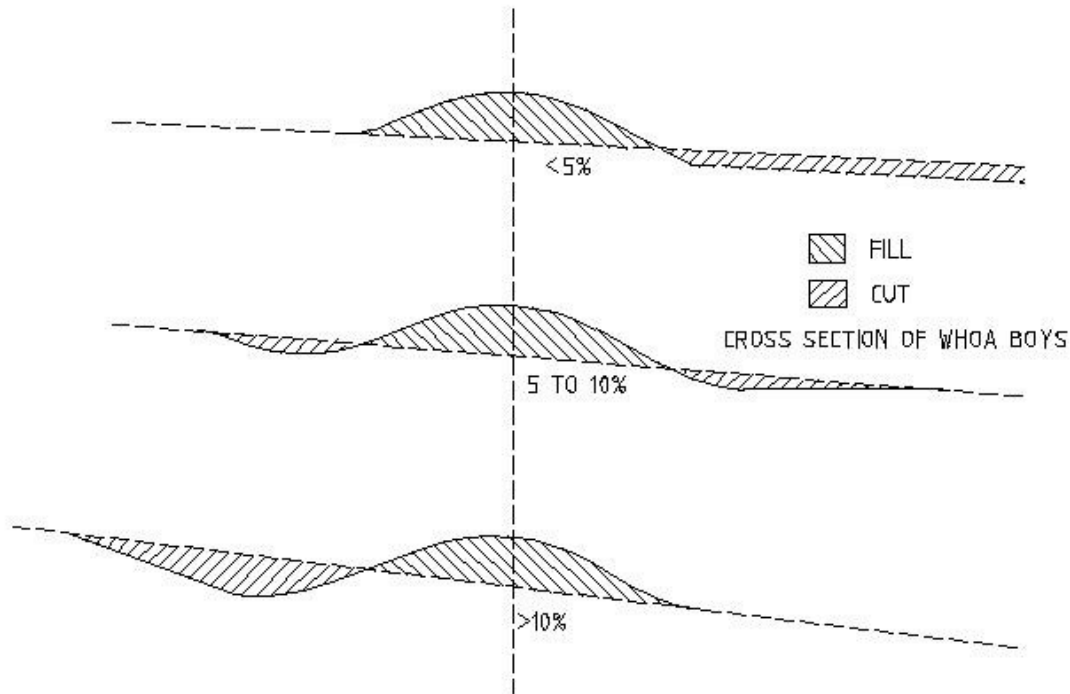
Generally:

For slopes <5%, materials should be sourced from the lower side of the mound.

For slopes 5% to 10%, materials should be sourced from both sides of the mound

For slopes >10%, all material should be sourced from above the mound (where possible)

In some very steep situations additional material may be required. Gravel may need to be sourced elsewhere and imported to the required hump location.



7.5. DOWN ROAD DRAINAGE TECHNIQUES

These techniques specifically relate to dispersal of water confined or concentrated on the running surface of the track (eg in wheel ruts or compacted zone).

Water is to be dispersed using:

- Cross Fall of running surface
- Humps
- Combination of the two above

Normally the cross fall of the running surface will suffice. Exceptions occur where the formation is:

- On very steep slopes where the longitudinal slope is much greater than the cross fall of the formation and even minor ruts may channel the water and frustrate water shedding from the running surface.
- In areas of highly erodible soil types In these situations additional protective techniques should be incorporated. The techniques include cross road drainage structures if applicable; or if not applicable, Minor humps should be installed.

If the track intercepts and concentrates overland (surface water runoff) flows of water than normal cross flow humps should be constructed. In these situations it is imperative that the structure discharge extends a sufficient distance to preclude any chance of this water migrating back to the track.

If overland flow is not a problem then Minor Humps would be acceptable.

7.5.1. MINOR HUMPS

Positioning Minor Humps

Placement of minor humps requires care and planning. They should be constructed at a critical point where there is:

- A significant change of grade
- A significant change of road direction
- A safe stable discharge point.

After these key points are located, additional Minor humps will need to be constructed so as to intercept the potential flow every 6 metres of vertical fall.

These structures must be free draining. Discharges must extend a sufficient distance to preclude any chance of this water migrating back to the track.

Dimensions Of Minor Humps

Minor Humps must be easily trafficable and must drain water off the running surface without scouring, ponding or overtopping.

They should be \approx 0.2 to 0.4m high (unconsolidated) and be compacted for a minimum of 2 metres on both top & bottom sides of the mound.

7.6. RIVER, STREAM & DRAINAGE-LINE CROSSINGS

As far as possible, these should:

- Be avoided
- Cross at right-angles
- Be situated to avoid box cuts
- Have minimal clearing
- Be protected by drainage structures immediately above the approach slopes.

Particular care should be paid to the river banks where the slope is likely to increase erosion potential.

NOTE: Any activity where more than 10 cubic meters of material may be moved requires environmental authorisation and a water use licence.

7.6.1 Culverts in drainage lines

Culverts should be placed at the lowest location in a road crossing. Wide, flat culvert profiles are recommended for use but other design criteria should still be the primary deciding factors. The inlets and outlets to the culverts should be protected to prevent erosion, scouring and collapses. In areas where piping in soils occur, all culvert joints should be watertight. The possibility of soil mechanical failure must be taken into account, especially in the case of non-cohesive materials.

Where steep gradients occur the need for erosion control on the outlet and downstream side is important to prevent loss of topsoil and erosion.

In the case of flat (shallow) gradients the minimum desirable slope in the culvert should not be less than 0.5% to ensure that maintenance and silting-up within the system can be kept to a minimum.

Each culvert should be treated individually and factors regarding slope of immediate adjacent areas and / or streams also play part in the deciding factor.

Culverts size should err on the side of being too large and too small.

7.6.2. Dry river crossings

These crossings need little maintenance in the river bed itself. Occasional smoothing may make crossings more comfortable.

The access to the river bed is the most important area and most likely to require stabilisation and protection from erosion and damage. Each access point needs to be assessed for the most appropriate and lowest impact methods.

Any of the following should be considered to protect the access against erosion and minor flooding:

- Concrete (re-enforced and 100mm thick)
- Gabion structures
- Well-paced rocks
- Angled approach down the bank before crossing the river bed at 90 degrees
- Existing rock
- Suitability of existing soils
- Gravel packing

The angle of approach to the river bed may be considered to reduce erosion potential.

8 GENERAL CONTROLS

8.1 VEHICLE ACCESS

Vehicle access to Singita Sabi Sands will be through Newington Gate only and via the existing approved access road. Access to the footprint of any development location will be via Singita Sabi

Sands roads. No new roads are to be created without prior authorisation from the Game Reserve Trust and SSW and shall be in writing with appropriate GPS co-ordinates and within a defined route. The contractor will be responsible for clearly marking any roads that are required to be closed to traffic for the construction or maintenance activity. The closure of any roads must be undertaken in consultation with the Ravenscourt Ranch Manager.

Ravenscourt Ranch Access time is 9am-3.30pm. An extended access permit may be applied for.

The reserve speed limit is 40km/h.

Heavy rain will restrict heavy vehicle access to the reserve as enforced by SSW management.

8.2 PROTECTION OF FAUNA AND FLORA

No tree of a trunk diameter exceeding 100mm should be removed without the written permission of the Ravenscourt Ranch Manager and densely wooded areas should be avoided where possible. No protected trees (list in Appendix 3) requiring a permit may be removed without such a permit. If in doubt on a particular tree, the Ravenscourt Ranch Manager will assist.

