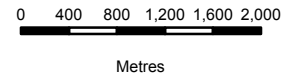


**BIOTHERM ENERGY
(PTY) LTD**
STATUS QUO
MARALLA EAST

Legend

- Eskom Powelines
- Non-Perennial Rivers
- ▭ Maralla East Wind Facility
- ▭ NFEPA Wetlands
- Heritage**
- ▭ No-Go Areas
- CBA's**
- ▭ CBA
- ▭ ESA
- Protected Vegetation**
- ▭ Western Karoo



DATA SOURCE:
CHIEF DIRECTORATE: NATIONAL GEO-
SPATIAL INFORMATION
NFEPA, SANBI

PROJECTION: WGS HARTEBEEHOCK 94

PROJECT TITLE: WIND AND SOLAR RENEWABLES

PROJECT NO: 47579

SCALE: 1:63,000 AT A4 | DATE: 08/12/2016

DRAWN BY: SABELO DUBE | FIGURE NO:

REVIEWED BY: ASHLEA STRONG



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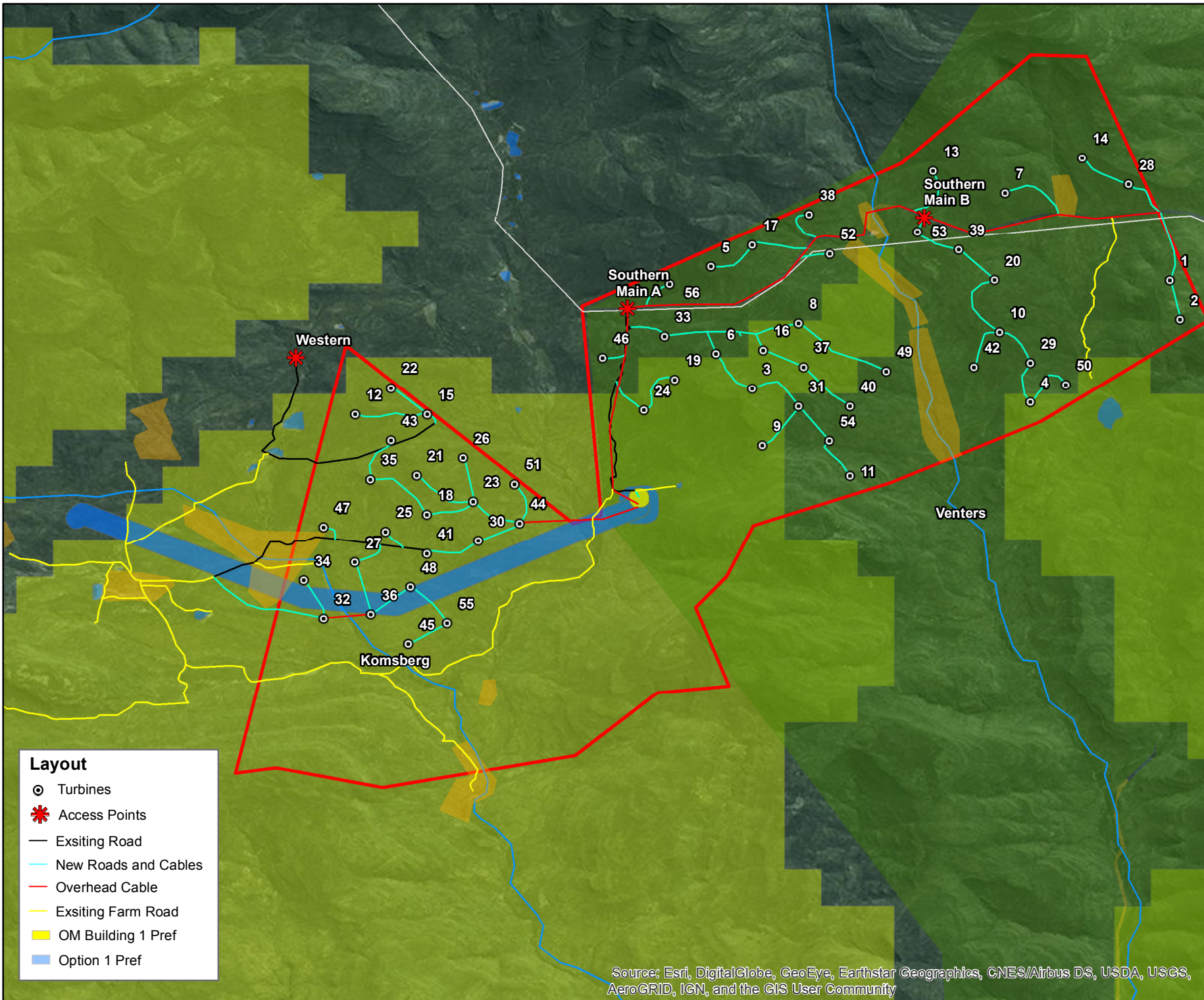
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Layout


- Turbines
- ✳ Access Points
- Exsiting Road
- New Roads and Cables
- Overhead Cable
- Exsiting Farm Road
- ▭ OM Building 1 Pref
- ▭ Option 1 Pref

