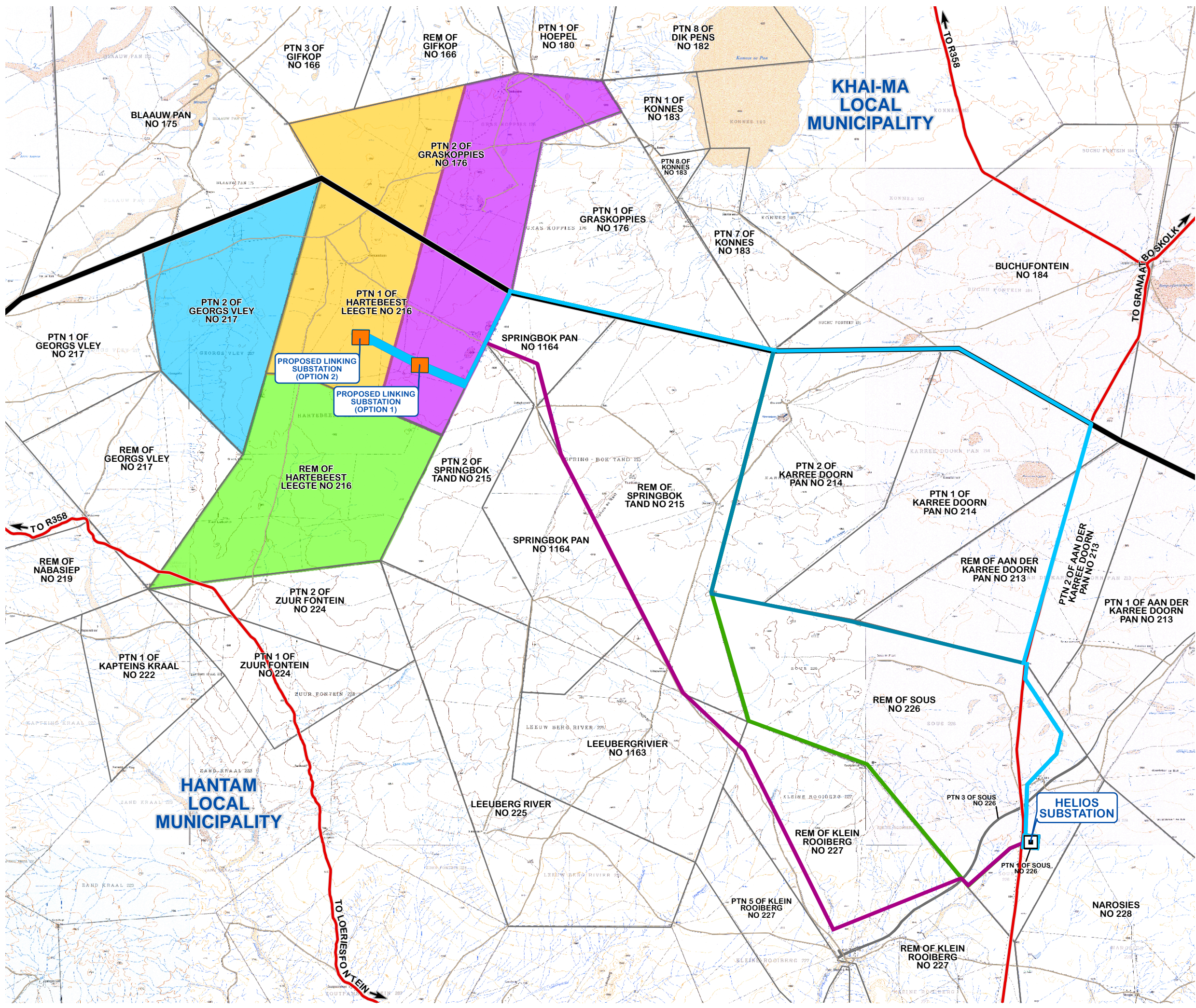


**PROPOSED CONSTRUCTION OF FOUR WIND FARMS AND ASSOCIATED GRID CONNECTION**  
**NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE**  
**PROJECT OVERVIEW**



- Legend**
- Local Municipal Boundaries
  - Secondary Roads
  - Local Access Roads
  - Adjoining Farm Boundaries
  - Helios Substation
  - Proposed Linking Substation Site Alternatives

- Proposed Wind Farm Projects**
- Graskoppies Wind Farm
  - Hartebeestleegte Wind Farm
  - Ithemba Wind Farm
  - Xha! Boom Wind Farm

- Proposed Corridor Alternatives**
- Option 1
  - Option 2
  - Option 3
  - Option 4

SOURCE: MUNICIPAL DEMARCATION BOARD, 2011  
 NGI, 2014

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Map Ref No 13622/BID_01	Revision 2	Date 23/05/2017

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**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE**

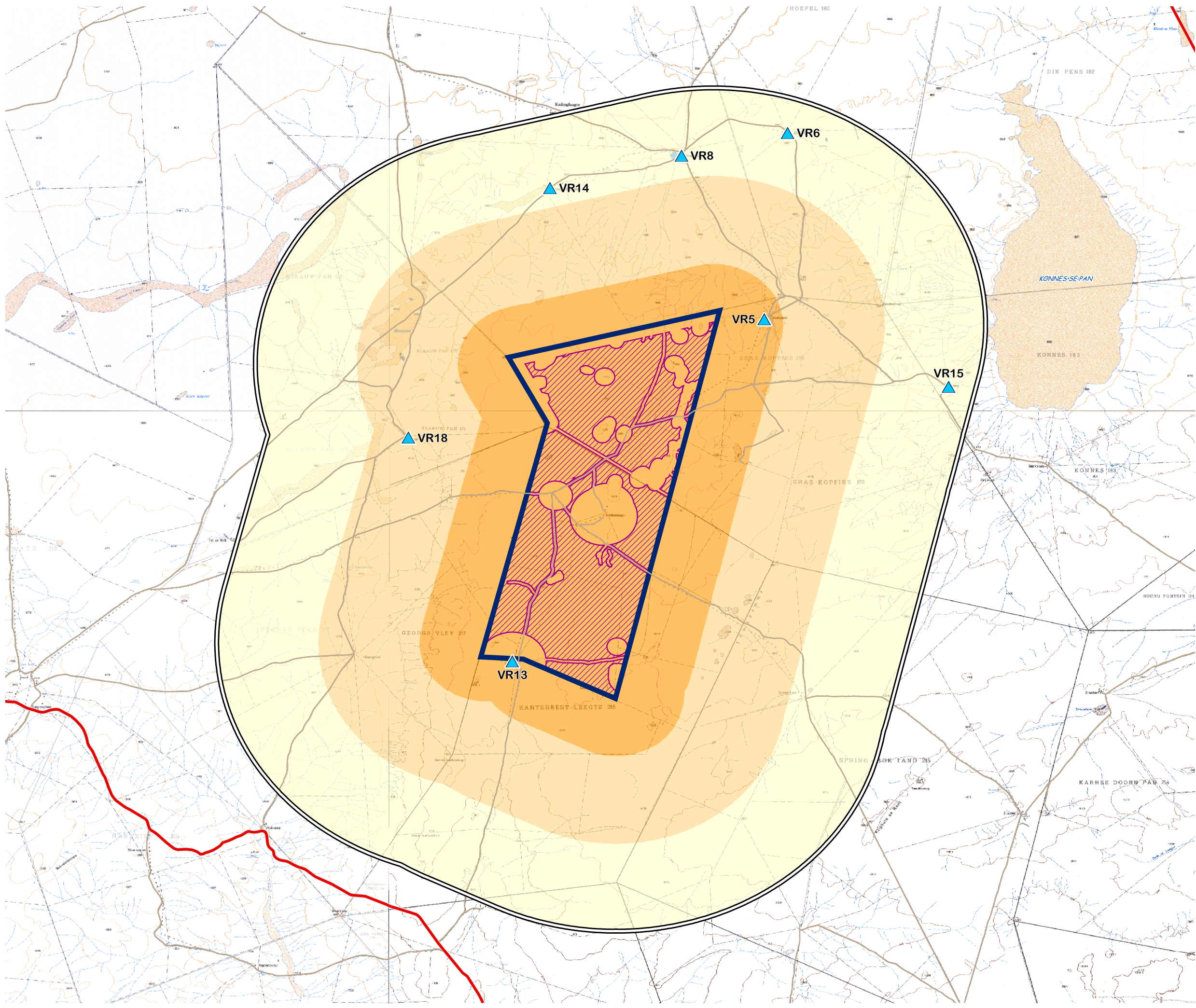
**VISUAL ASSESSMENT:  
POTENTIALLY SENSITIVE  
VISUAL RECEPTOR LOCATIONS**

**Legend**

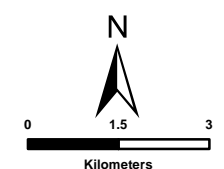
-  Secondary Roads
-  Local Access Roads
-  Ithemba Wind Farm Application Site
-  8km Visual Assessment Zone
-  Buildable Area
-  Potentially Sensitive Receptor Locations

**Zones of Potential Visual Impact**

-  High Impact (<=2kms)
-  Moderate Impact (2.1 - 5kms)
-  Low Impact (>5kms)



SOURCE:  
NGI, 2014



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51 WESSELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA

Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

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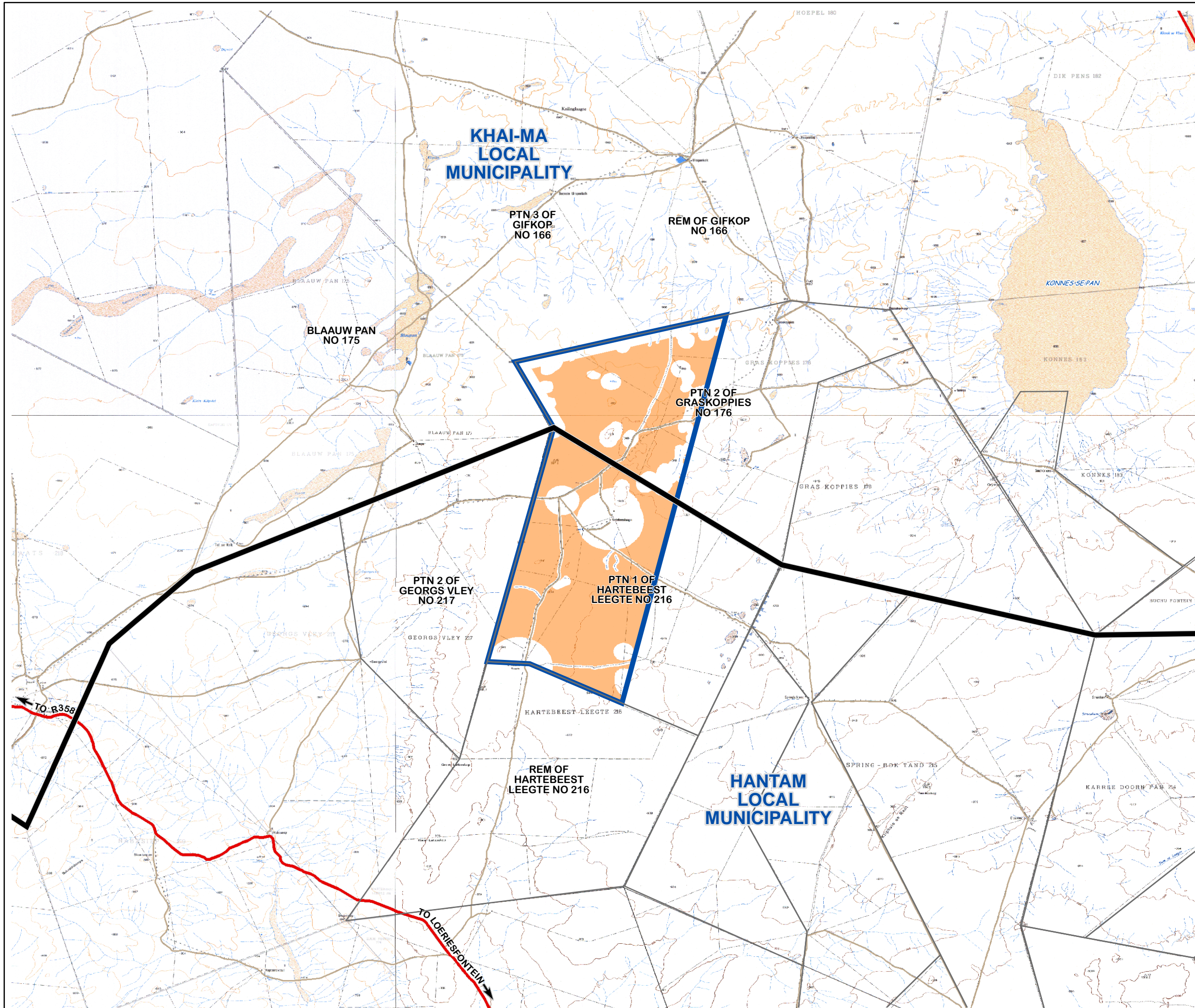
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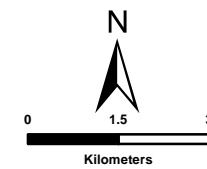
**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
SITE LOCALITY**

**Legend**

-  Local Municipal Boundaries
-  Secondary Roads
-  Local Access Roads
-  Adjoining Farm Boundaries
-  Ithemba Wind Farm Application Site
-  Buildable Area



SOURCE:  
MUNICIPAL DEMARCATION BOARD, 2011  
NGI, 2014



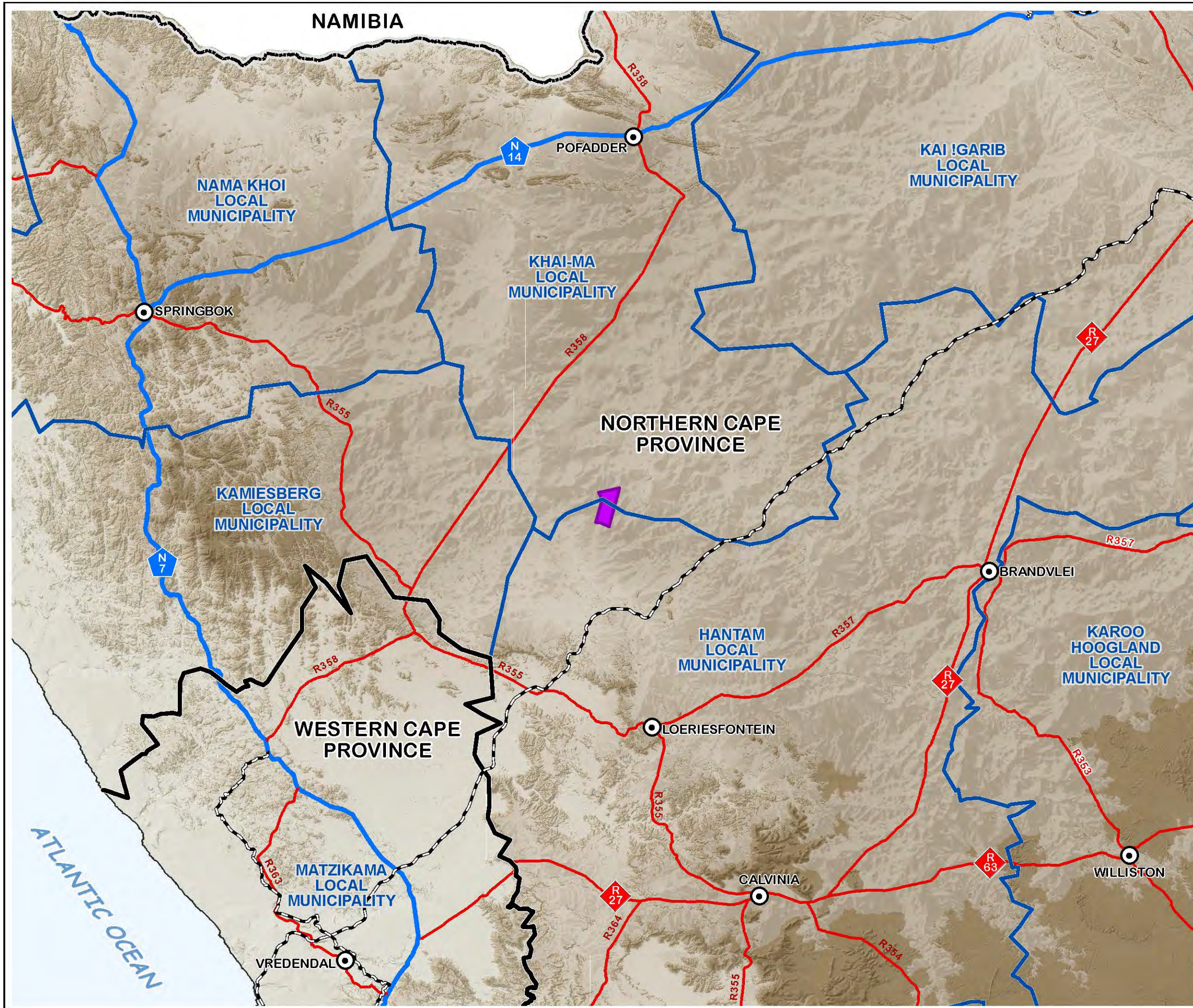
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RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA  
Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

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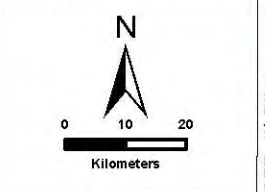




**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
REGIONAL CONTEXT**

- Legend**
- National Boundary
  - Provincial Boundaries
  - Local Municipal Boundaries
  - National Routes
  - Main Arterial Routes
  - Railways
  - Main Towns
  - Ithemba Wind Farm Application Site

SOURCE: MUNICIPAL DEMARCATION BOARD, 2011  
NGI, 2014



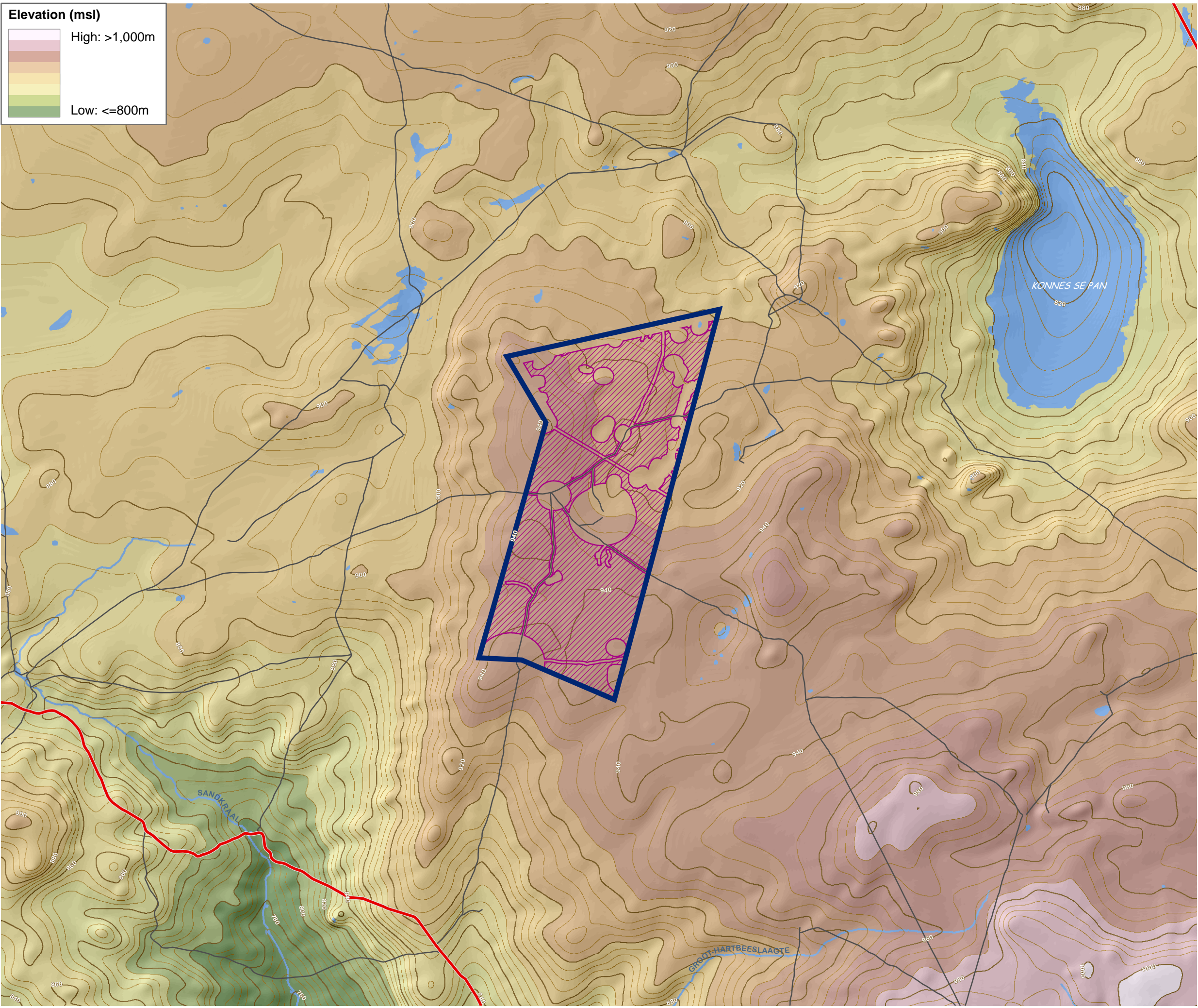
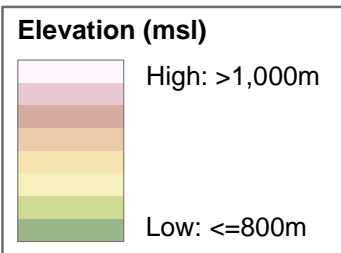
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RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA  
Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

