6 SOCIO-ECONOMIC BASELINE DESCRIPTION

6.1 INTRODUCTION

The purpose of this section is to describe the socio-economic environment within which the Project is located. The Project will have benefits on a national level in terms of increasing electricity supply to the national grid. However, the majority of socio-economic impacts will be experienced at the local level. A brief description of the Province and District Municipality is given below, but the socio-economic baseline description is focused on the local level, i.e. the Inxuba Yethemba Local Municipality.

The description provided in this section is based on the most up to date publicly available secondary information, as well as primary data collected for this project. It should be noted that in a few instances the latest data for certain socio-economic indicators were not yet available from the most recent census (Census, 2011), and in these cases data from the Statistics South Africa (StatsSA) Community Survey 2007 were used.

6.2 ADMINISTRATIVE STRUCTURE

The Site is located within Ward Six of the Inxuba Yethemba Local Municipality, which falls within the Chris Hani District Municipality, in the Eastern Cape Province (see Figure 6.1 and Figure 6.2). Within this administrative structure, the provincial government is responsible for providing a strategic vision and framework for the province, as well as ensuring cooperation between municipalities and ensuring each municipality performs their respective functions. The district and local municipalities are each responsible for the provision of services and infrastructure within their municipal boundaries. This is facilitated through the development and implementation of Integrated Development Plans (IDPs), Spatial Development Frameworks (SDFs) and Local Economic Development (LED) Plans.
6.3 PROVINCIAL CONTEXT

The Eastern Cape Province, in which the Site is located, is the second largest province in South Africa, measuring 169,580 km². There are two primary metropolitan areas within the Eastern Cape, namely, Port Elizabeth and East London. The town of Bisho is the provincial capital and smaller district towns include Grahamstown, King Williams Town, Queenstown, and Mthatha. In addition there are a number of small towns scattered throughout the Province.

The Eastern Cape is the third most populous province in South Africa (with a population of 6,562,049), comprising approximately 12.7 percent of the national population (Statistics South Africa [StatsSA], 2011). However in the period since the 2001 census was undertaken, the Eastern Cape’s population has grown at a rate of 4.5 percent, which is the second lowest growth rate of all provinces in the country. A factor which may underpin this trend is that the Eastern Cape tends to experience an out-migration of inhabitants who leave to live and work in other provinces (Eastern Cape Socio-Economic Consultative Council [ECSECC], 2012a). In this regard the StatsSA mid-year population estimate for 2013 noted that 264,449 people in the Eastern Cape migrated from the province for the period 2006 to 2011 (StatsSA, 2013a).

The Eastern Cape faces the challenge of high unemployment rates and low income levels. The unemployment rate in the Province as of the fourth quarter 2012 stood at 30.2 percent, the second highest in the country after the Free State (31.6 percent) and also higher than the national average of 25.2 percent. Employment increases in the Eastern Cape between the fourth quarter 2012 and the first quarter of 2013 amount to 51,000 new jobs.

1To illustrate this point, as of 2011 around 2 million of those born in the Eastern Cape were living in other provinces in the country.
However the unemployment rate in the province increased from 29.8 percent as of the fourth quarter 2012 to 30.2 percent in the first quarter of 2013 (StatsSA, 2013b). This occurrence is most likely the result of the entry into the labour market of recent school leavers who were not part of the economically active labour pool in 2012.

As indicated in Table 6.1 the economic sectors which are pertinent to an industrial development such as the PV project under consideration, namely trade, transport and construction, all underwent a contraction in employee numbers between the first and second quarters of 2012, with the transport sector losing 6,000, trade 3,000 and construction 2,000 employees respectively. Employment in manufacturing and utilities remained static over the same period (ECSECC, 2012a).

