PROPOSALS FOR A SOIL EROSION MANAGEMENT PLAN: PROPOSED SKYWALK PROJECT – GOD'S WINDOW. SITUATED ON THE FARMS DE HOUT 503 KT AND PORTION 2 OF THE FARM LISBON 531 KT: THABA CHWEU LOCAL MUNICIPALITY, EHLANZENI DISTRICT MUNICIPALITY: MPUMALANGA PROVINCE: APPROXIMATELY 2.0 HA: SEF PROJECT CODE 505201

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1.INTRODUCTION

The locality of area that is considered suitable for the expansion of existing services is described as the 'target site'. The target site is the currently unused land lying between the currently developed parking / trading area site (the current site) and the edge of the escarpment.

The considerations behind the soil erosion management proposals emanating from this study are threefold:

1) The impact of the status of the Soil Form at the target site.
2) The impact of prevailing climatic conditions.
3) To determine the impact, if any, of the proposed extension of services from the existing site to the target site, and in particular the civil works related thereto.

The recommendations arising from the study will cover two aspects of the proposed project, namely the construction phase and the rehabilitation programme.

The short outcome of the study is that, apart from nuisance dust generated during a brief site clearing period, there is no erosion risk. Solid rock that is hundreds of meters deep does not erode.

1.1 Soil Forms and Series

The Soil Forms and Series found within the target area are always good initial indicators of soil potential, of the level of management required to mitigate damage during the construction phase and then the rehabilitation steps that need to be taken after completion of construction.

This initial assessment has been further refined during the process of establishing the Land Capability Classes (LCCs) of the Soil Form found within the target area.

LCC determination includes establishing the soil texture (clay content), slope, topsoil depth, ability to absorb and hold water, drainage qualities, rockiness and crusting potential of the soils under review.

1.2. Topography

Topography is usually taken into account in this type of study, as topography and soil form usually play a large part in determining recommendations for ameliorative and rehabilitation measures that may need to be taken.

However, in this instance topography has little impact as the site is level or gently sloping. In view of the physical nature of the target site, run off from the slope immediately north of the target site should be no different from the impact on the present site. The target site will therefore require storm water runoff management similar to that practiced at the present site.

1.3 Climate

The climate is a third important determinant. This determines the volume of rainfall precipitation, the type of precipitation, the seasonal occurrence, soil moisture evaporation rate, the effect of sunshine hours, heat and chill units on ground cover and other vegetative vigour.

Climatic conditions are also an important indicator of the type of ameliorative and rehabilitation steps that will need to be taken.

This study has found that climate is the major natural resource in determining the status of the target site and therefore the main determinant of management practices that need to be followed.

1.4 Traffic

The type, frequency and volume of traffic during construction also have an impact on site management and rehabilitation recommendations that might arise therefrom. The volume and type of construction traffic usually determine factors such as soil compaction, dust creation and damage to surrounding vegetation.

1.5 General Comment

John Phipson has a lifelong interest in land management and nature conservation. He has served on the Natal Provincial Council Nature Conservation Portfolio Committee and was instrumental in the motivation for the establishment of a Chair of Nature Conservation at the University of KwaZulu-Natal.

He is a member of the Custodians of Rare and Endangered Wildflowers and the Zululand Indigenous Tree Society. He is, or has been a member of a number of soil fertility and crop management interest groups.

Over the last twenty years John Phipson has worked extensively on land usage planning and land usage management at both local and district levels, co operating with municipalities,

traditional authorities, provincial and national government as well as private sector participants.

1.6 Client Participation

The open and friendly response from site staff has been appreciated.

1.7 Community Considerations

Although this is basically a technical assessment, it was noted that the attitude and esprit de corps of the participant vendors will be a major contribution to the success of the proposal.

2. METHODOLOGY: DESKTOP STUDY

As this study is an addendum to the Final Scoping Report dated October 2013, SEF Ref: 505201and DEA Ref: 14/12/16/3/3/3/88, the Scoping Report has been the prime source for desktop material. Where relevant source data from the scoping report has been commented on in this text it is acknowledged as such.

However, data arising from the Final Scoping Report and other sources has been added to and verified or modified during the site evaluation.

2.1 Soils Data

The soil Parent Material at the target site is quartzite of the Black Reef Formation of the Transvaal Supergroup (Norman and Whitfield). The Black Reef Formation is a conglomerate of deposits that have formed the extremely hard ridge of the Great Escarpment (McCarthy and Rubridge).

