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1. INTRODUCTION

BKS has been appointed by Eskom Holdings Limited to execute an Environment Impact analyses (EIA) for the following proposed developments:

- One 400kV double circuit Transmission power line of approximately 23km from the existing Firgrove substation to a proposed new substation in Mitchell's Plain; and
- One 400kV single circuit Transmission power line of approximately 7km from the same proposed new substation in Mitchell's Plain indicated above to the existing Philippi substation proposed to be upgraded.
- Mitchell's Plain Substation and Mitchell's Plain-Firgrove 400kV power line

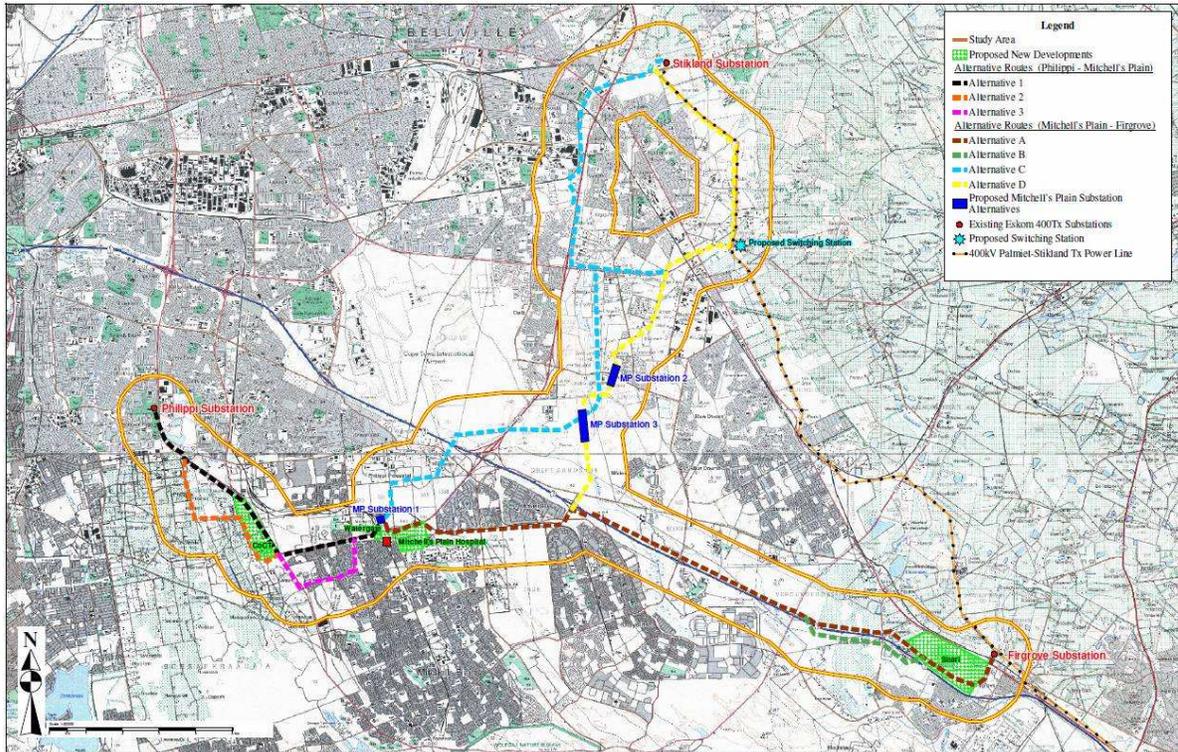
Agriconcept (Pty) Ltd has been appointed by BKS to execute a study to determine the loss of agricultural potential as a result of above mentioned developments.

One consolidated report is presented for both the projects in such a manner that that a clear distinction is being made between the projects.

2. PROJECT AREAS

The combined project areas for the three projects are demarcated in Figure 1.

Figure 1 Demarcation of project areas



3. METHODOLOGY

The land cover has been analysed for both the project areas and includes areas occupied by town development, agriculture, natural bush etc. Agriconcept made use of BKS GIS Division to do the analyses. Enpat environmental data base was used for this purpose.

Other information such as vegetation, soil potential etc, as included in Enpat was analysed and included in the report. Images from Google Earth (12 February 2009) were applied to control Enpat data and adjustments were made if necessary.

Soil potential was obtained from the Agricultural Research Council (ARC) Institute for Soil, Climate and Water.

Groundwater information was obtained from the Department of Water Affairs (DWA). The information covers a wide area and is not specifically applicable to the project areas. Farmers in the project area

were also contacted to control this information. This information may be more applicable than those of DWA.

Land owners in the project areas were contacted to confirm cropping programmes, yields, water sources etc.

4. ESKOM POLICY REGARDING AGRICULTURAL ACTIVITIES EXERCISED UNDER ELECTRIC TRANSMISSION LINES

It appears that Eskom does not have a policy regarding the exercising of agricultural activities under electric transmission lines. They, however, do have policy guidelines regarding vegetation management in the vicinity of transmission lines (Vosloo 2009). Elements of these guidelines are applicable on agricultural activities.

Eskom will register servitude on private property if transmission lines intersect these properties.

The definition for Eskom servitude is as follows: It is the right to use someone else's land, for a specified purpose. In the case of overhead line servitude, it is the right to erect, operate and maintain an electric line as well as enter that land for the execution of those activities. It does not constitute full ownership of land. Access and activities should always be carried out with due respect for the landowner. Servitude is registered in the Deeds office and forms part of the title deed of a property.

