

SOIL AND TERRAIN DATABASE OF MOZAMBIQUE

Scale 1:1,000,000

Consultant Report

by

Abdelghani Souirji
Land Resources Consultant

February 1997

ACKNOWLEDGEMENT

The author wishes to thank Mr. Zandamela, Director of the National Institute of Agronomic Research (INIA) of Mozambique, and the following staff of the Land and Water Department (DTA) of INIA.

- Mr. Feliciano Mazuze, Chief of DTA,
- Mr. Mosés Vilanculos, soil scientist,
- Mr. Mario Ruy Marques, soil scientist,
- Mr. Jacinto Mafalacusser, soil scientist,
- Mr. Lázaro Amós, soil scientist,
- Mr. Marten Westerinck, soil scientist,
- Mr. Vincent Lefebvre, soil scientist

They all facilitated the author's mission in Maputo in February 1997, and have provided him with data and verbal information. This work would have been impossible without their assistance and active participation.

The author wishes also to thank Dr. Freddy Nachtergaele, of FAO and Professor Jan Feyen, of the Catholic University of Leuven, for their guidance and support.

TABLE OF CONTENTS

1. INTRODUCTION	1
2. MATERIALS AND METHODS	1
2.1 Materials	1
2.1.1 The 1 :1,000,000 scale soil map	1
2.1.2 The Mozambican soil database	4
2.1.3 The soil survey report of the provinces of Maputo and Gaza	4
2.1.4 The land resources appraisal report of the district of Xai-Xai	4
2.2 Methods	4
3. RESULTS	6
4. CONCLUSIONS	7
BIBLIOGRAPHY	8
APPENDICES	9

LIST OF TABLES

Table 1. Soil classification key		2
Table 2. Map legend (part 1-6)	11-16	
Table 3. Map units composition (part 1-10)		19-28
Table 4 List of map unit components and their typifying pedons (part 1-3)		30-32

1. INTRODUCTION

The Food and Agriculture Organization of the United Nations (FAO) has published in 1996 a computer database for the Soils of East Africa (**SEA**). The following countries were covered : Burundi, Djibouti, Egypt, Eritrea, Ethiopia, Kenya, Rwanda, Somalia, Sudan and Uganda.

FAO has recently contracted the Institute for Land and Water Management of the Catholic University of Leuven (KUL) to expand the SEA database to include Angola and Mozambique. In this context, the author was contracted by the KUL to construct the Mozambique database.

The author travelled to Maputo, Mozambique, in February 1997 and collected all available documents and held discussions on related issues with the management and the staff of the Mozambique Land and Water Department. The author's task was greatly facilitated by the fact that there was already an available recently completed 1 : 1, 000, 000 scale soil map of the country.

2. MATERIALS AND METHODS

2.1 Materials

The 1 :1,000,000 scale soil map of Mozambique (in PC Arc/Info GIS format) and its legend (DTA, 1995a) and an internal document of DTA's GIS section (Frenckel, 1992) have been the main sources of information for map unit description.

The national soil database of Mozambique, the soil survey report of the provinces of Maputo and Gaza (DTA, 1993) and the land resources appraisal report of the district of Xai-Xai (DTA, 1995b) were used to identify and describe representative profiles.

2.1.1 The 1 :1,000,000 scale soil map

This map was compiled by DTA from existing soil maps at various scales, from a database of 800 soil profiles and from complementary interpretation of satellite imagery and of the 1 :1,000,000 scale geological and geomorphological maps of Mozambique (DTA, 1995a, Marques, 1995a, 1995b). The civil war situation which prevailed during much of the 1980s and the early 1990s made large areas inaccessible for field checking of the map.

DTA soil scientists built the map legend according to the national soil classification key shown in table I. It appears from this table that geology, parent material, soil texture, soil colour, soil depth, base saturation (dystric units), clay cation exchange capacity (oxic units), drainage and topography are the factors that are taken into account in defining soil units.

The booklet that accompanies the map provides definitions of lower categories named phases. The following soil phases are recognised :

- d** dune topography
- z** saline (FAO) : $E_{Co} > 15$ dS/m within upper 1 m
- s** sodic (FAO) : $ESP > 6\%$ within upper 1 m
- g** mottled
- l** lithic : depth < 50 cm
- m** moderately deep (50-100 cm)
- h** hydromorphic (watertable within 50 cm)

Table 1 : Soil classification key

GEOLOGY	PARENT MATERIAL	SOIL DIFFERENTIATING CRITERIA	SOIL PHASE	SYMBOL	
Alluvial and fluvio-marine areas	alluvial sediments	- clayey soils - sandy soils - soils with peaty layer	- - -	- FG - FS - FT	
	estuarine marine sediments	clayey soils	-	FE	
Sedimentary basin	coastal dunes	sandy soils	-	DC	
	cover sands and interior dunes	- yellow sandy soils	- - dune topography	- AA - dAA	
		- orange sandy soils	- - dune topography	- AJ - dAJ	
		- white sandy soils	-	- AB	
		- unspecified sandy soils	- - dune topography * - hydromorphic	- A - dA * - Ah	
	red sandstone	sandy soils	-	G	
	Mananga sediments	- soils with sand cover < 50 cm - soils with sand cover 50-100 cm - unspecified soils	- - -	- MM - MA - M	
		clayey colluvial soils	-	MC	
	Post-Mananga deposits	- coarse-textured soils - fine- and medium-textured soils	- -	- PA - PM	
pebbles deposits	- moderately deep soils - shallow soils < 30 cm	- - lithic	- SC - SI		
calcareous sedimentary rocks	- red soils - brown soils	- -	- WV - WK		
	Other sedimentary rocks	- deep soils - moderately deep soils	- -	- WM - WP	
Igneous rocks areas	Rhyolites	- depth < 30 cm - depth > 30 cm	- lithic -	- RI - RV	
	basalts	depth < 30 cm	lithic	- BI	
		depth > 30 cm	- black soils - red soils - colluvial soils	- - -	- BP - BV - BC
Precambrian shield	Acid rocks	shallow soils	-	I	
		red soils	coarse texture	- - dystric	- VA - VAp
			medium texture	- - oxic - dystric	- VM - VMo - VMp
			fine texture	- - oxic - dystric	- VG - VGo - VGp
		brown soils	coarse texture	- - mottled - dystric	- KA - KAg - KAp
			medium texture	- - oxic	- KM - KMo
			fine texture	- - oxic	- KG - KGo
		colluvial soils	- coarse texture - medium texture - fine texture - unspecified texture	- - - -	- CA - CM - CG - C
		Basic rocks	red soils	basic parent rock	VGb
			brown soils	basic parent rock **	KGb **

* Forgotten in the original table but included in the published map legend (see table 2, appendix 1)

** Not included by DTA in the published map legend (see table 2, appendix 1)

- o** oxic : CEC < 16 meq./100 g of clay
- p** dystric : base saturation < 50% in B horizon
- b** formed on basic igneous rock
- x** stoniness > 25%
- v** vertic

The vertic phase was forgotten in the printed legend of the 1 :1,000,000 though it was used in the soil map.

This soil classification key does not take into account genetic horizons in the definition of soil units. These may therefore be quite heterogeneous in terms of soil types as defined by the FAO legend or the US Soil Taxonomy. For example a red clayey soil will be classified the same way whether it has a Cambic or a Argillic horizon.

The printed map legend provides information on **53** units (soil groupings). This number includes all the 'primary soil units' and some of their phases e.g. dAA, VAp, VGo etc. However when the author extracted the full list of map units from the GIS soil polygons attribute files (of the soil map) they numbered **404** (see table 3, appendix 2) and the actual number of different map units components was found to be **117** (see table 4, appendix 3) instead of the **53** that are described in the map legend.

Map units may have up to 4 soil components, e.g. **VM + KM+KA +CG** (see table 3, appendix 2). The respective percentage of each component is neither indicated in the map legend nor in the GIS files.

The printed map legend provides 19 different types of information for 53 map units :

- the symbol of the unit
- the full name of the unit
- the dominant soil characteristics
- geomorphology and geology
- landform
- topography and slope gradient (%)
- texture of topsoil/subsoil
- soil depth (cm)
- drainage
- acidity and alkalinity (soil pH) of topsoil/subsoil
- organic matter % of topsoil
- salinity of topsoil/subsoil (EC of saturated paste extract)
- Sodicity of topsoil/subsoil (%)
- dominant soil classification according to FAO (1988), major soil groups and soil units level
- dominant soil classification according to US Soil Taxonomy (1992), subgroup level
- (natural) vegetation types
- main limitations for agriculture
- land capability (SCS)
- land suitability for irrigation (modified USBR)

It must be noted that both the printed and GIS versions of the 1/1,000,000 soil map exist only in 10 separate map sheets, each corresponding to one of the ten provinces forming Mozambique.

2.1.2 The Mozambican soil database

The personnel and management of DTA consider as a high priority the construction and maintenance of a computer soil database, using FAO's SDB software, to collate and make available to users the considerable amount of georeferenced soil information produced in the country. To this effect, a new soil description manual, inspired by FAO's (1990) guidelines, was elaborated and published (1995c) by DTA and the Agronomy and Forestry department of the Eduardo Mondlane University.

As it was supplied by DTA to the author in February 1997, the English version of the Mozambican SDB contained about 4,300 soil observations, out of which about one quarter have analytical data. The following general remarks can be made about this soil database :

- a majority of the soil descriptions are incomplete
- there are many data entry errors
- most base saturation ratios in the analytical data are wrong
- the clay cation exchange (CEC) was calculated from the CEC of the whole soil with a formula which includes a correction for the CEC of organic matter. This formula is doubtful since it often gives negative figures for clay CEC
- the printouts of the soil description come in a mixture of English and Portuguese terms.

Though good progress has been achieved by DTA in cleaning the database, further efforts are required. However, in spite of the above mentioned limitations, there is such a large quantity of useful data in this database that it could be used by the author as the main source for representative profiles for this work.