Table 6.1  

<table>
<thead>
<tr>
<th>Sector</th>
<th>Fourth Quarter 2012</th>
<th>First Quarter 2013</th>
<th>Quarter to Quarter Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport</td>
<td>65,000</td>
<td>64,000</td>
<td>-1.5%</td>
</tr>
<tr>
<td>Trade</td>
<td>284,000</td>
<td>275,000</td>
<td>-3.2%</td>
</tr>
<tr>
<td>Construction</td>
<td>131,000</td>
<td>128,000</td>
<td>-2.3%</td>
</tr>
</tbody>
</table>


6.4 THE CHRIS HANI DISTRICT MUNICIPALITY

The Chris Hani District Municipality (CHDM) is one of seven District Municipalities in the Eastern Cape. It is located inland, roughly in the centre of the Province and is approximately 36,561 km² in size. There are eight Local Municipalities (LM) within the District Municipality, namely, Emalahleni LM, Engcobo LM, Inkwanca LM, Intsika Yethu LM, Inxuba Yethemba LM, Lukhanji LM, Tsolwana LM, and Sakhisizwe LM.

According to the 2011 Census, the population of the CHDM is approximately 795,461, accounting for 12 percent of the total population in the Eastern Cape. A large portion of the population (40 percent) within the District is between the age of five and 24 (StatsSA, 2011). The occurrence of a young population is a Province-wide trend and may be linked to the fact that the Eastern Cape has historically been a labour sending area.

The CHDM is largely rural, with small to medium-sized urban centers, such as Queenstown, Middelburg, Lady Frere and Cradock. Like the Eastern Cape Province as a whole, the CHDM also experiences high levels of poverty, with a poverty rate of 53 percent and 10 percent unemployment amongst the population of working age (ECSECC, 2012b). There are 58,945 people (7.4 percent) in the district who are without any level of schooling.

1 Typically the population of working age refers to those individuals between the ages of 15 and 65.
The development of a special economic zone, with one aim to develop primary value adding capabilities (beneficiation) within the surrounding local municipalities, is part of the CHDM’s development agenda. The sectors to be targeted include crop production, livestock improvement, forestry, tourism, coal mining, and of significance for this Project, alternative energy (ECSECC. 2012b).

6.5 **THE INXUBA YETHEMBA LOCAL MUNICIPALITY**

The Site is located within a rural setting off the N10 approximately 28 km south of the town of Cradock on Portions 15 of Portion 1 of the Farm Waai Plaats (no. 550) near Drennan, situated in the Inxuba Yethemba Local Municipality (IYLM) (see Figure 6.2). The town of Cradock has one residential extension located on either side of the N10 upon entering the town from the south west, which is known as Lingelihle.

The IYLM comprises an area of 11,592 km². The administrative centre of the IYLM is Cradock. There are nine Wards within the Municipality and the Site is located in Ward 6. The Great-Fish River runs through the IYLM and is a vital water source for the irrigation of farm lands. The N10 national road bisects the Municipality from north to south.

The sections below provide a description of the socio-economic conditions pertaining to the IYLM, and, where relevant, to Ward 6.
6.5.1 Local Economy

According to the IYLM Integrated Development Plan (IDP) 2010, the most significant contributors to the municipal Gross Geographic Product (GGP) are finance (22 percent), general government services (21 percent), trade (18 percent) and agriculture (10 percent) see Figure 6.3. The IYLM contribution to the National Gross Domestic Product (GDP) was approximately 0.1 percent (R1.7 Billion) in 2007. According to the IDP, the contribution of agriculture to the GGP declined from 20 percent in 1995 to 10 percent in 2007, showing negative growth in this sector. According to the ECSECC (2011) the decline can be attributed to drought, climate change and deregulation of the agricultural industry. Agriculture, however, remains an important employer within the Municipality. Tourism has been identified as a potential growth sector within the IYLM, this is discussed in more detail in Section 6.5.5.

Figure 6.3 Economic Indicators (highest sector contributors)

![Economic Indicators](image)

Source: IYLM IDP 2010

6.5.2 Population Demographics

The population in the IYLM was an estimated 65,560 at the time of the 2011 census. This shows a slight increase since the 2001 census, when the population size was 60,364 (StatsSA, 2011). This increase is counter to the slight decrease of 0.1 percent which the CHDM experienced in the same period. This may be attributed to less out-migration of job seekers from the IYLM, as compared to the CHDM and Eastern Cape, to other provinces and urban areas. The largest increase in the IYLM population was experienced by the African population group, as shown in Figure 6.4.