In order to limit damage to the environment during construction, the planning phase includes identification of and pegging /demarcation of any stockpile sites.

No firewood or any other plant material or animal may be removed from the site.

In order to minimise the potential impact on Fauna, the footprints of the proposed development should be scrutinised for the presence of any vulnerable fauna and necessary relocation action taken in the event of finding any. No footprint may be worked until such time that the Ravenscourt Ranch Manager has completed the footprint investigation. Contractors should clearly understand that they are working within a nature reserve. Contravention of any conservation and environmental legislation may result in prosecution. The Contractor is responsible for any illegal action by his/her staff, e.g. illegal hunting, setting of snares, fishing etc.

The Ravenscourt Ranch Manager shall monitor that there is no introduction of alien invasive species to the construction site. Should any such species be identified, immediate and appropriate control measures are to be implemented under the guidance of the Ravenscourt Ranch Manager.

The area is an open system Big 5 reserve. Dangerous wild animals exist in the area and suitable precautions should be undertaken so as not to increase the risk of site personnel. It is also a malaria area. The Ravenscourt Ranch Manager will advise on suitable action to take as appropriate to the site, work and equipment.

8.3 ESTABLISHMENT OF CONSTRUCTION SITE

The Ravenscourt Ranch Manager will direct where stockpiles and equipment may be stored or parked.

8.4 ABLUTION FACILITIES AND WASTE/ REFUSE DISPOSAL

Toilet facilities are rarely available at the construction site. Road contractors are requested to use existing Singita Sabi Sands toilets as pointed out by the Ravenscourt Ranch Manager and to ensure that they are always left clean.

No refuse or litter may be allowed to be left overnight. Any building rubble and any other non-compactable rubble should be safely stored to be transported at a later stage. Building rubble must be removed from the reserve.

Contractors are expected, as are all staff in the reserve, to pick up any litter they notice in the reserve.

8.5 PROVISION OF WATER

Water may need to be transported to the construction site. Filling of water tankers and similar must be arranged in consultation with the Ravenscourt Ranch Manager.

The Ravenscourt Ranch Manager is to train Contractors on correct and safe water usage practices. Water is a precious and limited resource and should be used sparingly.

Washing of vehicles is prohibited.

Hose pipes must be entire and free of leaks and taps turned off when not in use.

8.6 AIR POLLUTION

No significant air pollution is anticipated, however, dust suppression may be necessary. This should be discussed with the Ravenscourt Ranch Manager.

8.7 NOISE

Contractors must gain confirmation with regards to work hours, as this is highly dependent on guest movements and game drive times. Contractors may be required to vacate the site from time to time to

a suitable venue, as directed by the Ravenscourt Ranch Manager. Management may require different work times to those normally permitted (7:00 to 17:00). Any work hour schedule should be in agreement with management and obtained in writing.

Unnecessary noise will not be tolerated. Contractors will not be permitted to shout on site. The use of megaphones is prohibited.

8.8 VEHICLE AND EQUIPMENT FUELLING AND MAINTENANCE

All vehicle fuelling and maintenance is to occur in areas specifically maintained for these activities e.g. the workshop. The servicing and repair of equipment is to take place in the workshop or off site in areas specifically designed and designated for this.

In the event of an on-site emergency repair, the contractor must ensure that all work is conducted over an impervious layer preventing spillage of oils and fuels into the environment. Sufficient absorbent materials and spill kits must be available to assist with clean-up operations.

8.9 SOIL CONTAMINATION AND RESPONSE

Should any soil contamination occur during construction, such contamination is to be immediately reported to the Ravenscourt Ranch Manager. The soil shall be removed and stored in an area determined by the Ravenscourt Ranch Manager and shall be labelled as to the form of contamination to prevent its future use. After consultation with the Ravenscourt Ranch Manager, the contaminated soil must be disposed of, in accordance with legislation. Minor (less than 50 litres) soil contamination by hydrocarbons (fuel) may be addressed with a bioremediation solution. Bioremediation is the application of biological microbes for the clean-up of hazardous oil spills resulting in a safe, efficient and cost-effective solution. Bioremediation uses microbes, enzymes, oxygen and other nutrients to chemically transform oil into carbon dioxide and water.

8.10 CEMENT

Cement mixing is to take place on an impermeable layer. Cement mixing areas must not be in the vicinity of drainage-lines or water bodies as cement is toxic to aquatic species. This is particularly important if cement is used on river crossing areas.

The cleaning of cement equipment, at the end of a working day, shall be washed in a drum of water. Allow the water to settle overnight. The top layer of water is subsequently used for further cement mixing and wetting. The process is repeated. Remaining sludge is allowed to dry and disposed of at the end of the project.

Any excess cement and concrete mixes shall be retained on the construction site until completion of the construction when all spoil material and rubble will be removed and the rehabilitation process commences.

All used cement bags are immediately to be disposed of into the solid waste system. These bags are not to be used for other on site applications.

8.11 PROVISION OF STORAGE FACILITIES - DANGEROUS AND TOXIC MATERIALS

All toxic materials such as paints, fuel, or oil shall be stored in well ventilated areas that can be locked. It is essential for safety reasons that all toxic materials are handled in an appropriate manner as prescribed by the labels on the products used.

Drip trays are to be placed underneath paints and toxic materials in storage to contain accidental spills.

Should any spillage or pollution of any toxic materials occur, the Ravenscourt Ranch Manager should immediately be contacted and mitigation measures taken. The Contractor will be liable for any clean-up costs, legal costs or fines, which may arise from such an accident.

Empty containers that contained toxic substances are not to be used for any other application, but are to be returned to supplier, or punctured and discarded (not in the reserve) as recommended by the Ravenscourt Ranch Manager and the product label.

8.12 PROVISION OF STORAGE FOR CONSTRUCTION MATERIAL

The Contractor will be responsible for the storage of construction material at a site determined in conjunction with the Ravenscourt Ranch Manager. Where necessary in the stockpiled areas, the topsoil is to be removed and stored adjacent to the stockpile. No bushes or trees are to be removed for this purpose. All storage areas are to be indicated with the Ravenscourt Ranch Manager.

8.13 BORROW PITS AND QUARRIES

The creation of borrow pits and quarries of any size on Singita Sabi Sands, is not permitted. Material may be obtained from borrow pits on Singita Sabi Sands with management's permission. Harvest of construction materials such as sand and stone is only to be done in limited amounts and under strict control by the Ravenscourt Ranch Manager. Any imported gravel or sand shall be free of weeds, litter and contaminants.

8.14 SPOIL MATERIAL

All spoil material shall be disposed of in accordance with legislation. No spoil material will be left on site at completion of the project and the potential of the reuse of any material (excess crushed stone, sand etc.) should be investigated. These spoil materials may be relocated to stockpile areas within Singita Sabi Sands for later use, after arrangement with the Ravenscourt Ranch Manager.

8.15 FIRE PREVENTION

No open fires will be allowed on the construction site or in the veld under any circumstances. It will be expected by all Contractors to indicate their ability to fight accidental fires, through having fully functional and serviced equipment on site in the event of accidental fires. The Ravenscourt Ranch Manager will determine the level of equipment and training required by the Contractors.

