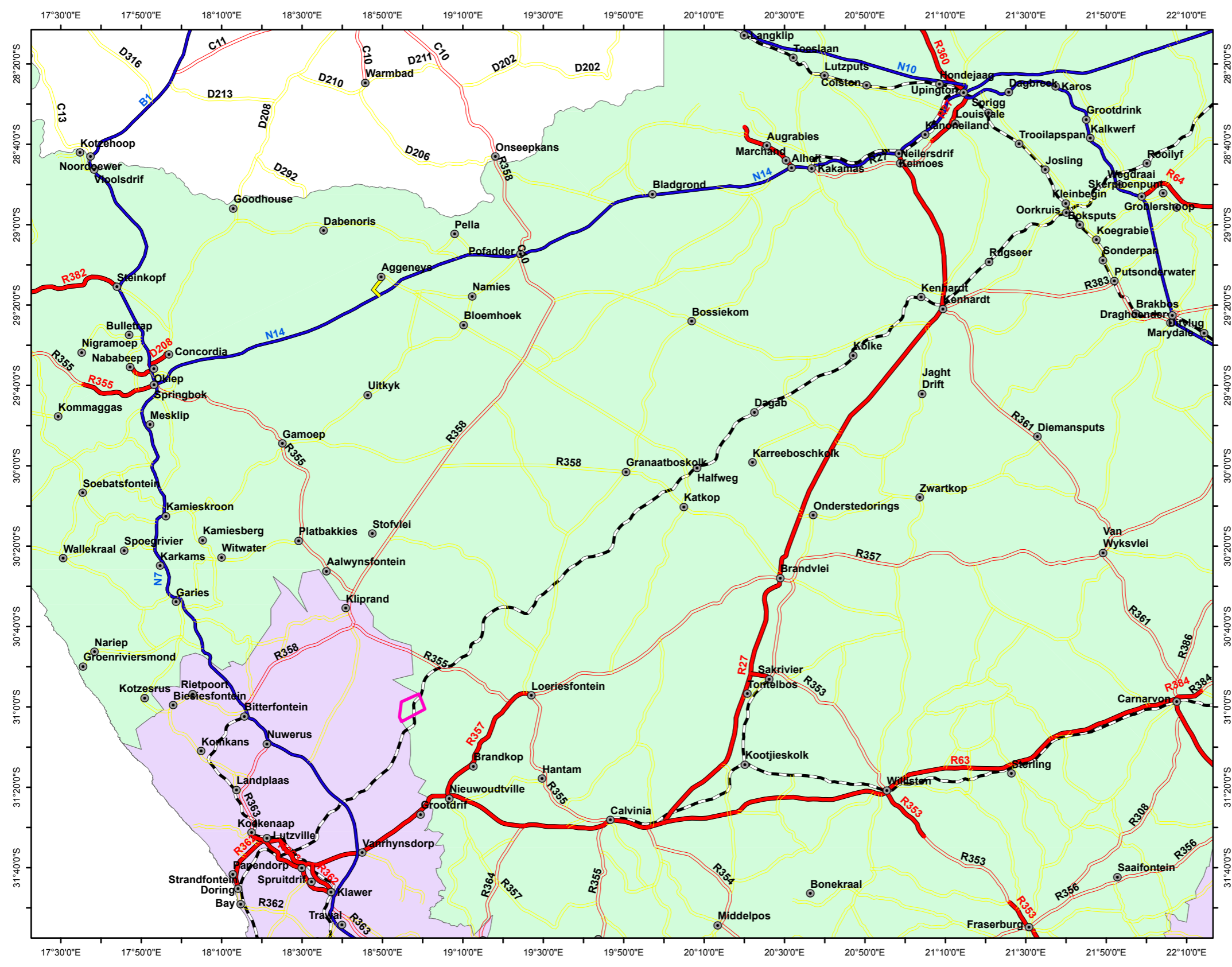
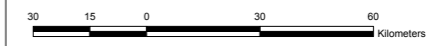


REGIONAL LOCATION OF KANAKIES 332



LEGEND

- Towns
- ▭ Farm boundary Kanakies332
- Main tar
- Main untarred
- National
- Secondary tar
- Secondary untarred
- Railways
- Northern Cape
- Western Cape





 Marna Swart
 M.Sc., Pr.Sci.Nat., Pr.GISc.
 GIS Professional PGP0041
 KookGIS
 Tel 083 456 3738
 Email:
 kookgis@gmail.com



 © Copyright www.cabangaconcepts.co.za

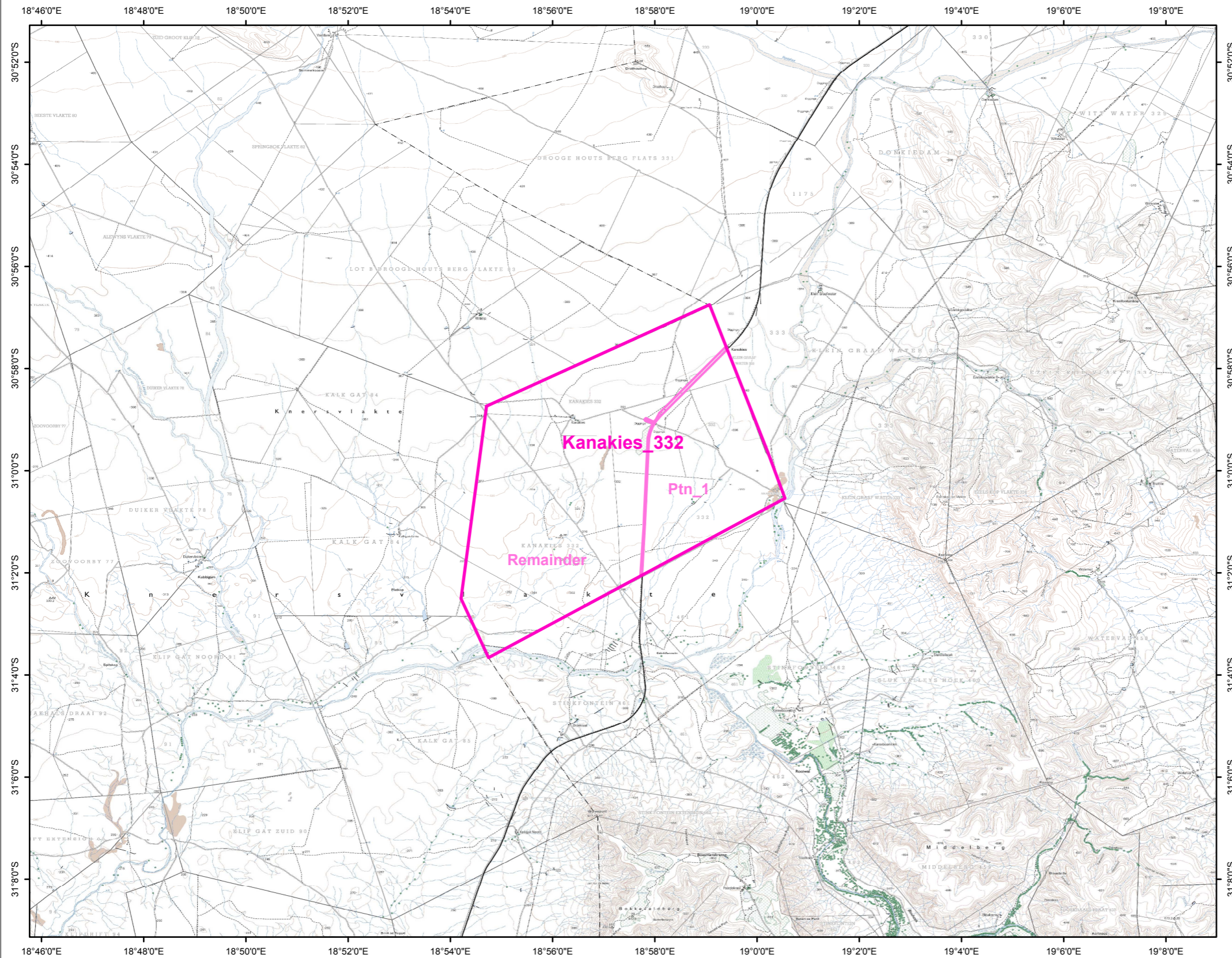
COORDINATE INFO:
 Datum: WGS84
 Spheroid: WGS84
 Projection: Decimal Degrees