Eskom also has the right to enter the servitude area to maintain the transmission lines.

The main reasons for managing the vegetation under power lines are:

- Ensuring safe clearances under and around power lines.
- Ensuring adequate access for inspection, maintenance and repair activities
- Reduction of fuels for fires under power lines that cause flashovers.

It is known that Eskom allows agricultural activities to be exercised within the servitude area of power lines as long as the agricultural crops and equipment do not interfere with the power lines.

The minimum ground clearance as well as minimum safe distance to trees, structures etc. according to voltage are shown in Table 1.

Table 1 Servitude width, minimum ground clearance as well as minimum safe distance to trees, structures etc. according to voltage

| Voltage (kV) | Servitude width (m) | Grown clearance (m) | Safe distance to trees (m) |
|--------------|---------------------|---------------------|----------------------------|
| 132 | 31 to 36 | 6,3 | 3,8 |
| 220 | 47 | 6,7 | 4,2 |
| 275 | 47 | 7,2 | 4,7 |
| 400 | 47 to 55 | 8,1 | 5,6 |
| 533 DC | 30 | 8,6 | 6,1 |
| 765 | 80 | 10,4 | 8,5 |

Source: Vosloo, 2009

5. NATURAL RESOURCES

5.1 SOILS

The Agricultural Research Council, Institute for Soil, Climate and Water (ARC-ISCW) executed a study to determine soil potential in the study area.

A desk study was executed to determine soil potential. Most of the study area occurs within the boundary of the coverage by 1:50 000 scale soil maps (Jacobs, Oosthuizen & Stehr, 2003). It was therefore decided to use this information. In the 1:50 000 scale survey, soil mapping units were established according to dominant and sub-dominant soil forms, which could then be allocated to a class of general agricultural potential.

The corresponding soil maps are shown in Annexes A to B.

5.1.1 Mitchell's Plain-Philippi

The area consists mainly of moderately deep to deep, fine- to medium-grained, grey to yellow sandy soils, dominantly of the Fernwood (Fw) and Namib (Nb) soil forms. Where the sandy soil has a subsoil clay horizon ("duplex" soil character), these soils belong mainly to the Kroonstad (Kd) and Katspruit (Ka) soil forms. Smaller areas of shallow soils with a structured clay or hardpan carbonate subsoil also occur.

A summary of the main soil characteristics is given in Table 2

Table 2 Soil potential of the Mitchell's Plain-Philippi route

| Map Unit | Dominant Soil form | Agricultural Potential |
|----------|--------------------|------------------------|
| dNb | Namib | Low to moderate |
| dFw | Fernwood | Low to moderate |
| dLt | Lamotte | Low to moderate |
| mdLt | Namib | Low to moderate |
| sKd | Kroonstad | Low |
| sKa | Katspruit | Very low |
| dWb | Witbank | Very low |
| U | - | None |

Source: Paterson 2010

The corresponding colours as shown on the soil map

5.1.2 Firgrove-Mitchell's Plain

The area consists mainly of a mixture of soils. Moderately deep to deep, fine- to medium-grained, grey to yellow sandy soils, dominantly of the Namib (Nb) soil form, occur mainly in the west, while shallower, duplex soils (sandy topsoil abruptly overlying a structured clay subsoil) of the Kroonstad (Kd) or Estcourt (Es) soil forms are found more toward the east. An area of wetland soils of the Katspruit (Ka) soil form is found next to the Kuils River, just east of Khayelitsha and the Eerste River itself.

Table 3 Soil potential of the Firgrove-Mitchell's Plain route

| Map Unit | Dominant Soil form | Agricultural Potential |
|-----------------|---------------------------|-------------------------------|
| dNb | Namib | Low to moderate |
| dHu | Hutton | Moderate to high |
| mdNb | Namib | Low to moderate |
| mdKd | Kroonstad | Low to moderate |
| sNb | Namib | Low |
| sGs | Glenrosa | Low |
| sKd | Kroonstad | Low |
| sKa | Katspruit | Very low |
| vsKa | Katspruit | Very low |
| Vlei | Katspruit | None |
| U | - | None |

Source: Paterson 2010

5.2 TOPOGRAPHY

The area is located on the Cape Flats. The area is mostly flat with an elevation of approximately 40 meters above sea level.

5.3 CLIMATE

The climate of the area can be regarded as typical of the Cape West Coast, with a low, all-year round rainfall distribution, warm to hot summers and cool winters. The main climatic indicators are shown in Table 4.

Table 4 Climate Data

| Month | Rainfall (mm) | Min. Temp (°C) | Max. Temp (°C) |
|-------------|-----------------|-------------------------|----------------|
| Jan | 14.5 | 15.5 | 29.5 |
| Feb | 14.7 | 15.6 | 29.8 |
| Mar | 13.8 | 14.4 | 28.4 |
| Apr | 48.9 | 11.9 | 25.3 |
| May | 76.7 | 9.2 | 21.5 |
| Jun | 89.2 | 6.9 | 18.4 |
| Jul | 89.0 | 5.7 | 17.6 |
| Aug | 79.9 | 5.9 | 18.4 |
| Sep | 45.9 | 7.4 | 20.3 |
| Oct | 32.7 | 9.4 | 23.3 |
| Nov | 21.7 | 12.4 | 26.3 |
| Dec | 14.8 | 14.3 | 28.2 |
| Year | 524.7 mm | 17.3°C (Average) | |

Source: (Paterson, D. G. May 2010)

The extreme high temperature that has been recorded is 43.0°C (presumably in “berg wind” conditions) and the extreme low –0.5°C.