8.16 STORM WATER MANAGEMENT

No obstructions of any storm water system will be allowed and the dumping of water used for the cleaning of equipment will also not be permissible, the management of this water has been addressed in detail in section 8.10 above.

Only level areas are to be used for stockpile zones and care is to be taken to prevent the stockpiling of materials in drainage lines. The Ravenscourt Ranch Manager will assist in determining these areas.

8.17 TRAFFIC CONTROL

All vehicles used by Contractors and sub-contractors are to be maintained in a safe working condition. Vehicle operators are to be in possession of valid driver licenses. It is advisable to insure vehicles and operators against claims arising from accidents and third party liability. All vehicles shall undergo regular checks to ensure they are free of oil or other lubricant leaks. The Ravenscourt Ranch Manager may at any time prevent sub-standard equipment from being used on Singita Sabi Sands.

Contractors and sub-contractor drivers are to be courteous in all dealings with all other road users and shall adhere to all roadway signage and speed limits.

All the contractor's vehicles must have the contractor's decal clearly visible on both sides.

Contractors and sub-contractors are to use the shortest possible route between the place of entry and the construction site at all times. Unauthorised driving through the reserve for purposes other than the contract is not permitted.

Road closures necessary for works must be adequately marked.

8.18 COMMUNICATION

It is essential that good communication channels between the Contractor, Ravenscourt Ranch Manager and SSW Reserve Management be maintained. This is particularly important with regard to road closures and wildlife safety.

9. REHABILITATION PHASE

On completion of construction, the site must be rehabilitated through the removal of all construction facilities introduced, removal of waste and any other feature constructed or established during the use of the site. All areas devoid of vegetation or where spoils and stockpiles have been stored shall be scarified or ripped and the topsoil, previously removed, shall be reintroduced to these areas. In some cases it may be necessary to re-seed and mulch. This, however, will be at the discretion of the Ravenscourt Ranch Manager.

10. DISASTER MANAGEMENT PROCEDURES

Disasters are a constant threat when working in conservation areas and especially on construction sites.

Where flooding is likely, the Contractor must be informed and trained in the Singita Sabi Sands flood management procedures.

In order to avoid accidental fires, the Contractors must be instructed in Singita Sabi Sands fire management procedures.

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The greatest factor regarding disaster management in this instance is the proximity to medical care for injuries on duty or evacuation in the case of serious illness. The Contractor is to develop and maintain a medical disaster management procedure that will be communicated to all staff. This procedure will, as a minimum, have evacuation protocols, medical attention detail and a list of necessary contact numbers included. This procedure is to be communicated to all workers and a copy is to be handed to the Ravenscourt Ranch Manager for inclusion in the audit results. Contractors will also be required to have a first aid kit available on site at all times.

ANNEX D: ENVIRONMENTAL MANAGEMENT PLAN FOR THE CONSTRUCTION AND RENOVATION OF BUILDINGS, INCLUDING TRENCHING

CONSTRUCTION AND RENOVATION OF BUILDINGS

1. SCOPE

The scope of this Environmental Management Plan (EMP) is to set a protocol for addressing environmental issues associated with the construction and renovation of buildings, to ensure that appropriate controls and checks are implemented to minimise potential environmental damage and to mitigate the impacts that may occur during the construction, renovation and development of buildings.

2. AGREEMENT

It is important to note that the EMP is to be read as a contract between the Contractor and Singita Sabi Sands. It is therefore crucial that the Contractor is supplied with a copy of the EMP (or provided access to this through a web link or by other means) and it is made clear that failure to adhere to its requirements may lead to penalties levied against the Contractor.

It is also noted that any damage caused by the Contractor to areas outside the construction site, is to be compensated for, repaired or replaced at the Contractor's expense, to the satisfaction of the Singita Sabi Sands Management in accordance with the Contractors penalty schedule as listed in Appendix 2.

The Ravenscourt Ranch Manager may institute contractual measurements to ensure that Contractors adhere to the environmental obligations agreed upon. Penalties for non-compliance may be enforced and Construction staff must adhere to any management plans, policies, codes of conduct and other requirements of the Sabi Sands Wildtuin, e.g. Development-Environmental Compliance Standard Operating Procedure (CON-19-01). These documents will be made available to the contractor and will be adhered to by Singita Sabi Sands.

The Contractor will be required to sign each page of this EMP as an acceptance of the conditions stipulated.

Singita Sabi Sands looks to maintaining a fair, ethical and transparent working environment. Disagreements and grievance structures are in place and should any disagreements or issues arise, these can be managed through the existing company processes. It is preferable to all parties that a reasonable attempt is made to resolve issues through open discussion, and if necessary, with a neutral party present.

3. RESPONSIBLE PERSON

The Ravenscourt Ranch Manager, acting in the capacity as Singita Sabi Sands's Environmental Officer (here after referred to as Ravenscourt Ranch Manager), is appointed by Company Board of Directors to ensure full compliance with the requirements of this Environmental Management Plan (EMP). The Ravenscourt Ranch Manager should be familiar with the contents of this document and requirements of Singita Sabi Sands and the Sabi Sands Wildtuin.

The primary role of the Environmental Control Officer is to act as quality controller regarding all environmental concerns. In this respect, the Ravenscourt Ranch Manager is to conduct periodic site inspections, attend regular site meetings, pre-empt problems and suggest mitigation and be available to advice on incidental issues that arise.

The Ravenscourt Ranch Manager will keep a written record in the form of compliance reports during the construction phase to monitor compliance and general progress. These compliance reports must be kept on file for possible future inspection.

The Ravenscourt Ranch Manager may at any time institute action against a contractor due to non-compliance with the EMP.

The Ravenscourt Ranch Manager will be responsible for the training of Contractors in terms of conveying the contents of this EMP and associated policy and Codes of Conduct to them through an induction / training session.

4. DEFINITIONS

Pre-construction: Involves all facets for the preparation of the site for construction.

Construction: For the purpose of this document, construction is defined as the physical action of constructing any structures, temporary as well as permanent. This activity should be checked prior to ensure it complies with all necessary legislation and EIA regulations.

Post-construction/rehabilitation: This phase includes the restoration of the surrounding environment that was impacted upon due to the construction process to its original state.

Decommissioning: The decommissioning of a building will occur when the use of the said structure is no longer required or when it has become non-viable in terms of maintenance to continue its upkeep. This phase is not anticipated, although it is acknowledged as a potential possibility. An EMP for this task specifically will have to be compiled. This activity should be checked prior to ensure it complies with all necessary legislation and EIA regulations.

Incident: An event resulting in temporary or permanent cumulative or immediate adverse effects on the environment, e.g. an oil or chemical spillage, or release of refrigerant gas. Typically, the spill of more than 1 litre of petrol or diesel or oil or paint would constitute an incident.

Natural vegetation: All existing vegetation species, indigenous or otherwise, of trees, shrubs, ground cover, grasses and all other plants found growing on the site.

Rehabilitation: Making the land useful again after a disturbance. It involves the recovery of natural ecosystem functions and processes in a degraded habitat. Rehabilitation does not necessarily re-establish the pre-disturbance condition, but does involve establishing geological and hydrologically stable landscapes that support the natural ecosystem mosaic.

Topsoil: The upper soil profile irrespective of the fertility appearance, structure, agriculture potential, fertility and composition of the soil, usually containing organic material and which is colour specific.