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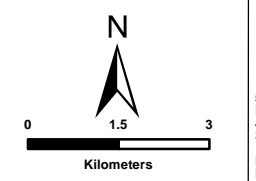




**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
TOPOGRAPHY**

- Legend**
- Secondary Roads
  - Local Access Roads
  - Main Watercourses
  - Contours (20m Interval)
  - Contours (5m Interval)
  - Pans/Wetlands/Waterbodies
  - Ithemba Wind Farm Application Site
  - Buildable Area

SOURCE:  
NGI, 2014



**SIVEST**

ENVIRONMENTAL DIVISION  
51 WESSELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA

Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

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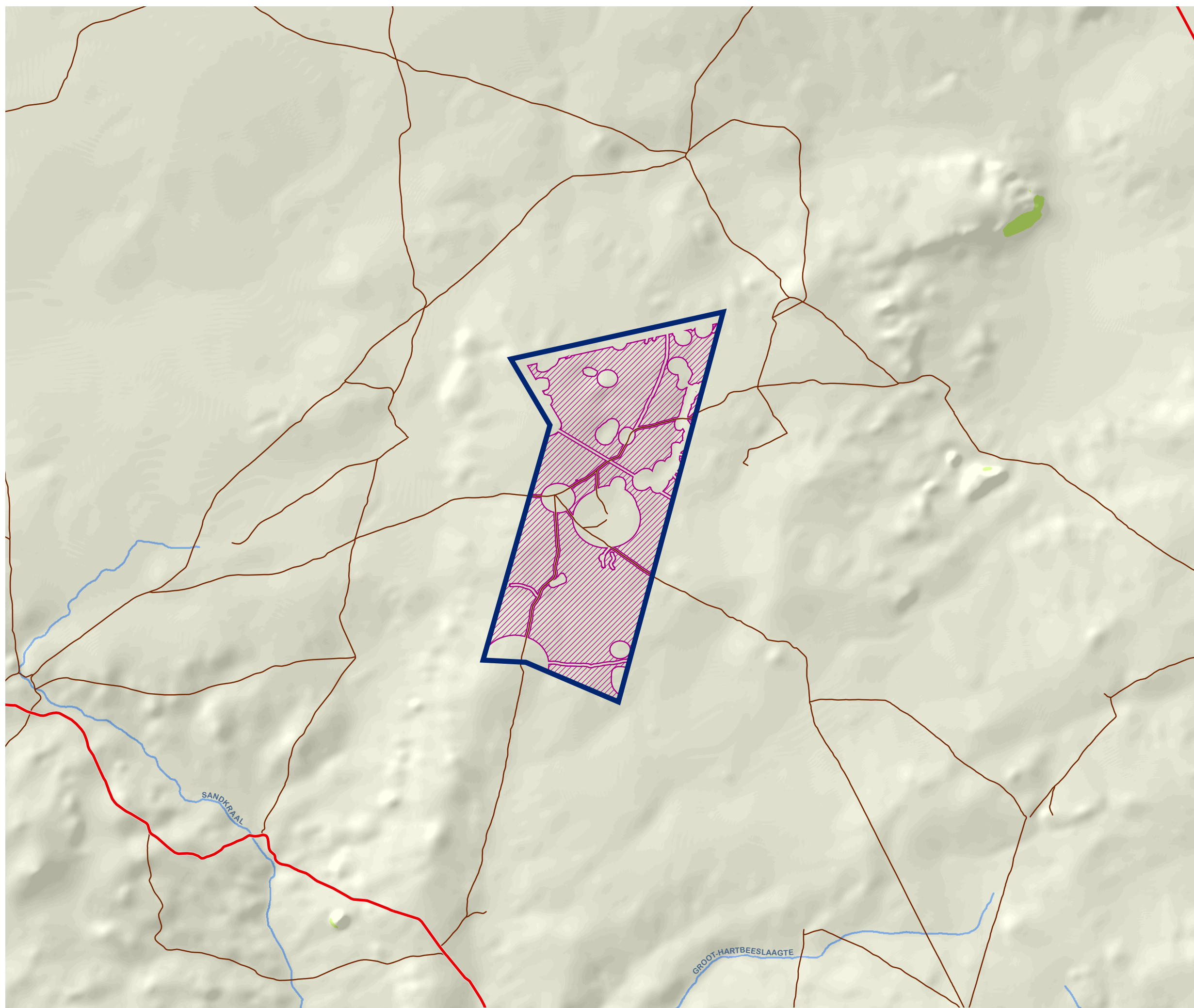
**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
SLOPE CLASSIFICATION**

**Legend**

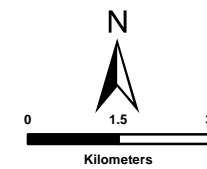
-  Secondary Roads
-  Local Access Roads
-  Main Watercourses
-  Ithemba Wind Farm Application Site
-  Buildable Area

**Slope Classification  
(Percent Rice)**

-  <= 8%
-  8.01 - 12%



SOURCE:  
NGI, 2014



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51 WESSELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA

Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

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<b>Map Ref No</b> 13622/EA_I04	<b>Revision</b> 0	<b>Date</b> _____



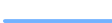


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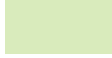






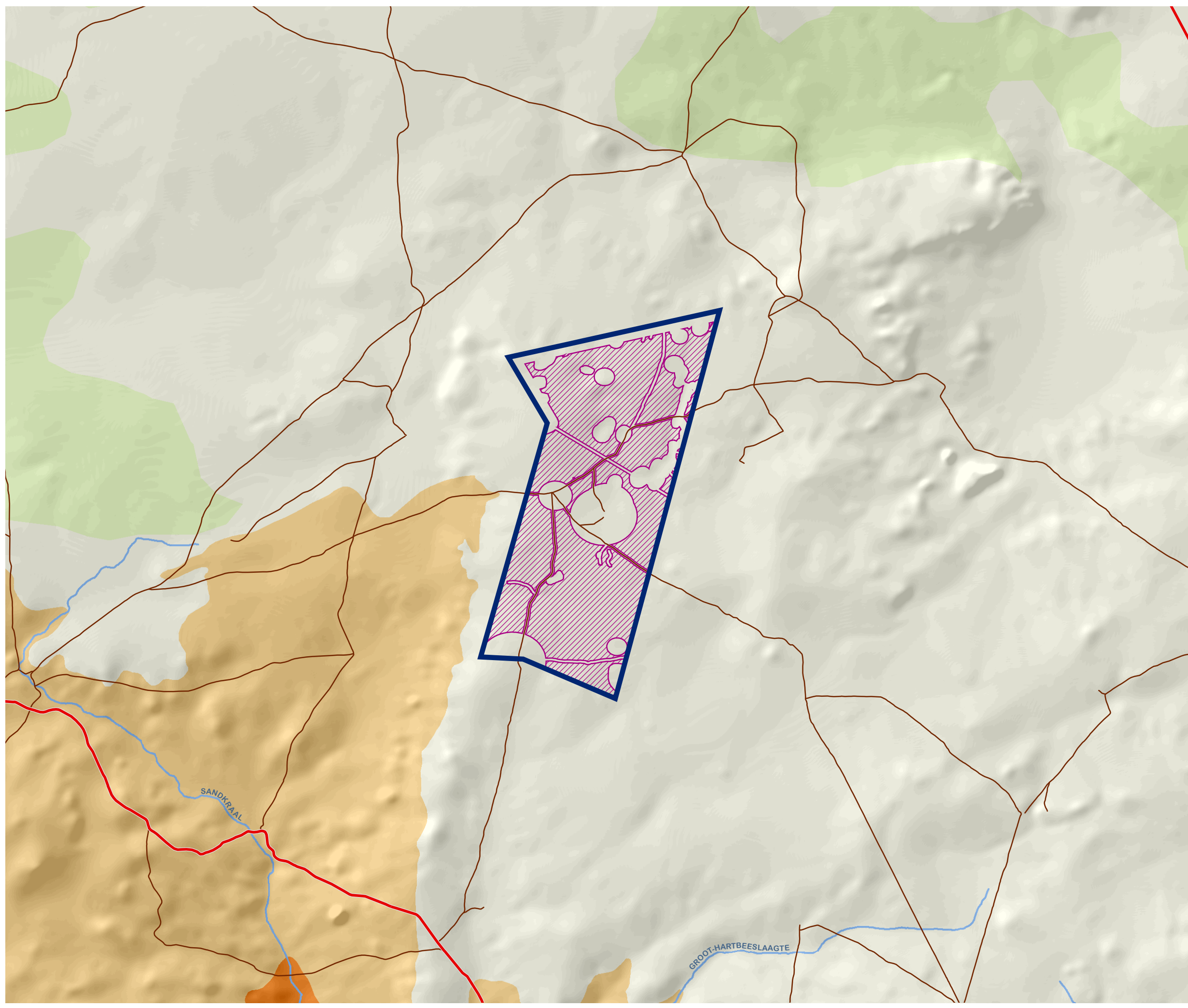
**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
VEGETATION CLASSIFICATION**