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community







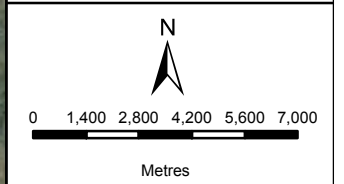
**BIOThERM ENERGY
(PTY) LTD**
SLOPE ANALYSIS
MARALLA EAST

Legend

 Maralla East Wind Facility

Slope

-  0 - 9%
-  15 - 25%
-  9 - 15%
-  > 25%



DATA SOURCE:
CHIEF DIRECTORATE: NATIONAL GEO-
SPATIAL INFORMATION
NFEPA, SANBI

PROJECTION: WGS HARTEBEEHSHOEK 94

PROJECT TITLE: WIND AND SOLAR RENEWABLES

PROJECT NO: 47579

SCALE: 1:200,000 AT A4 | DATE: 08/12/2016

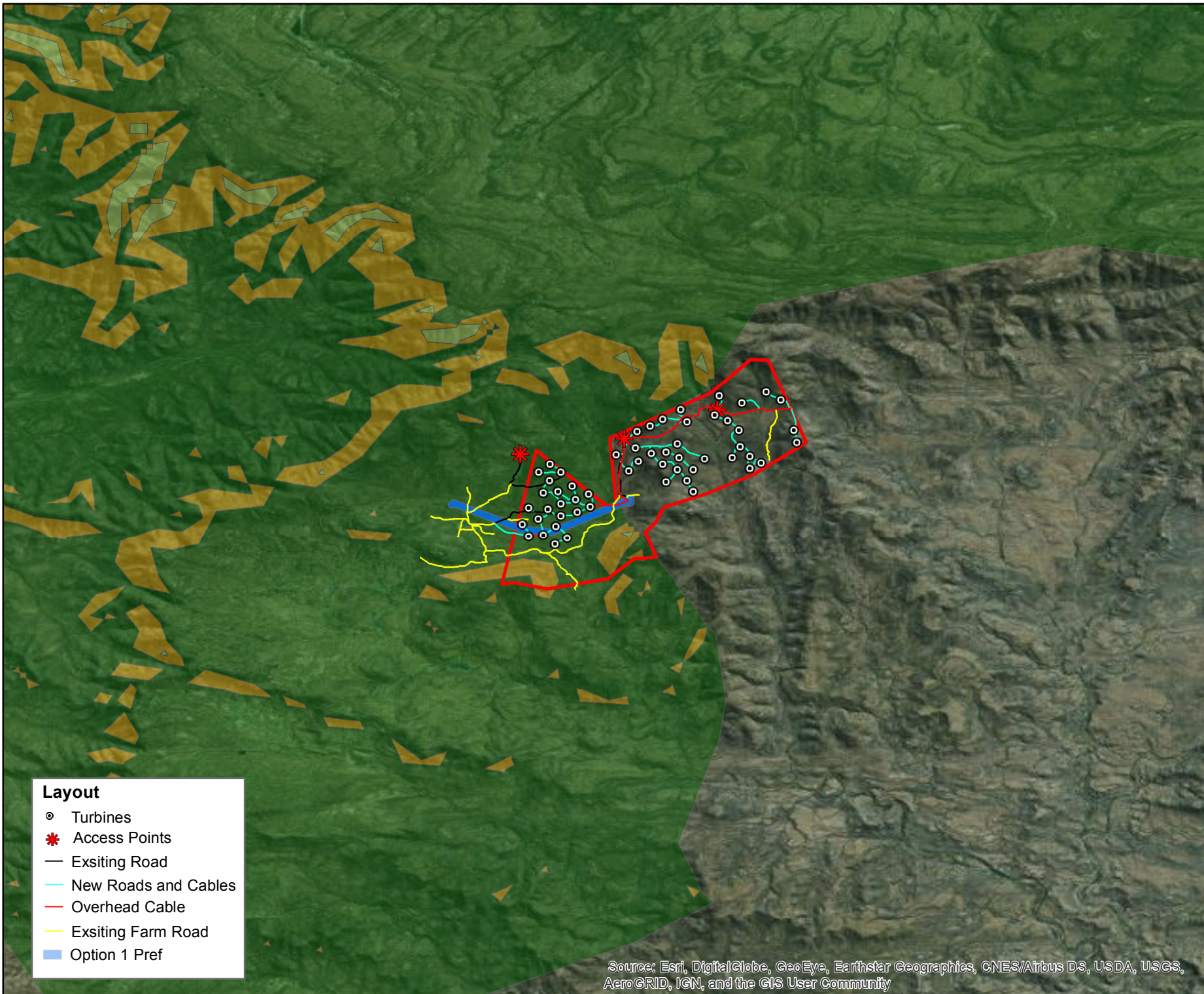
DRAWN BY: SABELO DUBE | FIGURE NO:








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- Layout**
-  Turbines
 -  Access Points
 -  Existing Road
 -  New Roads and Cables
 -  Overhead Cable
 -  Existing Farm Road
 -  Option 1 Pref

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

BIOTHERM ENERGY (PTY) LTD
REGIONAL MAP
MARALLA EAST

Legend

- Eskom Powelines
- Non-Perrenial Rivers
- Regional Road
- Powerlines (Preferred)
- Maralla East Wind Facility
- NFEPA Wetlands