2.1.3 The soil survey report of the provinces of Maputo and Gaza

The soil survey of the southern provinces of Maputo and Gaza was published by DTA in 1993. The legend of the soil maps of this soil survey, which were published, with the same legend, at scales 1 : 50,000 and 1 : 250,000, was used by DTA as a model for the construction of the legend of the national soil map at scale 1 : 1, 000, 000. Moreover, this soil survey report is the main source of information for soil units that are present in the south of the country.

The author used this report as a source for some of the representative profiles. Some of them have no analytical data and/or no geographic co-ordinates for location.

2.1.4 The land resources appraisal report of the district of Xai-Xai

This recent report (DTA, 1995) presents the results of the soil survey of the district of Xai-Xai, in the Province of Gaza. It's volume II includes 47 detailed profiles description and analytical data. Furthermore, the profiles are classified according to the FAO legend at the subunit level.

The author used this report as a source for some of the representative profiles. Unfortunately, the soil's electrical conductivity is only given for the 1 :2.5 extract. The author had therefore to use this data to estimate the EC of the paste extract.

2.2 Methods

Dr. Freddy Nachtergaele, Technical Officer at FAO's AGLS service, provided the author with a copy of FAO's SEA database software in which the 1 :1,000,000 scale soil map of Mozambique is to be incorporated. The author prepared the Mozambique material according to the instructions of the User's Guide manual included in the SEA software.

The author exported the data records of Uganda from the SEA database to a spreadsheet (Lotus 123W) to provide the database structure. Thereafter the Ugandan data was deleted and that of Mozambique was codified, according to SEA guidelines, and entered in the same database structure.

A major difficulty has been that the concepts of **mapunit** and **map unit component** in the Mozambique soil map differ dramatically from international practice. If we see for example the map unit (soil grouping as it is named in the map legend) **BV** :

- according to DTA (1993, p 151-152) it may include (no percentages are given):
 - Calcic Vertisols (dominant)
 - Vertic Cambisols
 - Calcic Phaeozems
 - Haplic Phaeozems
 - Luvisc Chernozems (Saline-sodic phase)
 - Calcic Chernozems (Saline-sodic phase)
 - Haplic Chernozems (Saline-sodic phase)
- this soil unit exist on its own as a map unit, but also as a mapunit component in 7 other mapunits:
 - BP+BI
 - BP+BPm
 - BP+Bv
 - BP+Bv+BI
 - BI+BP
 - Bv+BP
 - Bv+BP+BI

Therefore the components of map units are themselves map units ! On the other hand, a list of soil taxa present in map units is only available for a small minority of map units that are described in the soil survey report of the provinces of Maputo and Gaza (DTA, 1993). Therefore the author had to consider that all map units having only one component (e.g. FT, KA, I etc.) are assimilated to their main soil component.

The respective percentage of each component of compound map units was estimated according to an internal DTA document (Frenkel, 1992) which says that « it is assumed that, in case a compound unit has two constituents, the percentages are 60/40, and in the case of three constituents 50/40/10 ». Since there are three map units with four constituents, and no composition is defined by DTA for them, the author used the composition 40/30/20/10.

The characteristics of compound map units were considered to be the same as those of their dominant component.

Representative profiles were selected from over 4300 profiles in the soil database and the two above mentioned soil survey reports. Each profile was screened and checked for completeness, correctness and correspondence with the original definition of each soil unit. Soil classification according to the FAO legend had often to be done or corrected at the unit level and always to be completed to the subunit level. Table 4, in appendix 3, gives the list of map units components (117) and the number, FAO classification, co-ordinates, altitude and year of survey of their representative profile. No adequate typical profiles were found for about 35 mapunit components (out of 117).

The FAO classification at the subunit level was made according to Nachtergaele et al. (1994). The following abbreviations were used :

- | | |
|----------|---------------|
| ■ alb | albi- |
| ■ acr | acri- |
| ■ are | areni- |
| ■ calc | calci- |
| ■ chr | chromi- |
| ■ dys | dystri- |
| ■ eca | endocalcari- |
| ■ epigle | epigleyi- |
| ■ eut | eutri- |
| ■ fer | ferri- |
| ■ gle | gleyi- |
| ■ hyp | hyperferrali- |
| ■ lix | lix- |

■ lit	lithi-
■ mol	molli-
■ ort	orthi-
■ pel	PELLI-
■ rho	rhodi-
■ sal	sali-
■ salsod	sali- & sodi-
■ sod	sodi-
■ ver	verti-

Soil classification according to the US Soil Taxonomy was not included as reliable data on moisture and temperature regimes and soil mineralogy is not available.

The manual Users' Guide of SEA does not indicate a 'control section' for soil texture. This could mean that it is the upper 30 cm, as in the FAO soil map of the world. However, at scale 1 :1,000,000 and at the subunit level, the author believes that subsoil texture should also be indicated. Since this information is available in the Mozambican map legend, the author used the following procedure to indicate texture :

- for homogeneous soils one Arabic figure indicates the texture e.g. 1,
- for heterogeneous soils, topsoil texture, or range of textures, is indicated first between brackets followed by a slash, then by subsoil texture or range of textures, between brackets e.g. (3,4,5)/(2,3).

It was also needed to add some classes to SEA data classes :

- in geology subclasses, the symbol **Mn** was added for the well-known Mananga deposits which consist of a layer of < 20 m thick of hard sodic Pleistocene sediments. The symbol **AMn** was used to designate colluvium derived from Mananga sediments,
- in vegetation units, the symbols **R** and **V** were added to respectively represent shrubland and savannah.

3. RESULTS

The results are provided as 5 computer files enclosed in diskette n°1:

- **origincode.wk4** : this file gives the correspondence between the original map units symbols and their new numerical symbol. All the map units were given a number from 1 to 404 and this number is indicated in all files as the **Muidsheets** number.
- **muid.wk4** : this file includes a table which presents all the general information concerning map units. It corresponds to the table called **General Info** in SEA.
- **soil1.wk4** : this file includes a table which provides all the information concerning the dominant soil in each map unit. It corresponds to the table called **Soil 1** in SEA.
- **soil2.wk4** : this file includes a table which provides all the information concerning the second dominant soil in each map unit. It corresponds to the table called **Soil 2** in SEA.
- **soil3.wk4** : this file includes a table which provides all the information concerning the third dominant soil in each map unit. It corresponds to the table called **Soil 3** in SEA.
- **report.doc** : this file includes the present report.

There are 4 more diskettes :

- Diskettes n° 2, 3, 4 : contain all the original zipped GIS files of the 1 :1,000,000 scale soil map of Mozambique (as 10 separate provincial maps) in PC Arc/Info format.
- Diskette n° 5 : contains the zipped files of the original soil database of Mozambique (to start up the programme, once it is unzipped, type **sdb2enin** and press enter).

4. CONCLUSIONS

The 1 :1,000,000 scale soil map and the associated database, though perfectible, give a good idea of the nature of Mozambican soils and of their distribution.

The staff of the Land and Water Department are strongly encouraged to pursue their efforts in cleaning, maintaining and expanding the soil database.

BIBLIOGRAPHY

DTA (1993). Os solos das províncias de Maputo e Gaza. Nota explicativa dos mapas de solos. Escalas 1 :50,000 e 1 :250,000. INIA. Maputo, Mozambique.

DTA (1995a). Legenda da carta nacional de solos (escala 1 :1,000,000). Serie Terra E Água, Comunicação No. 73. INIA. Maputo, Mozambique.

DTA (1995b). Land Resources Appraisal Report. District of Xai-Xai. Vol. II. INIA. Maputo, Mozambique.

DTA (1995c). Manual para a descrição do solo e codificação para o banco de dados (SDB). Serie Terra E Água, Comunicação No. 74. DTA e Faculdade de Agronomia e Engenharia Florestal da Universidade Eduardo Mondlane INIA. Maputo, Mozambique.

FAO (1990a). Soil map of the world, revised legend. World Soil Report 60. FAO, Rome.

FAO (1990b). Guidelines for soil profile description. FAO. Rome.

FAO (1996) Soils of East Africa ; User's Guide. FAO, Rome.

Frenkel J. (1992). Note on the evaluation of compound mapping units. FAO/MOZ/86/010. DTA. INIA. Maputo, Mozambique.

Marques, M. R. (1995a). Carta dos solos de Mozambique (ESC. 1 :1000 000). Nota interna, DTA. INIA. Maputo, Mozambique.

Marques, M. R. (1995b). Soil Science Activities In Mozambique, A Progress Report. Paper presented at the 21th meeting of the SARCCUS Standing Committee for Soil Science. Inhaca Island, Mozambique. DTA. INIA. Maputo, Mozambique.

Nachtergaele, F., A. Remmelzwaal, J. Hof, J. van Wambeke, A. Souirji and R. Brinkman (1994). Guidelines for distinguishing soil subunits. Proceedings of the 15th congress of the International Soil Science Society in Mexico.

APPENDICES

APPENDIX 1.