Project:
 Loeriesfontein = MRA
 Printed: 2018/01/11

File:
 G:\Projects\NorthernCape\Loeriesfontein\Kanakies332\MXD\Location_regional_RoadAtlas_20180112_FN.mxd

Figure - Regional location

LOCAL SETTING



LEGEND

- Farm boundary Kanakies332
- Farm portions Kanakies332

1:50 000 Topographical sheets
from NGI:
3018DD
3019CC
3118BB
3119AA



Mama Swart
M.Sc.; Pr. Sci. Nat.; Pr. GISc.
GIS Professional PGP0041
KookGIS
Tel 083 456 3738
Email:
kookgis@gmail.com



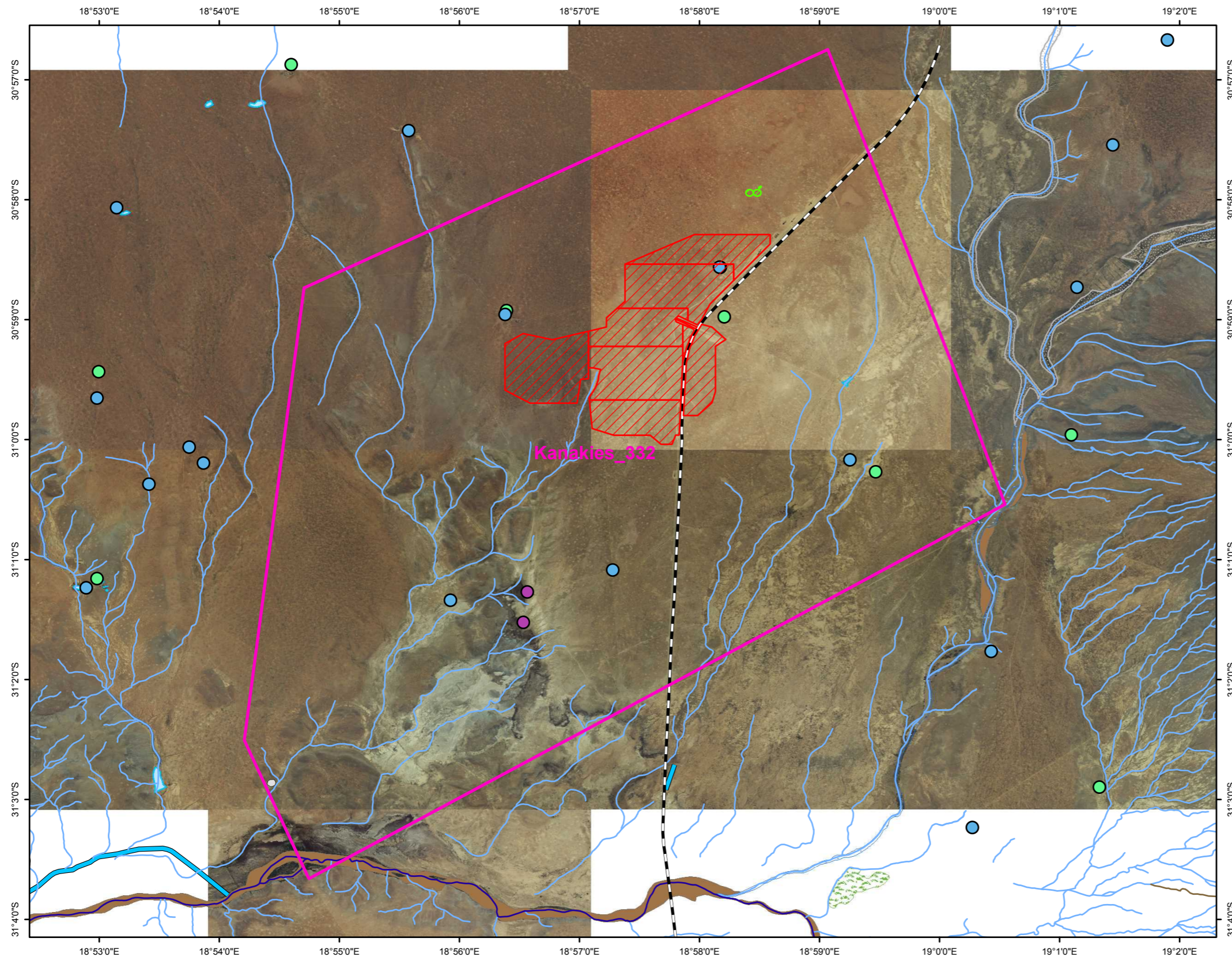
COORDINATE INFO:
Datum: WGS84
Sferoed: WGS84
Projection: Decimal Degrees

Project:
Loeriesfontein = Kanakies MRA
Printed: 2018/01/20

File:
G:\Projects\NorthernCape\Loeriesfontein\Kanakies332\MXD\
Location_local_topo50k_20180120_FN.mxd