The following standard soil classification texts have been used in order to determine site specific Soil Forms, obtain data on the physical properties of the Soil Forms encountered and thus provide guidelines to the management thereof:

Soil Classification: A Taxonomic System for South Africa: McVicar et al, ISCW (Blue book)

Identification and Management of the Soils of the South African Sugar Industry;

SA Sugar Research Institute. (Sugar book)

Agricultural Geo-Referenced Information System: (Agis.agric.), owned by DAFF and managed by the ISCW.

2.2 Climatic Data

The climatic data appearing on pages 25 and 26 of the scoping report is not site specific and may therefore not address micro-climate factors that can be important considerations when assessing a specific site. This aspect will be commented on further in the site verification section of this report.

As a follow up to the Scoping Report reference was also made to the Agricultural Geo-Referenced Information System: (Agis.agric). In view of the paucity of site specific climatic data, the final conclusions on the impact of climate was left over to the site verification portion of the study.

In the meanwhile, a description of Climate Capability Class Criteria appears overleaf.

Description of Climate Capability Class Criteria (Scotney et al. UKZN 1987)

Climate Capability Class	Limitation Rating	Description
C1	None to slight	Local climate is favourable for good yields for a wide range of adapted crops throughout the year.
C2	Slight	Local climate is favourable for a wide range of adapted crops and a year round growing season. Moisture stress and lower temperatures increase risk and decrease yields relative to C1.
C3	Slight to Moderate	Slightly restricted growing season due to the occurrence of low temperatures and frost. Good yield potential for a moderate range of adapted crops.
C4	Moderate	Moderately restricted growing season due to low temperatures and severe frost
C5	Moderate to Severe	Moderately restricted growing season due to low temperatures, frost and/or moisture stress. Suitable crops at risk of some yield loss
C6	Severe	Moderately restricted growing season due to low temperatures, frost and/or moisture stress. Limited suitable crops which frequently experience yield loss
C7	Severe to Very Severe	Severely restricted choice of crops due to heat, cold and/or moisture stress
C8	Very Severe	Very severely restricted choice of crops due to heat, cold and/or moisture stress. Suitable crops at high risk of yield losses.

Climate Capability Class 2 was determined during the course of the site visit.

2.3 Vegetative Data

Mucina and Rutherford (map 786) describes the vegetation on the crest and escarpment as Northern Escarpment Dolomite Grassveld and the vegetation along the edge of the escarpment as Northern Mistbelt Forest.

Apart from having no value for annual cultivated crops, the vegetation has extremely poor domestic livestock carrying capacity. The Agis.agric rating is one steer per 100 ha of rangeland. This is equivalent to the livestock carrying capacity of the wilderness in the most inhospitable parts of the Northern Cape.

Livestock carrying capacity is an important consideration when evaluating erosion potential. The norm for good quality rangeland is one steer per 2.5 ha. Poorly managed livestock traffic can rapidly create sunken paths that eventually erode into dongas

2.4 Land Tenure and 0wnership

The Final Scoping Report mentions that the land is owned by a collection of local Community Trusts and Community Property Associations. It is the author's experience that multiple ownership of such a small site, and even a whole farm, is, in the experience of the author hereof, most unusual.

Further doubt was cast by the fact that both farms are within, or partly within a major nature reserve.

Consultation with the Deeds Office in Nelspruit affirmed that both farms are owned by the Republic of South Africa.

It is possible that a Memorandum of Agreement or similar document regulates the relationship between the participating communities and the land owner, thus creating the perception that the land is in fact communally owned.

It is however good practice to consult with the site users at every stage of the proposed development.

3. METHODOLOGY : SITE VERIFICATION

3.1 Soils Data

The required frequency for soil profile evaluation of rangeland is 1: 100 000 or one profile per 200 ha of visibly uniform land. For permanent crops such as timber plantations it is 1: 10 000 or one profile per 40 ha of visibly uniform soil. For cultivated land the requirement is one profile per 10 ha of visibly uniform land.

However, in view of the dense vegetative cover and the anticipated land use, nine profiles were examined in order to ensure a truly representative cross section.

The tool used was a Dutch Auger. Due to the site being virtually level, there was no need to use an Abne level to measure slope.