CBA Terrestrial

CBA Type

- ESA_T
- T1
- T2

CBA & ESA CentralKaroo

CBA Category

- CBA
- CBA (known agric landuse)
- ESA



0 1,600 3,200 4,800 6,400 8,000

Metres

DATA SOURCE:
CHIEF DIRECTORATE: NATIONAL GEO-SPATIAL INFORMATION
NFEPA, SANBI

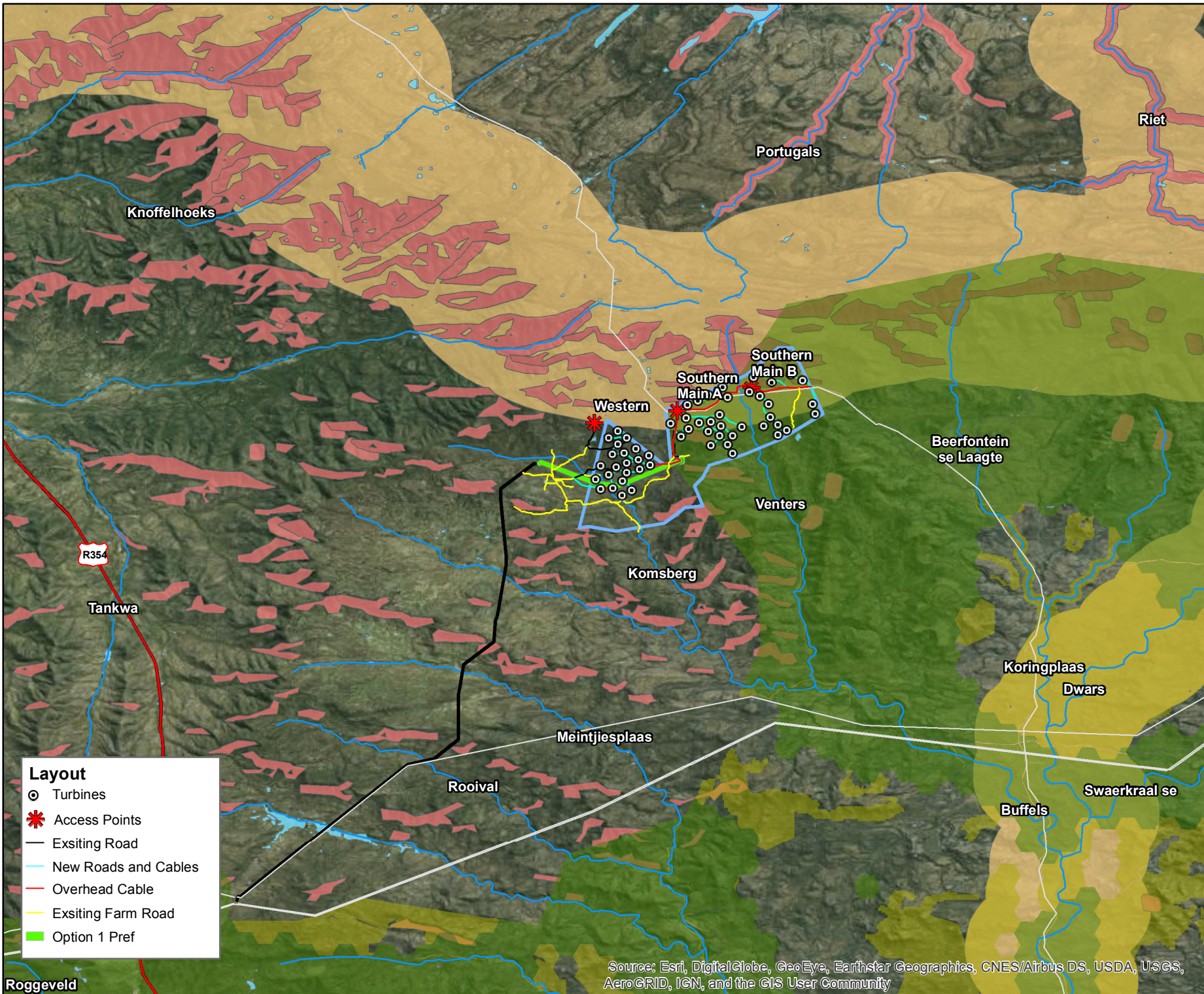
PROJECTION: WGS HARTBEESHOEK 94

PROJECT TITLE: WIND AND SOLAR RENEWABLES

PROJECT NO: 47579	DATE: 30/01/2017
DRAWN BY: SABELO DUBE	FIGURE NO:
REVIEWED BY: ASHLEA STRONG	



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Layout

- Turbines
- ✳ Access Points
- Exsiting Road
- New Roads and Cables
- Overhead Cable
- Exsiting Farm Road
- Option 1 Pref

Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

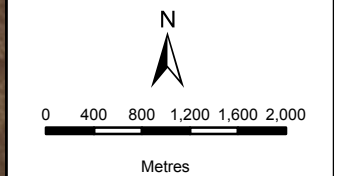
**BIOTHERM ENERGY
(PTY) LTD**
LAYOUT MAP
MARALLA EAST

Legend

- Non-Perennial Rivers
- Maralla East Wind Facility
- NFEPA Wetlands

SANBI Wetland Vegetation

- Karoo Shale Renosterveld
- Rainshadow Valley Karoo (Skv)



DATA SOURCE:
CHIEF DIRECTORATE: NATIONAL GEO-
SPATIAL INFORMATION
NFEPA, SANBI

PROJECTION: WGS HARTEBEESHOEK 94

PROJECT TITLE: WIND AND SOLAR RENEWABLES

PROJECT NO: 47579

SCALE: 1:63,000 AT A4 DATE: 30/01/2017

DRAWN BY: SABELO DUBE FIGURE NO:

REVIEWED BY: ASHLEA STRONG

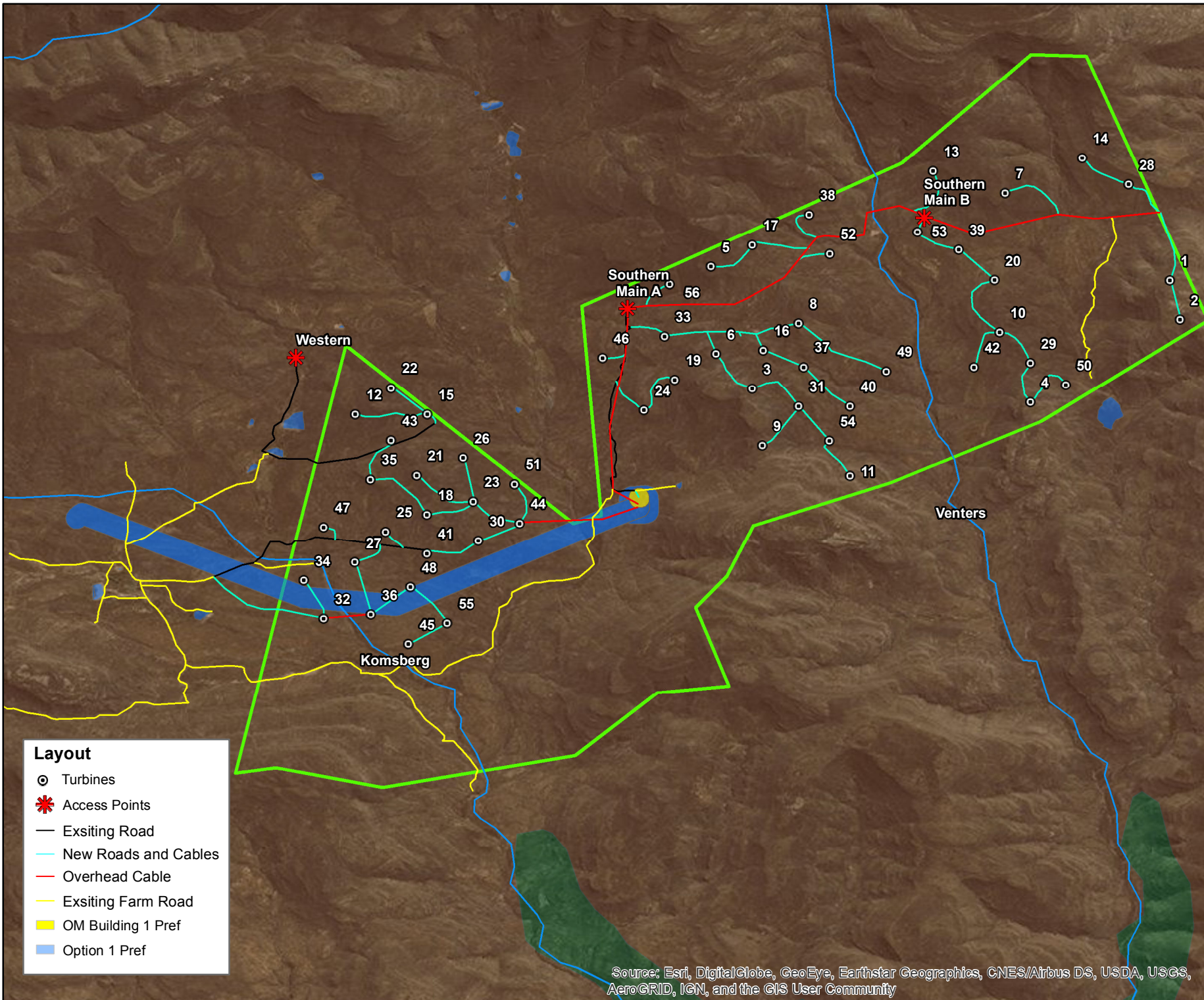


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Layout

- Turbines
- ✱ Access Points
- Exsiting Road
- New Roads and Cables
- Overhead Cable
- Exsiting Farm Road
- OM Building 1 Pref
- Option 1 Pref