**Legend**

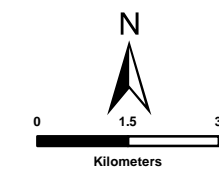
-  Secondary Roads
-  Local Access Roads
-  Main Watercourses
-  Ithemba Wind Farm Application Site
-  Buildable Area

**Vegetation Classification**

-  Bushmanland Arid Grassland
-  Bushmanland Basin Shrubland
-  Bushmanland Vloere
-  Western Bushmanland Klipveld
-  Namaqualand Blomveld



SOURCE:  
NGI, 2014  
SANBI, 2012



**ENVIRONMENTAL DIVISION**  
51 WESSELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA

Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

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<b>Map Ref No</b> 13622/IE_105	<b>Revision</b> 0	<b>Date</b> _____



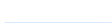




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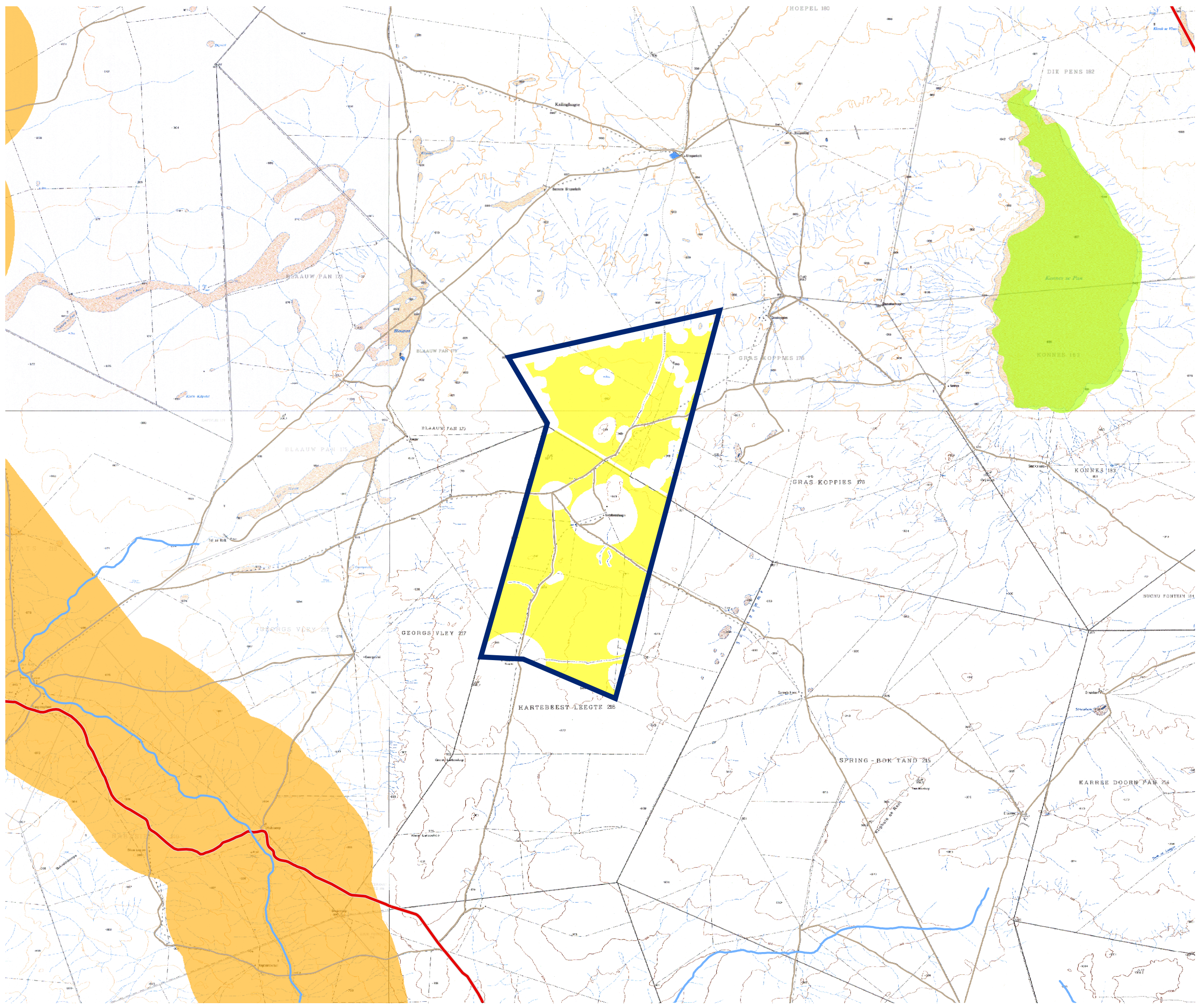
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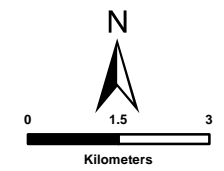
**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
CRITICAL BIODIVERSITY AREAS  
(TERRESTRIAL)**

**Legend**

-  Secondary Roads
  -  Local Access Roads
  -  Main Watercourses
  -  Ithemba Wind Farm Application Site
  -  Buildable Area
- Critical Biodiversity Areas**
-  CBA2
  -  ESA



SOURCE:  
NGI, 2014  
SANBI, 2012  
NAMA-KWA DISTRICT BIODIVERSITY SECTOR PLAN, 2008



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51 WESSELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA  
Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

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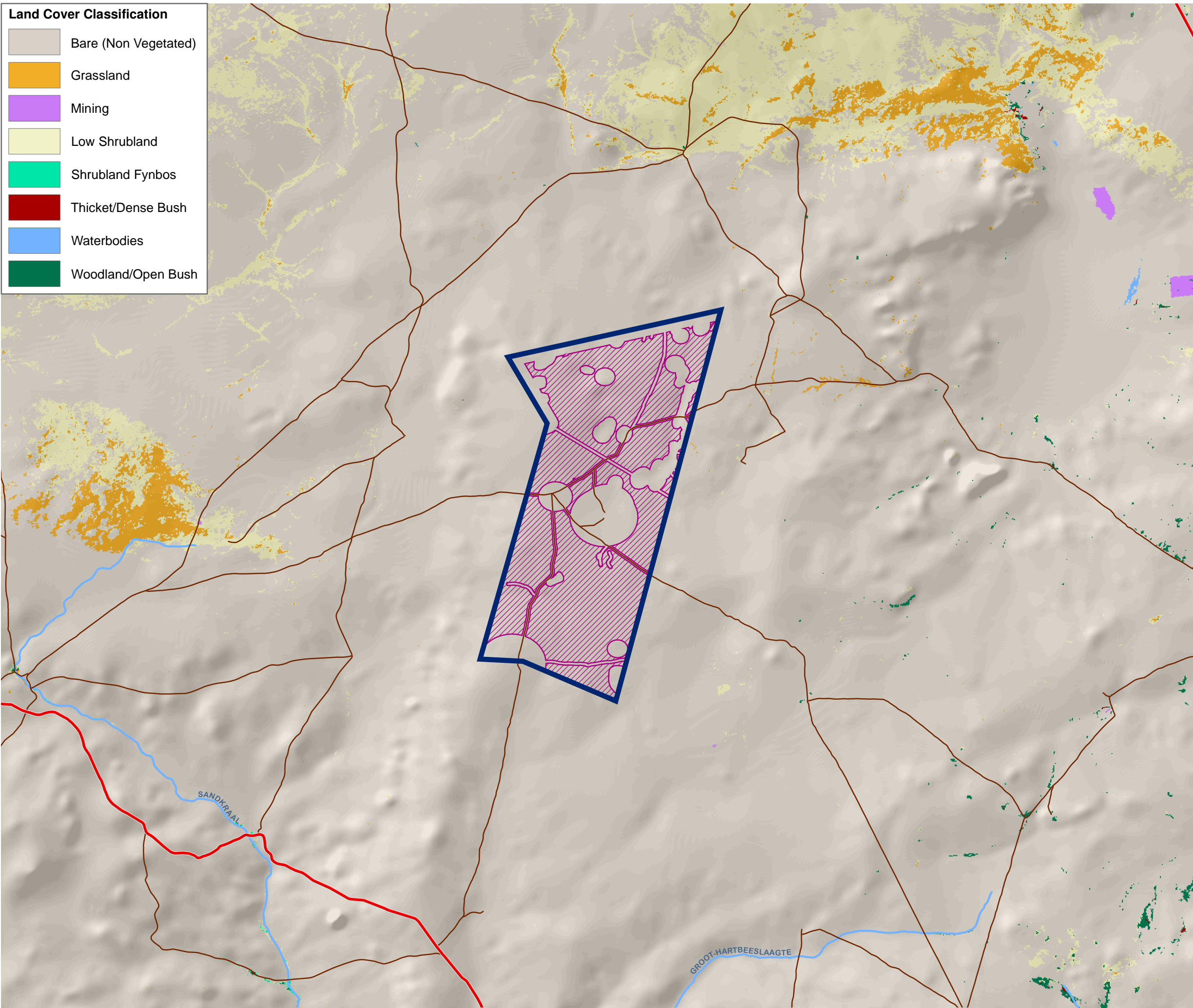
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**Land Cover Classification**

-  Bare (Non Vegetated)
-  Grassland
-  Mining
-  Low Shrubland
-  Shrubland Fynbos
-  Thicket/Dense Bush
-  Waterbodies
-  Woodland/Open Bush