A unique feature of this site is that the prevailing Soil Form at the target site does not correspond directly with any of the ninety six officially recognized Soil Forms or Soil Families that occur within RSA. For the purpose of illustration and explanation the closest soil form to that occurring at the site, i.e. The Mispah Soil Form has been used to explain the measures that need to be taken during the construction phase of the target site.

As indicated in the table and accompanying soil profile distribution map that make up Appendix 3 hereto, all nine profiles revealed the same profile – a quasi Mispah Soil Form.

The Soil Form found at the target site differs from the Mispah Form in that the topsoil (A Horizon) consists mainly of a shallow layer of decomposed vegetation, whereas the Mispah Soil Form A Horizons are made up of shallow sand or sandy clay loams.

For illustrative purposes a typical Mispah Soil Form profile is illustrated overleaf.

As it has not been feasible to obtain a full soil profile at the target site, the Mispah Soil Form profile illustrated below, but photographed at another site, illustrates the soil profile status at the target site.

The limited topsoil evident in this photograph is sufficient to support poor quality grasses and some sisal plants as well as a few eucalyptus trees, all shallow rooted plants. The sandy topsoil has devolved mainly from weathering of the rock over great periods of time, by means of chemical reactions. Depending on conditions, this process typically creates one mm of topsoil every 15 to 25 years.

The process that has occurred at the target site is the rapid decomposition of organic matter that has fallen onto and between the surface rocks, thus forming layers of humus. This rapid process is mainly the result of the local micro-climate rather than the slow weathering of rock. The main natural resource factors have been high rainfall, frequent and heavy mist and dense vegetative ground cover. The resulting humic topsoil is illustrated overleaf.

The photograph below illustrates the challenges associated with the poor quality of the limited 'topsoil' there is present at the target site. The formation and consequent structure of what has to be termed, for want of a better word, 'topsoil' has been brought about by a virtual composting of surface moss and abundant *Erica* (fynbos) detritus.

The outcome has been an unstructured ‘quasi-soil’ that has no inherent binding strength and no ability to store moisture for more than a few hours. When handled, it fragments into fine dust and semi-decomposed plant matter.

The samples reflect the surface facing up and the surface inverted. The samples are so loosely bound that neither tool nor hand pressure was needed to lift them. It is this ‘topsoil’ that could be a major nuisance dust hazard during the construction phase.

Humic soils are a common denominator in mist belt habitats as frequent mist not only dampens the soil, but also inhibits soil moisture evaporation. ‘A Pan’ evaporation rates at the target site are in the region of 1400 mm per annum compared with 1800 to 2000 mm per annum at mist free sites with similar other climatic conditions.

3.2. Land Capability Class Determination

This is the fundamental step in assessing all the individual components that determine the capability of a particular soil at a particular site.

Examination and assessment of the individual components of the determination can give valuable insights into the management practices that will be required within the target area.

The following determinants are applied to a Land Capability Class determination flowsheet

Soil texture (clay content)

Slope % of surrounding area

Effective rooting depth

Moisture intake rate

Soil permeability

Soil wetness

Risk assessments and management recommendations will be directly related to the above components in conjunction with own observations and experience.

All the profiles at the target site reflected LCC VIII, suitable for wild game only.

3.3 Erodibility : Water, wind and traffic

No evidence was found of either water or wind erosion at either site, nor on the hill. It is therefore presumed that storm water runoff is well managed. Wind erosion is inhibited by existing hardened surfaces in the parking and trading area.

Wind erosion at the target site is inhibited by thick and heavy comprehensive vegetative cover, ranging from lichens and mosses to almost impenetrable *Erica species* (fynbos) type shrubs.

As the target site is parallel to the existing parking and trading site and shares the same gentle north to south downward slope, it is assumed that, if required, a parallel storm water management system will be utilized.

It is anticipated that when the fynbos type brush is removed for the construction of the envisaged additional services, the creation of nuisance dust in the form of wind erosion will become a very real consideration.

It must at this stage be recognized that any agricultural considerations will play a minimal part during the construction phase. The real issues to be faced are in the field of civil engineering for the hard surfacing of the parking and trading areas. Surface mining considerations will prevail in and adjacent to the new toilet areas.

Recommendations for the management of nuisance dust have been made in Section 6 hereof.

3.4 Climatic Data

Climatic data compiled during the desk top study and the impact thereof has been modified by personal observation at the site. The important factors are evidence of high rainfall aggravated by frequent and heavy mist.