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

**BIOHERM ENERGY
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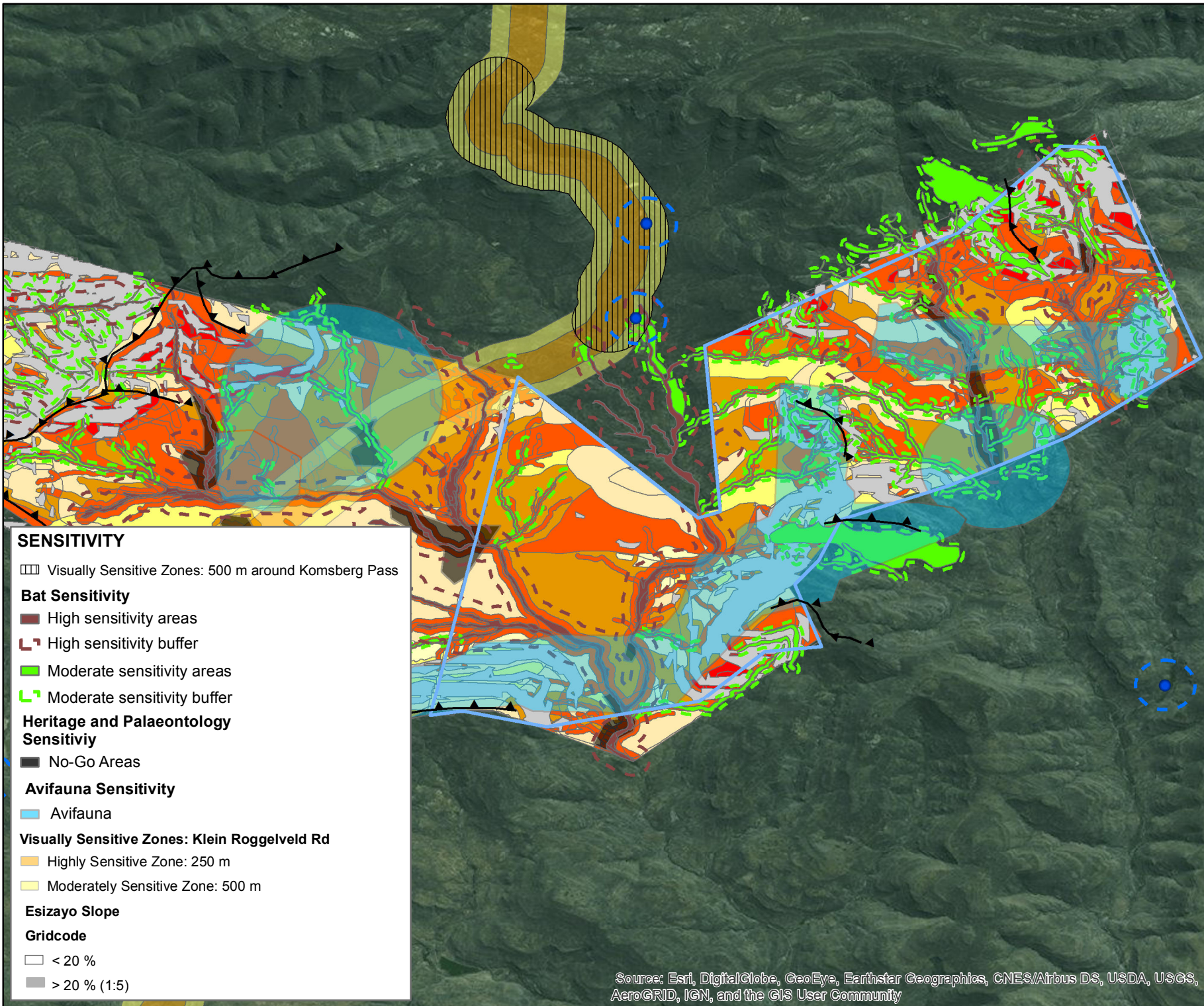
**COMBINED SENSITIVITY
MAP**

Legend

- ▲ Ridgelines
- Homesteads
- ⬜ Homesteads Buffers
- ⬜ Maralla West Wind Facility

Biodiversity

- Medium Low Sensitivity
- Medium Sensitivity
- Medium High Sensitivity
- High Sensitivity
- Very High Sensitivity



SENSITIVITY

▨ Visually Sensitive Zones: 500 m around Komsberg Pass

Bat Sensitivity

- High sensitivity areas
- High sensitivity buffer
- Moderate sensitivity areas
- Moderate sensitivity buffer

Heritage and Palaeontology Sensitivity

No-Go Areas

Avifauna Sensitivity

Avifauna

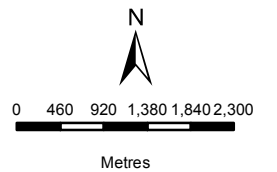
Visually Sensitive Zones: Klein Roggeveld Rd

- Highly Sensitive Zone: 250 m
- Moderately Sensitive Zone: 500 m

Esizayo Slope

Gridcode

- < 20 %
- > 20 % (1:5)



DATA SOURCE: CHIEF DIRECTORATE: NATIONAL GEO-SPATIAL INFORMATION	
PROJECTION: WGS HARTEBEESHOEK 94	
PROJECT TITLE: WIND AND SOLAR RENEWABLES	
PROJECT NO: 47579	
SCALE: 1:80,000 AT A4	DATE: 16/01/2017
DRAWN BY: SABELO DUBE	FIGURE NO: 5
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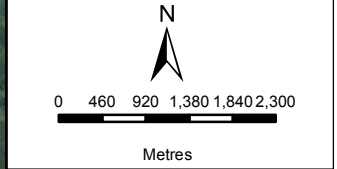
COMBINED SENSITIVITY MAP

Legend

- ▲ Ridgelines
- Homesteads
- ▭ Homesteads Buffers
- ▭ Maralla West Wind Facility
- Existing Farm Roads
- Existing Road
- New Roads and Cables
- Overhead Cable
- ▭ OM Building 1 Pref
- ▭ Option 1 Pref
- ▭ Option 2
- ▭ Option A
- ▭ Option B