Census 2011 data indicates that females represent 52 percent of the population within the IYLM, while males account for 48 percent, which is almost identical to the 51.8 to 48.2 percent split recorded in the 2001 census. In addition according to the IYLM IDP 2010, within Ward 6, the gender split differs, with

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(1) The gross geographic product (GGP) of a particular area amounts to the total income or payment received by the production factors – (land, labour, capital, and entrepreneurship) - for their participation in the production within that area.

(2) The market value of all the finished goods and services produced within a country’s borders in a specific time period:
a greater percentage (55.9 percent) of the population being male (StatsSA, 2011).

The racial composition of the IYLM comprises of 56.2 percent African, 32.1 percent Coloured and 10.5 percent White people. Whilst in Ward 6 the racial composition is 55.1 percent African, 34 percent Coloured, 8.8 percent White and less than one percent Indian/Asian people (StatsSA, 2011).

**Figure 6.4** Population change between 1996, 2001 and 2011, by population group

An estimated 11 percent of the population over 20 years of age have not received any form of schooling. It is estimated that 36 percent of the population over 20 years have completed some secondary schooling, followed by 20 percent who have completed grade 12 and nine percent who have attained a higher education qualification (StatsSA, 2011).

Almost two thirds (64.7 percent) of those with a higher education are White, while 35.2 percent are African or Coloured. A slightly higher percentage of females (51.7 percent) have completed grade 12, which is in line with the 52 percent female – 48 percent male gender split within the IYLM, as mentioned in Section 6.5.2 above.

Source: Statistics South Africa: Census Data, 2011
The IYLM IDP 2010 indicates there were 23 crèches and 20 primary schools within the Municipality, and only two pre-primary schools and seven secondary schools. There are only two tertiary educational facilities within the Municipality. Within Ward 6 there are four primary schools and one crèche. Samephore Primary School is located around 10km to the north of the Site on a rural road which links the N10 to the R337/R390. The number of learners attending the school was noted as 50 as of a survey conducted by the Department of Water Affairs in 2000\(^{(1)}\).

A key challenge for the IYLM is that education facilities are not distributed evenly around the Municipality. As such, access to these facilities is limited. A further challenge is that many crèches and pre-primary schools have been established in inadequate structures.

**6.5.4 Employment and Livelihoods**

The economically active population (aged 15 – 64 years) of the IYLM was estimated to be 42,341 people in 2011, making up 64.6 percent of the total population.

Of that total, 25.5 percent are employed, while 10 percent are unemployed. A further 25.7 percent are considered economically inactive\(^{(2)}\). The


\(^{(2)}\) Economically inactive population refers to students, elderly, sick, differently-abled persons and people who choose not to work.

Source: Statistics South Africa: Census Data, 2011
unemployment rate in the IYLM is lower than that of the Province (29.8 percent), and in line with the National unemployment rate of 24.9 percent. At a Ward level, unemployment is seen as a major concern, despite the relatively low levels of unemployment (which as of 2011 was 8.87 percent). It was reported that alcohol consumption is high amongst unemployed people, which could explain the increase in crime and other social nuisance factors in the area(1).

There is a difference in the employment rate between males and females, with 43 percent of males unemployed in the IYLM as compared to 57 percent females, see Figure 6.6. Females also make up a larger portion of the economically inactive population, as shown in Figure 6.6 below. Figure 6.7 shows that the unemployed population in both the IYLM and Ward 6 consists largely of previously disadvantaged South Africans, i.e. African and Coloured groups. In contrast, unemployment is very low among the White population group and the Indian/Asian group, although the population size of the latter in the IYLM is very small.