These have resulted in the surfaces of the rock formations being covered in lichens and mosses under a canopy of bushy *Erica* species, which species drop an abundant litter of detritus, thus masking the true nature of the surface.

The impact of climate on the vegetative cover is illustrated overleaf and in the page following thereafter.

This photograph, taken at S 24.52.39’4” and E 30.53.15’4” at an elevation of 1650 m, facing towards the escarpment, amply illustrates the diversity and density of the woody vegetative cover. Although the author hereof is not well versed in montane vegetation, the predominant shrubs appeared to be *Erica caffrorum* (Mountain Tree Heath).

This cover will need to be removed immediately prior to the commencement of construction, leaving the mosses and grasses that constitute the non woody surface cover exposed to the elements.

This latter stratum, plus the humic soils that are covering the surface rocks and that are intruding down between the surface rocks, will need to be moved from the target site as soon as possible.

The rocks in the foreground and top right of the photograph below were not visible until surface moss had been brushed off.

The rocks in the top left corner are still covered by mosses and other scrub vegetation

Attempts to find pockets of deeper soil were frustrated by the auger jamming in the gap between the rocks at depths of less than 150 mm. The leading edge of the auger is 25 mm wide.

It would appear that the most effective means of clearing the site will be through brush cutting and then removing the humic component manually, using hard brooms and rubber rakes.

3.5 Livestock

Due to the densely compacted *Erica* (fynbos) type vegetation, no domestic livestock is grazed at the target site. One incidence of fresh antelope droppings was noted.

4. INFRASTRUCTURE, ACCESS AND SERVICES

Access from the adjacent R 534 to the existing trading and parking site is excellent. Existing infrastructure in the form of kiosks, parking bays, ablution facilities and footpaths is in a well maintained good condition. There is no reason why the existing quality of the infrastructure cannot be maintained.

The current parking bay alongside the R 534 could be substantially enlarged.

5. IMPACT ASSESSMENT AND MITIGATION MEASURES

5.1 Impact assessment: Site Considerations

Due to the level or gently sloping nature of the target site storm water erosion is not anticipated to be an issue. It will be dissipated in the same manner as at the present site.

The target site consists of a level and solid stratum of impervious quartzite covered by thickly populated scrub. Once this protective scrub is removed, and the unprotected surface thus exposed, the dust will fly, not only annoying visitors but also contaminating high value, labour intensive and time extensive artifacts.

The most effective strategy for dust management is to keep the target site damp until the threat has been removed.

Present storm water erosion would appear to already be well under control, even if rainfall sometimes totals over 2 000 mm per annum.

Due to the overall flatness of the adjoining areas of the Great Escarpment the concept of trapping storm water in dams does not appear to be an option.

5.2 Impact Assessment: Offsite considerations

Storm water runoff from the hill north of the target site can be disposed of in the same manner as storm water running off the hillside onto the present hardened trading and parking site.

6. CONCLUSIONS AND RECOMMENDATIONS

Based on the desk top study, followed by a thorough site verification process, there is no reason to suggest that either soil or wind erosion present either a medium term or long term management challenge.

There are neither medium term nor long term erosion or related considerations that could have a negative impact on the proposed development.

It is recommended that the following steps be taken in order to minimize the short term impact of dust erosion

1. Start the site clearing exercise immediately after good rain.
2. Store the cut brush offsite until dry enough to give away or burn.
3. Store the humic 'topsoil' in mesh bags or stockpile under a fine mesh net until it can be re-used for landscaping. Sealed bags will lead to the development of unwanted fungi.
4. The aloes can be pulled out or cut off with as much root as possible. They can be stored in the open for up to six months and then replanted for landscaping purposes. New roots will emerge within a few days of replanting.
5. Employ sufficient labour to clear the site in 5 working days. Those clearing detritus can work a few meters behind the brush cutters.

The conclusion arrived at by this study is that the proposed target site has been well chosen.

7. USEFUL REFERENCES

Soil Classification: A Taxonomic System For South Africa : McVicar et al, ISCW (Blue Book)

Identification and Management of the Soils of the South African Sugar Industry ;
SA Sugar Research Institute.(Sugar Book)

The Vegetation of South Africa, Lesotho and Swaziland : Mucina and Rutherford : Sanbi

Agricultural Geo-Referenced Information System : Agis.agric.za. ISCW/DAFF

Veld Types of South Africa ;Acocks ; Botanic Research Institute

Quality Maintenance Begins at the Design Table ; Awie Marais ; Netafim Irrigation International.