Protected Tree/ plant: A tree or plant which is listed as a protected species in terms of the National Forest Act or the Mpumalanga Nature Conservation Act. Both these lists are attached in Appendix 3.

5. INCIDENT REGISTERS AND REPORTING

Accidents, resulting in an incident will happen from time to time. The reporting process seeks to ensure that these are addressed and that environmental damage is minimised and that practical measures are put in place to prevent recurrence where appropriate. The purpose of the reporting is not to apportion blame; however this does not exclude the possibility that action will be taken if a failure to follow the environmental management plan, specific instructions or negligence is shown.

A site book will be kept on site at all times and completed/updated by the Contractor regularly. All incidents, instructions and agreements must be recorded in the site book. The site book must be a copy type book, available to Singita Sabi Sands management for inspections. All incidents must be reported to the Ravenscourt Ranch Manager, and the responsible Contractor will sign the logging of the incident, to ensure that the information contained in the site book is correct. The site book must contain the date, time and place of the incident that took place. Remedial measure(s) taken must also be recorded in the logbook. Refer to Appendix 1, for an example of the information and format for incident recording.

6. CONTROLS DURING PRE-CONSTRUCTION AND CONSTRUCTION

6.1 VEHICLE ACCESS

Vehicle access to Singita Sabi Sands will be through Newington Gate only and via the existing main access road. No new roads or short-cuts are to be constructed by the Contractor. Access to the footprint of the development location will be via existing roads and through the Singita Sabi Sands access control boom gate. No new access is to be created without prior authorisation from the Singita Sabi Sands Management (in writing) and Sabi Sands Game Reserve (if necessary).

The access road should be closely monitored for signs of potential degradation during the course of the project, this particularly due to the movement of heavy machinery. The

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Ravenscourt Ranch Manager will advise on appropriate measures to mitigate any road degradation should it be required.

6.2 PROTECTION OF FAUNA AND FLORA

Singita Sabi Sands has a responsibility to comply with the National Environmental Management Act (NEMA). The Singita Sabi Sands properties are also declared protected in terms of the National Environmental Management Protected Areas Act (NEMPAA) and there is a SSW management plan in the process of formal approval. Contractors have no right to damage or destroy fauna and flora without written approval from the Ravenscourt Ranch Manager. During site layout, trees that are authorised for removal will be identified and tagged and only these trees may be removed. Any trees that are protected species may not be moved or damaged unless this is the only option available. In these cases, efforts will be made to transplant the tree following the granting of the prescribed permits.

If wood from a protected species, such as Lead Wood, is to be used in construction, permits to possess said wood must be kept on file. If wood from a protected species is purchased, this must come with a permit for transport and possession. If dead wood is collected, permits must be obtained prior to such collection.

In order to limit damage to the environment during construction, the site layout phase will also identify and peg/demarcate the stockpile sites.

No foreign materials may be nailed or attached to any trees and all 'no-go' areas are to be demarcated through the use of colour coded pegs.

No firewood or any other plant material or animal may be removed from the site.

No soil or overburden or naturally occurring rocks may be removed from the site.

The footprint to be impacted must be scrutinised for the presence of any fauna (burrowing animals such as baboon spiders, scorpions etc.) and necessary relocation action taken in the event of finding any. No footprint may be worked until such time that the Ravenscourt Ranch Manager has completed the footprint investigation.

Open trenches must be marked and if left overnight must have escape routes available for animals – such as a sloped end to natural ground level, or a branch 'ladder' placed in the trench.

Debris and litter on site must be removed daily, particularly plastics, rope, string and wire, which can all form animal traps, or entangle on an animal, compromising its survivability.

All toxins, solvents and harmful substances must be removed from site or stored in a locked vermin proof container or room.

Contractors should clearly understand that they are working within a nature reserve. Contravention of any conservation and environmental legislation may result in prosecution. The Contractor is responsible for any illegal action by his/her staff, e.g. illegal hunting, setting of snares, fishing etc.

The Contractor will be held liable for the replacement of any plant or feature under the protection of these specifications that is removed or damaged by the Contractor's negligence or mismanagement.

The Ravenscourt Ranch Manager shall monitor that there is no introduction of alien invasive species to the construction site. Should any such species be identified, immediate complete physical removal and any additional appropriate control measures are to be implemented under the guidance of the Ravenscourt Ranch Manager.

6.3 ESTABLISHMENT OF CONSTRUCTION SITE

6.3.1 Inside of camp:

The location of storage areas etc. will be indicated by the Ravenscourt Ranch Manager. No drainage lines may be impacted upon by stored material. Where building materials are stored on the construction site, these must be neatly stacked and kept tidy. It is necessary for the Contractors to travel to and from the construction site on a daily basis.

The site boundaries will be laid out by the Ravenscourt Ranch Manager with coloured pegs. This boundary may not be altered without Ravenscourt Ranch Manager approval. All activities must be contained within the demarcated area and are the responsibility of the contractor. The demarcations must remain in place until rehabilitation phase has been completed.

6.3.2 Outside of camp:

There is to be no storage of construction materials outside of camp. Should storage be required for an out-of-camp construction job, this will be allocated in camp in consultation with the Ravenscourt Ranch Manager.

Where building materials are stored on the construction site, these must constitute a maximum of one days supplies, except for stockpiles of sand and stone. Building materials must be neatly stacked on as small a footprint as possible and kept tidy.

All Contractors are to comply with the terms as stipulated in this document It is necessary for the Contractors to travel to and from the construction site on a daily basis.

No contractor on site accommodation is available at Singita Sabi Sands, however, by arrangement, it may be possible for the contractor to erect tents on a site identified for such and with management agreement.

6.4. ABLUTION FACILITIES AND WASTE/ REFUSE DISPOSAL

Toilet facilities are not always available at the construction sites. Contractors are encouraged to tap into the existing sewerage pipes and septic tanks wherever possible. However, a temporary abluion facility must be in place. Toilets are to be erected at a ratio of at least 1:15 toilets per persons. The Ravenscourt Ranch Manager will monitor the standard of hygiene and maintenance of toilets throughout the duration of the contract. It is the Contractors responsibility to keep these toilets clean and functional. Toilet paper is to be provided by the Contractor. Temporary toilets are to be secured to prevent toppling over.

Contractors are requested to paint all portable toilets a dull military nutria type colour (e.g.: Polynesia, matt finish) to lessen the visual impact of these temporary facilities in the natural environment. The same applies to any temporary sheds erected for material storage on building sites.

In terms of refuse disposal, the Contractor will ensure that, on a daily basis, all refuse is removed from site and disposed of at the Singita Sabi Sands waste centre. The use of clear plastic refuse liners in the dustbins is obligatory to facilitate the sorting and removal of waste. These dustbins will be managed in accordance with the Singita Sabi Sands waste management policy and management plan (part 4 of this document). It is essential that no refuse be disposed of amongst the building rubble generated, since this rubble may later be used in other applications. Building rubble and building waste is not catered for in the Singita Sabi Sands waste stream. Building rubble and any other non-compactable rubble should be safely stored to be transported at a later stage. A skip container for rubble may be placed at the site as determined by the Ravenscourt Ranch Manager. All such rubble and building waste must be removed from the site and the reserve unless specifically directed to do otherwise by the Ravenscourt Ranch Manager.

6.5. PROVISION OF WATER

Water is currently available from the Singita Sabi Sands reticulation system. This water is suitable for human consumption.