Biodiversity

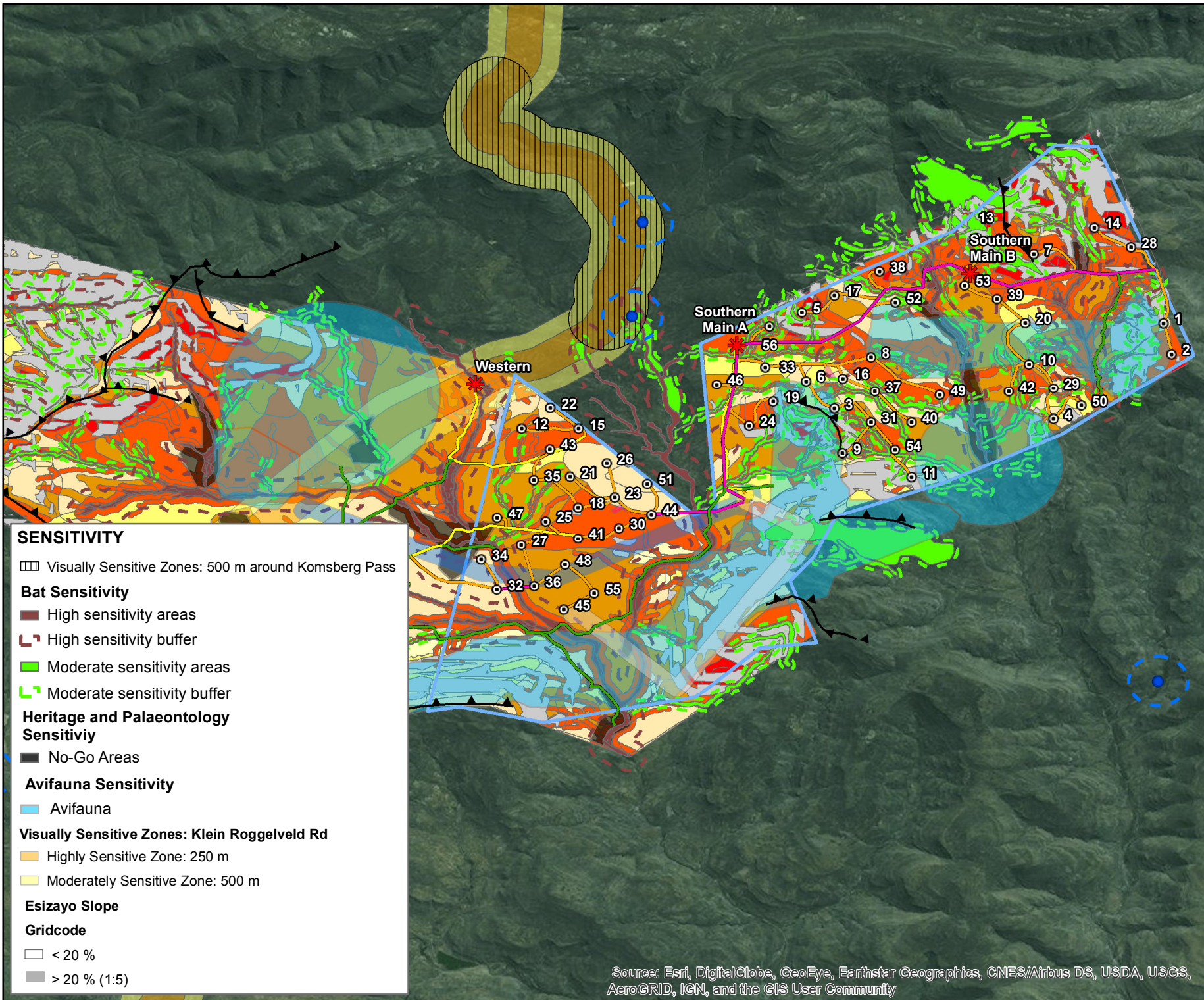
- ▭ Medium Low Sensitivity
- ▭ Medium Sensitivity
- ▭ Medium High Sensitivity
- ▭ High Sensitivity
- ▭ Very High Sensitivity



DATA SOURCE:	
CHIEF DIRECTORATE: NATIONAL GEO-SPATIAL INFORMATION	
PROJECTION: WGS HARTBEESHOEK 94	
PROJECT TITLE: WIND AND SOLAR RENEWABLES	
PROJECT NO: 47579	
SCALE: 1:80,000 AT A4	DATE: 16/01/2017
DRAWN BY: SABELO DUBE	FIGURE NO: 5
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SENSITIVITY

















- ▭ Visually Sensitive Zones: 500 m around Komsberg Pass
- Bat Sensitivity**
- ▭ High sensitivity areas
- ▭ High sensitivity buffer
- ▭ Moderate sensitivity areas
- ▭ Moderate sensitivity buffer
- Heritage and Palaeontology Sensitivity**
- ▭ No-Go Areas
- Avifauna Sensitivity**
- ▭ Avifauna
- Visually Sensitive Zones: Klein Roggeveld Rd**
- ▭ Highly Sensitive Zone: 250 m
- ▭ Moderately Sensitive Zone: 500 m
- Esizayo Slope**
- Gridcode**
- ▭ < 20 %
- ▭ > 20 % (1:5)

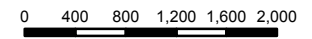
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

BIOTERM ENERGY (PTY) LTD

BAT SENSITIVITY MAP

Legend

-  Turbines
-  Access Points
-  Exsiting Road
-  New Roads and Cables
-  Overhead Cable
-  Exsiting Farm Road
-  OM Building 1 Pref
-  Option 1 Pref
-  Option 2
-  Option A
-  Option B
-  High sensitivity areas
-  High sensitivity buffer
-  Moderate sensitivity areas
-  Moderate sensitivity buffer
-  Maralla East Wind Facility



Metres

DATA SOURCE:

CHIEF DIRECTORATE: NATIONAL GEO-SPATIAL INFORMATION

PROJECTION: WGS HARTERBEESHOEK 94

PROJECT TITLE: WIND AND SOLAR RENEWABLES

PROJECT NO: 47579

SCALE: 1:60,000 AT A4 DATE: 17/01/2017

DRAWN BY: SABELO DUBE FIGURE NO: 5

REVIEWED BY: ASHLEA STRONG



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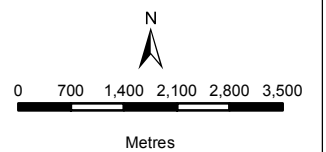
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BIOTERM ENERGY (PTY) LTD
VISUAL SENSITIVITY MAP