Table 2 : Map legend (part 1)

SYMBOL	SOIL GROUPING	DOMINANT SOIL CHARACTERISTICS	GEOMORPHOLOGY & GEOLOGY	LANDFORM	TOPOGRAPHY Slope (%)	TEXTURE Topsoil / Subsoil	DEPTH (cm)	DRAINAGE	ACIDITY & ALKALINITY Topsoil / Subsoil (pH-H2o)
ALLUVIAL AND FLUVIO-MARINE AREAS (Units F)									
FT	Soils of peaty alluvium	Peaty layer over dark grey soils, deep	Holocene alluvium	Valleys and plains	level 0-1	peat layer SL	> 100	poor-very poor	strong.-mod. acid (4-5.5) mod. acid (5-6)
FG	Soils of clayey alluvium	Clayey, dark greyish brown, deep	Holocene estuarine marine sediments		level 0-1	SCL-C siC-C	> 100	moderate-poor	sl. acid-sl. alkaline (6-8) sl. acid-sl. alkaline (6-8.5)
FS	Soils of coarse or medium-textured stratified alluvium	Sandy loam, greyish brown, deep			nearly level 0-2	S-siCL S-SCL	> 100	imperfect-poor	sl. acid-sl. alkaline (6-7.5) mod. acid-sl. alkaline (6.5-7.5)
FE	Soils of estuarine marine sediments	Clayey, grey, deep and frequently saturated	Holocene estuarine marine sediments	Estuarine plains	level 0-1	siCL-C siC-C	> 100	poor-very poor	sl. alkaline (7.5-8) sl.-mod. alkaline (7.5-9)
SEDIMENTARY BASIN (Units D, A, G, M, P, S, W)									
DC	Soils of coastal dunes	Sand, greyish brown, deep	Coastal dunes, Holocene sands	Coastal dunes	hilly (0-35)	S S	generally > 180	excessive	mod. acid (5-6) mod. acid - strong. alkaline (5-9.5)
AA	Yellow sandy soils	Sand, yellowish brown, very deep	Pleistocene cover sands and aeolian sands	Sand plains	nearly level (0-2)	S-LS S-LS	> 180	good-excessive	strong.-mod. acid (4-6) strong.-sl. acid (4-6.5)
dAA	Yellow sandy soils, dune phase			Interior dunes	undulated (> 2)				
AJ	Orange sandy soils	Sand, orange, very deep		Sand plains	nearly level (0-2)	S-LS S-LS	> 180	good-excessive	mod.-sl. acid (5-6.5) mod.-sl. acid (5-6.5)
dAJ	Orange sandy soils, dune phase			Interior dunes	undulated (> 2)				
AB	White sandy soils	Sand, white, very deep		Sand plains	nearly level (0-2)	S-LS S	> 180	Imperfect - moderate	mod.-sl. acid (5-7) mod. acid-mod. alkaline (5.5-8.5)
Ah	Hydromorphic sandy soils			Hydromorphic sandy depressions	level (0-1)	S-LS S	> 180	poor-very poor	mod.-sl. acid (5-7) mod.-sl. acid (5.5-7)
A	Unspecified sandy soils	Sand, very deep		Sand plains	nearly level (0-2)	S-LS S	> 180	good-excessive	strong.-sl. acid (4-7) strong. acid -mod. alkaline (4-8.5)
dA	Unspecified sandy soils, dune phase			Interior dunes	undulated (> 2)				
G	Soils derived from red sandstone	Coarse sand, dark reddish brown, deep	Tertiary sandstone hills and red sands	Low hills	undulated (0-8)	S-SL S-LS (60-90% coS)	> 100	excessive	mod. acid (5-6) mod.-sl. acid (5.5-7)
MA	Soils of Mananga with sand cover of varying thickness	Sandy clay loam, yellowish brown, moderately thick surface sand layer	Mananga sediments : layer of < 20 m of hard sodic Pleistocene deposits	Plains, valley bottoms in cover sands area	nearly level (0-2)	S-SL (50-100 cm) SL-SC	> 100	moderate	mod. acid-sl. alkaline (5-7.5) mod. acid-sl. alkaline (5-8)
MM					nearly level (0-2)	S-SL (0-50 cm) SL-SC	> 100	imperfect	mod. acid-sl. alkaline (5-8) mod. acid-mod. alkaline (5.5-8.5)
M		Unspecified Mananga soils (MM or MA)			nearly level (0-2)	see MM/MA	> 100	imperfect - moderate	see MM/MA
MC	Soils of clayey Mananga colluvium	Clayey, dark greyish brown, deep	Colluvium derived from Mananga	Circular depressions at the foot of side slopes, drainage ways	level (0-1)	sil-C siC-C	> 100	imperfect-poor	sl. acid-mod. alkaline (6.5-8.5) sl.-strong. alkaline (7-9)
PA	Coarse-textured soils of Post-Mananga **	Sandy loam, reddish brown, deep and moderately deep	Red upper Pleistocene Post-Mananga deposits (0.5-10 m) of valleys' side slopes,	Colluvial slopes	gently undulated (0-5)	S-SL LS-SL	70-120	good	mod. acid-sl. alkaline (5.5-7.5) mod. acid-sl. alkaline (5.5-7.5)
PM	Medium-textured soils of Post-Mananga				gently undulated (0-5)	LS-SCL SL-SCL	70-25	good	sl. acid-sl. alkaline (6-7.5) mod. acid-sl. alkaline (5.5-7.5)

- Mananga : deposits
- Post-Mananga :

Table 2 : Map legend (part 2)

SYMBOL	ORGANIC MATTER TopsoilL (%)	SALINITY Topsoil / Subsoil EC _o (mS/cm)	SODICITY Topsoil / Subsoil ESP (%)	DOMINANT CLASSIFICATION		VEGETATION TYPE	MAIN LIMITATIONS FOR AGRICULTURE	LAND CAPABILITY (USDA)	LAND SUITABILITY FOR IRRIGATION (USBR)
				FAO 1988	USDA 1992				
ALLUVIAL AND FLUVIO-MARINE AREAS (Units F)									
FT	very high (>5)	non saline (0-1) non saline (0-1)	non sodic (0-1) non-sl. sodic (0-8)	Umbric Fluvisols	Fluvaquentic Humaquepts	hydrophilous forest, grassland	drainage, flooding	V di	V-VI di
FG	high (3-4.5)	non saline (0.5-3) non-sl. saline (1-8)	non sodic (1-4) non-mod. sodic (1-20)	Mollic Fluvisols	Fluventic Haplustolls	grassland, shrubland	drainage, sometimes salinity & sodicity	II (III-V) dsni	II-III ds
FS	low-high (0.5-3.5)	non saline (0-2) non saline (0-2)	non sodic (1-4) non-mod. sodic (1-15)	Eutric Fluvisols	Mollic Ustifluvents	forest and open bushland	sometimes drainage & sodicity	I (II-III) d(n)	I-IV sd
FE	moderate (1-3)	non saline (0-4) non -strong. saline (2-44)	non-strong. sodic (6-45) mod.-strong. sodic (15-80)	Salic Fluvisols	Mollic Fluvaquents	halophilous grassland, mangrove	salinity, sodicity, drainage, flooding	V-VII dn	IV-VI nd VI ndi
SEDIMENTARY BASIN (Units D, A, G, M, P, S, W)									
DC	low (0.2-1)	non saline (0-1) non saline (0-1)	non sodic (1-5) non-sl. sodic (1-15)	Haplic Arenosols	Ustic quartzipsamments	shrubland	water holding capacity, fertility	VII fs (IV+VII+VIII) fs	V-VI sdt
AA	low to moderate (0-3)	non saline (0-1.5) non saline (0-2)	non sodic (0-2) non sodic (1-12)	Ferralic Arenosols	Ustoxic Quartzipsamments	residual forest and open bushland or grassland	water holding capacity, fertility	IV fs (VII) fs	IV sd
dAA									
AJ	low to moderate (0.5-2)	non saline (0-1) non saline (0-1)	non sodic (0-1) non sodic (0-2)	Ferralic Arenosols	Ustoxic Quartzipsamments	residual forest and open bushland or grassland	water holding capacity, fertility	IV fs	IV sd
dAJ								IV tfs (VII) tfs	V sdt
AB	low to moderate (0-2)	non saline (0-2) non saline (0-2)	non sodic (0-3) non-mod. sodic (0-21)	Albic Arenosols	Ustoxic Quartzipsamments	open or closed bushland, wooded savannah, shrubland	fertility, water holding capacity	IV fs (VII) fs	V sd
Ah	low to high (0-5)	non saline (0-2) non saline (0-2)	non sodic (0-3) non-mod. sodic (1-25)	Gleyic Arenosols	Aquic Quartzipsamments	savannah or grassland	drainage, flooding, sometimes sodicity	V di (n)	V-VI di
A	moderate (0-3)	non saline (0-2) non saline (0-2)	non sodic (0-3) non-mod. sodic (0-21)	Arenosols	Psamments	savannah or grassland	water holding capacity, fertility	IV fs (VII) fs	IV sd
dA									
G	low-moderate (0-2)	non saline (0-1) non saline (0-1)	non sodic (0-2) non-sl. sodic (0-10)	Ferralic Arenosols	Ustoxic Quartzipsamments	closed or open bushland	water holding capacity, fertility	IV sf	V sd
MA	low-moderate (0.5-3)	non saline (0.5-1) non-sl. saline (0.5-7)	non-strong. sodic (5-40) non-strong. sodic (1-45)	Ferralic Arenosols	Thapto- Camborthidic Quartzipsamments	open bushland, shrubland	water holding capacity, fertility	III dn (II-IV) dn	V dns IV dns
MM	low-high (0.5-5)	non saline (0.5-2) non-sl. saline (0.5-9)	non-sl. sodic (1-8) sl.-strong. sodic (10-40)	Stagnic or Haplic Luvisols	Aquic or Typic Haplustalfs	grassland and open bushland	soil hardness and permeability, sodicity, sometimes salinity	IV dn	III dn (VII-V) dn
M	see MM/MA	see MM/MA	see MM/MA	see MM/MA	see MM/MA	see MM/MA	see MM/MA	see MM/MA	see MM/MA
MC	moderate-high (2-4.5)	non-sl. saline (0.5-7.5) non-mod. saline (3-15)	non-mod sodic (1-21) non-mod sodic (2-26)	Mollic Solonchaks	Salorthidic Haplustolls	grassland and bushland	salinity, sodicity, drainage, flooding	IV dn (III-IV) dn	III dn (II-V) dtni
PA	low-moderate (0.5-2.5)	non saline (0.5-1) non saline (0.5-1)	non sodic (0-6) non sodic (1-7)	Chromic Cambisols	Typic Ustochrepts	open bushland	fertility, water holding capacity	II sf (I-III) snf	I-II tsp(n) III tsp
PM	mod-high (1-4)	non saline (0-1) non saline (0-1.5)	non sodic (0-2) non-sl. sodic (0-15)	Haplic Lixisols or Chromic Luvisols	Kanhaplic Haplustalfs or Typic Haplustalfs	open or closed bushland	sometimes soil depth (<1 m), erosion (on slopes), salinity, sodicity	II st (III) tpf	I-II t(n)p