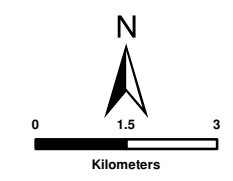


**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
BROAD LAND COVER  
CLASSIFICATION**

**Legend**

-  Secondary Roads
-  Local Access Roads
-  Main Watercourses
-  Ithemba Wind Farm Application Site
-  Buildable Area

SOURCE:  
2013-2014 SA NATIONAL LAND COVER  
(© GEOTERRAIMAGE - 2014)



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ENVIRONMENTAL DIVISION  
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RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA  
Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

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<b>Map Ref No</b> 13622/EA_I06	<b>Revision</b> 0	<b>Date</b> _____







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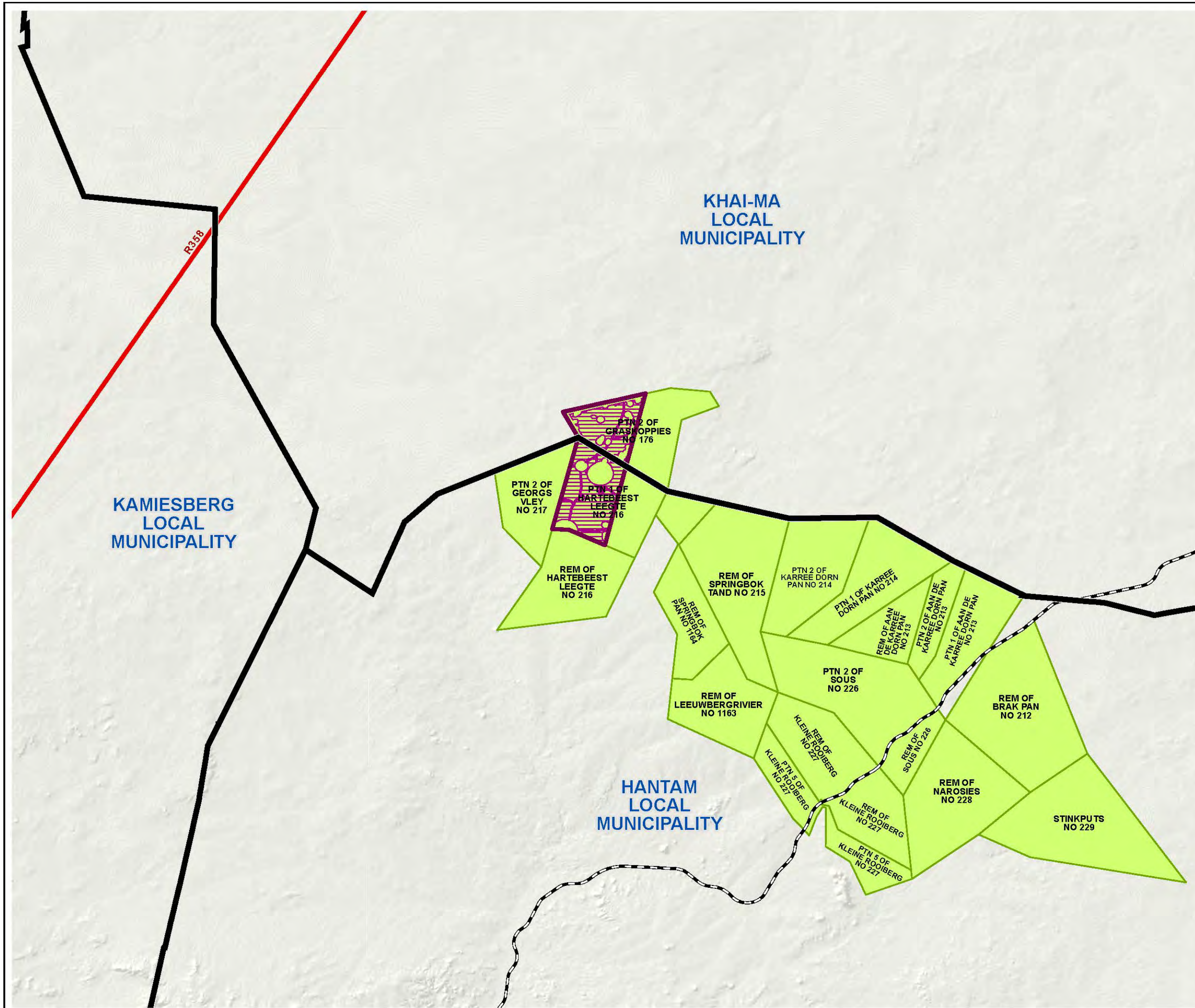
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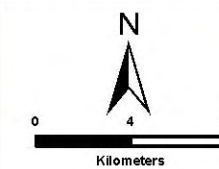
**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
OTHER PROPOSED RENEWABLE  
ENERGY DEVELOPMENTS**

**Legend**

-  Local Municipal Boundaries
-  Main Arterial Routes
-  Railways
-  Ithemba Wind Farm Application Site
-  Buildable Area
-  Renewable Energy Application Sites



SOURCE: MUNICIPAL DEMARCATION BOARD, 2011  
NGI, 2014



**ENVIRONMENTAL DIVISION**  
51 WESSELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA  
Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
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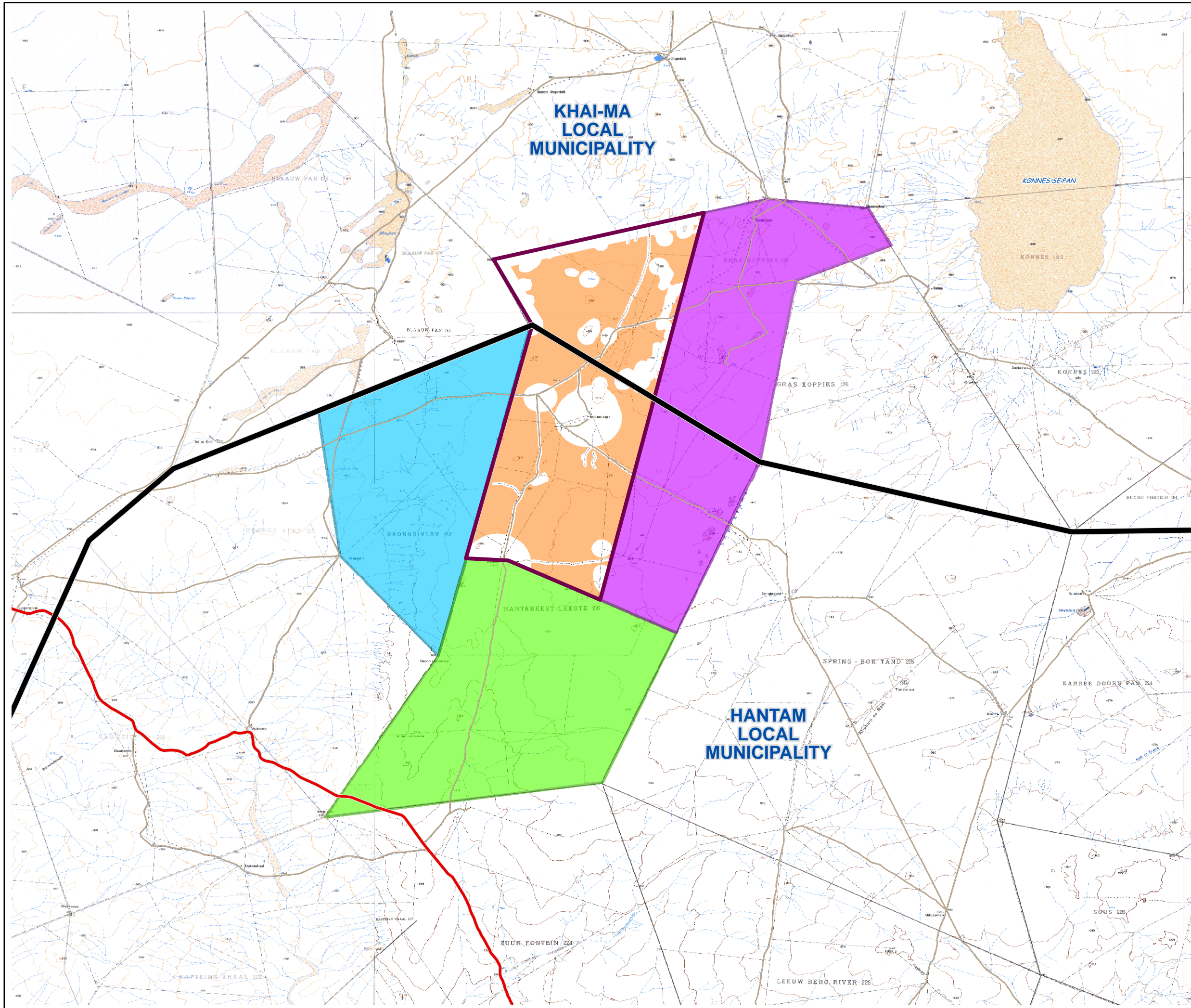
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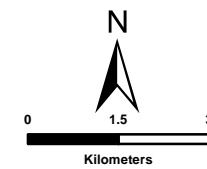
**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
ADJACENT MAINSTREAM  
WIND FARM PROJECTS**



**Legend**

-  Local Municipal Boundaries
  -  Secondary Roads
  -  Local Access Roads
  -  Ithemba Wind Farm Application Site
  -  Buildable Area
- Adjacent Mainstream Wind Farm Projects**
-  Graskoppies Wind Farm Application Site
  -  Hartebeest Leegte Wind Farm Application Site
  -  Xha! Boom Wind Farm Application Site

SOURCE:  
MUNICIPAL DEMARCATION BOARD, 2011  
NGI, 2014



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51 WESSELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA  
Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

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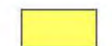

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**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
'NO-GO' AREAS**

**Legend**

-  Local Access Roads
-  Ithemba Wind Farm Application Site
-  Buildable Area
-  Proposed Ithemba Substation Site Alternatives
-  Proposed Turbine Positions