The Ravenscourt Ranch Manager is to train Contractors on correct and safe water usage practices. Water is a precious and limited resource at Singita Sabi Sands and must be used sparingly.

Washing of vehicles and laundry is prohibited on all construction sites.

Hose pipes must be entire and free of leaks and taps turned off when not in use. Hose pipes should have taps at both ends.

Hand-wash facilities and drinking water should be available to employees at all times.

6.6. AIR POLLUTION

No significant air pollution is anticipated. Dust suppression may be necessary if work is conducted in camp. This should be discussed with the Ravenscourt Ranch Manager.

6.7. NOISE

Within camp, contractors must gain confirmation with regards to work hours, as this is highly dependent on existing guest movements and occupation levels. Site personnel may be required to vacate the site from time to time to a suitable venue, as directed by the Ravenscourt Ranch Manager.

Outside of camp, management may allow extended work hours. Any work hour schedules should therefore be in agreement with management and obtained in writing.

Noise pollution will be monitored and should the need arise, the Ravenscourt Ranch Manager may request the contractors to use manual equipment or to fit sound deadening apparatus to their equipment e.g. silencers, soundproof boxes etc. The Ravenscourt Ranch Manager will monitor noise levels and if deemed to be excessive will request for the contractors to limit use to specified times.

Noise levels shall adhere to SABS 0103 specifications and no hooters or sirens may be used on site except where required in terms of SABS standards or in emergencies.

The use of generators may only be done with the prior permission (in writing) from Singita Sabi Sands Management.

Unnecessary noise will not be tolerated. Contractors will not be permitted to shout on site. The use of megaphones is prohibited. Radios and / or any other music or sound systems are prohibited.

6.8. VEHICLE AND EQUIPMENT FUELLING AND MAINTENANCE

All vehicle refuelling and maintenance is to occur in areas specifically maintained for these activities e.g. the workshop. The servicing and repair of equipment is to take place in the workshop or off site in areas specifically designed and designated for this.

In the event of an on-site emergency repair, the contractor must ensure that all work is conducted over an impervious layer preventing spillage of oils and fuels into the environment. Sufficient absorbent materials and spill kits must be available to assist with potential clean up requirements.

6.9. SOIL CONTAMINATION AND RESPONSE

Should any soil contamination occur during construction, such contamination is to be immediately reported to the Ravenscourt Ranch Manager. The soil shall be removed and stored in an area determined by the Ravenscourt Ranch Manager and shall be labelled as to the form of contamination to prevent its future use. After consultation with the Manager, the contaminated soil must be cleaned or disposed of in accordance with legislation. Minor (less than 50 litres) soil contamination by hydrocarbons (fuel) may be addressed with a bioremediation solution. Bioremediation is the application of biological microbes for the clean-up of hazardous oil spills resulting in a safe, efficient and cost-effective solution. Bioremediation uses microbes, enzymes, oxygen and other nutrients to chemically transform oil into carbon dioxide and water.

6.10. CEMENT

Cement mixing is to take place on an impermeable layer. Cement mixing areas must not be in the vicinity of drainage-lines or water bodies as cement is toxic to aquatic species. Cement wash must be prevented from entering any drainage lines.

It is suggested that cement working equipment, at the end of a working day, is washed in a drum of water. Allowing the water to settle overnight will make the upper layers of water available for further cement mixing and wetting. The remaining sludge can be allowed to dry and disposed of at the end of the project as building rubble.

Any excess cement and concrete mixes shall be retained on the construction site until completion of the construction when all spoil material and rubble will be removed and the rehabilitation process commences.

All used cement bags are immediately to be disposed of into the solid waste system. These bags are not to be used for other on site applications. On site burning of cement bags is not

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permitted unless in a controlled manner and with the Ravenscourt Ranch Managers permission. The normal process will be for waste cement bags to enter the general waste system.

6.11. PROVISION OF STORAGE FACILITIES - DANGEROUS AND TOXIC MATERIALS

All toxic materials such as paints, fuel, or oil shall be stored in well ventilated areas that can be locked. It is essential for safety reasons that all toxic materials are handled in an appropriate manner as prescribed by the labels on the products used.

Drip trays are to be placed underneath paints and toxic materials in storage to contain accidental spills.

Toxic substance volumes must be kept at less than a total of 100 litres on site at any one time.

Should any spillage or pollution of any toxic materials occur, the Ravenscourt Ranch Manager should immediately be contacted and mitigation measures taken. The Contractor will be liable for any clean-up costs, legal costs or fines, which may arise from such an accident.

Washing of tools used for the application of these materials is to be done in washing trays and water stored in drums, adequately labelled as toxic, with closing lids for disposal on recommendation by the Ravenscourt Ranch Manager. No cleaning may take place using the environment as a receptor.

Empty containers that contained toxic substances are not to be used for any other application, but are to be returned to supplier, or punctured and discarded (not in the reserve) as recommended by the Ravenscourt Ranch Manager and the product label.

6.12. PROVISION OF STORAGE FOR CONSTRUCTION MATERIAL

The Contractor will be responsible for the storage of construction material at a site determined in conjunction with the Ravenscourt Ranch Manager. Where necessary in the stockpiled areas, the topsoil is to be removed and stored adjacent to the stockpile. No bushes or trees are to be removed for this purpose. All storage areas are to be indicated with the Ravenscourt Ranch Manager.

6.13. TOPSOIL REMOVAL AND STORAGE

The topsoil of all the areas affected by construction (material stockpiles and construction footprint) is to be removed and stored in heaps not higher than 1.5 meters. Periodic watering will be required to maintain the microbial action within the topsoil. Care should be taken to store topsoil in such an area, where it will not be susceptible to soil erosion or contamination from any other materials. Care should be taken to prevent any compaction of the topsoil occurring. In some case it may be necessary to trench the area around the topsoil stockpiles to prevent runoff water from heavy rains eroding these stockpiles.

6.14 BORROW PITS, QUARRIES AND THATCH

The creation of borrow pits and quarries of any size on Singita Sabi Sands, is not permitted. Material may be obtained from borrow pits on Singita Sabi Sands with management's permission.

Any imported fill or sand shall be free of weeds, litter and contaminants.

Thatch grass shall be free of contaminants, combed and be free of viable seed as per standard thatching regulations and standards.

6.15 SPOIL MATERIAL

All spoil material shall be disposed of in accordance with legislation. No spoil material will be left on site at completion of the project and the reuse of any material (excess crushed stone, sand etc) should be investigated. These spoil materials may be relocated to stockpile areas within Singita Sabi Sands for later use, by arrangement with the Ravenscourt Ranch Manager.

6.16 FIRE PREVENTION

No open fires will be allowed on the construction site or in the veld under any circumstances.

It will be expected by all Contractors to indicate their ability to fight accidental fires, through having fully functional and serviced equipment on site in the event of accidental fires. The Ravenscourt Ranch Manager will determine the level of equipment and training required by the Contractors.

6.17 STORM WATER MANAGEMENT

No obstructions of any storm water system will be allowed and the dumping of water used for the cleaning of equipment will also not be permissible, the management of this water has been addressed under point 6.10 and 6.11 above.

Only level areas are to be used for stockpile zones and care is to be taken to prevent the stockpiling of materials in drainage lines. The Ravenscourt Ranch Manager will assist in determining these areas.