Figure - Local Setting

MINE LAYOUT KANAKIES 332



LEGEND

Farm boundary Kanakies332

Mine Works - TYPE

Infrastructure area

Mine / pit areas

Railway lines

FEAT_TYPE

● Spring

● Water Reservoir

● Wind Pump

River Types - FEAT_TYPE

— Non-Perennial River Centre line

Hydrology Areas - FEAT_TYPE

Dam

Dry Pan

Dry Water Course

Flood Bank Area

Non-Perennial River

Non-perennial pan

Open Reservoir

Perennial Pan

Perennial River

Vlei

Aerial Photos NGI & date photographed:
 3018DD_20, 3018DD_23 & 3018DD_24 = 2016
 3018DD_25 = 2013
 3019CC_21 = 2014
 3118BB_03, 3118BB_04 & 3118BB_05 = 2016
 3118BB_09 = 2013
 3119AA_01 = 2014



Mama Swart
 M. Sc., Pr. Sci./Nat., Pr. GISc.
 GIS Professional PGP0041
 KookGIS
 Tel 083 456 3738
 Email:
 kookgis@gmail.com



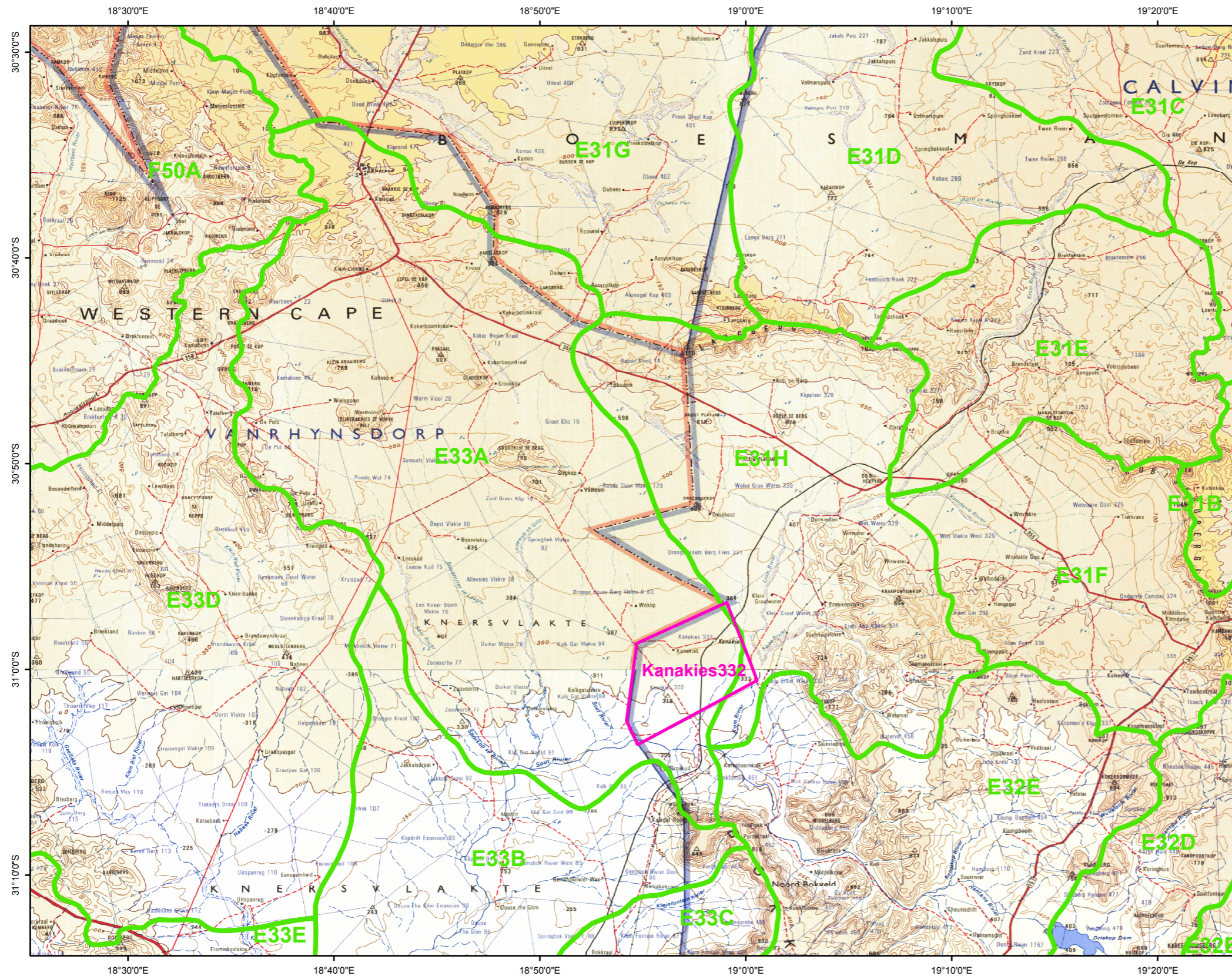
COORDINATE INFO:
 Datum: WGS84
 Stereoid: WGS84
 Projection: Decimal Degrees

Project:
 Loeriesfontein - Kanakies332 MRA
 Printed: 2018/02/01

File:
 G:\Projects\NorthernCape\Loeriesfontein\Kanakies332\MXD\
 MineLayout_AerialPhotos_20180201_n04_WGSDD.mxd

Figure: Mine Layout

QUATERNARY CATCHMENTS



LEGEND

- Farm boundary Kanakies332
- Quaternary catchments

Kanakies332 is mostly inside quaternary catchment E33A, with a little part falling in E31H.
 E33A = 135476.703764 ha
 E31H = 72607.071598 ha

1:250 000 Topographical sheets from NGI:
 3018
 3118



Mama Swart
 M. Sc., Pr. Sci. Nat., Pr. GISc.
 GIS Professional PGP0041
 KookGIS
 Tel 083 456 3738
 Email: kookgis@gmail.com