Soil Fertility and Fertilizers ; Havlin et al; Prentice Hall

Soil Science and Management : Plaster : Delmar

Geological Journeys ; Norman and Whitfield; Struik

The Story of Earth and Life : McCarthy and Rubidge ; Struik

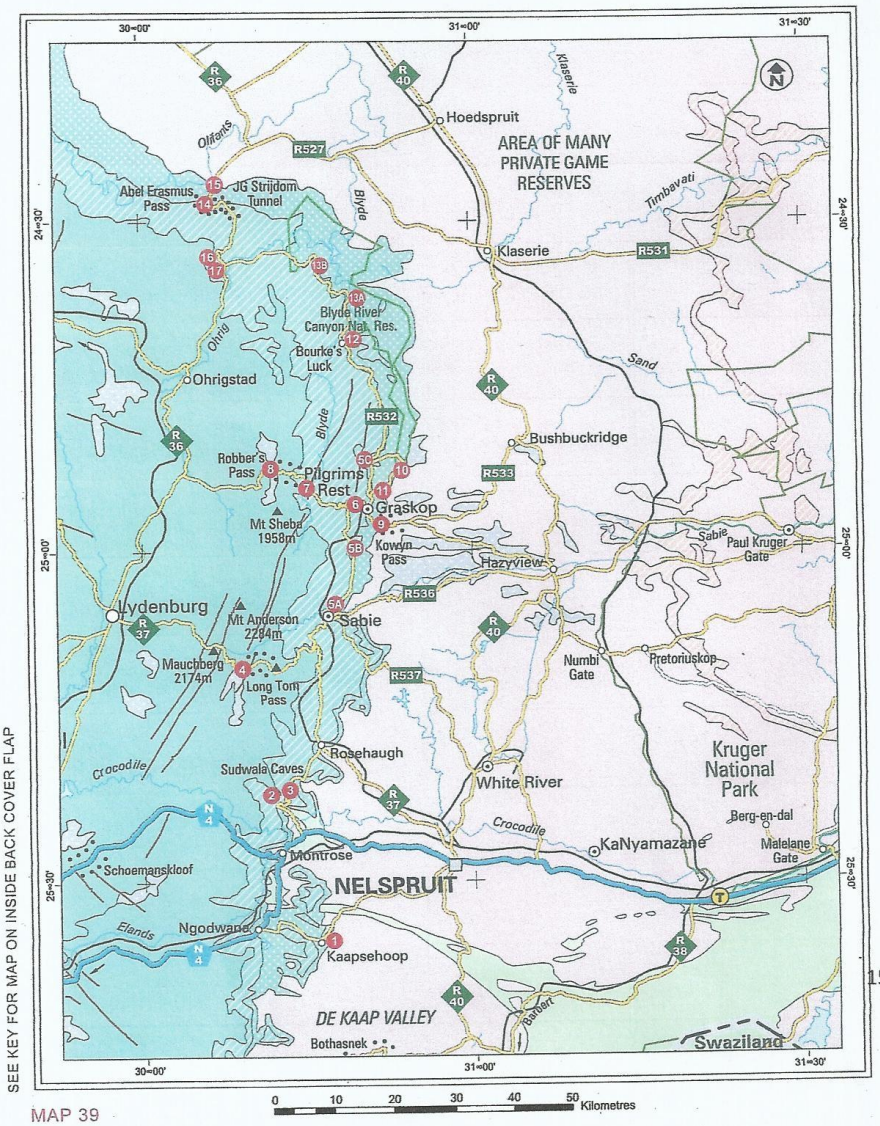
8. APPENDICES

8.1 The Great Escarpment : Soil Parent Materials

A knowledge and understanding of the Soil Parent Materials (underlying rock)in a given target area is a useful tool in determining what physical soil conditions in the area are likely to be.