6.18 GROUNDWATER MANAGEMENT

Caution should always be deployed when working with or in the vicinity of bore holes. No construction site run-off or waste should be allowed within 100m of a borehole.

6.19 WASTE DISPOSAL

All refuse waste will be managed in accordance with Singita Sabi Sands's waste management policy and management plan.

Building rubble and any other non-compactable rubble should be safely and suitably stored for later removal. Open vehicles transporting rubble should be carefully loaded to prevent material from falling off the load area. No waste may be buried or burned on site.

6.20 TRAFFIC CONTROL

All vehicles used by Contractors and sub-contractors are to be maintained in a safe working condition. Vehicle operators are to be in possession of valid driver licenses. It is advisable to insure vehicles and operators against claims arising from accidents and third party liability. All vehicles shall undergo regular checks to ensure they are free of oil or other lubricant leaks. The Ravenscourt Ranch Manager may at any time prevent sub-standard or dangerous equipment from being used on Singita Sabi Sands.

Contractors and sub-contractor drivers are to be courteous in all dealings with other road users and shall adhere to all roadway signage and speed limits.

Contractors and sub-contractors are to use the shortest possible route between the place of entry and the construction site at all times. Unauthorised driving through the reserve for purposes other than the building contract is not permitted.

All the contractor's vehicles must have the contractor's decal clearly visible on both sides.

Contractor's vehicles may not be left on a building site over weekends or holiday periods. These vehicles must be removed and parked in an area indicated by the Ravenscourt Ranch Manager during these periods.

6.20 LITTERING

No littering by the Contractors or sub-contractors shall be allowed. The Ravenscourt Ranch Manager shall monitor the neatness of the work site for any litter.

6.21 COMMUNICATION

It is essential that good communication channels between the Contractor and Ravenscourt Ranch Manager be maintained.

6.22 TRENCHING

Trenching must be undertaken with care, considering appropriate drainage, existing water and power services and other buried obstacles.

For significant trees (as indicated by the Ravenscourt Ranch Manager), trenching must be 3m away from the stem.

Where possible, trenches should be excavated and backfilled on a progressive basis. Excavations to stand open for no longer than 2 days if at all possible. Excavations should preferably be opened and closed on the same day. If excavations are to be left open over night, they must be clearly marked with a reflecting material and have exit points for fauna so any such can escape and are not trapped.

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Ensure that no trench longer than 500m is exposed at any one time.

Programme excavation to take place only once the required materials are on site. This facilitates the immediate laying of services and / or construction of subsurface infrastructure and minimises open trench time.

7. REHABILITATION PHASE

7.1 REHABILITATION OF THE CONSTRUCTION SITE

On completion of construction, the site must be rehabilitated through the removal of all construction facilities introduced, removal of waste and any other feature constructed or established during the use of the site. All areas devoid of vegetation or where spoils and stockpiles have been stored shall be scarified or ripped and the topsoil, previously removed and stockpiled, shall be reintroduced to these areas. In some cases it may be necessary to re-seed and mulch. This, however, will be at the discretion and under the advice of the Ravenscourt Ranch Manager.

All natural and appropriate storm water drainage areas and channels must be restored. This may also entail the creation and installation of appropriate erosion control measures. Such measures will be determined by the Ravenscourt Ranch Manager and may involve berms, walls or other construction.

Any concrete from past activity on the site may be required to be broken and removed – as determined by the Ravenscourt Ranch Manager.

7.2 FINAL REHABILITATION OF THE SURFACE

On completion of the construction phase, the various surfaces in use by the contractors and subcontractors shall be finally rehabilitated as described in this document. All infrastructures, equipment, plant and any other items used during the construction period must be removed from site. Waste receptacles, scrap and rubble will be removed entirely from site. No burial or burning of any material whatsoever will be allowed on site.

Final rehabilitation shall commence within 1 week from cessation of construction operations.

8. SITE SAFETY MANAGEMENT PROCEDURES

Disasters are a constant threat when working in conservation areas and especially on construction sites.

In order to avoid accidental fires and to aid fire-fighting, the Contractors must be instructed in Singita Sabi Sands fire management procedures by the Ravenscourt Ranch Manager.

In case of flooding, Singita Sabi Sands will notify contractors of flooding potential as soon as this information is received (from, for example, weather forecasts).

The greatest factor regarding disaster management in this instance is the proximity to medical care for injuries on duty or evacuation in the case of serious illness. The Contractor is to have a first aid kit available on site at all times along with at least one person with a basic first aid training and current / valid certificate.

Contractors are expected to abide by National health and safety standards, and as such, hard hats are expected to be worn on site, protective eye wear, dust masks and ear protection made available for tasks that require such and harnesses for any work above 1.8 meters. Scaffolding must be secure and appropriate warning signage placed for dangerous activities. Proper footwear should be worn by all employees.

The contractor must identify the following person(s) to the Ravenscourt Ranch Manager for each site:

- A safety representative
- A first aid officer

Contractors must be able to demonstrate that all workers are registered with the Workers Compensation Commission - WCA.

ANNEX E: EVIDENCE OF PUBLIC NOTIFICATION



Figure 41: Site notices posted at Newington (top) and Shaw's (bottom) entrance gates to the SSW (© M Alkema)

NOTICE: APPLICATION FOR ENVIRONMENTAL AUTHORISATION

Ravenscourt Ranch (Pty) Ltd, is applying in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), and the Environmental Impact Assessment Regulations, 2014, to the Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs; for environmental authorisation at the Basic Assessment level, to install a Fibre Optic Cable (FOC) from Castleton to Ebony Lodge on Ravenscourt farm in the Sabi Sands Game Reserve. The FOC will be installed in a trench of approximately 7km in length and which will cross three non-perennial water courses. The FOC will also connect the terminal building on their airstrip and the access control at their boom gate. In addition to this they wish to construct a two toilet ablution facility at their bush breakfast/braai site which will require the activation of a borehole and the installation of electricity and water reticulation infrastructure to augment supply to Ebony Lodge.


These developments are aimed at enhancing the capacity of Singita Sabi Sands to continue to deliver high quality services to their guests and to meet their expectations.

It is envisaged that the potential negative environmental impacts that will occur as a result of these developments are either avoidable or will be mitigated through the careful implementation of an environmental management plan, implementation of which will be closely and regularly monitored.

The Ravenscourt Ranch falls within the Bushbuckridge Local Municipality and the Ehlanzeni District Municipality (DC32) which is in the Mpumalanga Province.

In order to participate in the Basic Assessment process you are invited to register as an Interested and Affected Party by contacting the Environmental Assessment Practitioner as per the details provided below. Please submit your name, contact information and interest in the above mentioned project no later than 15 February 2019.

Kevan Zuncel of Emross Consulting (Pty) Ltd.
Address: 7 Annthia Road, Hilton, 3245
Tel: 033-3431739
Fax: 086 517 5582
Cell: 082 929 4270
Email: kevan@emross.co.za



TAB68276

PLEASE NOTE - FIRST PROOF

Please see attached ad proof

***PLEASE NOTE THAT DUE TO VERY TIGHT DEADLINES, IT IS VERY IMPORTANT TO REPLY AS SOON AS POSSIBLE.**
****WE ALLOW A MAXIMUM OF TWO PROOFS PER ADVERT. AFTER THAT A FEE OF R295 WILL APPLY FOR EVERY PROOF SENT.**
ALL PROOFS MUST BE SIGNED OFF WITH THE SECOND PROOF.