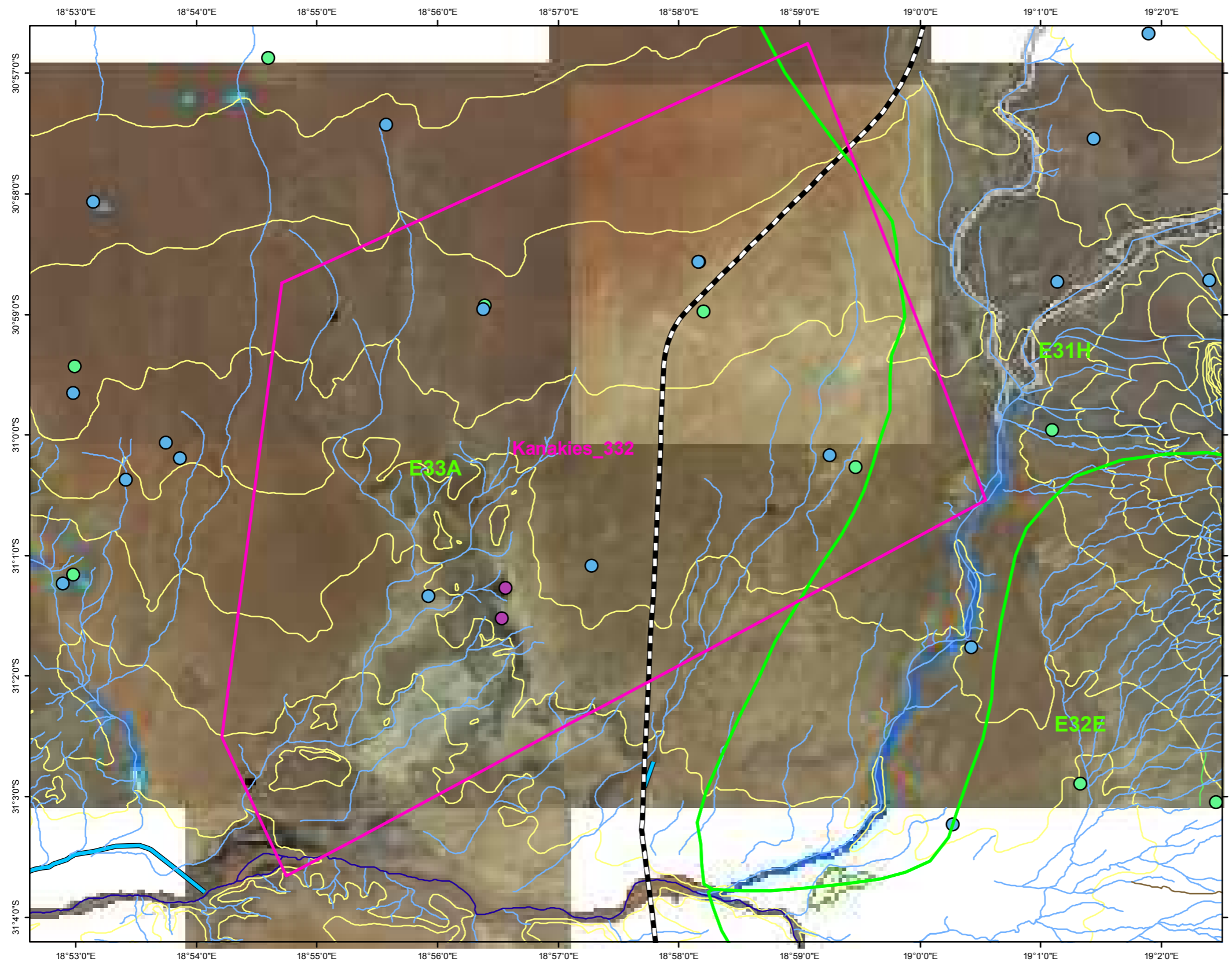
COORDINATE INFO:
 Datum: WGS84
 Spheroid: WGS84
 Projection: Decimal Degrees

Project:
 Loeriesfontein - Kanakies332 MRA
 Printed: 2018/01/23

File:
 G:\Projects\NorthernCape\Loeriesfontein\Kanakies332\MXD\catchments_quaternary_topo250k_20180123_FN.mxd

Figure - Catchments

SURFACE WATER HYDROLOGY



LEGEND

- Farm boundary Kanakies332
- Quaternary Catchments
- Railway lines

FEAT_TYPE

- Spring
- Water Reservoir
- Wind Pump

River Types - FEAT_TYPE

- Non-Perennial River Centre line

HEIGHT

- - 580.000000
- 600.000000 - 860.000000
- 880.000000 - 1060.000000
- 1080.000000 - 1240.000000
- 1260.000000 - 1700.000000

Hydrology Areas - FEAT_TYPE

- Dam
- Dry Pan
- Dry Water Course
- Flood Bank Area
- Non-Perennial River
- Non-perennial pan
- Open Reservoir
- Perennial Pan
- Perennial River
- Vlei

Aerial Photos NGI & date photographed:
 3018DD_20, 3018DD_23 & 3018DD_24 = 2016
 3018DD_25 = 2013
 3019CC_21 = 2014
 3118BB_03, 3118BB_04 & 3118BB_05 = 2016
 3118BB_09 = 2013
 3119AA_01 = 2014



Mama Swart
 M.Sc.; Pr.Sci.Nat.; Pr.GISc.
 GIS Professional PGP0041
 KookGIS
 Tel 083 456 3738
 Email:
 kookgis@gmail.com



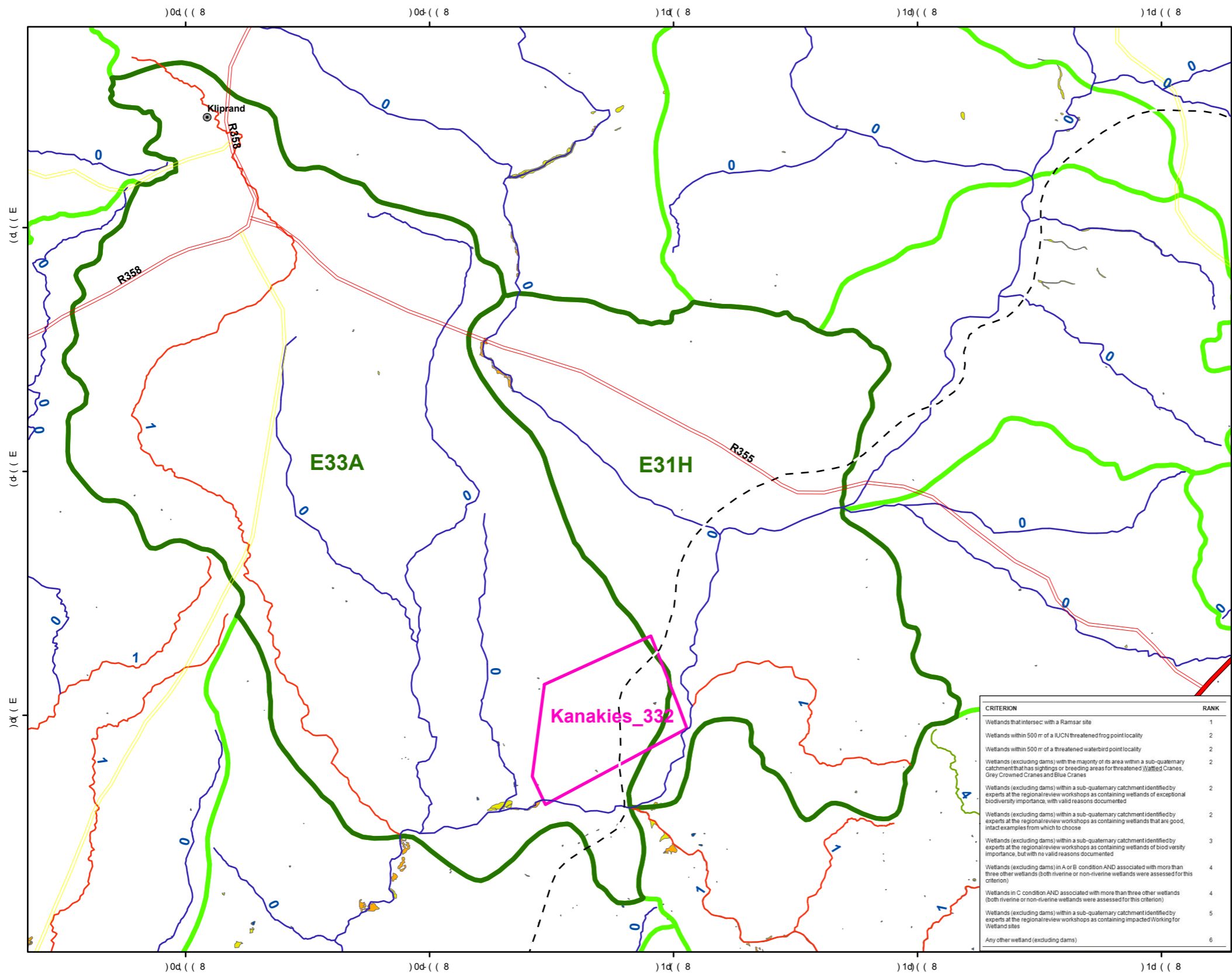
COORDINATE INFO:
 Datum: WGS84
 Spheroid: WGS84
 Projection: Decimal Degrees