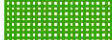
**Avifaunal 'No-Go' Areas**

-  Turbines and Infrastructure

**Bat 'No-Go' Areas**

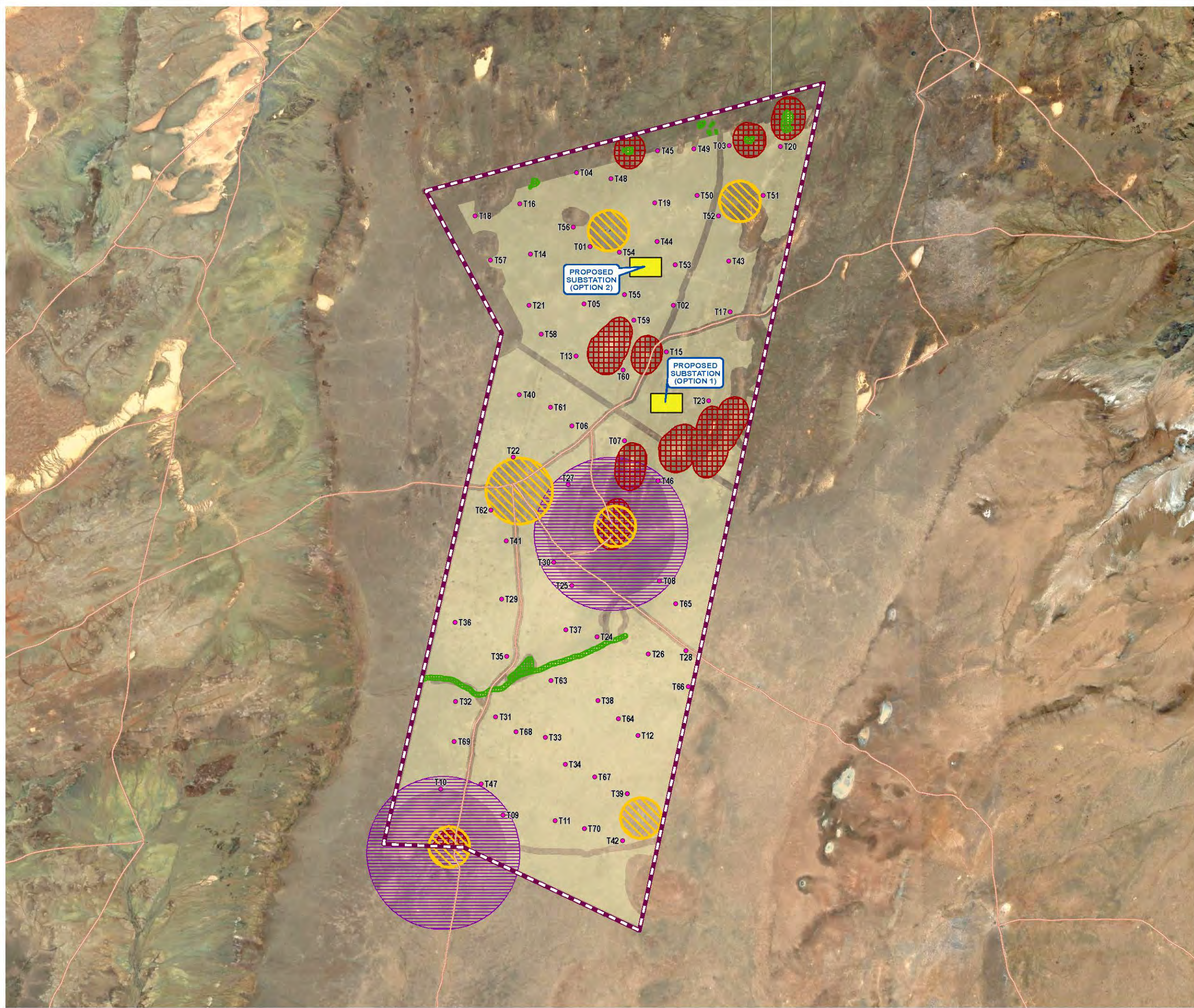
-  Turbines Only

**Ecological 'No-Go' Areas**


-  Turbines Only

**Noise 'No-Go' Areas**


-  Turbines Only




SOURCE:  
NGI, 2014  
SANBI, 2012



N



Kilometers



**ENVIRONMENTAL DIVISION**  
51 WESELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA

Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

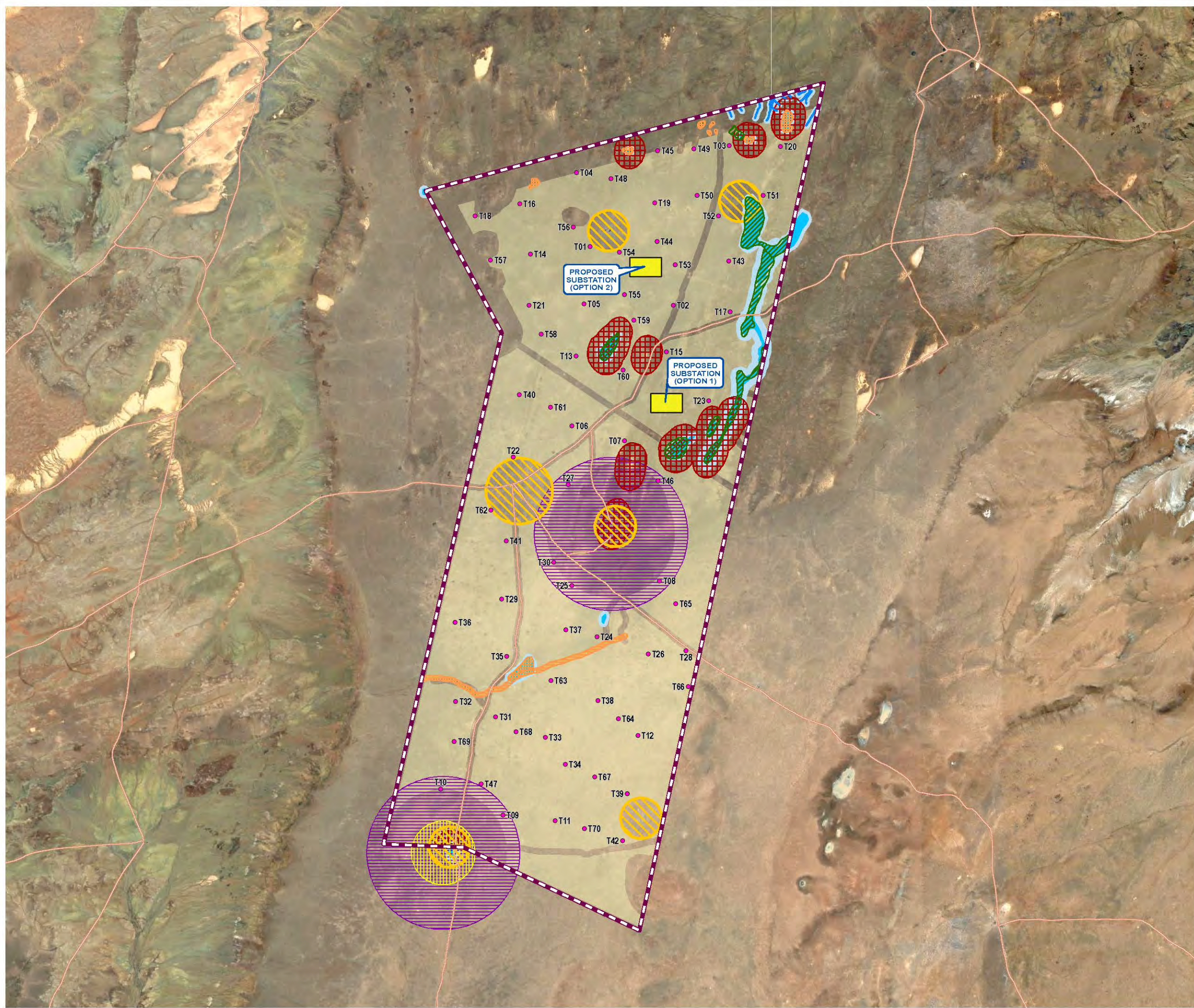
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**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
ENVIRONMENTAL SENSITIVITY**



**Legend**

- Local Access Roads
- Ithemba Wind Farm Application Site
- Buildable Area
- Proposed Ithemba Substation Site Alternatives
- Proposed Turbine Positions

**Environmental Sensitivity**

- Avifaunal Sensitivity
- Bat Sensitivity: High (Inclusive of Buffers)
- Ecological Sensitivity: High
- Ecological Sensitivity: Medium-High
- Noise Sensitivity
- Visual Sensitivity
- Wetlands
- Water Courses
- Surface Water Buffers

SOURCE:  
NGI, 2014  
SANBI, 2012

**ENVIRONMENTAL DIVISION**  
51 WESELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA  
Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

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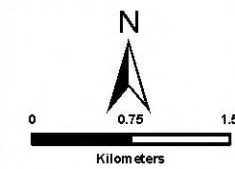
**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
PROPOSED SITE LAYOUT**



**Legend**

-  Local Access Roads
-  Ithemba Wind Farm Application Site
-  Buildable Area
-  Proposed Ithemba Substation Site Alternatives
-  Proposed Turbine Positions

SOURCE:  
NGI, 2014  
SANBI, 2012



**ENVIRONMENTAL DIVISION**  
51 WESSELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA

Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

<b>Project No</b> 13622	<b>Prepared By</b> KLS	<b>Date</b> 28/06/2017
<b>Map Ref No</b> 13622/EA_110	<b>Revision</b> 0	<b>Date</b>



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**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
SURFACE WATER ASSESSMENT:  
DATABASE SURFACE WATER  
OCCURRENCE**

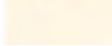

**Legend**

-  Local Access Roads
-  Ithemba Wind Farm Application Site
-  Buildable Area
-  Proposed Ithemba Substation Site Alternatives
-  Proposed Turbine Positions