Table 2 : Map legend (part 3)

SYMBOL	SOIL GROUPING	DOMINANT SOIL CHARACTERISTICS	GEOMORPHOLOGY & GEOLOGY	LANDFORM	TOPOGRAPHY Slope (%)	TEXTURE Topsoil / Subsoil	DEPTH (cm)	DRAINAGE	ACIDITY & ALKALINITY Topsoil / Subsoil (pH-H ₂ O)
SEDIMENTARY BASIN (Units D, A, G, M, P, S, W)									
SI	Lithic soils on pebbles	Sandy clay loam, dark brown, shallow	Platforms of Mananga's basal pebbles	Platforms of pebbles	gently undulated (0-5)	SL-C	<30	moderate	mod.-sl. acid (5-7)
SC	Colluvial soils on pebbles	clayey, very dark grey, moderately deep over pebbles			gently undulated (0-5)	SC-siC-C	30-100	imperfect-moderate	sl. acid-sl. alkaline (6.5-7.5)
WV	Clayey red soils derived from calcareous rocks	clayey, reddish brown, moderately deep	Sedimentary rock outcrop of Karroo, Cretaceous or Tertiary	Hills	gently undulated (0-5)	L-CL	<100	good	mod.-sl. acid (5.5-6.5)
WP	Shallow soils on non-calcareous rocks	clayey, brown, moderately deep		Hills	undulated (0-8)	L-CL	<100	Imperfect-moderate	sl. acid (6-7)
WM	Medium-textured soils derived from sedimentary rocks	Sandy clay loam, brown, deep		Hills	undulated (0-8)	SL-SCL	>100	good	sl. acid (6-7)
WK	Shallow soils on calcareous rocks	Sandy clay loam, brown, moderately deep, calcareous		Hills	undulated (0-8)	SL-SCL	generally <100	Imperfect-good	sl. acid-sl. alkaline (6.5-8)
						C-SCL calcareous		sl. acid-mod. alkaline (6-9)	
IGNEOUS ROCKS AREAS (Units R, B)									
RV	Red rhyolitic soils	Clay loam, dark reddish brown, varying depth	Limbobos' volcanic range, Karroo rhyolites	Plateaus (>500 m) residue of Tertiary peneplanation	undulated (0-6)	SCL-C	30-150	good	mod.-sl. acid (5.5-6.5)
						CL-C			mod.-sl. acid (5.5-7)
RI	Lithic rhyolitic soils	Sandy clay loam, yellowish brown, shallow over weathered rock	Limbobos' volcanic range, Karroo rhyolites	Cuestas and valleys' side slopes	steep (> 8)	LS-SCL	< 30	moderate	moderately acid (5-6)
						weathered rock			
BI	Lithic basaltic soils	Sandy clay loam, dark brown, shallow over weathered rock	Basaltic mantle along the Precambrian shield and the	Plains and slopes	undulated (1-8)	SL-C	< 30	good	mod.-sl. acid (5.5-7)
						weathered rock			
BP	Black basaltic soils	clayey, black, heavy with cracks, varying depth	Limbobos' volcanic range, Karroo basalts		level (0-1)	siC-C	30-150	moderate	sl. acid-sl. alkaline (6.5-7.5)
BV	Red basaltic soils	clayey, dark reddish brown, varying depth			nearly level (0-2)	SCL-C	30-150	good	strong.-sl. acid (4.8-6.5)
BC	Brown soils of clayey colluvium	clayey, very dark brown, varying depth		Colluvial plains	nearly level	CL-C			mod. acid-sl. alkaline (5-7.5)
						SL-C	> 30	moderate-imperfect	sl. acid-mod. alkaline (6-8.5)
						SC-C			
PRECAMBRIAN SHIELD (Units V, K, I, C)									
VA	Reddish sandy soils	Sandy, reddish brown, deep	Precambrian shield, acid rocks : granite, gneiss ...	Interfluves, upper and middle slopes	undulated (0-8)	S-LS	> 120	somewhat excessive	mod.-sl. acid (5.5-7)
VAp	Dystric red sandy soils	Sandy, reddish brown, deep			undulated (0-8)	S-LS	> 120	somewhat excessive	mod. acid (5-5.5)
VM	Medium-textured red soils	Sandy clay loam, reddish brown, deep			undulated (0-8)	LS-SL	> 100	good	mod. acid-sl. alkaline (5.5-7)
VMo	Oxic medium-textured red soils	Sandy clay loam, reddish brown, deep			undulated (0-8)	LS-SL	> 100	good	mod.-sl. acid (5-6.5)
VMp	Dystric medium-textured red soils	Sandy clay loam, reddish brown, deep			undulated (0-8)	SL-SCL			mod. acid-sl. alkaline (5-7)
						LS-SL	> 150	good	mod.-sl. acid (5-6.5)
VG	Clayey red soils	Clayey, reddish brown, deep	Precambrian shield, (ultra) basic rocks, amphibolites	Interfluves, upper slopes and plateaus	undulated (0-8)	SL-C	> 100	good	mod.-sl. acid (5-6.5)
VGb	Clayey red soils	Clayey, reddish brown, deep			undulated (0-10)	SCL-C	> 100	good	sl. acid (6-7)
VGo	Oxic clayey red soils	Clayey, reddish brown, deep			gently undulated (0-5)	SL-C	> 100	good	mod.-sl. acid (5-7)
						SC-C			mod.-sl. acid (5-6.5)
VGp	Dystric clayey red soils	Clayey, reddish brown, deep			gently undulated (0-5)	SL-C	> 100	good	mod.-sl. acid (5-6.5)
						SC-C			mod. acid (5-6)

Table 2 : Map legend (part 4)

SYMBOL	ORGANIC MATTER TopsoilL (%)	SALINITY Topsoil / Subsoil ECo (mS/cm)	SODICITY Topsoil / Subsoil ESP (%)	DOMINANT CLASSIFICATION		VEGETATION TYPE	MAIN LIMITATIONS FOR AGRICULTURE	LAND CAPABILITY (USDA)	LAND SUITABILITY FOR IRRIGATION (USBR)
				FAO 1988	USDA 1992				
SEDIMENTARY BASIN (Units D, A, G, M, P, S, W)									
SI	moderate-high (2-6)	non saline (0-4)	non-sl. sodic (0-10)	Mollic Leptosols	Lithic Haplustolls	xerophyllous open bushland, shrubland and savannah	shallow depth, erosion (on slopes)	VII-VIII p	V-VI p
SC	moderate-high (3-4.5)	non saline (0-1.5) non-sl. saline (0-6.5)	non-sl. sodic (0-11) non-mod. sodic (0-30)	Luvic Chernozems	Calcicustolls	xerophyllous open bushland, shrubland and savannah	shallow depth, erosion (on slopes)	III-IV pd(n)	III-IV pd(n)
WV	moderate (1-1.5)	non saline (0-0.5) non saline (0-0.5)	non sodic (1-2) non sodic (1-3)	Chromic Luvisols or Haplic Lixisols	Typic Haplustalfs or Kanhaplic Haplustalfs	open bushland and wooded savannah	sometimes soil depth (<1 m), erosion (on slopes)	II pt	II tsp
WP	low-moderate (0-2.5)	non saline (0-3) sl. saline (0-5)	non sodic (1-3) non sodic (1-6)	Eutric Cambisols	Typic Ustochrepts	open bushland or wooded savannah	soil depth, drainage, soil fertility	III pt (II-IV) pfd	III-IV pn
WM	moderate (1-3)	non saline (0-1) non saline (0-1)	non sodic (0-2) non sodic (0-3)	Eutric Cambisols	Typic Ustochrepts	dense forest or open woodland	soil fertility	II-III tf	II-III pt
WK	moderate (1-3)	non saline (0.1-1) non-mod. saline (0.5-15)	non-sl. sodic (2-8) mod. sodic (15-25)	Calcic Cambisols or Eutric Cambisols	Typic Ustochrepts	bushland	soil depth, sodicity, sometimes salinity	IV pfdn (III-IV) dpfn	III-IV pn
IGNEOUS ROCKS AREAS (Units R, B)									
RV	moderate-high (2-6)	non saline (0-1.5) non saline (0-1)	non sodic (0-1) non sodic (0-5)	Ferric Lixisols	Kanhaplic Rhodustalfs	open forest and wooded savannah	erosion (on slopes), soil depth (<1 m)	II tp (I-III) tp	III pt (II-IV) pt
RI	moderate-high (2-6)	non saline (0-1)	non sodic (0-2)	Eutric Leptosols	Typic and Lithic Ustorthents	wooded savannah or open shrubland	soil depth	VII-VIII tp	V-VI ptcb
BI	moderate-high (1-6)	non saline (0-2)	non-sl. sodic (0-8)	Eutric Leptosols	Lithic Ustorthents	wooded savannah, grassland	soil depth, erosion	VII-VIII tp	V-VI pcb
BP	moderate-high (1.5-6)	non saline (0-2) non saline (0-2)	non-sl. sodic (2-8) non-mod. sodic (4-20)	Calcic Vertisols	Typic Calcicusterts	wooded savannah, grassland	sodicity, sometimes depth, land preparation	III snp	II-III spd (n)
BV	moderate-high (2-6)	non saline (0-1) non saline (0-1)	non sodic (1-3) non sodic (1-6)	Ferric Lixisols	Kanhaplic Rhodustalfs	wooded savannah, grassland	sometimes soil depth	I-III p	I-III ps
BC	moderate-high (2-5.5)	non-sl. saline (0.5-4.5) non-mod. saline (0.5-15)	non-mod. sodic (1-25) non-strong. sodic (1-35)	Haplic Chernozems	Vertic Haplustolls	grassland, open bushland	soil depth, sometimes sodicity and salinity, drainage	III sp(n) (II-IV) sp(n)	II-IV p(n)
PRECAMBRIAN SHIELD (Units V, K, I, C)									
VA	low-high (0.5-4)	non saline (0-1) non saline (0-1)	non sodic (0-2) non sodic (0-4)	Ferralic Arenosols	Ustic Quartzipsammments	wooded savannah and open forest	water holding capacity, fertility	III-IV stf	II-III st
VAp	low-moderate (0.5-1.5)	non saline (0-1) non saline (0-1)	non sodic (0-1) non sodic (0-1)	Ferralic Arenosols	Ustic Quartzipsammments	wooded savannah and open forest	water holding capacity, fertility	III-IV stf	II-III st
VM	low-high (0.9-4.5)	non saline (0-1) non saline (0-1)	non sodic (0-5) non sodic (0-5)	Ferric Lixisols	Rhodustalfs Kanhaplic Rhodustalfs	open forest, bushland	germination conditions, erosion hazard	I-III tf	II-III pt
VMo	low-moderate (0.5-3)	non saline (0-2) non saline (0-1)	non sodic (0-2) non sodic (0-1)	Rhodic Ferralsols	Rhodic Haplustox	open forest, bushland	fertility, erosion hazard	II-III tf	II-III pt
VMP	moderate-high (1-10)	non saline (0-1) non saline (0-1)	non sodic (0-1) non sodic (0-3)	Haplic Acrisols	Paleustults	wooded savannah, open bushland	fertility, erosion hazard	II-IV f	II-III pt
VG	moderate-high (1-6)	non saline (0-1) non saline (0-2)	non sodic (0-2) non sodic (0-5)	Ferric Lixisols	Paleustults	open forest	germination conditions, erosion hazard	I-III tf	II-III tp
VGb	moderate-high (1.5-6)	non saline (0-1) non saline (0-2)	non sodic (0-1) non sodic (0-5)	Rhodic Nitisols	Rhodic/Ultic Paleustalfs	savannah and mixed bushland	-	I-III tsf	II-III tsp
VGo	low-very high (0.5-6)	non saline (0-1) non saline (0-1)	non sodic (0-2) non sodic (0-3)	Rhodic Ferralsols	Rhodic Eutrustox	open forest, wooded savannah	phosphorus fixation, fertility	II-III s	II pst
VGP	low-high (0.5-6)	non saline (0-1) non saline (0-1)	non sodic (0-5) non sodic (0-3)	Ferric Acrisols	Paleustults	wooded savannah	fertility, erosion hazard	III tsf	I-III ts