Project:
 Loeriesfontein - Kanakies332 MRA
 Printed: 2018/01/29

File:
 G:\Projects\NorthernCape\Loeriesfontein\Kanakies332\MXD\
 SurfaceWater_Hydrology_AerialPhotos_20180129_n04.mxd

Figure: Surface Water Hydrology

WETLANDS RANK & RIVER STATUS OF THE NATIONAL FRESHWATER ECOSYSTEMS PRIORITY AREAS PROJECT (NFEPA)



LEGEND

- Fa
 - LT LI
 - LT LI\PO
 - EPN Q\l\ L\PO
 - DLT\l\l
- FEPACODE**
- (@ E L _) - DTPA PRXP
 -) 98 5 T C_L P L\l\ 6L NSXP
 - @ L _ (3 1.
 - 9TS9E5 98 5) 3- /
 - 9TS6 \l\ DP , 3 (
 - SL P 98 5
 - , G \PLX
 - 9LX M _ Q\l\ = L L P
 - C_L P L\l\ 6L NSXP
 - E\l\ _ QTRC_L P L\l\ 6L NSXP
- Wetlands - RANK**
- -
 -

CRITERION	RANK
Wetlands that intersect with a Ramsar site	1
Wetlands within 500m of a IUCN threatened frog point locality	2
Wetlands within 500m of a threatened waterbird point locality	2
Wetlands (excluding dams) with the majority of its area within a sub-quaternary catchment that has sightings or breeding areas for threatened (Wattled Cranes, Grey Crowned Cranes and Blue Cranes)	2
Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands of exceptional biodiversity importance, with valid reasons documented	2
Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands that are good, intact examples from which to choose	2
Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing wetlands of biodiversity importance, but with no valid reasons documented	3
Wetlands (excluding dams) in A or B condition AND associated with more than three other wetlands (both riverine or non-riverine wetlands were assessed for this criterion)	4
Wetlands in C condition AND associated with more than three other wetlands (both riverine or non-riverine wetlands were assessed for this criterion)	4
Wetlands (excluding dams) within a sub-quaternary catchment identified by experts at the regional review workshops as containing impacted/working for Wetland sites	5
Any other wetland (excluding dams)	6

@ @8 5 9WR ST \TP T 8 5 8) NL NSXP

E_XXL\l\l SP98 5 DTPA E L _ _ TR

L_X P L\l\l OP a SP2

) 3 9 \P Sa L P 8 N b PX \l\l T b 5 \l\l "98 5

3 9 TS _ \ l\l \l\l \l\l \l\l \l\l

3 SL P 98 5

, 3 G \l\l XL LRPXP L\l\l

T L NP a SP P PLWQSP PXL

NL PR \l\l P\l\l PO SP L

SP Q W\l\l TR \l\l Q \l\l NP2

98 5 f SL P 98 5 9TSQ Lg \

f 9 TS N \l\l Tg L O SP f G \l\l XL LRPXP L\l\l P

Scale bar: 0 1 2 3 4 5 6 7 8 9 10 km

North arrow

Scale: 1:100,000

CABANGA environmental

© Copyright www.cabangaconcepts.co.za

6AAD7 @F8 @A2

7L_X2H: E0,

E0 @PC2H: E0,

\l\l NT 27 FNK LW PRPP

\l\l N2

P\l\l Q PT = L L P D5

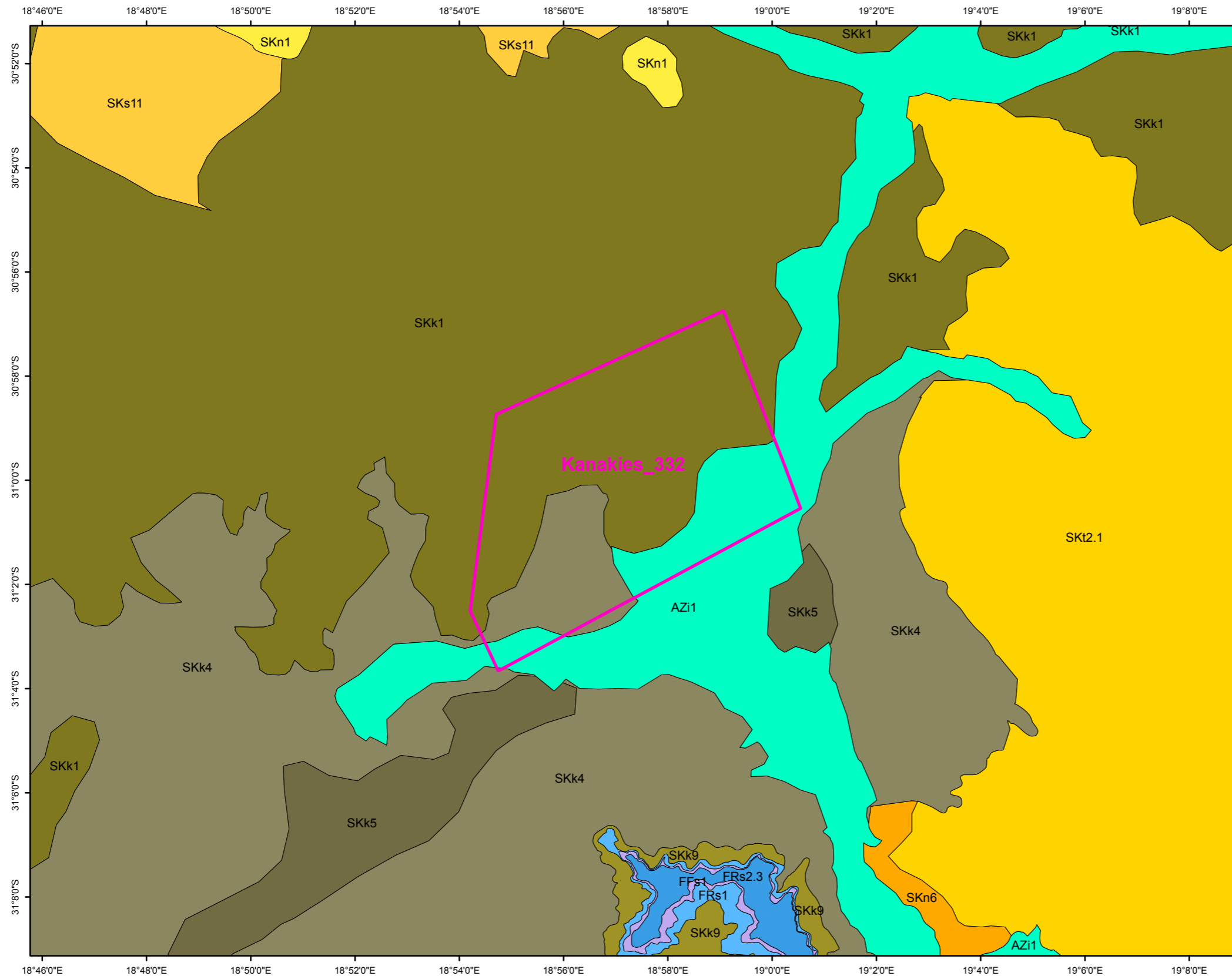
\l\l PC2 () ()