5.4 VEGETATION

According to Mucina and Rutherford (2006) veld types of the area are being classified as Cape Flats Dune Strandveld, Cape Flats Sand Fynbos, Swartland Shale Renosterveld and the Cape Lowland Freshwater Wetlands.

The area according to veld type is shown in Table 5.

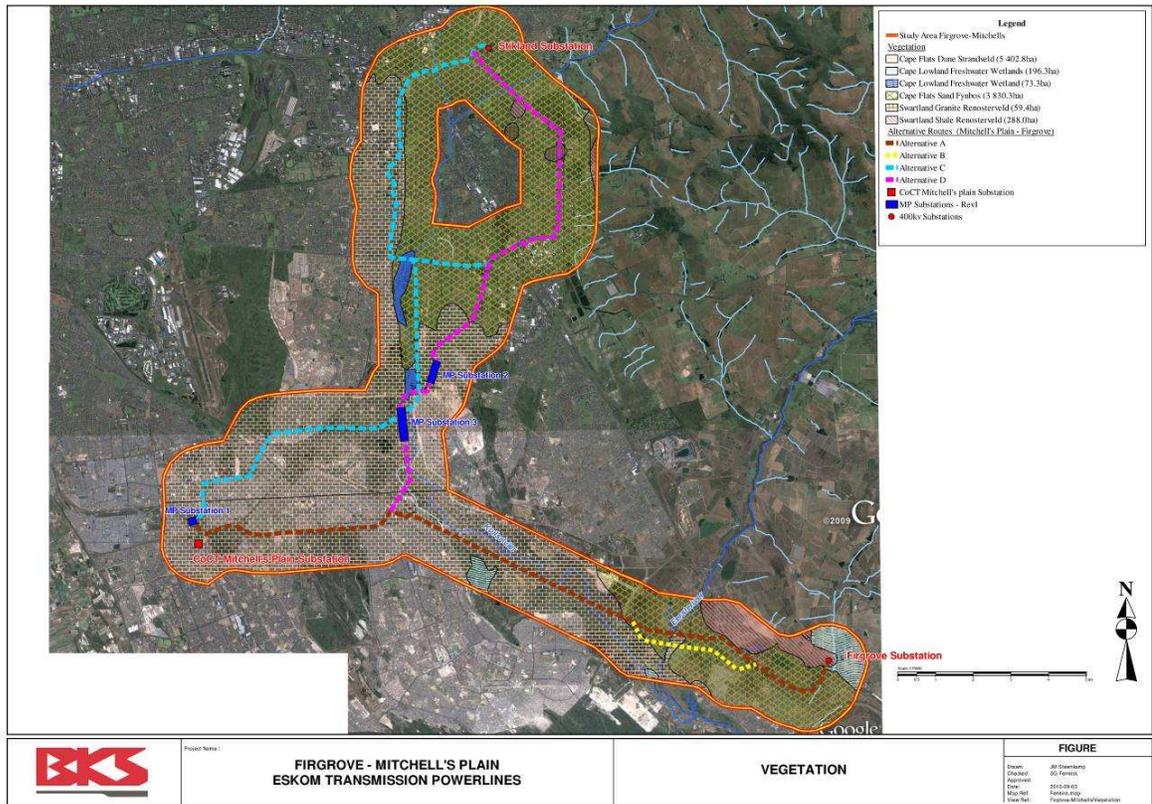
Table 5 Area according to type of vegetation, project areas

| Item | Mitchell's Plain – Firgrove | Mitchell's Plain – Philippi | Mitchell's Plain- Stikland |
|--|--------------------------------|--------------------------------|-------------------------------|
| | ha | ha | ha |
| Cape Flat Dunes | 2 578,8 | 1 551,5 | 4 435,2 |
| Cape Low Land Fresh Water Wetlands | 225,8 | | 73,3 |
| Cape Flats Sand Fynbos | 1 041,8 | 897,7 | 3 457,1 |
| Swartland Schale: Renosterveld | 332,7 | | 36,7 |
| Swartland Schale: Granite Renosterveld | | | 58,0 |
| TOTAL | 4 179,1 | 2 449,2 | |

Source: (Steenkamp M. 2010)