God's Window is at locality (9)

Geology of the route



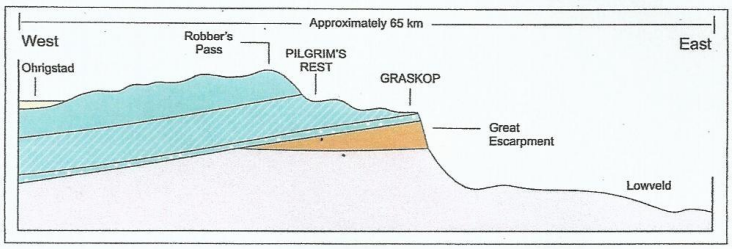
SEE KEY FOR MAP ON INSIDE BACK COVER FLAP

MAP 39

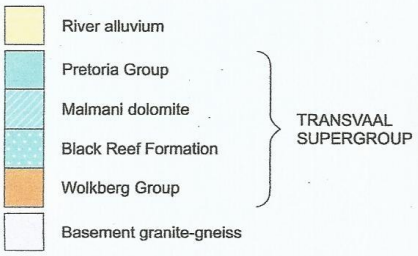
15

FIGURE 21

EAST-WEST GEOLOGICAL CROSS-SECTION
OF THE GREAT ESCARPMENT THROUGH PILGRIM'S REST



This region of panoramic scenery owes its existence to a fortuitous combination of geology and climate. At the escarpment edge hard, resistant and almost flat-lying quartzites of the Transvaal sequence overlie more easily weathered Archaean Basement granites and gneisses of the Lowveld. Millions of years of rain from moisture-laden air coming off the Indian Ocean have rapidly eroded the Basement rocks, leaving a spectacular retreating scarp. West of Pilgrim's Rest, gently west-dipping resistant quartzite beds of the Pretoria Group have acted in a similar manner, forming the elevated terrain.



From God's Window looking south along the edge of the Great Escarpment, the flat-lying quartzite formation is part of the Wolkberg Group.

8.2 Definition and Determination of Land Capability Classes (LCCs)

The table below defines the qualities of each of the eight nationally recognised Land Capability Classes. The flowsheets overleaf describe the methodology used to arrive at each of the Capability Classes.

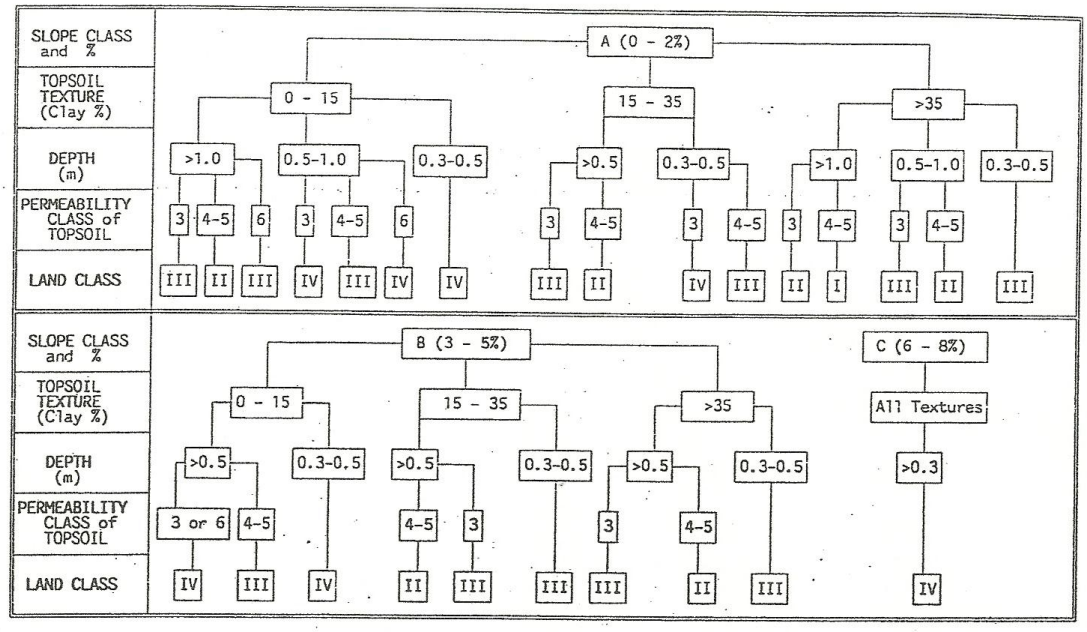
The values attached to each determinant of an LCC also provide useful management guides. e.g. Texture, rooting depth, permeability etc.