**Surface Water Features**

-  Quaternary Catchment Boundaries
-  Rivers
-  Wetlands

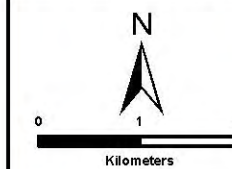
**Water Management Areas (2004)**

-  14 - Lower Orange
-  17 - Olifants/Doorn

**Critical Biodiversity Areas (Terrestrial)**

-  Ecological Support Area

SOURCE:  
DWS, 2004  
NFEPA, 2011  
NAMAQWA DISTRICT BIODIVERSITY SECTOR PLAN, 2008

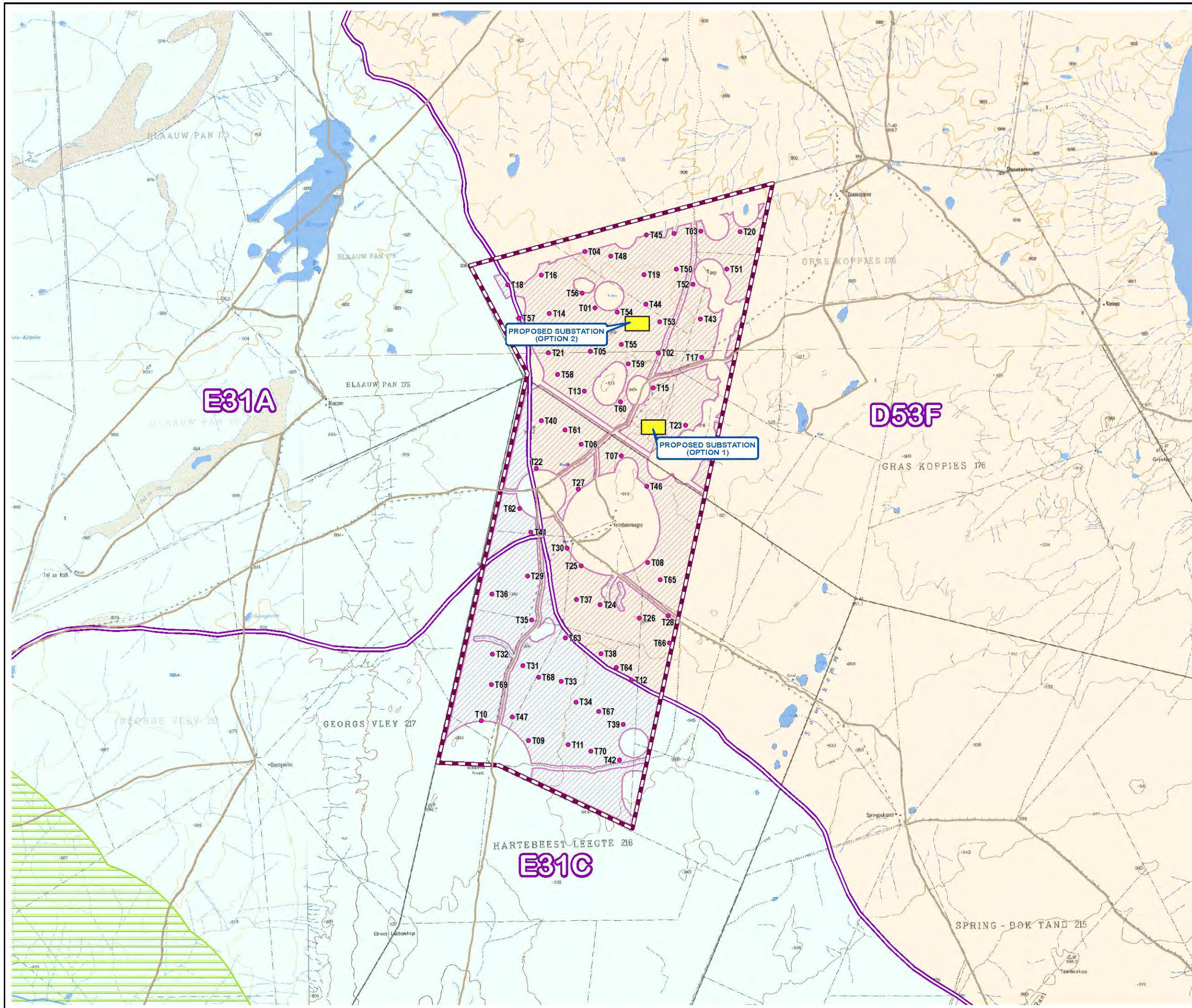


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51 WESSELS ROAD  
RIVONIA, 2128  
JOHANNESBURG  
SOUTH AFRICA  
Phone: +27 11 798 0600  
Fax: +27 11 803 7272  
e-mail: info@sivest.co.za

Project No 13622	Prepared By KLS	Date 11/07/2017
Map Ref No 13622/EAS_01	Revision 0	Date

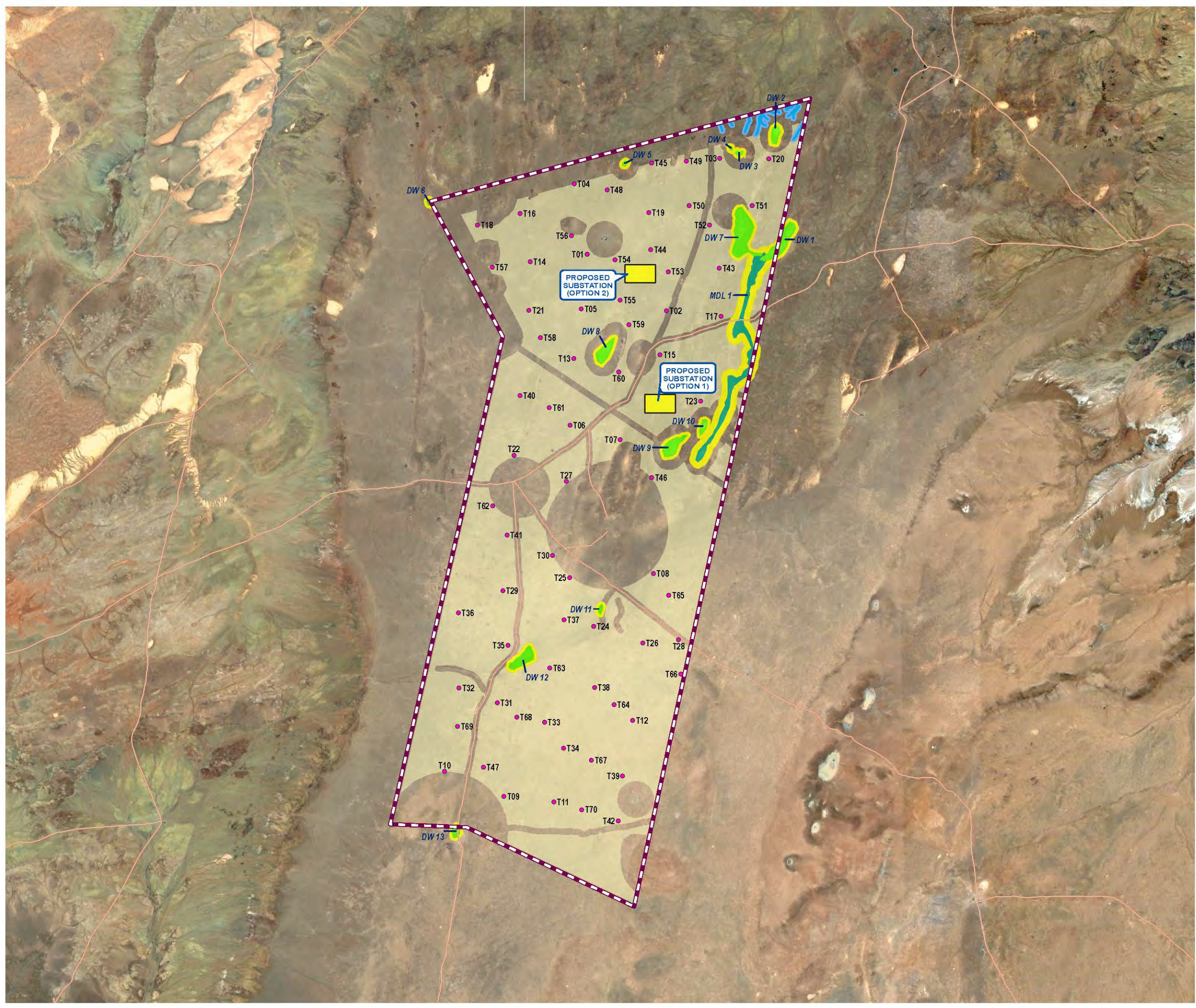
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**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE**  
**SURFACE WATER ASSESSMENT:  
GROUND TRUTHED FIELDWORK  
DELINEATIONS**



**Legend**

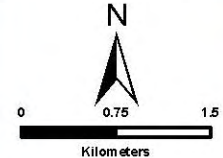

-  Local Access Roads
-  Ithemba Wind Farm Application Site
-  Buildable Area
-  Proposed Ithemba Substation Site Alternatives
-  Proposed Turbine Positions

**Surface Water Features**

-  Major Drainage Line
-  Depression Wetland
-  Major Drainage Line/Wetland Buffers\*
-  Drainage Lines
-  Drainage Line Buffers (50m)

\*Major Drainage Line Buffer: 100m  
Wetland Buffer: 50m

SOURCE:  
GOOGLE EARTH, 2016










		
	<p><b>ENVIRONMENTAL DIVISION</b> 51 WESSELS ROAD RIVONIA, 2128 JOHANNESBURG SOUTH AFRICA</p> <p>Phone: +27 11 798 0600 Fax: +27 11 803 7272 e-mail: info@sivest.co.za</p>	