Legend

- Turbines
 - Maralla Substations
 - Access Points
 - Homesteads
 - Maralla Powerlines Routes
 - Maralla Ridgelines
 - Wolwenhoek Pass
 - Exsiting Road
 - New Roads and Cables
 - Overhead Cable
 - Exsiting Farm Road
 - Maralla Substations Footprints
 - Maralla East Wind Facility
 - Homesteads Buffers
 - OM Building 1 Pref
 - Option 1 Pref
 - Option 2
 - Option A
 - Option B
- Powerlines Routes**
- Route 1
 - Route 2
 - Route 3
 - Route 4

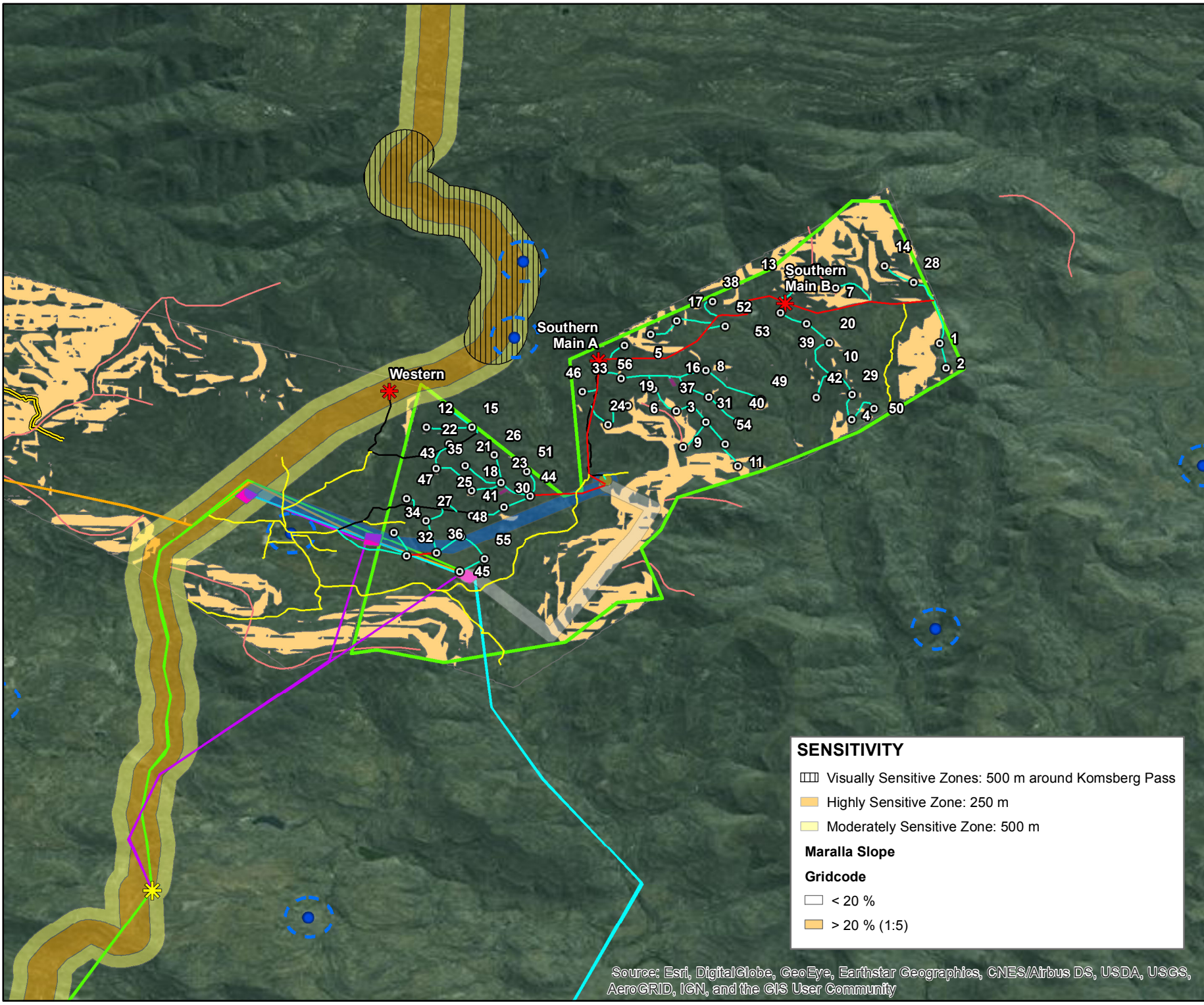


DATA SOURCE:
 CHIEF DIRECTORATE: NATIONAL GEO-SPATIAL INFORMATION
 PROJECTION: WGS HARTBEESHOEK 94
 PROJECT TITLE: WIND AND SOLAR RENEWABLES

PROJECT NO: 47579
 SCALE: 1:100,000 AT A4 DATE: 19/01/2017
 DRAWN BY: SABELO DUBE FIGURE NO:
 REVIEWED BY: ASHLEA STRONG



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SENSITIVITY

- Visually Sensitive Zones: 500 m around Komsberg Pass
- Highly Sensitive Zone: 250 m
- Moderately Sensitive Zone: 500 m

Maralla Slope

- < 20 %
- > 20 % (1:5)

Gridcode

- < 20 %
- > 20 % (1:5)

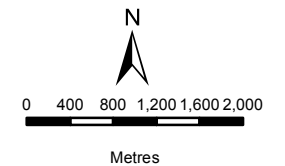
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

BIOTHERM ENERGY (PTY) LTD

HERITAGE AND PALAEOONTOLOGY SENSITIVITY MAP

Legend

- Preserved Tetrapod Trackways
- Anomaly 190 of Cole & Vorster 1999
- Turbines
- ✱ Access Points
- Exsiting Road
- New Roads and Cables
- Overhead Cable
- Exsiting Farm Road
- OM Building 1 Pref
- Option 1 Pref
- Option 2
- Option A
- Option B
- Maralla East Wind Facility
- No-Go Areas