- When advertising in any of Lowveld Media's publications, an artwork proof is sent to every client. Since we simultaneously work on numerous publications, each has certain deadlines to be adhered to, eg. for material to be handed in, design, client and production deadlines.
- **Upon receiving the first proof, the onus is on the client to thoroughly read and carefully check spelling, prices, dates, telephone numbers, names, etc.** Due to time constraints in the printing industry, clients are requested to respond as soon as possible. ALL changes should be done after receipt of first proof.

These will be done as requested and a second proof will be sent to the client. Thereafter a signature of approval is expected since it is of vital importance to continue with production. **NO RESPONSIBILITY WILL BE ACCEPTED BY LOWVELD MEDIA IF THIS SIGNED PROOF IS INCORRECT.**

PLEASE SIGN HERE OR REPLY BY EMAIL IF WE CAN GO AHEAD WITH THE ATTACHED ADVERT


Stay with the established 

Figure 42: Notice of intent to apply for environmental authorisation in the Mpumalanga News on Thursday 13 December 2018 and the Lowvelder on Friday 14 December 2018.

ANNEX F: BACKGROUND INFORMATION DOCUMENT

ANNEX G: MINUTES OF PRE-APPLICATION MEETING

ANNEX H: COMMENT AND RESPONSE REPORT

I & AP	COMMENT	RESPONSE
IN RESPONSE TO BACKGROUND INFORMATION DOCUMENT AND CALL FOR REGISTRATION AS I & AP		
Allan Taylor Trust	<p>23 December 2018 09:18</p> <p>The Allan Taylor Trust, as the adjacent land owner, does not wish to participate in this process and has no objections to the proposed activities</p>	<p>23 December 2018 15:31</p> <p>Thank you very much for your response. We appreciate your feedback.</p>
Tom Robson	<p>08 March 2019 11:10</p> <p>Thank you for all the information in your email. It is very useful.</p> <p>Broadband</p> <p>Thank you for all this information. I will pass it on to Kevin Jackson who is responsible for our Group IT.</p> <p>Thank you for keeping me informed of new construction on Singita. I am always sad when human impact increases in our spectacular bushveld. As an executive committee we are paying particular attention to human impact in an attempt to contain it and reduce its effect on fellow members as well as on the environment. I am sure we all agree that the SSW is over developed. With some thought I am sure we can achieve this without too much effort. Please do not take what follows as criticism it is simply my personal attempt to improve the bushveld experience. Should you have similar concerns to these on Othawa I would be happy to meet your requests.</p> <p>Toilets</p> <p>Thank you for your assurances here.</p> <p>Gym</p> <p>The Singita shop is visible from Othawa because it is higher up on the slope from the river. It seems that the new gym will be as equally as visible. Please could I have Singita's assurance it will be painted and perhaps even hidden behind trees or another planted barrier so that we can't see it.</p> <p>Although you say it will face north east it is worth remembering that Othawa extends down river for another 4 kilometres and lights from the gym will be visible on Othawa further downstream. Perhaps from</p>	<p>8 March 2019 2:23 PM</p> <p>I want to thank you for your email and all your concerns will be noted.</p> <p>I will ensure that Marianda Horley who is our project manager coordinator is 100% up to speed with regards to these points you raised.</p> <p>I will ask her for an update once I have addressed these points at our next meeting.</p> <p>The lighting concerns are fair and these will be addressed with Singita management to ensure that with the design and as well as operationally that they take your concerns seriously.</p> <p>The gym's position with regards to its visual aspect we will address with the design as well as the surrounding area to try create natural barrier so it is blending in.</p> <p>We would like to thank you for your time to look at this and keep you updated with our projects and any changes going forward.</p> <p>March 8, 2019 8:50 PM</p> <p>From my side as the environmental assessment practitioner responsible for these EIA on these projects, I also want to thank you for pointing out your concerns. As marc says, they will be addressed and captured in the Draft Basic Assessment Report (DBAR) of which you will receive a copy for review. If the design and other mitigation measure put forward in the DBAR are inadequate from your</p>

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I & AP	COMMENT	RESPONSE
	<p>the slope above Manuli camp. Will there be lights leading to the gym? Please could I ask that these face back into Singita rather than towards Othawa.</p> <p>Boulders Boma Again please could I ask that Singita ensures that this new boma will not be visible from Othawa during the day or night and that particular attention is paid to pathway and other lighting. In particular I am concerned that candles or flares are very visible at night. Although these may be temporary they still offer considerable light pollution.</p> <p>11 March 2019 12:22 PM The enquiry with regard to lights and other visual pollution goes beyond current EIA considerations. Although they can be mentioned and there are opportunities to comment I have never seen an EIA result in a strict requirement for lighting standards or strict requirements for elimination of visual impact.</p> <p>I would value the opportunity of discussing this with you as I think the current EIA and associated assessment reports fall far short of our current needs to control human impact and improve the experience of paying guests and visitors.</p>	<p>perspective, you will then have an opportunity to comment and ensure that all potential impacts are either avoided or mitigated to address your concerns.</p>
	<p>1/9/2019 11:18 AM Please find attached our registration as an I&AP for the Singita FOC installation etc. As you have already got a copy of the SOP, I have not included it again.</p>	
<p>ECO SSW dd 30 November 2018</p>	<p>Kindly register the SSW-MA as an I&AP for this development and send all relevant documentation to the ECO, Warden and HOD of Conservation. We also request to please be included in monthly inspections and audit reports during development (refer to SOP 1/18-Development: Environmental Compliance).</p>	<p>Contact details recorded in I&AP database and SOP requirements acknowledged.</p>
<p>Percy Floyd Themba dd 29 November 2018</p>	<p>i am interested in the development and i would also need to learn more.</p>	<p>Contact details recorded in I&AP database</p>
<p>Lebo Nkosi dd 30 November 2018</p>	<p>Hi I'm a lady of 25 years. .I've seen the proposal of roads developed and upgraded on Sparta farms.im interested in this opportunity..wish to be contacted to 0767681100.</p>	<p>Please note that this is not an advertisement for job opportunities but rather for people who wish to contribute to the environmental assessment process. I assume from your email and CV that you read this as a job opportunity,</p>