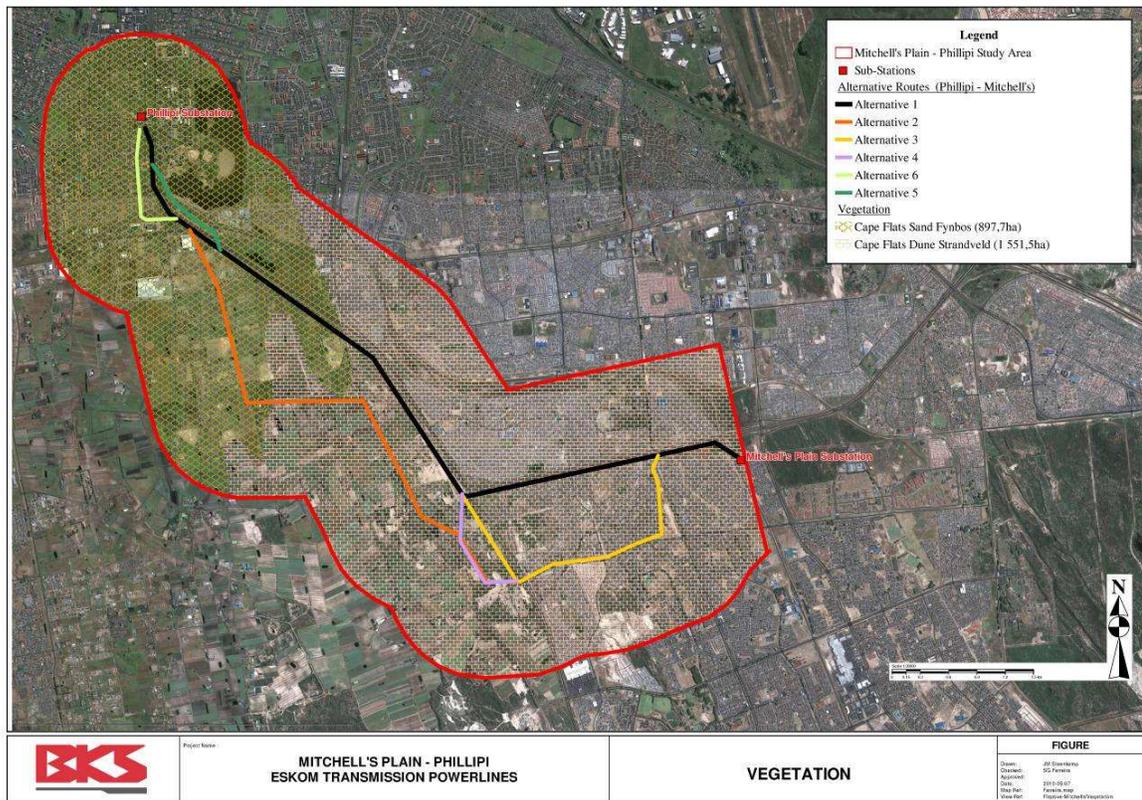
The original vegetation distribution for the project areas is shown in Figure 2 through Figure 3.

Figure 2 Vegetation, Firgrove- Mitchell's Plain Project Area



Source: (Steenkamp M. 2010)

Figure 3 Vegetation, Mitchell's Plain-Philippi Project Area



Source: (Steenkamp M. 2010)

The project areas are very disturbed with patches of natural vegetation remaining. Most of these patches are highly impacted on and the only areas of concern are the Driftsands nature reserve and the Buffelsvlei, which is a large wetland between Firgrove and Mitchell's Plain. (Le Roux, Betsie.2010)

Detail regarding vegetation in the project areas can be found in the ecological assessment section of the overall report.

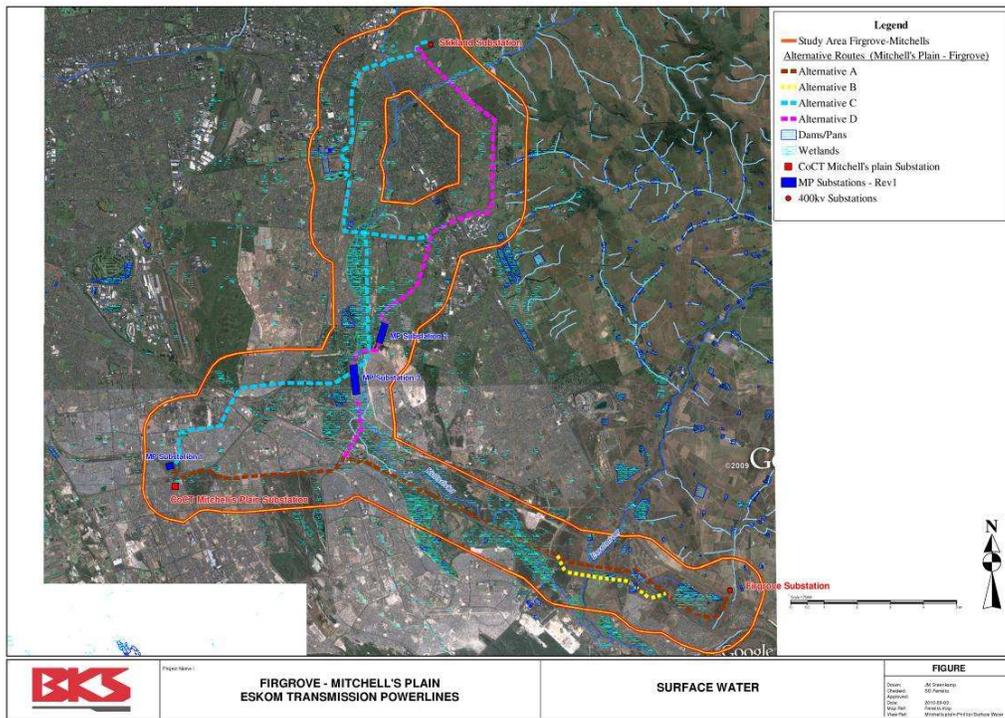
It is concluded that the grazing potential of natural grazing is very low due to the absence of large area natural grazing.