Figure 6.6 Employment by Gender in 2007

Source: Statistics South Africa: Census Data, 2011

(1) Personal Communication: Ward Councillor
The main occupations undertaken by those living in IYLM are shown in Figure 6.8. The StatsSA Community Survey 2007 indicated that elementary occupations i.e. occupations which require unskilled labour, were the dominant occupation at 29 percent in 2007 (StatsSA, 2007). Twelve percent of the IYLM were indicated as undertaking professional occupations, followed by clerks, legislators and senior officials, and service workers, shop and market sales workers, who each comprised approximately nine percent of the occupations undertaken within the IYLM. Skilled agricultural workers made up eight percent of the occupations within the IYLM. The high percentage of people with elementary occupations reflected the lack of specialised skills training and completion of higher education in the IYLM. The lack of specialised skills within the labour force and the lack of skills training available has also been highlighted as a concern at Ward level\(^{(1)}\). The low numbers of people with professional occupations may be influenced by the lack of availability of such jobs and the limited opportunities for training.

\(^{(1)}\) Personal Communication: Ward Councillor
Figure 6.8  Primary Occupations within the Local Municipality

According to the StatsSA Community Survey 2007, the primary employment sector within the IYLM was community; social and personal services, employing approximately 23 percent of the working population (see Table 6.2). The next most dominant sector was agriculture, hunting, forestry and fishing, employing 17 percent of the working population, followed by wholesale and retail trade, employing 13 percent\(^1\). As shown in Table 6.2 other sectors such as manufacturing, construction and transport, each employed less than ten percent of the population.

Table 6.2  The Main Employment Sectors in 2007

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community; social and personal services</td>
<td>23%</td>
</tr>
<tr>
<td>Agriculture; hunting; forestry and fishing</td>
<td>17%</td>
</tr>
<tr>
<td>Wholesale and retail trade</td>
<td>13%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>10%</td>
</tr>
<tr>
<td>Financial; insurance; real estate and business services</td>
<td>7%</td>
</tr>
<tr>
<td>Construction</td>
<td>6%</td>
</tr>
</tbody>
</table>

\(^1\) Statistics South Africa: Community Survey, 2007
Within the IYLM, 32.5 percent of the economically active population reported that they had no income in the 2011 Census, while 40 percent reportedly earn a low income of below R1,600 per month. A smaller number, 12.1 percent, earn between R1,601 and R12,800 per month. Only 2.7 percent earn between R12,801 and R52,200 per month, and 0.4 percent reported earning above R51,200 per month (StatsSA, 2011). The high percentage of people who earn low to no incomes can be attributed to the high unemployment rate and dominance of elementary (unskilled/low skilled) occupations in the IYLM.

In addition to low income levels a significant portion of the IYLM population has historically been dependent on social grants from the Government, specifically 28 percent in 2007 (StatsSA, 2007). As shown in Figure 6.9 the main social grants received at that time were child support grants (58 percent), followed by old age pensions (24 percent) and disability grants (13 percent).

The comparative indications of household income between the 2001 and 2011 censuses (indicated in Table 6.3 below) shows that the IYLM is substantially better positioned than both the CHDM and the Eastern Cape. The national average household income per annum underscores the relative poverty currently experienced within the Eastern Cape Province.

<table>
<thead>
<tr>
<th>Sector</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport; storage and communication</td>
<td>4%</td>
</tr>
<tr>
<td>Undetermined, unspecified</td>
<td>20%</td>
</tr>
</tbody>
</table>

Source: Community Survey, 2007
### Table 6.3 Distribution of annual average household income—2001 and 2011

<table>
<thead>
<tr>
<th></th>
<th>2001 (R)</th>
<th>2011 (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inxuba Yethemba</td>
<td>33,405</td>
<td>81,892</td>
</tr>
<tr>
<td>Chris Hani</td>
<td>19,689</td>
<td>48,183</td>
</tr>
<tr>
<td>Eastern Cape</td>
<td>29,334</td>
<td>64,539</td>
</tr>
<tr>
<td>SA Average</td>
<td>48,385</td>
<td>103,204</td>
</tr>
</tbody>
</table>

Source: StatsSA Census 2011

### 6.5.5 Surrounding Landuse

The Site is located in a rural setting and the surrounding landuse is dominated by commercial agriculture undertaken along the Great-Fish River. Other activities in proximity to the Site include tourism and small businesses. These are discussed in more detail below.