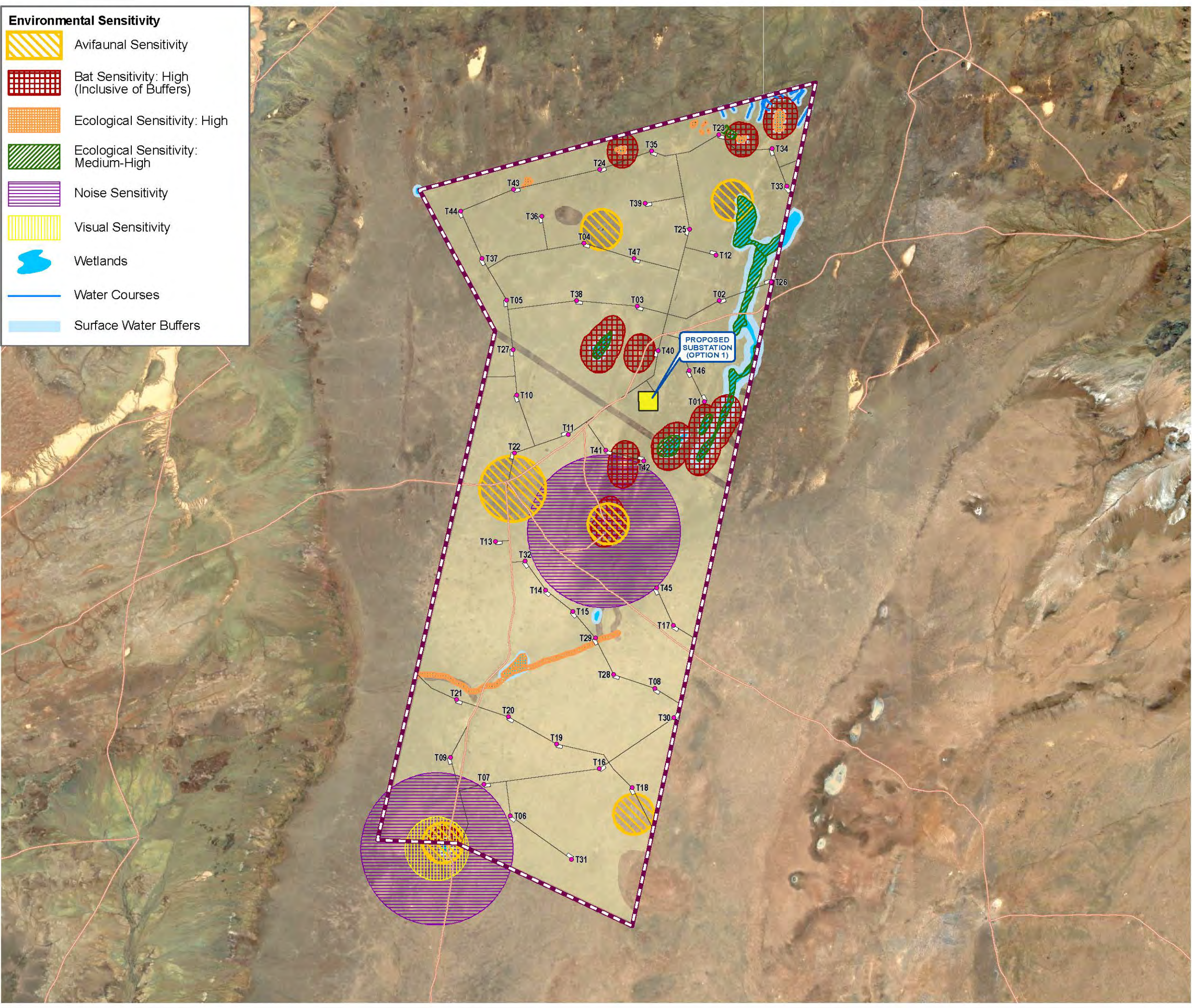
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Map Ref No 13622/EAS_102	Revision 0	Date

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- Environmental Sensitivity**
-  Avifaunal Sensitivity
  -  Bat Sensitivity: High (Inclusive of Buffers)
  -  Ecological Sensitivity: High
  -  Ecological Sensitivity: Medium-High
  -  Noise Sensitivity
  -  Visual Sensitivity
  -  Wetlands
  -  Water Courses
  -  Surface Water Buffers






**PROPOSED  
CONSTRUCTION OF THE  
ITHEMBA WIND FARM  
NEAR LOERIESFONTEIN,  
NORTHERN CAPE PROVINCE  
SENSITIVITY OVERLAY  
(PREFERRED LAYOUT)**

- Legend**
-  Local Access Roads
  -  Ithemba Wind Farm Application Site
- Layout Components**
-  Buildable Area
  -  Preferred Ithemba Substation Site Alternative\*
  -  Proposed Turbine Positions
  -  Proposed Hardstand Areas
  -  Proposed Internal Road Network

\*300m x 300m Footprint to include:  
Ithemba Substation  
Operation & Maintenance Buildings  
Construction Laydown Area

SOURCE:  
NGI, 2014  
SANBI, 2012

 	 <b>ENVIRONMENTAL DIVISION</b> 51 WESSELS ROAD RIVONIA, 2128 JOHANNESBURG SOUTH AFRICA Phone: +27 11 798 0600 Fax: +27 11 803 7272 e-mail: info@sivest.co.za
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<b>Project No</b> 13622	<b>Prepared By</b> KLS	<b>Date</b> 17/10/2017
<b>Map Ref No</b> 13622/EA_113	<b>Revision</b> 0	<b>Date</b>

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**Avifaunal 'No-Go' Areas**

 Turbines and Infrastructure

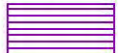
**Bat 'No-Go' Areas**

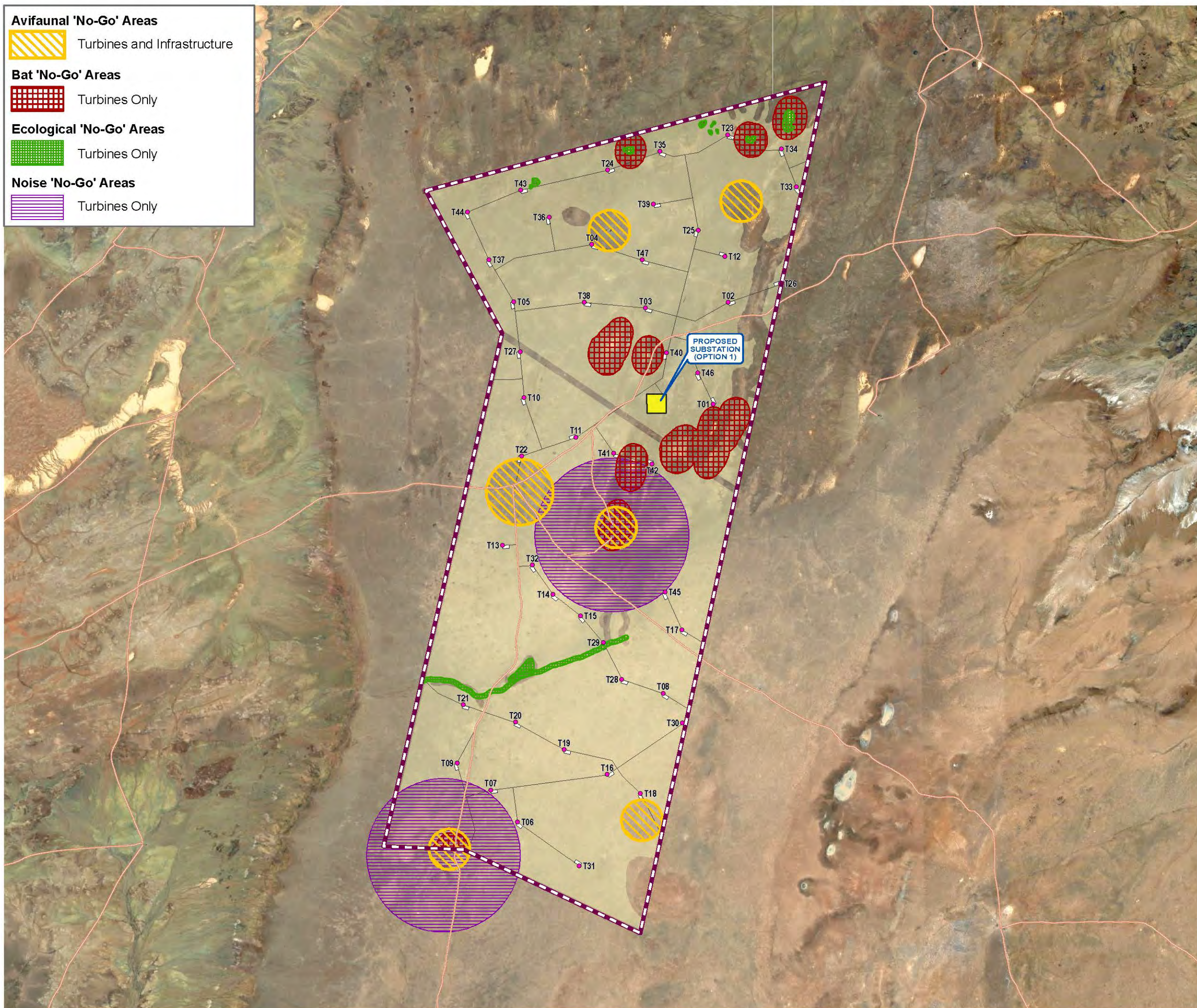
 Turbines Only

**Ecological 'No-Go' Areas**

 Turbines Only

**Noise 'No-Go' Areas**

 Turbines Only



**PROPOSED CONSTRUCTION OF THE ITHEMBA WIND FARM NEAR LOERIESFONTEIN, NORTHERN CAPE PROVINCE 'NO-GO' AREAS (PREFERRED LAYOUT)**

**Legend**


 Local Access Roads


 Ithemba Wind Farm Application Site


**Layout Components**

 Buildable Area

 Preferred Ithemba Substation Site Alternative\*




 Proposed Turbine Positions

 Proposed Hardstand Areas

 Proposed Internal Road Network

\*300m x 300m Footprint to include:  
Ithemba Substation  
Operation & Maintenance Buildings  
Construction Laydown Area

SOURCE:  
NGI, 2014  
SANBI, 2012

 	 <b>ENVIRONMENTAL DIVISION</b> 51 WESSELS ROAD RIVONIA, 2128 JOHANNESBURG SOUTH AFRICA Phone: +27 11 798 0600 Fax: +27 11 803 7272 e-mail: info@sivest.co.za	
	Project No 13622	Prepared By KLS

Map Ref No 13622/EA_114	Revision 0	Date
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