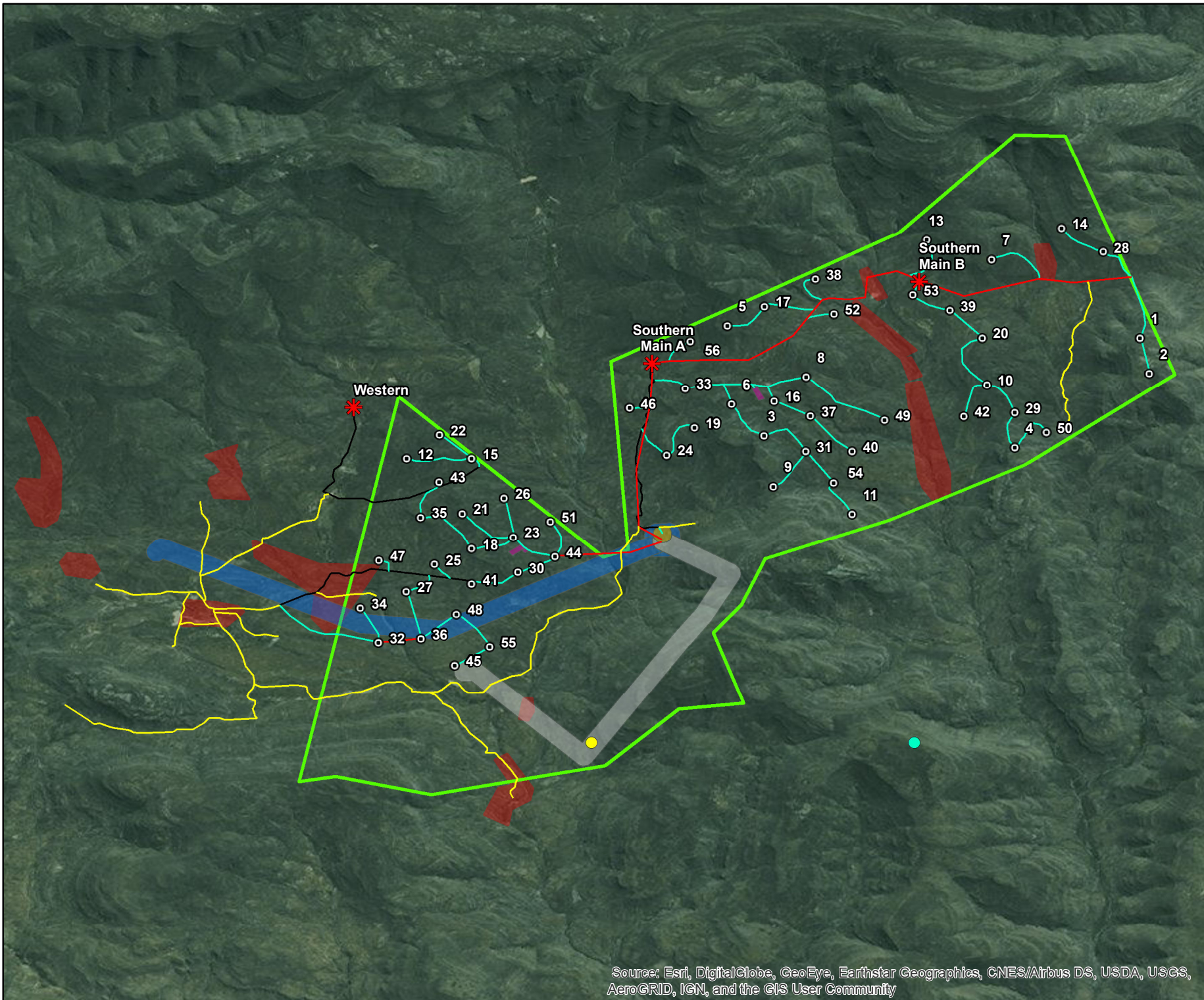
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CHIEF DIRECTORATE: NATIONAL GEO-SPATIAL INFORMATION

PROJECTION: WGS HARTBEESHOEK 94
PROJECT TITLE: WIND AND SOLAR RENEWABLES

PROJECT NO: 47579
SCALE: 1:70,000 AT A4 DATE: 16/01/2017
DRAWN BY: SABELO DUBE FIGURE NO: 5
REVIEWED BY: ASHLEA STRONG















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




**BIOThERM ENERGY
(PTY) LTD**

**BIODIVERSITY SENSITIVITY
MAP**

Legend

-  Turbines
-  Access Points
-  Existing Road
-  Existing Farm Road
-  New Roads and Cables
-  Overhead Cable
-  OM Building 1 Pref
-  Option 1 Pref
-  Option 2
-  Option A
-  Option B
-  Maralla East Wind Facility

Biodiversity

-  Medium Low Sensitivity
-  Medium Sensitivity
-  Medium High Sensitivity
-  High Sensitivity
-  Very High Sensitivity



0 400 800 1,200 1,600 2,000

Metres

DATA SOURCE:

CHIEF DIRECTORATE: NATIONAL GEO-SPATIAL INFORMATION

PROJECTION: WGS HARTEBEESHOEK 94

PROJECT TITLE: WIND AND SOLAR RENEWABLES

PROJECT NO: 47579

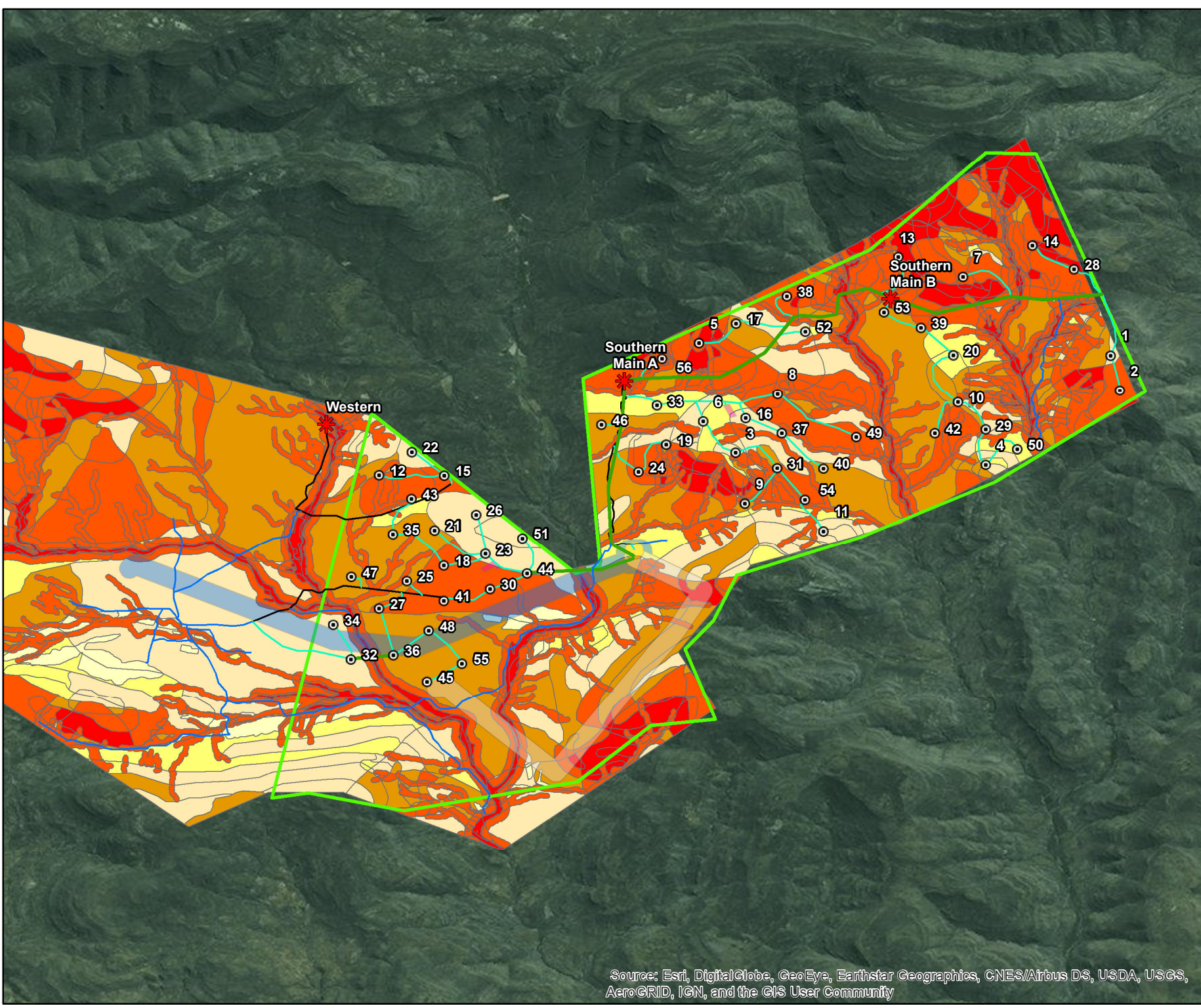
SCALE: 1:70,000 AT A4 DATE: 16/01/2017

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REVIEWED BY: ASHLEA STRONG
















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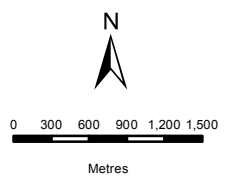
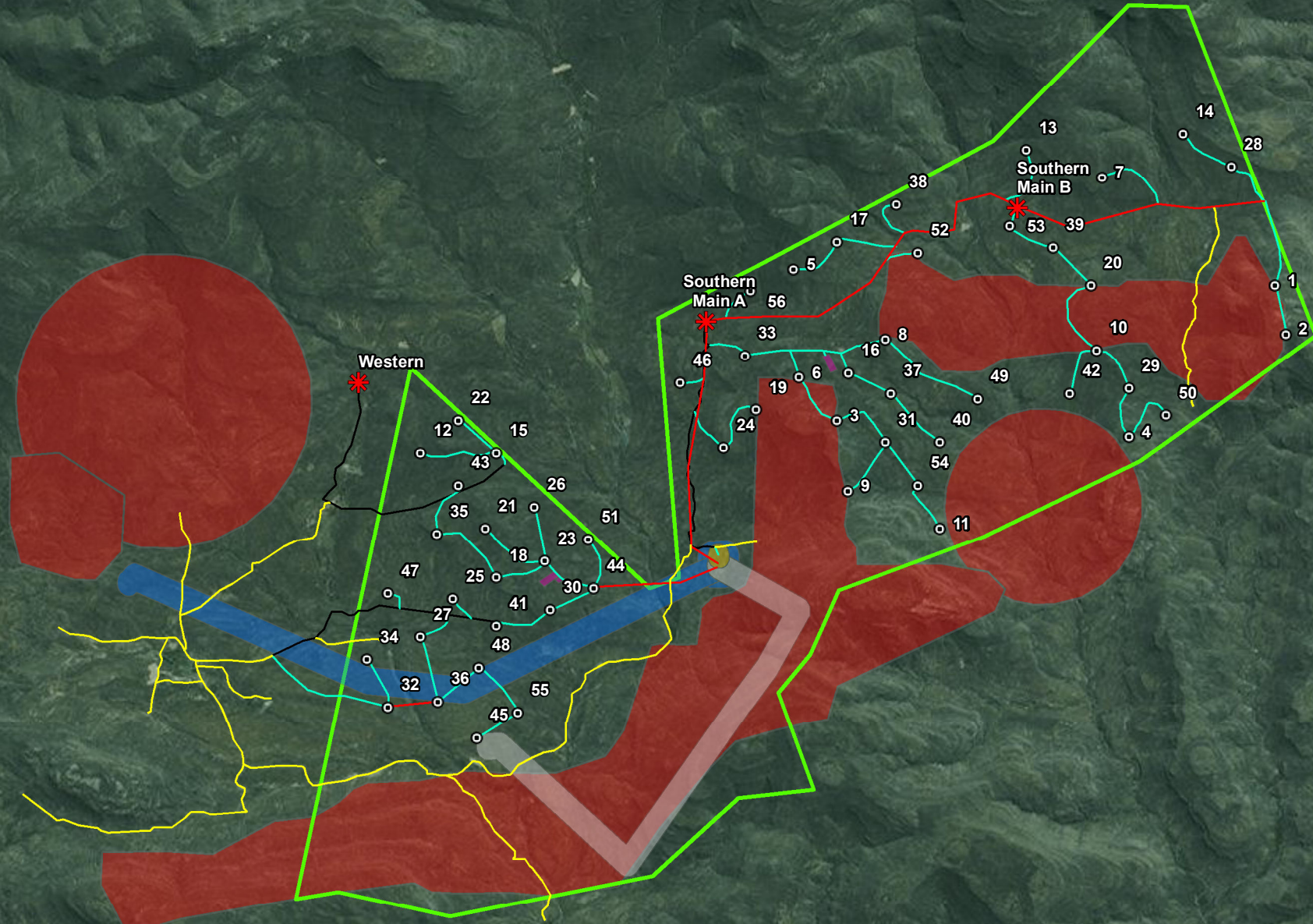


**BIOTHERM ENERGY
(PTY) LTD**

AVIFAUNA SENSITIVITY
56 TURBINE LAYOUT

Legend

-  Turbines
-  Access Points
-  Exsiting Road
-  New Roads and Cables
-  Overhead Cable
-  Exsiting Farm Road
-  OM Building 1 Pref
-  Option 1 Pref
-  Option 2
-  Option A
-  Option B
-  Maralla East Wind Facility
-  Avifauna



DATA SOURCE:	
CHIEF DIRECTORATE: NATIONAL GEO-SPATIAL INFORMATION	
PROJECTION: WGS 21 HARTEBEEHOCK 94	
PROJECT TITLE: WIND AND SOLAR RENEWABLES	
PROJECT NO: 47579	
SCALE: 1:60,000 AT A4	DATE: 13/01/2017
DRAWN BY: SABELO DUBE	FIGURE NO: 5
REVIEWED BY: ASHLEA STRONG	



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