#### Agriculture

Despite the fact that the contribution of agriculture to the GGP within the IYLM has been steadily declining, it remains an important sector in the Municipality. The IYLM IDP indicates that there are around 350 to 400 commercial farmers in the Cradock area, practicing two primary types of farming activities, namely dryland farming and intense irrigation farming (IYLM IDP, 2010). The irrigation farming takes place along the Fish and Tarka Rivers, where water from the rivers can be used to irrigate lucerne, wheat, oats, maize and vegetables. The irrigated fields also facilitate dairy farming. The dryland farming in the area consists of stock farming, (sheep, cattle, goats, ostrich) and game ranching.

The farming activities surrounding the Site are commercial, large-scale undertakings. The Site does not contain any large water bodies and there does not appear to have been any significant irrigation of the land undertaken within the Site. The eastern boundary of the Site is, however, around one kilometre away from the Fish River where intensive agriculture is being undertaken.

There are some emerging farmers in the IYLM, with two groups in the Middelburg area and 12 groups in the Cradock area. According to the IYLM IDP 2010, the emerging farmers mostly farm the same piece of land in groups and these commonages are rented from the municipality. The IDP notes that the challenges faced by emerging farmers include a lack of appropriate skills amongst them, little support from government and limited access to agricultural finance. There are however opportunities to access training in that there are two agricultural institutions, one of which is located in Cradock (Marlow agricultural high school), and another in Middelburg (Grootfontein College).
Tourism

The Site is located along the N10 National Road, which connects the coastal city of Port Elizabeth to the inland towns of Bloemfontein and Kimberley. Middelburg, Cradock and the surrounding areas are convenient stopover locations along the N10, therefore, much of the domestic tourism in the area consists of people passing through the area and overnight stays. The IYLM IDP notes that there is opportunity to grow the tourism sector. However there are a number of constraints, primarily the lack of cohesion amongst operators, the long distances between tourist attractions and lack of support from government, whose focus is primarily on coastal towns.

The Mountain Zebra National Park is located 36km north west of the Site. There are no other statutory nature reserves or national parks within a 50km radius of the Site. There are a number of private game reserves in the Eastern Cape; however, none appear to be located close to the Drennan Site. Other attractions in the area include historical buildings in Cradock and Middelburg, rock art, agri-tourism and natural Karoo landscapes.

The Karoo Calata Route is a tourist route designed to take visitors to the above mentioned attractions in the area. It forms a loop between Middelburg, Cradock and Queenstown and passes through Tarkastad, Sterkstroom, Molteno and Rosmead before returning to Middelburg. It does not appear to be well established or widely advertised as a tourist route.

Local Businesses

The Site is located in a rural setting and the local businesses are largely located in the nearby town of Cradock. Cradock has a number of local accommodation options. A number of eateries, grocery stores and speciality stores such as florists can be found in Cradock, and other amenities include filling stations, liquor stores, hardware stores and clothing stores.

Existing infrastructure surrounding the Site

There is an existing railway line 500m to the east of the PV footprint, which traverses the Site in a north south direction. An existing gravel road network exists on the Site, which crosses the railway line and runs 500m to the north east of the PV Footprint in a south-east to north-west direction (see Figure 6.10). Existing 132kV overhead transmission lines run along the north eastern boundary of the PV footprint, which link to the existing 132kV Drennan Traction Substation located two kilometers to the north of the Site. Two kilometers beyond the northern boundary of the Site there is an area of irrigated land where pivot agriculture has been undertaken. Housing infrastructure is scattered along the portion of railway line located around 500m to the immediate north east of the PV Footprint.
6.5.6 Health

There are two hospitals and eight clinics located in the IYLM, including one in the Lingelihle extension adjacent to Cradock. In the rural areas, access to health care facilities is somewhat limited (IYLM IDP, 2010); people living in the rural areas travel long distances to access medical facilities. The IYLM 2012 IDP identified the need for mobile clinics within the IYLM to address this problem and by 2012 there were three mobile clinics operating out of Cradock (Education Management Information System [EMIS], 2012). Other health challenges within the IYLM include clinics with insufficient medicine supplies and staff. The percentage of the population in the IYLM infected with HIV/AIDS increased from 5.7 percent in 2001, to 7.6 percent in 2010, although it should be noted that this was a decrease from 2007 when this number was 8.8 percent (ECSECC, 2013).