Class	Concepts
I	Land in Class I has few limitations that restrict its use; it may be used safely and profitably for cultivated crops; the soils are nearly level and deep; they hold water well and are generally well drained; they are easily worked, and are either fairly well supplied with plant nutrients or are highly responsive to inputs of fertilizer; when used for crops, the soils need ordinary management practices to maintain productivity; the climate is favourable for growing many of the common field crops.
II	Land in Class II has some limitations that reduce the choice of plants or require moderate conservation practices; it may be used for cultivated crops, but with less latitude in the choice of crops or management practices than Class I; the limitations are few and the practices are easy to apply.
III	Land in Class III has severe limitations that reduce the choice of plants or require special conservation practices, or both; it may be used for cultivated crops, but has more restrictions than Class II; when used for cultivated crops, the conservation practices are usually more difficult to apply and to maintain; the number of practical alternatives for average farmers is less than that for soils in Class II.
IV	Land in Class IV has very severe limitations that restrict the choice of plants, require very careful management, or both; it may be used for cultivated crops, but more careful management is required than for Class III and conservation practices are more difficult to apply and maintain; restrictions to land use are greater than those in Class III and the choice of plants is more limited.
V	Land in Class V has little or no erosion hazard but has other limitations which are impractical to remove that limit its use largely to pasture, range, woodland or wildlife food and cover. These limitations restrict the kind of plants that can be grown and prevent normal tillage of cultivated crops; it is nearly level; some occurrences are wet or frequently flooded; others are stony, have climatic limitations, or have some combination of these limitations.
VI	Land in Class VI has severe limitations that make it generally unsuited to cultivation and limit its use largely to pasture and range, woodland or wildlife food and cover; continuing limitations that cannot be corrected include steep slope, severe erosion hazard, effects of past erosion, stoniness, shallow rooting zone, excessive wetness or flooding, low water-holding capacity; salinity or sodicity and severe climate.
VII	Land in Class VII has very severe limitations that make it unsuited to cultivation and that restrict its use largely to grazing, woodland or wildlife; restrictions are more severe than those for Class VI because of one or more continuing limitations that cannot be corrected, such as very steep slopes, erosion, shallow soil, stones, wet soil, salts or sodicity and unfavourable climate.
VIII	Land in Class VIII has limitations that preclude its use for commercial plant production and restrict its use to recreation, wildlife, water supply or aesthetic purposes; limitations that cannot be corrected may result from the effects of one or more of erosion or erosion hazard, severe climate, wet soil, stones, low water-holding capacity, salinity or sodicity.

CAPABILITY CLASS DETERMINATION GUIDELINE for BRGs:

Dry Zululand Thornveld (20), Valley Bushveld (21), Lowveld (22), Sandy Bushveld (23) (Average annual rainfall 587-830 mm)

Use the following flow chart to determine the land capability classes for land to be cropped in the above Bioresource Groups.



PERMEABILITY CLASS DESCRIPTION*			
Class	Rate (seconds)	Description	Texture
7	<1	Extremely rapid	Gravel and Coarse Sand. 0 to 10 % clay.
6	1-3	Rapid	5% to 10% clay.
5	4-8	Good	> 10% clay.
4	9-20	Slightly restricted	
3	21-40	Restricted	Strong structure, grey colours, mottles. > 35% clay.
2	41-60	Severely restricted	Strong structure, weathered rock. > 35% clay.
1	>60	Impermeable	Rock and very strong structure. > 35% clay.

* If roots can penetrate the subsoil, test permeability of upper subsoil.
If roots cannot penetrate the subsoil, test the permeability of the mid-topsoil.
Dark structured clay topsoil (vertic & melanic) with a Class 2 permeability should be assessed in the chart as if it has a Class 3 permeability. If permeability is Class 7, downgrade to Land Class IV.

Now refer to the opposite page to make adjustments for wetness, rockiness, crusting or permeability.

USE THE FOLLOWING LAND CHARACTERISTICS TO MODIFY THE LAND CLASS OBTAINED OPPOSITE, IF NECESSARY: The land capability class determined using the "flow chart" cannot be upgraded through consideration of wetness, rockiness, surface crusting or permeability classes given below, but it may be downgraded as indicated.