2 \l\l N @ \l\l SA 6L P P P Q PT = L L P 17

\l\l T P Ka P W OK @ LK () () K @ T P L _ Ka P W OL & 17

Figure - Wetlands & Rivers (NFEPA)

VEGETATION of Mucina & Rutherford (VEGMAP2012)



LEGEND:

- Farm boundary Kanakies332
- Vegetation Types - MAPCODE12**
- FFs 1 Bokkeveld Sandstone Fynbos
- FRs 1 Vanrhynsdorp Shale Renosterveld
- FRs 2 Nieuwoudtville Shale Renosterveld
- SKn 1 Namaqualand Klipkoppe Shrubland
- SKn 6 Kamiesberg Mountains Shrubland
- SKs 11 Namaqualand Arid Grassland
- SKk 1 Northern Knersvlakte Vygieveld
- SKk 4 Knersvlakte Shale Vygieveld
- SKk 5 Vanrhynsdorp Gannabosveld
- SKk 9 Kobee Succulent Shrubland
- SKt 2 Hantam Karoo
- AZi 1 Namaqualand Riviere

VEGMAP2012
Released 2017/07/06

MAPCODE12
Code for a vegetation type.
Types added in 2006
correspond with codes in
Mucina and Rutherford (2006).
Vegetation types added in
subsequent versions have been
assigned new codes.
Follows BiomeCode+BioregionCode+Sequence.



Mama Swart
M.Sc., Pr.Sci.Nat., Pr.GISc.
GIS Professional PGP0041
KookGIS
Tel 083 456 3738
Email:
kookgis@gmail.com



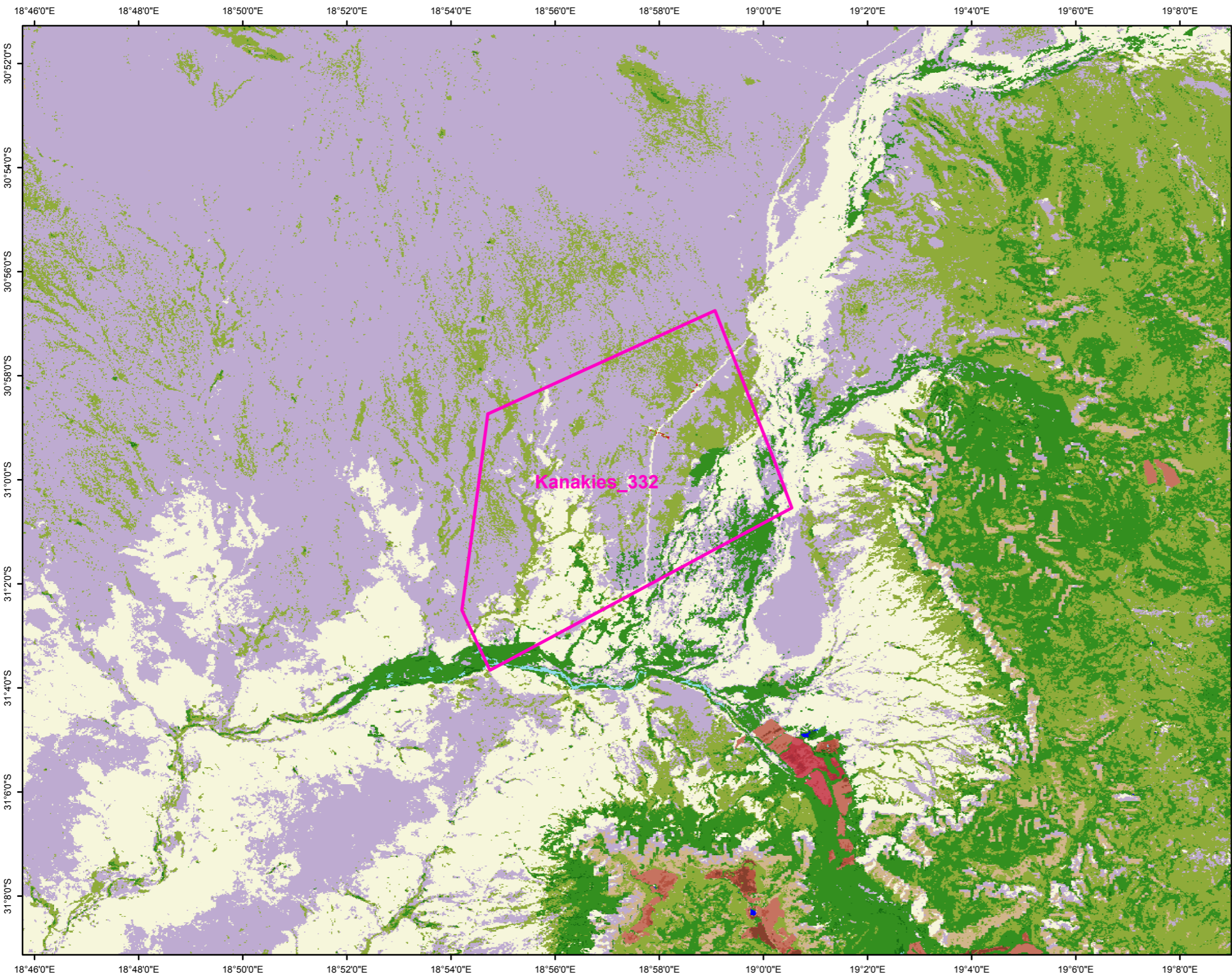
COORDINATE INFO:
Datum: WGS84
Sferoed: WGS84
Projection: Decimal Degrees