Table 2 : Map legend (part 5)

SYMBOL	SOIL GROUPING	DOMINANT SOIL CHARACTERISTICS	GEOMORPHOLOGY & GEOLOGY	LANDFORM	TOPOGRAPHY Slope (%)	TEXTURE Topsoil / Subsoil	DEPTH (cm)	DRAINAGE	ACIDITY & ALKALINITY Topsoil / Subsoil (pH-H2o)
PRECAMBRIAN SHIELD (Units V, K, I, C)									
KA	Grey brown sandy soils	Sandy, greyish brown, deep	Precambrian shield, acid rocks : granite, gneiss...	Lower slopes of interfluves	undulated (0-8)	S-LS	> 100	somewhat excessive	sl. acid-sl. alkaline (6-7.5)
KAg	Mottled grey brown sandy soils	Sandy, greyish brown, deep			gently undulated (0-4)	S-LS	> 100	moderate-imperfect	sl. acid (6-6.5)
KAp	Dystric brown sandy soils	Sandy, greyish brown, deep			undulated (0-6)	S-LS	> 100	somewhat excessive	strong.-sl. acid (4.5-6.5)
KM	Medium-textured brown soils	Sandy clay loam, brown, deep		Interfluves, middle and lower slopes	undulated (0-8)	S-LS SL-SCL	> 100	moderate	sl. acid (6-7) mod.-sl. acid (5-7)
KMo	Oxic dystric medium-textured brown soils	Sandy clay loam, brown, deep		Interfluves, plateaus	nearly level (0-2)	LS-SL SL-SCL	> 100	good	sl. acid (6-6.5) sl. acid (6-6.5)
KG	Grey brown clayey soils	Clayey, greyish brown, deep		Interfluves, middle and lower slopes	undulated (0-8)	LS-SCL SC-C	> 100	moderate	mod. acid (5-6) mod.-sl. acid (5-6.5)
KGo	Oxic grey brown clayey soils	Clayey, greyish brown, deep		Interfluves, upper slopes	gently undulated (0-5)	SL-C SC-C	> 200	good	mod.-sl. acid (5-6.5) strong.-sl. acid (4.5-6.5)
I	Lithic soils	Sandy loam, brown, shallow over weathered rock		Inselbergs, eroded areas, rock outcrop	mountainous (> 30)	LS-SL weathered rock	0-30	excessive	mod.-sl. acid (5.5-6.5)
CA	Soils of sandy colluvium	Sandy, mottled grey, deep	Dambos colluvium, derived from Precambrian rocks : gneiss, granite	Dambos, river beds, flat valley bottoms	nearly level (0-2)	S-LS S-LS	> 180	imperfect-poor	mod.-sl. acid (5.5-6.5) mod.acid-sl. alkaline (5.5-7.5)
CM	Soils of medium-textured colluvium	Sandy clay loam, greyish brown, deep		Dambos, flat valley bottoms	nearly level (0-2)	LS-SL SL-SCL	> 150	imperfect-poor	mod.-sl. acid (5-7) strong.-sl. acid (4.5-7)
CG	Soils of clayey colluvium	clayey, greyish brown, deep		Dambos, without river bed	gently undulated (0-3)	SCL-SL SC-C	> 120	imperfect-moderate	sl. acid (6-7) mod.acid-sl. alkaline (5.5-7.5)
C	Unspecified colluvial soils	Greyish brown of varying texture		Dambos	nearly level (0-2)	unspecified	> 100	imperfect-poor	unspecified

Table 2 : Map legend (part 6)

SYMBOL	ORGANIC MATTER TopsoilL (%)	SALINITY Topsoil / Subsoil ECo (mS/cm)	SODICITY Topsoil / Subsoil ESP (%)	DOMINANT CLASSIFICATION		VEGETATION TYPE	MAIN LIMITATIONS FOR AGRICULTURE	LAND CAPABILITY (USDA)	LAND SUITABILITY FOR IRRIGATION (USBR)
				FAO 1988	USDA 1992				
PRECAMBRIAN SHIELD (Units V, K, I, C)									
KA	low-moderate (0.5-2.5)	non saline (0-2) non saline (0-1)	non sodic (0-3) non sodic (0-6)	Cambic Arenosols	Ustic Quartzipsamments	open forest, shrubland	water holding capacity, fertility	III-IV st	II-III st
KAg	moderate-high (1-5)	non saline (0-1) non saline (0-1)	non sodic (0-1) non sodic (0-1)	Albic and Cambic Arenosols	Ustic Quartzipsamments	open bushland	water holding capacity, fertility	III-IV sd	III-IV s
KAp	low-high (1-3.5)	non saline (0-1) non saline (0-1)	non sodic (0-3) non sodic (0-6)	Ferralic Arenosols	Ustic Quartzipsamments	open bushland, wooded savannah	water holding capacity, fertility	III-IV sf	II-III st
KM	low-high (0.5-4)	non saline (0-1) non saline (0-1)	non sodic (0-2) non sodic (0-4)	Haplic Acrisols	Paleustults	open bushland or open forest	erosion hazard, germination conditions	II-IV tfs	II-III pts
KMo	moderate (1-2)	non saline (0-1) non saline (0-1)	non sodic (0-2) non sodic (0-2)	Ferralsols	Typic Kandiuustults	open bushland	fertility, erosion hazard	II-III ps	II-III ps
KG	moderate (1.5-2.5)	non saline (0-1) non saline (0-1)	non sodic (0-1) non sodic (0-1)	Haplic Lixisols	Kandic Paleustalfs	wooded savannah or open bushland	germination conditions, erosion hazard	II-III tp	II-III stp
KGo	moderate (1-2)	non saline (0-1) non saline (0-1)	non sodic (0-1) non sodic (0-1)	Haplic Ferralsols	Kandiuustalfic Eutrustox	open Forest	fertility	II-III s	II st
I	low-moderate (0.5-2)	non saline (0-1) non saline (0-1)	non sodic (0-3)	Eutric Leptosols	Lithic Ustorthents	open bushland or grassland	depth, erosion hazard	VII-VIII p	VI p
CA	low-moderate (0.5-2.5)	non saline (0-1) non saline (0-1)	non sodic (0-3) non sodic (0-6)	Eutric Fluvisols, Gleyic Arenosols	Psamments	grassland	drainage, fertility	IV id	III-V sd
CM	moderate-high (1-3.5)	non saline (0-1) non saline (0-1)	non sodic (0-2) non sodic (0-6)	Gleyic Phaeozems	Tropaquents, Tropaqualfs	open bushland or grassland	drainage	III d	III d
CG	moderate-high (1-5.5)	non saline (0-1) non saline (0-1)	non sodic (0-2) non sodic (0-5)	Gleysols, Fluvisols	Aquepts, Aquepts	grassland	drainage	IV d	III d
C	unspecified	unspecified, probably non saline	unspecified, probably non sodic	Gleysols	Fluvaquents	unspecified	drainage	IV d	III d

EXPLANATION OF THE SYMBOLS USED IN THE MAP LEGEND

TEXTURE

S	sand
LS	loamy sand
SL	sandy loam
SCL	sandy clay loam
CL	clay loam
C	clay
SC	sandy clay
siC	silty clay
siCL	silty clay loam
L	loam
siL	silt loam

LAND SUITABILITY CLASSIFICATION

CLASS	LAND CAPABILITY (USDA *)	LAND SUITABILITY FOR IRRIGATION (Adapted from USBR)
I	excellent	very suitable
II	good	moderately suitable
III	moderate	marginally suitable
IV	marginal	special use (overhead irrigation, rice)
V	good for pasture	not recommended, potentially suitable
VI	marginal for pasture	not recommended
VII	forests	-
VIII	natural reserves	-

* Actually it is the USDA-SCS land capability system.