WETNESS		
Class	Definition	Land Class
W0	Well drained - no grey colour with mottling within 1.5 m of the surface. Grey colour without mottling is acceptable.	No change
W1	There is no evidence of wetness within the top 0.5 m. Occasionally wet - grey colours and mottling begin between 0.5 m and 1.5 m from the surface.	Downgrade Class I to Class II, otherwise no change
W2	Temporarily wet during the wet season. No mottling in the top 0.2 m but grey colours and mottling occur between 0.2 m and 0.5 m from the surface. Included are: soils with G horizons (highly gleyed and often clayey) at depths deeper than 0.5 m; soils with an E horizon overlying a B horizon with a strong structure; soils with an E horizon over G horizons where the depth to the G horizon is more than 0.5 m.	Downgrade to Class IV
W3	Periodically wet. Mottling occurs in the top 0.2 m, and includes soils with a heavily gleyed or G horizon at a depth of less than 0.5 m. Found in bottomlands.	Downgrade to Class Va
W4	Semi-permanently / permanently wet at or above soil surface throughout the wet season. Usually an organic topsoil or an undrained vlei. Found in bottomlands.	Downgrade to Class Vb

PERMEABILITY	
Permeability Class	Adjustment to be made
1 - 2	If in sub-soil, rooting is likely to be limited: Use the permeability of the topsoil in the flow chart. If this is the permeability of the topsoil, then the topsoil is probably a dark structured clay, in which case a permeability Class 3 can be used in the flow chart.
3 - 5	Classify as indicated in the flow chart.
6	Topsoil should have < 15% clay - use the flow chart.
7	Downgrade Land Classes I to III to Land Class IV.

ROCKINESS		
Class	Definition	Land Class
R0	No rockiness	No change
R1	2 - 10% rockiness	Downgrade Classes I to II, otherwise no change
R2	10 - 20% rockiness	Downgrade Classes I to II, otherwise no change
R3	20 - 30% rockiness	Downgrade to Class IV
R4	> 30% rockiness	Downgrade Classes I, II, III & IV to Class VI

SOIL SURFACE CRUSTING		
Class	Definition	Land Class
t0	No surface crusting when dry	No change
t1	Slight surface crusting when dry	Downgrade Class I to Class II, otherwise no change
t2	Unfavourable surface crusting when dry	Downgrade Classes I & II to Class III, otherwise no change

NB **Any land not meeting the minimum requirements shown is considered non-arable (Class V, VI, VII or VIII).**
Non-arable land in BRGs 2, 4, 6, 9, 12, 14, 15, 16, 17, 18 & 19 includes:

* all land with W3, W4 or R4,
* all land with slope exceeding 20%,
* land with slope 13-20%, if clay < 15% or depth < 0.4m,
* land with slope 8-12% and clay > 15%, if depth < 0.25m,
* land with slope 8-12% and clay < 15%, if depth < 0.5m, and
* land with slope 0-7%, if depth < 0.25m.

8.3 SKYWALK - GOD'S WINDOW, LCC
Land Capability Class Determination

Ref	Co – ordinates	Soil Form	Slope %	Texture %	depth (mm)	permea-bility	Wetness	LCC
A	South : 24.52.38'9" East : 30.53.14'9"	Mispah	<3	<6	<150	1	W0	**VIII**
B	South : 24.52.39'4" East : 30.53.15'4"	Mispah	<3	<6	<150	1	W0	**VIII**
C	South : 24.52.38'8" East : 30.53.16'4"	Mispah	<3	<6	<150	1	W0	**VIII**
D	South : 24.52.38'5" East : 30.53.16'3"	Mispah	<3	<6	<150	1	W0	**VIII**
E	South : 24.52.37'4" East : 30.53.17'2"	Mispah	<3	<6	<150	1	W0	**VIII**
F	South : 24.52.37'0" East : 30.53.16'6"	Mispah	<3	<6	<150	1	W0	**VIII**
G	South : 24.52.37'3" East : 30.53.16'3"	Mispah	<3	<6	<150	1	W0	**VIII**
H	South : 24.52.36'0" East : 30.53.18'2"	Mispah	<3	<6	<150	1	W0	**VIII**
I	South : 24.52.35'5" East : 30.53.19'3"	Mispah	<3	<6	<150	1	W0	**VIII**

Notes

1. Texture (Clay Content) is too low for the topsoil to have any moisture retention or soil binding properties

2. Effective rooting depth was in all instances less than 150 mm, in most instances less than 50 mm.

3. The immediate substrate is totally impermeable solid rock.

4. Neither the topsoil nor the substrate can hold moisture, so soil wetness is nil.

5. Land Capability Class (LCC) will support wild game only.