5.5 WATER

5.5.1 Surface water

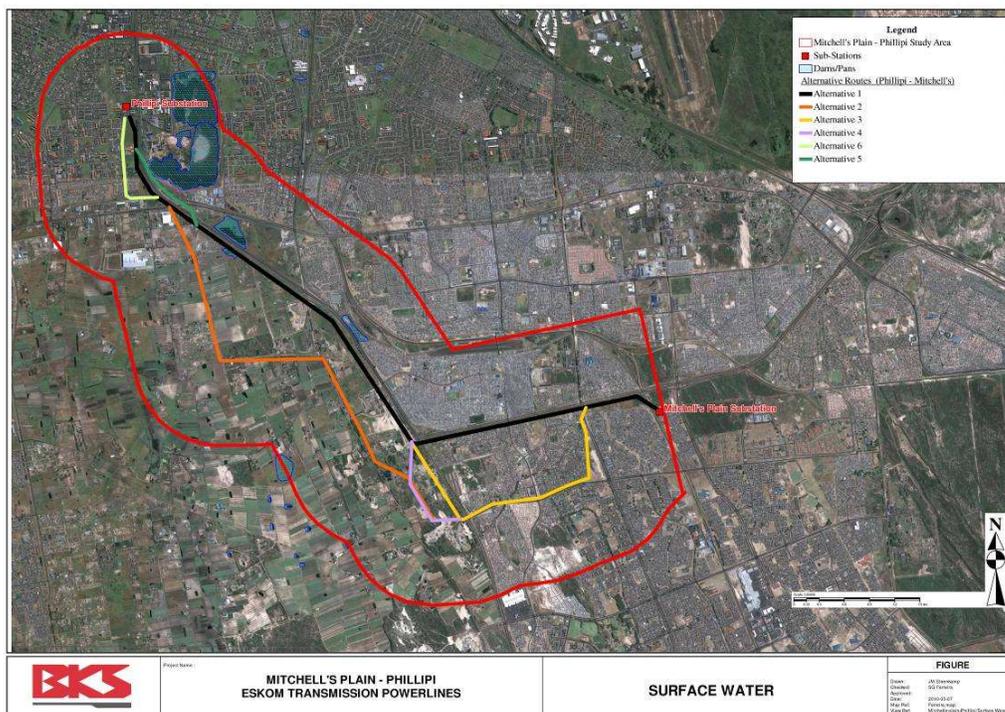
Surface dams are present on both the project areas. No information is available in this respect but the distribution of these dams is shown in Figure 4 and Figure 5.

Figure 4 Distribution of surface dams, Firgrove Mitchell's Plain project area



Source: (Steenkamp M. 2010)

Figure 5 Distribution of surface dams, Mitchell's Plain Philippi project area



Source: (Steenkamp M. 2010)

5.5.2 Ground water (Meyer P. S. 2001)

The project areas are located within the broad Sandveld Geological Group which extends along the west coast from False Bay to Saldanha. It is hydro geologically divided into mainly four units, viz the Cape Flats unit, extending from False Bay to Melkbosstrand, the Silwerstroom-Witzand unit in the Atlantis area, the Grootwater unit in the Yzerfontein region and finally the Berg River unit in the Saldanha area. The project areas are located in the Cape Flats unit.

Groundwater is applied for irrigation purposes in the Mitchell's Plain Philippi project area. Water is subtracted from boreholes and pumped into earthen dams which may be lined out with chemical products to prevent seepage. Borehole yields are reported to vary between 3,7 and 25 l per second. The quality is also good for irrigation purposes. Borehole depth may vary between 30 and 40 meter. (Rix, Leon, May 2010).

The average EC of borehole water on the Cape Flats is 53.5 mS/m. Determinants seldom exceed maximum recommended limits and groundwater generally displays a sodium-chloride-calcium-alkaline nature. There is concern, especially in densely populated areas, regarding the vulnerability of these aquifers to pollution. An inherent contamination problem in coastal aquifers is a function of the porous nature of the aquifers and their proximity to the sea. The aquifer may extend below sea level, thus over-abstraction and mismanagement of the groundwater can result in saline water intrusion into the fresh water zone of the aquifer. Careful control of abstraction rates is thus essential in such circumstances to preserve the potability of groundwater.

The chemistry of groundwater from the Sandveld Group is shown in Table 6.

Table 6 Chemistry of Groundwater from the Sandveld Group

| Element/Parameter | Mean Value |
|---|------------|
| pH | 8,0 |
| Electrical Conductivity (mS/m) | 53,5 |
| Total Dissolved Salts (mg/l) | 365,0 |
| Calcium (mg/l) | 70,0 |
| Magnesium (mg/l) | 6,0 |
| Sodium (mg/l) | 21,0 |
| Potassium (mg/l) | 1,5 |
| Chloride (mg/l) | 29,0 |
| PO ₄ as P (mg/l) | 0,14 |
| Total Alkalinity (CaCO ₃) (mg/l) | 157,0 |
| NO ₃ + NO ₂ (as N) (mg/l) | 2,86 |
| Fluoride (mg/l) | 0,19 |
| SO ₄ | 33,0 |
| PO ₄ as P (mg/l) | 0,014 |
| Si (mg/l) | 2,9 |
| NH ₄ (as N) (mg/l) | 0,05 |

Source: (Meyer P. S. 2001)

The water quality indicated in Table 6 and based on electrical conductivity and mean pH value of 8 indicate that the quality is generally acceptable for any use.

Quality of water in the region according to the respondents is generally good for irrigation purposes.

6. CURRENT LAND USE

6.1 BREAK-DOWN OF CURRENT LAND-USE

A break-down of current land-use in the project areas is shown in Table 7.