I & AP	COMMENT	RESPONSE
		but if you wish to be involved in the process please confirm and I will forward the Background Information Document to you.
Nicolas Shilubane 23 November 2018	Hello. I am Shilubane Nicolas I am interested to participate in the Basic Assessment process. I can be contacted at this number 0725210445	Contact details recorded in I&AP database
Simpfiwe Chris Vilakazi dd 26 November 2018	I would like to participate on the project	Contact details recorded in I&AP database
DRAFT BASIC ASSESSMENT REPORT DD JUNE 2019		
Ms Thokozile Sithole (MDARDLEA) dd 11 June 2019	<p>1. The final basic assessment report must include a consolidated single A3 layout plan that must be referenced and dated, and must include a legend and a land use table. You are further referred to the following provisions of the EIA Regulations 2014:</p> <ul style="list-style-type: none"> ▪ Appendix 1: 3(1)(c) - A basic assessment report must contain the information that is necessary for the competent authority to consider and come to a decision on the application, and <u>must</u> include – a plan which locates the proposed activity or activities applied for as well as associated structures and infrastructure at an appropriate scale. ▪ Appendix 4: 1(1)(c) – An EMPr must comply with section 24N of the Act and include - a map at an appropriate scale which superimposes the proposed activity and its associated structures and infrastructure on the environmental sensitivities of the preferred site indicating any areas that should be avoided. 	1. Layout plans and an EMPr provided in this document.
	2. According to page 33, table 3 of the report, the fibre optic cable will be limited to three crossings of the non-perennial tributaries of the Sand River. Please note that all coordinates of proposed watercourse crossings must be provided.	2. Coordinates for all watercourse crossings provided in text and on layout maps
	3. Please note that the EMPr must comply with the requirements Appendix 4 of the EIA Regulations 2014 (as amended), you are specifically referred to paragraph 1(1)(h) and (j) of which outlines the requirements for the frequency of monitoring and the time periods within impact management actions must be implemented. The final basic assessment report must include an amended EMPr, that must be dated, and that complies with the abovementioned requirements of Appendix 4.	3. EMPr provided together with this document.
	4. The final BAR must provide proof that all potential and registered I&AP's, including Organs of State, were provided with access to and an opportunity to comment on the draft BAR following submission of the application form (Regulation 40(3)).	4. Proof provided in Annex K.
	5. The final basic assessment report must include an issues and response report, as well as copies of and responses to comments received from all I&APs, including these comments.	5. Comment and response report included as Annex H.
Tom Robson 26 June 2019	<p>Who will check that the excellent lighting management recommendations you make will be adhered to?</p> <p>The same goes for the recommendations you make regarding the new gym and walkway?</p> <p>It is important that you note that there is no water course crossing at the Singita Bush breakfast site. Singita approached me to ask if they</p>	<p>Part of the process, if and when environmental authorisation is granted, is the appointment of an independent environmental compliance officer (ECO) who is responsible to ensure that all recommendations are adhered to by the applicant/developer. Note also that the authorisation will come with specific conditions of establishment to which compliance is a legal obligation. You will find details of this in Section 8.3 of the DBAR.</p>

I & AP	COMMENT	RESPONSE
	<p>could cross the river there. This request was denied.</p> <p>I am a little disappointed to note that little or nothing is being reduced. Only more additions will be placed in our bushveld.</p>	<p>The watercourse crossing at the Bush Breakfast Site refers to the non-perennial tributary of the Sand River and not the Sand River itself. See Figure 2 in the DBAR where a blue pin indicates the crossing. There is no intention to cross the Sand River.</p> <p>In terms of reductions vs additions you are right that there will be a nett increase in development footprint, but in some instances, like the boma and the gym between Ebony and Boulders, they are replacing existing structures where some bush will be rehabilitated. Otherwise some relate to the expansion of existing buildings. I am sure though that Singita are aware that there is a crucial threshold that cannot be crossed in order to preserve the wildness of the bush.</p>
<p>Tom Robson 28 June 2019</p>	<p>Are the Environmental Compliance Officers, who are appointed, effective?</p> <p>Who appoints the ECO's?</p> <p>How often have ECO's visited the SSW to check on adherence to environmental recommendations?</p> <p>For how long do they repeat visits to check compliance?</p> <p>What process do the ECO's follow when they find defects?</p> <p>All the above questions have to be answered if you, and your professional peers, are to feel that the work they are doing is good for the environment and specific environmental situations and not just an academic exercise.</p>	<p>Are the Environmental Compliance Officers, who are appointed, effective?</p> <p>On the whole they are as their reputation and credibility depends on them doing a good job. Compliance audit reports are sent to the designated official from the department who is also responsible to follow up and ensure that conditions of establishment are implemented.</p> <p>Who appoints the ECO's?</p> <p>The developer.</p> <p>How often have ECO's visited the SSW to check on adherence to environmental recommendations?</p> <p>I can only answer from my own perspective and where I have been involved, i.e. Londolozi and the upgrade of one of their camps. Here I visited monthly and the designated official from the department carried out an inspection at the end of the project and provided an official notice of closure confirming all was according to the authorisation.</p> <p>Otherwise I believe that your Green Audit process that has now got off the ground is serving this purpose as well and that one of the aspects that is checked is compliance and</p>

I & AP	COMMENT	RESPONSE
		<p>authorisations.</p> <p>For how long do they repeat visits to check compliance? Compliance audits will continue for as long as the developments are being implemented and until all rehabilitation has been successfully completed.</p> <p>What process do the ECO's follow when they find defects? Any deviation from the conditions of establishment are immediately brought to the attention of the project manager/s and contractor/s who are tasked with implementing immediate remedial action. If the infringement is significant a contractor may be requested to leave the site. Penalties may also be imposed. Project managers and contractors also keep an 'Incident Register' where they have to report any incident that may cause harm to the environment, describing the incident and the remedial actions taken, etc.</p>

ANNEX I: SUMMARY OF QUANTIFIERS AND QUALIFIERS USED FOR ASSESSMENT PURPOSES

CAREGORY	RATING	EXPLANATION
Sensitivity of Aspect / Magnitude or intensity of impact:	Low	The aspect has very little value in terms of its ecological importance e.g. a highly disturbed area is rated as low);
	Medium	The aspect has certain qualities which make it ecologically valuable); or
	High	The aspect is near pristine and has numerous qualities which make it extremely ecologically valuable).
Duration (time scale):	Short-term	Impact restricted to construction and early operation (0-5 years);
	Medium-term	Impact will cease on closure of the site (6-30 years);
	Long-term	Impacts will exist beyond the life of the site (>30 years); or
	Permanent	Impacts will have permanent potential.
Geographic Spatial Scale:	Site	The impact will be limited to within the site boundaries;
	Local	The impact will affect surrounding areas;
	Regional	The impact will affect areas far beyond the site boundary but limited to the Province of KwaZulu-Natal; or
	National	The impact will affect areas far beyond the site boundary within the South Africa.
Significance rating pre / post-mitigation:	Low	The impact will have a minimal effect on the environment;
	Medium	The impact will result in a measurable deterioration in the environment; or
	High	The impact will cause a significant deterioration in the environment.
Degree of certainty:		Definite (>90%);
		Probable (>70%);
		Possible (40%); or
		Unsure (<40%).
Mitigation:		No mitigation necessary;
	Full	Full mitigation/reversal of the impact is possible;
	Partial	Only partial mitigation/reversal of the impact is possible; or
	None	No mitigation or reversal of the impact is possible.

ANNEX J: HERITAGE IMPACT ASSESSMENT REPORT

ANNEX K: EVIDENCE OF DISTRIBUTION OF DBAR TO I&APS

ANNEX L: COPIES OF COMMENTS FROM NATIONAL AND PROVINCIAL ENVIRONMENTAL MANAGEMENT AUTHORITIES

ANNEX M: RECORDS OF SITE MEETINGS WITH AUTHORITIES

A site visit was undertaken on 20 June 2019 and was attended by the following:

Mr Xolani Nkosi	MDARLEA
Ms Thokozile Sithole	MDARLEA - designated officer
Mr Anthony Emery	Emross Consulting
Mr Marc Alkema	Singita Sabi Sands

The comments reflected in Annex H and L were provided prior to the site visit and at the site visit it was agreed that the 1:100 year flood line was not required in lieu of 32m riparian buffers being provided on dated layout maps overlain on aerial photos.