Specific limitations are indicated with the following indices :

b	surface stoniness
c	stoniness inside the soil profile
t	topography
i	flooding
d	drainage
s	soil texture
n	salinity and sodicity
f	fertility
p	soil depth

Parentheses () are used to indicate the variability of soil suitability/land capability within the soil grouping

Additional symbols used in the legend :

CEo	electrical conductivity of saturated paste extract
sl.	slightly
mod.	moderately
strong.	strongly

Remark : the range of values indicated for specific soil characteristics are the actual ranges observed in available data.

APPENDIX 2.

Table 3 : Map units composition (part 1)

ORIGINAL SYMBOL	MUID No.	COMPONENT %						
		100	60	50	40	30	20	10
FT	1	FT						
FT+A	2		FT		A			
FT+dA	3		FT		dA			
FG	4	FG						
FG+FE	5		FG		FE			
FG+FGvg	6		FG		FGvg			
FG+FGz	7		FG		FGz			
FG+FS	8		FG		FS			
FG+MC+MM	9			FG	MC			MM
FG+M+MC	10			FG	M			MC
FGg	11	FGg						
FGg+FGh	12		FGg		FGh			
FGgz	13	FGgz						
FGh	14	FGh						
FGhz	15	FGhz						
FGv	16	FGv						
FGv+FGvz	17		FGv		FGvz			
FGv+KM	18		FGv		KM			
FGv+MM	19		FGv		MM			
FGv+VM	20		FGv		VM			
FGvg	21	FGvg						
FGvh+FGgz	22		FGvh		FGgz			
FGvs	23	FGvs						
FGvsg+FGvsz	24		FGvsg		FGvsz			
FGvz+FGh	25		FGvz		FGh			
FGx+FS	26		FGx		FS			
FGz	27	FGz						
FGz+FS	28		FGz		FS			
FGz+VM	29		FGz		VM			
FS	30	FS						
FS+FG	31		FS		FG			
FS+FGh	32		FS		FGh			
FS+FGvs	33		FS		FGvs			
FS+KM	34		FS		KM			
FS+PA	35		FS		PA			
FS+PM	36		FS		PM			
FSg	37	FSg						
FSh	38	FSh						
FSm	39	FSm						
FE	40	FE						
FE+DC	41		FE		DC			
FE+FG	42		FE		FG			

Table 3 : Map units composition (part 2)

ORIGINAL SYMBOL	MUID No.	COMPONENT %						
		100	60	50	40	30	20	10
DC	43	DC						
DC+Ah	44		DC		Ah			
A	45	A						
A+AA	46		A		AA			
A+Ah	47		A		Ah			
A+M	48		A		M			
A+MC	49		A		MC			
dA	50	dA						
dA+M	51		dA		M			
AA	52	AA						
AA+AB	53		AA		AB			
AA+Ah	54		AA		Ah			
AA+Ah+M	55			AA	Ah			M
AA+AJ	56		AA		AJ			
AA+G	57		AA		G			
AA+MA	58		AA		MA			
AA+MA+MC	59			AA	MA			MC
AA+WKI	60		AA		WKI			
AA+WM	61		AA		WM			
AA+WP	62		AA		WP			
dAA	63	dAA						
dAA+Ah	64		dAA		Ah			
AB	65	AB						
AB+AA	66		AB		AA			
AB+MA	67		AB		MA			
AB+MM	68		AB		MM			
AB+PM	69		AB		PM			
AB+WPI	70		AB		WPI			
Ah	71	Ah						
Ah+DC	72		Ah		DC			
AJ	73	AJ						
AJ+AB	74		AJ		AB			
AJ+MA	75		AJ		MA			
AJ+WP	76		AJ		WP			
dAJ	77	dAJ						
dAJ+Ah	78		dAJ		Ah			
G	79	G						
GI	80	GI						

Table 3 : Map units composition (part 3)

ORIGINAL SYMBOL	MUID No.	COMPONENT %						
		100	60	50	40	30	20	10
MA	81	MA						
MA+AA	82		MA		AA			
MA+AA+MC	83			MA	AA			MC
MA+dAA	84		MA		dAA			
MA+MM	85		MA		MM			
MA+PM	86		MA		PM			
MA+SI	87		MA		SI			
MM	88	MM						
MM+A	89		MM		A			
MM+AA	90		MM		AA			
MM+AB	91		MM		AB			
MM+C	92		MM		C			
MM+CM	93		MM		CM			
MM+KA	94		MM		KA			
MM+KM	95		MM		KM			
MM+MA	96		MM		MA			
MM+MC	97		MM		MC			
MM+PA	98		MM		PA			
MM+SI	99		MM		SI			
MM+WP	100		MM		WP			
M	101	M						
M+A	102		M		A			
M+MC	103		M		MC			
MC	104	MC						
MC+M	105		MC		M			
MC+MM	106		MC		MM			
MC+PA+WVm	107			MC	PA			WVm
MC+WV	108		MC		WV			
MC+WVm+PA	109			MC	WVm			PA
MCz	110	MCz						
MCz+M	111		MCz		M			
PA	112	PA						
PA+AA	113		PA		AA			
PA+MA	114		PA		MA			
PA+PM	115		PA		PM			
PA+WP	116		PA		WP			
PA+WVm+MC	117			PA	WVm			MC
PM	118	PM						
PM+FS	119		PM		FS			
PM+PA	120		PM		PA			

Table 3 : Map units composition (part 4)

ORIGINAL SYMBOL	MUID No.	COMPONENT %						
		100	60	50	40	30	20	10
SI	121	SI						
SC+SI	122		SC		SI			
WV	123	WV						
WV+BC	124		WV		BC			
WV+CG	125		WV		CG			
WV+CG+AA	126			WV	CG			AA
WV+WKI	127		WV		WKI			
WV+WVI	128		WV		WVI			
WVI	129	WVI						
WVI+BI	130		WVI		BI			
WVI+I	131		WVI		I			
WVI+MC+PA	132			WVI	MC			PA
WVI+WV	133		WVI		WV			
WV _m	134	WV _m						
WV _m +PA+MC	135			WV _m	PA			MC
WV _m +WV	136		WV _m		WV			
WV _m +WVI	137		WV _m		WVI			
WV _{mx}	138	WV _{mx}						
WV _{mx} +WV	139		WV _{mx}		WV			
WP	140	WP						
WP+A	141		WP		A			
WP+MM	142		WP		MM			
WP+WK	143		WP		WK			
WP+WM	144		WP		WM			
WPI	145	WPI						
WPI+FG	146		WPI		FG			
WPI+RI	147		WPI		RI			
WPI+WP _m	148		WPI		WP _m			
WP _v	149	WP _v						
WP _v +A	150		WP _v		A			
WM	151	WM						
WM+AA	152		WM		AA			
WMI	153	WMI						
WMI+WV+PA	154			WMI	WV			PA
WMI+WV _m +PA	155			WMI	WV _m			PA
WM _m	156	WM _m						
WM _{mx}	157	WM _{mx}						
WM _x	158	WM _x						

Table 3 : Map units composition (part 5)

ORIGINAL SYMBOL	MUID No.	COMPONENT %						
		100	60	50	40	30	20	10
WK	159	WK						
WKI	160	WKI						
WKI+FG	161		WKI		FG			
WKm	162	WKm						
WKm+WKI	163		WKm		WKI			
WKx	164	WKx						
RI	165	RI						
RI+BI	166		RI		BI			
RI+RV	167		RI		RV			
BI	168	BI						
BI+BP	169		BI		BP			
BI+RI	170		BI		RI			
BI+SI	171		BI		SI			
BP	172	BP						
BP+BI	173		BP		BI			
BP+BPm	174		BP		BPm			
BP+BV	175		BP		BV			
BP+BV+BI	176			BP	BV			BI
BV	177	BV						
BV+BC+BI	178			BV	BC			BI
BV+BI	179		BV		BI			
BV+BP	180		BV		BP			
BV+BP+BI	181			BV	BP			BI
BV+PA	182		BV		PA			
BC	183	BC						
BC+MM	184		BC		MM			
VA	185	VA						
VA+KA	186		VA		KA			
VA+KA _m +I	187			VA	KA _m			I
VA+KA _p	188		VA		KA _p			
VA+KG	189		VA		KG			
VA+KM	190		VA		KM			
VA+VA _I +VM _p	191			VA	VA _I			VM _p
VA+VA _m	192		VA		VA _m			
VA+VA _m +VA _p	193			VA	VA _m			VA _p
VA+VM	194		VA		VM			
VA+VM _m +KA _p	195			VA	VM _m			KA _p
VA+VM _p	196		VA		VM _p			
VA _I +VA _m	197		VA _I		VA _m			

Table 3 : Map units composition (part 6)