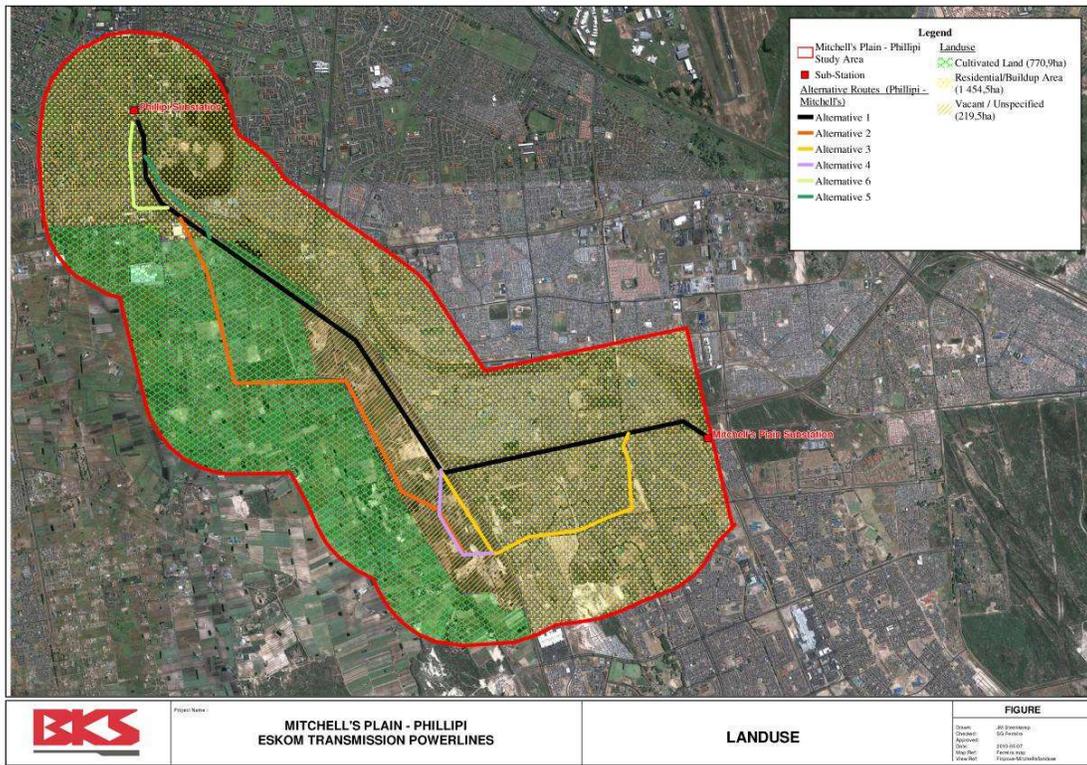
Table 7 Break-down of land use, project areas

| Item | Firgrove -Mitchell's Plain | Mitchell's Plain – Philippi | Mitchell's Plain-Stikland | TOTAL |
|------------------------|----------------------------|-----------------------------|---------------------------|---------------|
| | ha | ha | ha | Ha |
| Vergenoegd Wine Estate | 225,7 | | | 225,7 |
| Cultivated Land | 482,0 | 770,9 | 139,9 | 1 391,8 |
| Forestry | 28,9 | | | 28,9 |
| Residential | 1 558,1 | 1 454,5 | 5 622,1 | 8 634,7 |
| Denel Property | 176,5 | | | 176,5 |
| Commercial/Industrial | | | 203,7 | 203,7 |
| Vacant/Unspecified | 1 707,3 | 219,5 | 2 094,9 | 4 021,7 |
| TOTAL | 4 178,5 | 2 444,9 | 8 059,6 | 14 683 |

Source: (Steenkamp M. 2010)

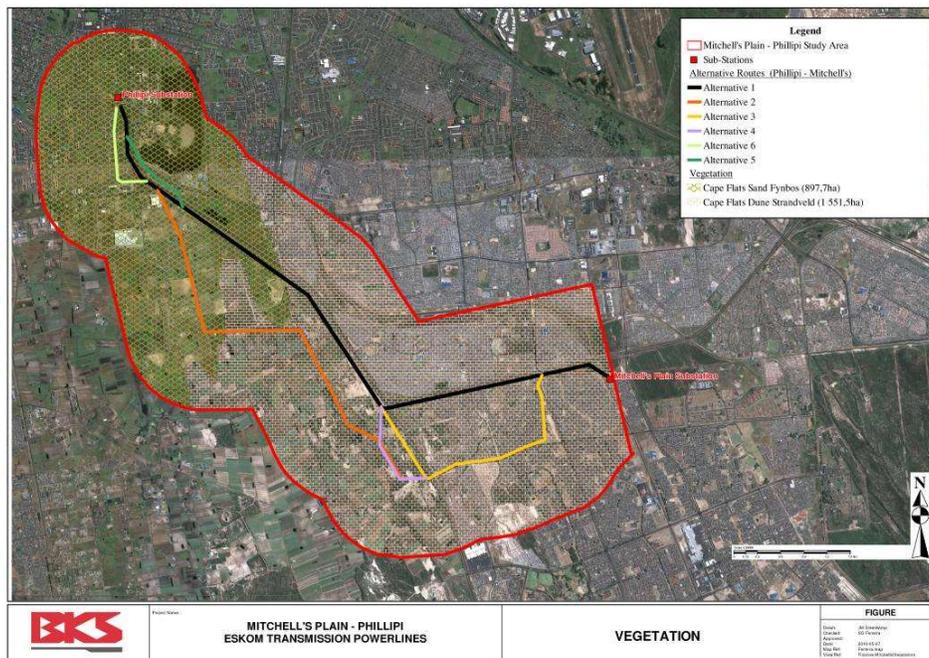
The current landuse in the area is shown in Figure 6 and Figure 7.