Project:
Loeriesfontein - Kanakies332 MRA
Printed: 2018/01/20

File: File:
G:\Projects\NorthernCape\Loeriesfontein\Kanakies332\MXD\
Vegetation_VegMap2012_SANBI_20180120_n01.mxd

Figure - Vegetation

LANDCOVER

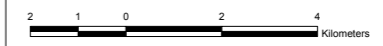


Legend

- Farm boundary Kanakies332
- National Landcover - Class_Names x72**
- Bare none vegetated
- Cultivated comm fields (high)
- Cultivated comm fields (low)
- Cultivated comm fields (med)
- Cultivated orchards (high)
- Cultivated orchards (low)
- Cultivated orchards (med)
- Grassland
- Low shrubland
- Mines 1 bare
- Mines 2 semi-bare
- Shrubland fynbos
- Thicket /Dense bush
- Water permanent
- Water seasonal
- Wetlands
- Woodland/Open bush

Landcover - refers to the observed physical surface of the earth, including various combinations of vegetation types, soils, exposed rocks, water bodies.
 Landuse - refers to the purpose to which land is committed, including the production of goods (such as crops, timber and manufactures) and services (such as defence, recreation, biodiversity and natural resources protection).
http://www.ruraldevelopment.gov.za/phocadownload/spatial_planning_information/NLUSW/international_perspective26_27june13.pdf

Owner Copyright: GeoTerralmage
 Dataset source: Landsat 8 multispectral imagery of April 2013 - March 2014
 Data released 2015/02/04



Mama Swart
 M.Sc.; Pr.Sci.Nat.; Pr.GISc.
 GIS Professional PGP0041
 KookGIS
 Tel 083 456 3738
 Email: kookgis@gmail.com



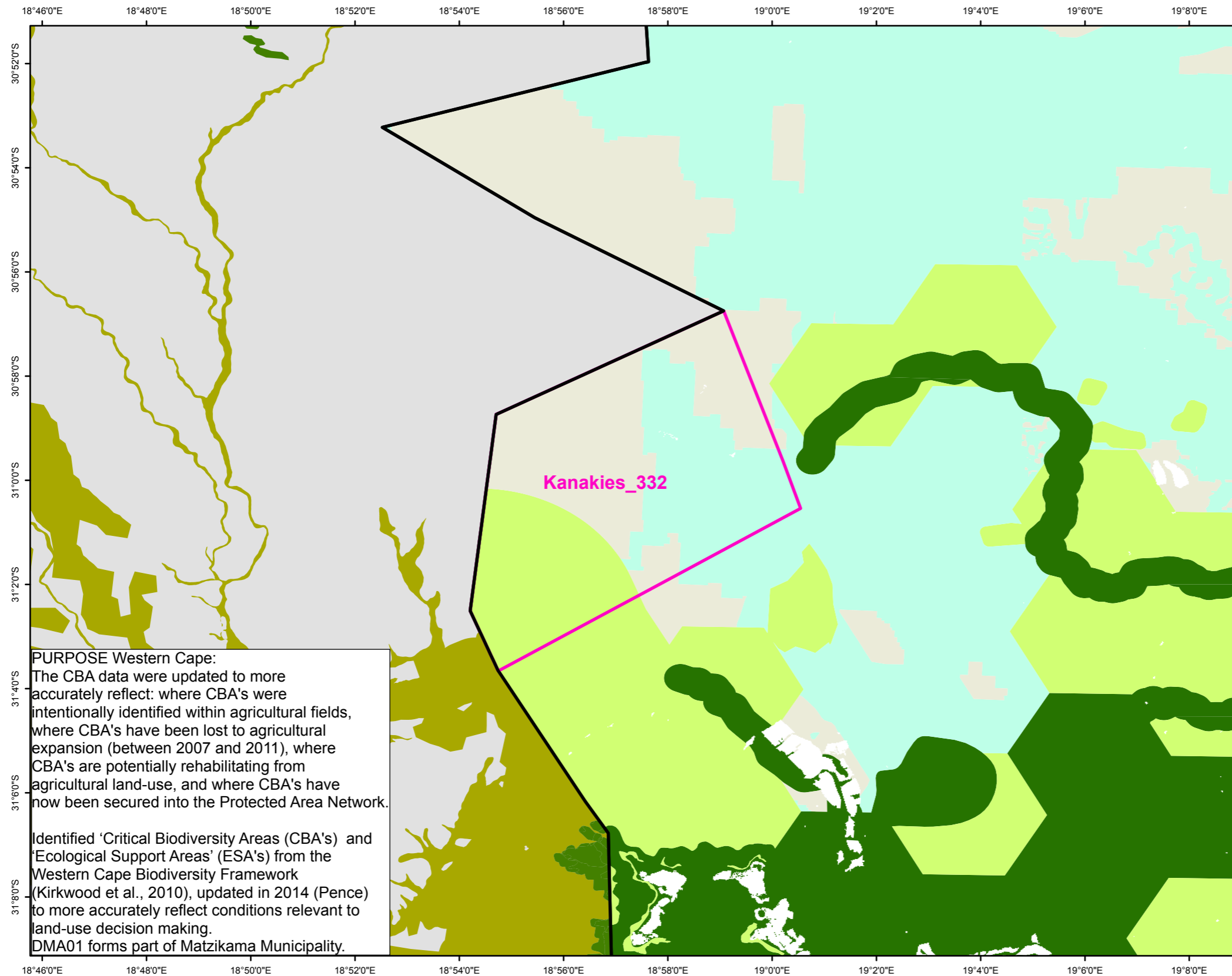
COORDINATE INFO:
 Datum: WGS84
 Spheroid: WGS84
 Projection: Decimal Degrees

Project:
 Loeriesfontein - Kanakies332 MRA
 Printed: 2018/01/20

File:
 G:\Projects\NorthernCape\Loeriesfontein\Kanakies332\MXD\Landcover_NLC_-_DEA2014_20180120_n01.MXD

Figure - Landcover

CRITICAL BIODIVERSITY AREAS (CBA)



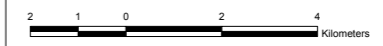
Legend

- Farm boundary Kanakies332
- WesternCape: CBA category NEW_CAT**
- CBA = Critical Biodiversity Area
- ESA = Ecological Support Area
- WesternCape Matzikama Municipality
- NorthernCape: CBA Category CBA_Cat**
- Protected Area
- Critical Biodiversity Area One
- Critical Biodiversity Area Two
- Ecological Support Area
- Other Natural Areas

DATA OWNERSHIP:
 Western Cape CBA&ESA data:
 Cape Nature
 Date released 2014/03/31

Northern Cape CBA data:
 Northern Cape Department of
 Environment and Nature Conservation
 Data released 2016

PURPOSE Northern Cape:
 The CBA Map identifies
 biodiversity priority areas, called
 Critical Biodiversity Areas (CBA's)
 and Ecological Support Areas (ESA's),
 which, together with protected areas,
 are important for the persistence of a
 viable representative sample of all
 ecosystem types and species as
 well as the long-term ecological
 functioning of the landscape as a whole.