ORIGINAL SYMBOL	MUID No.	COMPONENT %						
		100	60	50	40	30	20	10
VAm+VAI	198		VAm		VAI			
VAm+VAI+VMm	199			VAm	VAI			VMm
VAm+VMo	200		VAm		VMo			
VAm+VMpm	201		VAm		VMpm			
VApX	202	VApX						
VM	203	VM						
VM+C	204		VM		C			
VM+CA	205		VM		CA			
VM+CG+VMm	206			VM	CG			VMm
VM+C+I	207			VM	C			I
VM+I	208		VM		I			
VM+KA	209		VM		KA			
VM+KAI	210		VM		KAI			
VM+KAm	211		VM		KAm			
VM+KG	212		VM		KG			
VM+KM	213		VM		KM			
VM+KM+C	214			VM	KM			C
VM+KM+CA	215			VM	KM			CA
VM+KM+I	216			VM	KM			I
VM+KM+KA	217			VM	KM			KA
VM+KM+KA+CA	218				VM	KM	KA	CA
VM+KM+KA+CG	219				VM	KM	KA	CG
VM+VA	220		VM		VA			
VM+VG	221		VM		VG			
VM+VGm	222		VM		VGm			
VM+VGo	223		VM		VGo			
VM+VMm+VG	224			VM	VMm			VG
VMb+KA _p	225		VMb		KA _p			
VMb+VG _b	226		VMb		VG _b			
VMI	227	VMI						
VMI+I	228		VMI		I			
VMI+KMI	229		VMI		KMI			
VMI+VA+I	230			VMI	VA			I
VMI+VMm	231		VMI		VMm			
VMm	232	VMm						
VMm+I	233		VMm		I			
VMm+KA	234		VMm		KA			
VMm+KAm	235		VMm		KAm			
VMm+KAm+I	236			VMm	KAm			I
VMm+KMm	237		VMm		KMm			
VMm+KMm+KA	238			VMm	KMm			KA

Table 3 : Map units composition (part 7)

ORIGINAL SYMBOL	MUID No.	COMPONENT %						
		100	60	50	40	30	20	10
VMm+VAm	239		VMm		VAm			
VMm+VM	240		VMm		VM			
VMm+VMI	241		VMm		VMI			
VMmx	242	VMmx						
VMx	243	VMx						
VMx+I	244		VMx		I			
VMx+KA+C	245			VMx	KA			C
VMx+KMx	246		VMx		KMx			
VMo	247	VMo						
VMo+I	248		VMo		I			
VMo+KA	249		VMo		KA			
VMo+KA+I	250			VMo	KA			I
VMo+KAp	251		VMo		KAp			
VMo+KG	252		VMo		KG			
VMo+KM	253		VMo		KM			
VMo+VGo	254		VMo		VGo			
VMp	255	VMp						
VMp+KAp	256		VMp		KAp			
VMp+KM+I	257			VMp	KM			I
VMp+VGo	258		VMp		VGo			
VMp+VMm	259		VMp		VMm			
VMp+VMpm	260		VMp		VMpm			
VMpm+VMI	261		VMpm		VMI			
VG	262	VG						
VG+CA	263		VG		CA			
VG+CGv	264		VG		CGv			
VG+I	265		VG		I			
VG+KA	266		VG		KA			
VG+KA+CA	267			VG	KA			CA
VG+KG	268		VG		KG			
VG+KGv+KA _m	269			VG	KGv			KA _m
VG+KM	270		VG		KM			
VG+KM+CA	271			VG	KM			CA
VG+KM+KA _m	272			VG	KM			KA _m
VG+VA	273		VG		VA			
VG+VGI	274		VG		VGI			
VG+VG _m	275		VG		VG _m			
VG+VGo	276		VG		VGo			
VG+VG _x	277		VG		VG _x			
VG+VM	278		VG		VM			
VG+VM+CA	279			VG	VM			CA
VG+VM+KA+CA	280				VG	VM	KA	CA

Table 3 : Map units composition (part 8)

ORIGINAL SYMBOL	MUID No.	COMPONENT %						
		100	60	50	40	30	20	10
VGI+I	281		VGI		I			
VGm	282	VGm						
VGm+C	283		VGm		C			
VGm+KMm	284		VGm		KMm			
VGm+VGI	285		VGm		VGI			
VGm+VMm	286		VGm		VMm			
VGm+VMm+VGI	287			VGm	VMm			VGI
VGx+VMx	288		VGx		VMx			
VGb	289	VGb						
VGb+CG	290		VGb		CG			
VGb+KGb	291		VGb		KGb			
VGo	292	VGo						
VGo+CG	293		VGo		CG			
VGo+CM	294		VGo		CM			
VGo+I	295		VGo		I			
VGo+KGo	296		VGo		KGo			
VGo+KM	297		VGo		KM			
VGo+KMo	298		VGo		KMo			
VGo+KM+I	299			VGo	KM			I
VGo+VGb	300		VGo		VGb			
VGo+VGm	301		VGo		VGm			
VGo+VGx	302		VGo		VGx			
VGo+VMm	303		VGo		VMm			
VGo+VMo	304		VGo		VMo			
VGo+VMom	305		VGo		VMom			
VGo+VMo+CA	306			VGo	VMo			CA
VGo+VMo+KA	307			VGo	VMo			KA
VGo+VMp	308		VGo		VMp			
VGom	309	VGom						
VGom+VMo	310		VGom		VMo			
VGom+VMom	311		VGom		VMom			
VGomx+VMom+I	312			VGomx	VMom			I
VGp	313	VGp						
VGp+KM	314		VGp		KM			
VGp+KMx	315		VGp		KMx			
VGp+VGo	316		VGp		VGo			
VGp+VMp	317		VGp		VMp			
VGp+VMp+KA	318			VGp	VMp			KA

Table 3 : Map units composition (part 9)

ORIGINAL SYMBOL	MUID No.	COMPONENT %						
		100	60	50	40	30	20	10
KA	319	KA						
KA+I	320		KA		I			
KA+KA _m	321		KA		KA _m			
KA+KM	322		KA		KM			
KA+VG	323		KA		VG			
KA+VM	324		KA		VM			
KA+VM+C	325			KA	VM			C
KA _g	326	KA _g						
KA _g +CG	327		KA _g		CG			
KA _g +CM	328		KA _g		CM			
KA _g +VA	329		KA _g		VA			
KA _g +VM	330		KA _g		VM			
KAI	331	KAI						
KAI+KMI	332		KAI		KMI			
KAI+KMo	333		KAI		KMo			
KAI+VM	334		KAI		VM			
KAI+VMI	335		KAI		VMI			
KAI+VM _m	336		KAI		VM _m			
KA _m	337	KA _m						
KA _m +KA	338		KA _m		KA			
KA _m +KAI	339		KA _m		KAI			
KA _m +VM	340		KA _m		VM			
KA _x +KM _x	341		KA _x		KM _x			
KA _x +KM _x +CA	342			KA _x	KM _x			CA
KA _p	343	KA _p						
KA _p +VA	344		KA _p		VA			
KA _p +VA _p	345		KA _p		VA _p			
KA _p +VM	346		KA _p		VM			
KA _p +VM _m	347		KA _p		VM _m			
KA _p +VM _o	348		KA _p		VM _o			
KA _p +VM _p	349		KA _p		VM _p			
KM	350	KM						
KM+C	351		KM		C			
KM+CA	352		KM		CA			
KM+I	353		KM		I			
KM+KA	354		KM		KA			
KM+KA _g	355		KM		KA _g			
KM+KA _p	356		KM		KA _p			
KM+KG	357		KM		KG			
KM+VM	358		KM		VM			
KM+VM+CA	359			KM	VM			CA
KMI+KAI	360		KMI		KAI			
KM _m	361	KM _m						

Table 3 : Map units composition (part 10)

ORIGINAL SYMBOL	MUID No.	COMPONENT %						
		100	60	50	40	30	20	10
KMm+KMI	362		KMm		KMI			
KMm+VMm	363		KMm		VMm			
KMp+l	364		KMp		l			
KMx	365	KMx						
KMx+C	366		KMx		C			
KMx+KA	367		KMx		KA			
KMx+VMx+C	368			KMx	VMx			C
KMo	369	KMo						
KG	370	KG						
KG+KA	371		KG		KA			
KG+VG	372		KG		VG			
KGm+KG	373	KGmx						
KGmx	374		KGmx		KG			
KGmx+KG	375		KGmx		KMI			
KGmx+KMI	376		KGmx		VGo			
KGmx+VGo	377		KGm		KG			
KGx	378	KGx						
KGx+KGm	379		KGx		KGm			
KGo	380	KGo						
KGo+VGo	381		KGo		VGo			
l	382	l						
l+Bl	383		l		Bl			
l+KMmx	384		l		KMmx			
l+VG	385		l		VG			
l+VGom+VMom	386			l	VGom			VMom
l+VGomx+VMom	387			l	VGomx			VMom
l+VMm	388		l		VMm			
l+VMmx	389		l		VMmx			
l+VMm+KA	390			l	VMm			KA
CA	391	CA						
CA+VG	392		CA		VG			
CA+VM	393		CA		VM			
CM	394	CM						
CM+CG	395		CM		CG			
CG+CM	396		CG		CM			
CG+CM+VGo	397			CG	CM			VGo
CGm	398	CGm						
C	399	C						
C+KA	400		C		KA			
C+KA _g	401		C		KA _g			
C+KM	402		C		KM			
C+VA	403		C		VA			
C+VM	404		C		VM			

APPENDIX 3.