Figure 6 Land-use, Firgrove – Mitchell's Plain Project Area



Source: (Steenkamp M. 2010)

Figure 7 Land-use, Mitchell's Plain Philippi project area



Source: (Steenkamp M. 2010)

6.2 CULTIVATED AREA

6.2.1 Firgrove Mitchell's Plain project area

a) Area close to Firgrove Substation

Cultivated land in the Firgrove-Mitchell's Plain project area extends over 482 ha.

Contradictory information is found with respect to crops produced in the area close to Firgrove Substation. It, however, appears that vineyards and vegetables are found here.

b) Vergenoegd Wine Estate

Vergenoegd farm has been owned by the Faure family for six generations. Historic Vergenoegd, was granted land rights in 1696 and the Faures have been on the farm since the 1820's. The Cape Dutch homestead is a historic monument and dates from 1773.

The following wine cultivars are produced on the estate: Cabernet Sauvignon, Shiraz, Merlot, Cabernet Franc, Malbec, Petit Verdot, Tinta Barocca, Touriga Nacional and other.

An old world cellar, equipped with modern winemaking machinery, is in operation on the estate. (Vergenoegd Estate Winery Web Page, May 2010).

The estate extends over an area of approximately 230 ha. Currently 74 ha is established with vineyards of which 17 ha is irrigated on a permanent basis with drip irrigation system. The remaining vineyards are produced with supplementary irrigation.

The Eerste River intersects the property from north to south.

The main activities on the estate are exercised on the western side of the Eerste River. The eastern side is not cultivated due to poor soils and is currently used for natural grazing. .

Irrigation water is conveyed by a canal upstream in the Eerste River to a lined dam on the property from where vineyards are irrigated. If necessary water is subtracted directly from the Eerste River on the property. This water subtraction is controlled by the Lower Eerste River Irrigation Board.

The quality of the water is threatened by municipal sewage upstream. Contamination is currently at acceptable levels and does not have a negative affect on agricultural production. (Jacobs, Marlize, May 2010)

6.2.2 Mitchell's Plain Philippi project area

Cultivated land in the Mitchell's Plain Philippi project area extends over 771 ha. The area was originally divided in small holdings of approximately 10 ha each. Commercial irrigated farming are mainly found in this area. Farmers farm on 4 to 5 small holdings which may vary in size from 40 to 50 ha. A variety of vegetables are produced under irrigation. Flower production and small dairies are also

present but of minor importance. The following vegetables are produced: Soup vegetables during winter, potatoes, cabbage, cauliflower, salad and other. Double cropping of more than 200 percent is achieved especially when crops with a short growing season such as salad are produced. Sprinkler irrigation systems are mainly found in the area. (Rix, Leon, May 2010).

6.3 OTHER

Natural forest and shrubs of 29 ha are found in the Firgrove -Mitchell's Plain project area.

Residential or build-up areas extends over 1 558 ha in the Firgrove -Mitchell's Plain project area and 1 455 ha in the Mitchell's Plain Philippi project area

Denel (Pty) Limited, manufacturer of defence equipment in South Africa, owes 177 ha in the Firgrove - Mitchell's Plain project area

Vacant and unspecified land covers an area of 1 707 ha in the Firgrove -Mitchell's Plain project area and 220 ha in the Mitchell's Plain Philippi project area.

7. LAND VALUES

Land values are negated by a number of factors such as on-farm infrastructure, soil quality, water availability for irrigation, quality of water, location etc. According to information agricultural land values has exploded recently. It is only possible to submit a range of values for the purpose of this report.

The market price for vineyards may vary from R400 000 to R1 million per ha while the value of land currently used for vegetable production may vary between R250 000 to R500 000 per ha. The price in the Philippi area is relative high due to the demand of land for industrial development.

An investigation is required to determine more accurate indications.

8. EMPLOYMENT OPPORTUNITIES

The total labour requirements for vegetable production is shown in

Table 8` Labour requirements, vegetable production, Western Cape

| Type | Man days per ha | Man years per ha |
|--------------|-----------------|------------------|
| Permanent | 210 | 0,9 |
| Seasonal | 90 | 0,4 |
| TOTAL | 300 | 1,3 |

One ha of vegetables create approximately 1, 3 employment opportunities.

The total labour requirements for vineyard production, excluding labour requirements in cellar is approximately 150 man days per ha or 0,65 employment opportunities per ha.

9. ALTERNATIVE SUBSTATIONS

There are two alternative substations at Mitchell's Plain.