6.5.7 General Infrastructure and Services

Housing

The IYLM IDP notes that there is an average of six people per household in the municipality (IYLM IDP, 2010). As of 2011 the majority (97 percent) of the population of IYLM lived in formal dwellings, while two percent resided in informal dwellings. Only one percent of the population lived in traditional dwellings (StatsSA, 2011). The housing in Lingelihle is predominantly of the Reconstruction and Development Plan (RDP) type (see Figure 6.11).

Table 6.4 Distribution of Households in the IYLM by Dwelling Type

<table>
<thead>
<tr>
<th>Census</th>
<th>Formal dwellings</th>
<th>Informal dwellings</th>
<th>Traditional dwellings</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>15 531</td>
<td>247</td>
<td>216</td>
</tr>
<tr>
<td>2011</td>
<td>17 903</td>
<td>381</td>
<td>67</td>
</tr>
</tbody>
</table>

Source: StatsSA, Census 2011
Energy

The StatsSA Community Survey 2007 showed that the majority of the households within the IYLM (94 percent) had access to electricity, which was used primarily for lighting, heating and cooking, as shown in Figure 6.12. Households that did not have access to electricity for cooking made use of other fuel sources. For example, paraffin was used for cooking by 14 percent of the households in the IYLM, and for heating by 33.5 percent of the households. Wood was used for heating by 17 percent of households (StatsSA, 2007).

By 2011, as indicated in Table 6.5, the IYLM had experienced a steady increase in the proportion of households that utilised electricity for lighting, heating and cooking. Of particular significance were the greater number of households which prepared food with electricity as opposed to other energy sources mentioned above, which are commonly associated with health risks and environmental pollution.

In Ward 6 specifically the IYLM IDP 2010 indicated that 90 percent of the Ward had access to electricity, and 99 percent to street lights (IYLM IDP, 2010).
Table 6.5  Percentage of households use of electricity in the IYLM

<table>
<thead>
<tr>
<th>Inxuba Yethemba</th>
<th>Census 2011</th>
<th>CS 2007</th>
<th>Census 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electricity used for lighting</td>
<td>82.5</td>
<td>94.1</td>
<td>95.6</td>
</tr>
<tr>
<td>Electricity used for heating</td>
<td>44.3</td>
<td>43.7</td>
<td>56.8</td>
</tr>
<tr>
<td>Electricity used for cooking</td>
<td>52.8</td>
<td>79</td>
<td>90.2</td>
</tr>
</tbody>
</table>

Source: StatsSA Community Survey 2007/Census 2011

Figure 6.12  Household energy sources and their uses in the IYLM in 2007

Source: Statistics South Africa: Community Survey, 2007

Water and Sanitation

According to the StatsSA 2007 Community Survey, an estimated 52 percent of households in the IYLM had access to tap water inside their homes, while 39 percent had access to water outside their homes (within their yard). Three percent of households have access to piped water from an access point outside of their yard and six percent do not have access to piped water and obtain water from boreholes. The 2011 Census indicated that 97 percent of households in the IYLM had access to piped water inside their yard or dwelling, and there were less than one percent of households without access to piped tap water (see Table 6.6). The percentage of households with connection to flush toilets in the IYLM (87 percent) compares far more favourably that the percentage in the CHDM (31 percent).
Table 6.6  Household Access to Piped Water in the IYLM, 2001 and 2011

<table>
<thead>
<tr>
<th>Inxuba Yethemba</th>
<th>2001</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Piped (tap) water inside yard/dwelling</td>
<td>85%</td>
<td>97%</td>
</tr>
<tr>
<td>Piped (tap) water on a communal stand</td>
<td>12%</td>
<td>3%</td>
</tr>
<tr>
<td>No access to piped (tap) water</td>
<td>3%</td>
<td>&lt;1%</td>
</tr>
</tbody>
</table>

Source: StatsSA Census 2011

Roads and Access

Long sections of the N10 are currently being upgraded and re-surfaced, and as a result the N10 is in good condition. Most roads are paved in the older parts of Cradock, while some roads in the extension of Lingelihle are unpaved. The R390 by which the Site can be accessed is a graded gravel road and there are additional dirt tracks which occur within the Site. The proposed access road would be 900m in length and 6m wide, entering at the north of the PV Footprint.