Table 4 : List of map unit components and their typifying pedons (part 1)

Component (Original code)	Typical profile	FAO Classification	Latitude (S)	Longitude (E)	Elevation (m)	Year of Survey
A	-	AR	-	-	-	-
AA	896, ref1 *	ARb.dys	26 28 30	32 41 20	30	1962
AB	173, ref1	ARa.dys	26 06 50	32 24 15	35	1961
Ah	GX00628, ref2 **	ARg.eut	25 04 23	33 41 59	7	1994
AJ	893, ref1	ARo.dys	26 25 50	32 43 20	9	1962
BC	18, ref1	PHI.ort	26 03 55	32 17 00	38	1980
BI	970, ref1	LPe.ort	26 03 20	32 16 20	30	1963
BP	MA0178, SDB-Moz ***	VRe.cal	25 45 19	32 18 15	58	1962
BPm	MO0058, SDB-Moz	VRe.cal	25 21 30	32 06 50	117	1962
BV	87, ref1	PHI.rho	26 09 00	32 13 30	58	1961
C	-	GLm/PHg/ARg	-	-	-	-
CA	PI0168, SDB-Moz	ARg.alb	14 24 27	38 54 29	420	1994
CG	ZU0033, SDB-Moz	GLm.eut	16 49 20	37 09 34	-	1995
CGm	PA0052, SDB-Moz	GLm.eut	13 43 35	39 44 30	265	1994
CGv	-	GLm.ver	-	-	-	-
CM	CH0103, SDB-Moz	PHg.eut	13 17 45	39 48 50	380	1994
dA	-	AR	-	-	-	-
dAA	GX00616, ref2	ARb.dys	25 09 37	33 21 48	55	1994
dAJ	GX0003, SDB-Moz	ARo.chr	25 04 20	33 47 30	23	1982
DC	GX00627, ref2	ARh.dys	25 06 33	33 43 41	56	1994
FE	GX00643, ref2	FLs.epigle	25 08 57	33 30 05	0.5	1994
FG	MT0143, SDB-Moz	FLm.ver	26 48 00	32 27 30	18	1962
FGg	GH0017, SDB-Moz	FLm.gle	24 31 55	33 02 10	22	1982
FGgz	-	FLs.gle	-	-	-	-
FGh	GX00609, ref2	FLm.epigle	24 52 33	33 27 13	12	1994
FGhz	GX00641, ref2	FLs.epigle	25 08 46	33 32 08	1	1994
FGv	GX00631, ref2	VRe.pel	24 48 50	33 30 00	13	1994
FGvg	GX0033, SDB-Moz	VRe.gle	24 47 45	33 33 10	8	1980
FGvh	GH0051, SDB-Moz	VRe.epigle	24 28 29	32 54 57	31	1988
FGvs	GX00633, ref2	VRe.sod	24 49 47	33 27 52	12	1994
FGvsg	GX0027, SDB-Moz	VRe.sodgle	24 51 45	33 34 50	7	1980
FGvsz	-	VRe.salsod	-	-	-	-
FGvz	-	VRe.sal	-	-	-	-
FGx	-	FLm.ort	-	-	-	-
FGz	MA0343, SDB-Moz	FLs.ver	26 09 40	32 24 40	9	1961
FS	MT0124, SDB-Moz	FLe.ort	26 50 30	32 20 57	28	1961
FSg	MO0001, SDB-Moz	FLe.gle	25 15 30	32 16 20	-	1990
FSh	MT0105, SDB-Moz	FLe.epigle	26 22 45	32 40 15	2	1962
FSm	MO0078, SDB-Moz	FLe.ort	25 21 50	32 14 15	66	1962
FT	T159, ref1	FLu.epigle	-	-	7	1982
G	532, ref1	ARo.dys	26 44 25	32 28 45	120	1961
GI	-	ARo.dys	-	-	-	-
KA	PA0024, SDB-Moz	ARb.ort	13 56 15	39 50 15	300	1983
KAg	-	ARb.ort	-	-	-	-
KAI	AO0147, SDB-Moz	LPe.ort	19 11 04	33 50 15	290	1994
KAm	PA0031, SDB-Moz	ARb.ort	13 59 58	39 40 38	360	1983
KAmp	PP0004, SDB-Moz	ARb.dys	14 42 05	39 55 46	315	1993
KAp	PW0015, SDB-Moz	ARI.dys	14 57 30	38 08 38	590	1982
KAx	-	ARb.ort	-	-	-	-

Table 4 : List of map unit components and their typifying pedons (part 2)

Component (Original code)	Typical profile	FAO Classification	Latitude (S)	Longitude (E)	Elevation (m)	Year of Survey
KG	ZU0002, SDB-Moz	LVf.ort	16 57 53	36 57 14	100	1995
KGb	CH0024, SDB-Moz	LXh.hyp	13 34 94	39 49 53	236	1994
KGm	-	LVf.ort	-	-	-	-
KGmx	-	LVf.ort	-	-	-	-
KGo	CN0075, SDB-Moz	FRh.lix	13 36 17	38 47 35	495	1994
KGv	ZU0024, SDB-Moz	LVv.ort	16 38 00	37 06 11	-	1995
KGx	CP0074, SDB-Moz	LXh.ort	13 07 32	40 15 32	200	1994
KM	PW0030, SDB-Moz	LXh.ort	14 54 24	38 28 17	620	1982
KMI	AO0150, SDB-Moz	LPe.ort	19 12 03	33 53 06	245	1994
KMm	PL0001, SDB-Moz	LXh.ort	14 25 08	38 11 15	420	1979
KMmx	-	LXh.ort	-	-	-	-
KMo	PA0101, SDB-Moz	LXh.hyp	14 03 25	40 02 32	275	1994
KMp	PI0042, SDB-Moz	LXh.are	14 47 04	38 46 30	560	1982
KMx	-	LXh.ort	-	-	-	-
l	ZU00137, SDB-Moz	LPe.ort	16 46 00	36 47 16	-	1995
M	-	SNh/PLe	-	-	-	-
MA	686, ref1	PLe.are	26 05 30	32 39 45	4	1961
MC	30, ref1	SNg.ver	26 02 30	32 24 55	2.5	1980
MCz	-	SNg.ver	-	-	-	-
MM	138, ref1	SNh.ort	26 08 30	32 19 20	35	1961
PA	153, ref1	LVx.ort	26 05 20	32 26 50	20	1961
PM	735, ref1	LXh.ort	26 14 40	32 24 10	20	1961
RI	1965, ref1	LPe.ort	26 56 00	32 00 15	600	1963
RV	1100, ref1	LXh.ort	25 57 20	32 01 15	450	1962
SC	28, ref1	CHI.ver	32 06 15	32 17 00	32	1980
SI	363, ref1	LPm.ort	26 36 55	32 18 40	50	1961
VA	ZU0009, SDB-Moz	ARo.chr	17 04 08	37 00 09	-	1995
VAI	AO0133, SDB-Moz	LPe.ort	19 04 16	33 46 10	340	1994
VAm	CA0155, SDM-Moz	ARo.chr	13 07 11	39 50 31	355	1994
VAmp	-	ARo.chr	-	-	-	-
VAp	-	ARo.chr	-	-	-	-
VApX	-	ARo.chr	-	-	-	-
VG	ZU0001, SDB-Moz	LVf.chr	16 59 07	36 57 53	110	1995
VGb	ZU0012, SDB-Moz	PHI.chr	16 47 59	37 04 44	165	1995
VGI	PN0561, SDB-Moz	LPe.chr	15 09 09	39 18 09	-	1993
VGm	PN0536, SDB-Moz	LVf.chr	15 09 09	39 18 09	-	1993
VGo	ZU0020, SDB-Moz	FRh.acr	16 51 11	36 50 13	-	1995
VGom	CN0064, SDB-Moz	FRh.lix	13 53 21	38 38 08	390	1994
VGomx	-	FRh.lix	-	-	-	-
VGp	ZU0021, SDB-Moz	ACh.hyp	16 52 04	36 47 40	-	1995
VGx	-	ACh.hyp	-	-	-	-
VM	PA0019, SDB-Moz	LXh.hyp	13 55 55	39 48 50	357	1983
VMb	PI0192, SDB-Moz	LXh.hyp	14 01 36	39 03 18	320	1994
VMI	AO0152, SDB-Moz	LXh.fer	-	-	510	1994
VMm	AO0187, SDB-Moz	LXh.hyp	19 25 05	33 34 12	500	1994
VMmx	AO0141, SDB-Moz	LXh.hyp	19 07 20	33 43 05	500	1994
VMo	ZU0016, SDB-Moz	LXh.hyp	17 02 11	37 10 23	130	1995
VMom	CN0188, SDB-Moz	LXh.hyp	13 34 00	39 14 00	400	1994

Table 4 : List of map unit components and their typifying pedons (part 3)

Component (Original code)	Typical profile	FAO Classification	Latitude (S)	Longitude (E)	Elevation (m)	Year of Survey
VMp	ZU0008, SDB-Moz	ACh.hyp	17 00 44	36 58 30	-	1995
VMpm	-	ACh.hyp	-	-	-	-
VMx	ZU0005, SDB-Moz	ACf.hyp	16 54 51	36 46 40	205	1995
WK	42, ref1	CMe.mol	-	-	-	-
Wkl	-	CMe.lit	-	-	-	-
Wkm	-	CMe.mol	-	-	-	-
Wkx	-	CMe.mol	-	-	-	-
WM	MP0107, SDB-Moz	CMe.mol	26 42 50	32 16 30	48	1963
WMI	-	CMe.lit	-	-	-	-
WMm	-	CMe.mol	-	-	-	-
WMmx	-	CMe.mol	-	-	-	-
WMx	-	CMe.mol	-	-	-	-
WP	53, ref1	LVh.ort	-	-	-	-
WPI	MM0019, SDB-Moz	PHI.lit	25 13 50	32 27 15	87	1963
WPm	-	LVh.ort	-	-	-	-
WPv	-	LVh.ver	-	-	-	-
WV	206, ref1	LVh.eca	-	-	-	1980
WVI	-	LVh.lit	-	-	-	-
WVm	-	LVh.eca	-	-	-	-
WVmx	-	LVh.eca	-	-	-	-

* ref 1 : Os solos das Províncias de Maputo E Gaza. Nota Explicativa Dos Mapas De Solos. Escalas 1 :50,000 e 1 :250,000. Departamento de Terra E Água, INIA. 1993, Maputo, Mozambique.

** ref 2 : Land Resources Appraisal Report, district of Xai-Xai (Volume II), Departamento de Terra E Água, INIA. 1995, Maputo, Mozambique.

*** SDB-MOZ : Computerized Soil Database of Mozambique