Mama Swart
 M.Sc.; Pr.Sci.Nat.; Pr.GISc.
 GIS Professional PGP0041
 KookGIS
 Tel 083 456 3738
 Email:
 kookgis@gmail.com



COORDINATE INFO:
 Datum: WGS84
 Spheroid: WGS84
 Projection: Decimal Degrees

Project:
 Loeriesfontein - Kanakies332 MRA
 Printed: 2018/01/20

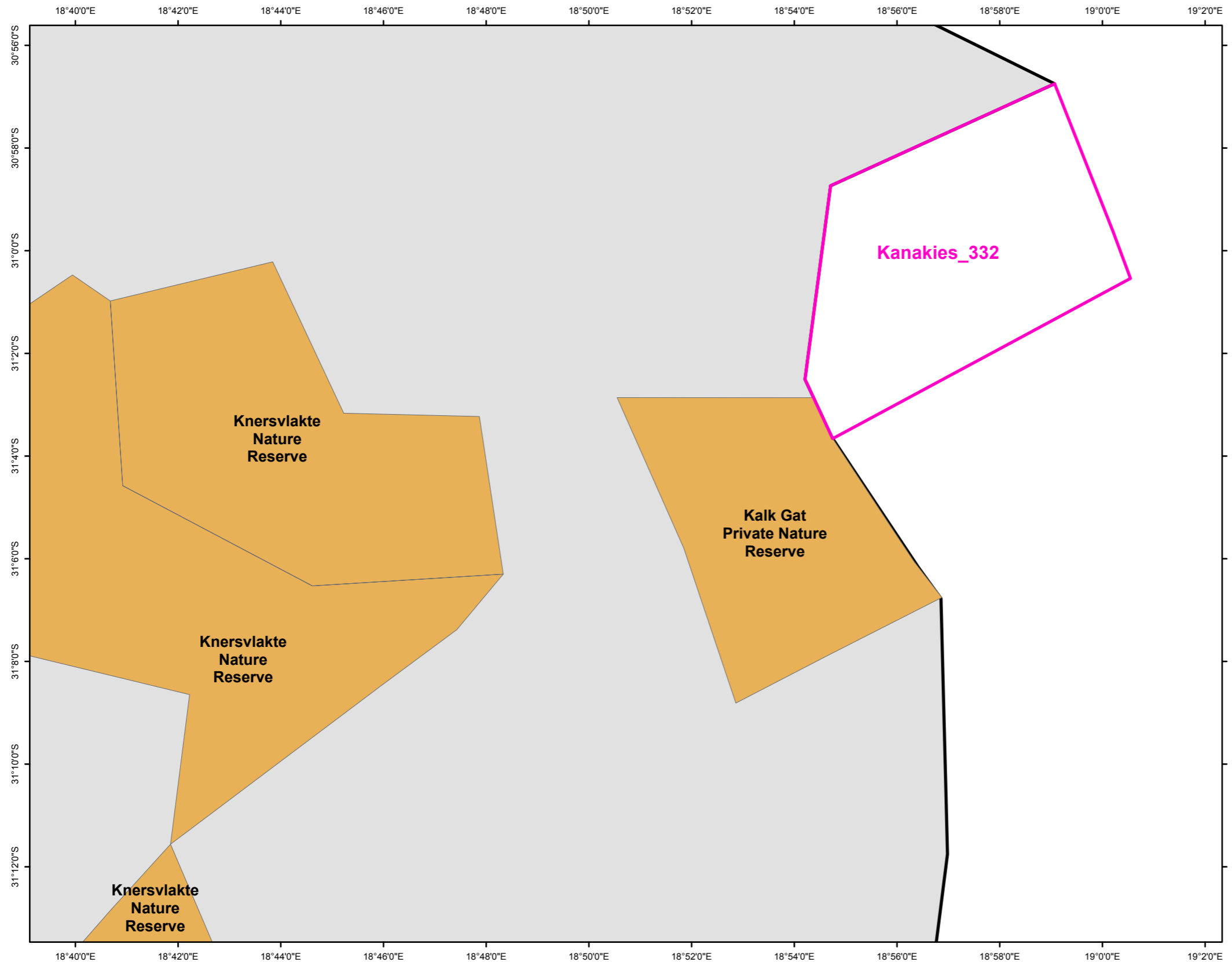
File:
 G:\Projects\NorthernCape\Loeriesfontein\Kanakies332\MXD\Biodiversity_Critical_CapeNature2014_DEA2016_20180120_n01.mxd

Figure - Biodiversity Critical












PURPOSE Western Cape:
 The CBA data were updated to more accurately reflect: where CBA's were intentionally identified within agricultural fields, where CBA's have been lost to agricultural expansion (between 2007 and 2011), where CBA's are potentially rehabilitating from agricultural land-use, and where CBA's have now been secured into the Protected Area Network.

Identified 'Critical Biodiversity Areas (CBA's) and 'Ecological Support Areas' (ESA's) from the Western Cape Biodiversity Framework (Kirkwood et al., 2010), updated in 2014 (Pence) to more accurately reflect conditions relevant to land-use decision making.
 DMA01 forms part of Matzikama Municipality.

PROTECTED AREAS (SAPAD)



Legend

-  Farm boundary Kanakies332
- Protected Areas - SITE_TYPE**
-  Forest Nature Reserve
-  Forest Wilderness Area
-  Marine Protected Area
-  Mountain Catchment Area
-  National Park
-  Nature Reserve
-  Protected Environment
-  Special Nature Reserve
-  World Heritage Site
-  WesternCape Matzikama Municipality

South Africa Protected Areas Database

Responsible for data:
 Department of Environmental Affairs
 Director
 Enterprise
 Geospatial Information Management
 Data released 2017/09/21



Mama Swart
 M.Sc.; Pr.Sci.Nat.; Pr.GISc.
 GIS Professional PGP0041
 KookGIS
 Tel 083 456 3738
 Email:
 kookgis@gmail.com



COORDINATE INFO:
 Datum: WGS84
 Spheroid: WGS84
 Projection: Decimal Degrees

Project:
 Loeriesfontein - Kanakies332 MRA
 Printed: 2018/01/20

File:
 G:\Projects\NorthernCape\Loeriesfontein\Kanakies332\MXD\ProtectedAreas_SAPAD2017Q3_DEA_20180120_n01.mxd

Figure - Protected Areas (SAPAD)