Figure 8 Alternative 1 site for substation, Mitchell's Plain

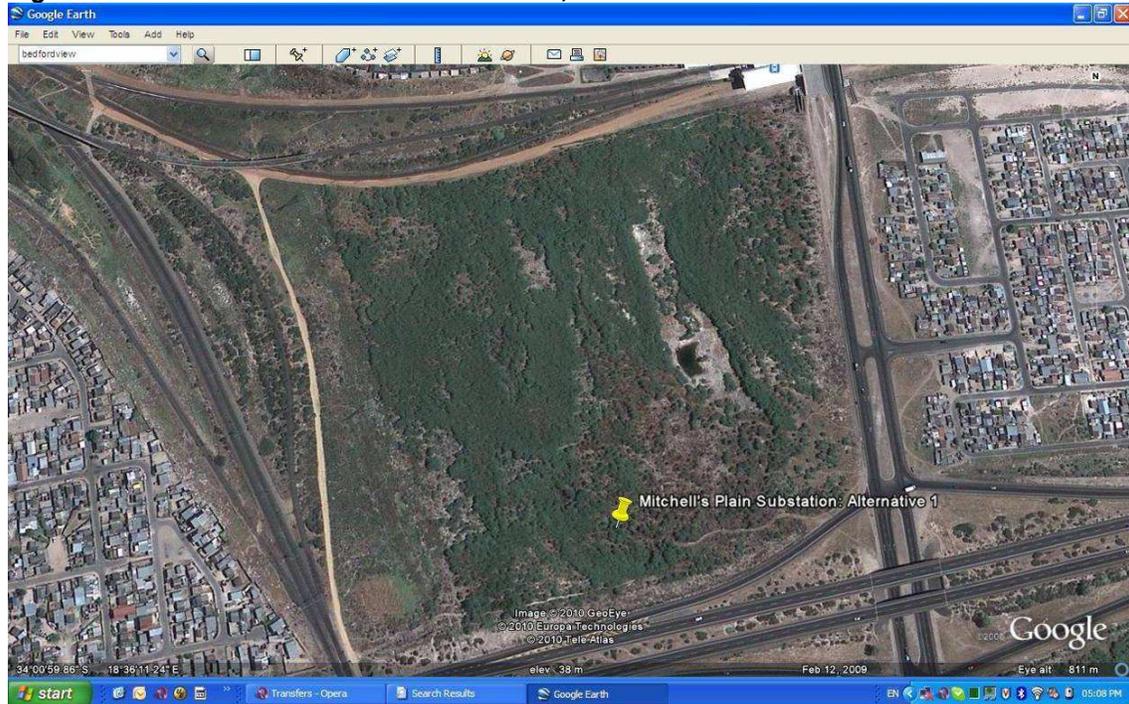
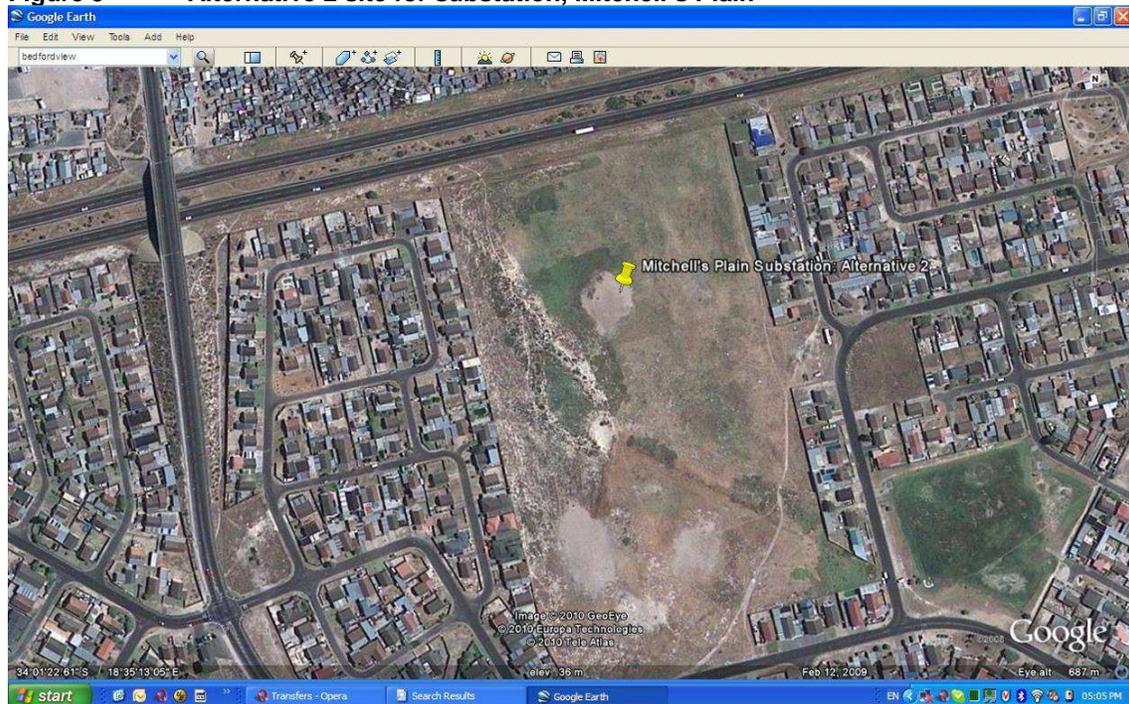


Figure 9 Alternative 2 site for substation, Mitchell's Plain



Both the alternative sites are surrounded by residential area.

10. FATAL FLAWS

Fatal flaws are defined as environmental problems that are impossible or prohibitively expensive to manage and that may render the project unacceptable from an agricultural economic perspective.

No serious fatal flaws from an agricultural viewpoint are identified.

It is not foreseen that the proposed power lines will interfere with crop production although farmers will oppose that lines intersect their farms.

Vergenoegd Wine Estate is of ecstastic importance as it is an historical farm and historical monuments are present on the property. It is also an important tourist attraction. The presence of power lines, intersecting the estate may detract the aesthetical value of the estate.

The agricultural potential sites of the alternative substation sites in Mitchell's Plain will depend on the quantity and quality of groundwater on these sites as well as the soil potential.

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