Access to Technology

The results from the 2011 Census (Figure 6.13) indicate that there has been a considerable increase in television, computer and cell phone possession between 2001 and 2011. During this time, television access amongst households in the IYLM increased from 56 to 80 percent, computer access from 5.6 to nearly 16.7 percent, and cell phone use increase from 21 to 77.5 percent. The number of households with landlines decreased by 37.5 percent between 2001 and 2011 which reflects the significant shift towards cell phone use in the IYLM. According to the StatsSA Community Survey 2007, only four percent of households within the IYLM had access to the internet. This has increased to 26 percent in 2011 (StatsSA, 2011).
6.5.8 Crime

Stock theft is a problem in the rural areas of South Africa, especially on farms located close to main roads or towns. There are regular police patrols in the IYLM to try and combat this problem\(^\text{(1)}\). It was noted that small solar panels used for road signage, communication towers and PV panels located on farms have been stolen and damaged in the past\(^\text{(2)}\).

6.6 Archaeology and Cultural Heritage

6.6.1 Archaeology

Many archaeological collections were received from the Cradock area, where freshwater mussel middens containing stone implements and pottery were recorded from the banks of the Great-Fish River.

It is therefore anticipated that the study area will contain artefactual material dating to the Early and Middle Stone Age of the Pleistocene epoch (3 million – 20,000 years ago). This material is often noted in eroded areas, or on terraces in river valleys.

It can be predicted, with confidence, that there will be Later Stone Age sites within the study area. These are attributed to the ancestors of the San people and Khoekhoen pastoralists (after 2,000 years ago). The legacy of the San includes numerous open sites while traces of their presence can also be found

\(^\text{(1)}\) Personal Communication: Ward Councilor
\(^\text{(2)}\) Personal Communication: Neighbouring Landowner
in most large rock shelters, often in the form of rock art. They frequently settled a short distance from permanent water sources (springs or waterholes) and made use of natural shelters such as rock outcrops or large boulders. In the Great Karoo natural elevated features such as dolerite dykes and ridges played a significant role in San settlement patterns.

The introduction of pastoralism (sheep and goats, later cattle) roughly 2,000 years ago, along with the arrival of the Khoekhoen, was a significant event that broke the ancient tradition of hunting and gathering. According to the historic records, the Khoekhoen herders were divided into large tribal communities, distributed along the coastal plains and up as far as Graaff Reinet. These communities in transition (herding cattle and sheep) may have utilized the grazing opportunities of the Karoo on a seasonal basis but information on this is sketchy.

The San appear to have retreated to the Great Karoo with the arrival of the first Dutch Trekboers in the mid-18th century. Here they managed to eke out an existence which includes hunting, gathering and raiding the livestock of the Trekboers, resulting in the “Bushman War” which continued for almost 60 years. Eventually the kommandos which were dispatched from regional centres such as Graaff Reinet prevailed, and the “wild bushman” of the Karoo were rendered extinct by the early 19th century.

Field Survey Results

Four archaeological sites were found within the area (see Figure 6.14). One of these was a very well preserved Koekhoen stone kraal/alignment (circa 1000 – 1400 AD) while the others included a historical Kraal (see Figure 6.15) and two potential pre-colonial graves (stone cairns, see Figure 6.16). Fortunately all of these sites are limited in size and avoidable in terms of project development.

The Koekhoen stone kraal (DRN 13) is best conserved in-situ due to its completeness with a 10m buffer zone. However if this is not possible, its destruction can only be undertaken under a permit issued by the Eastern Cape Provincial Heritage Resources Authority. For this to happen it will need to be recorded and documented first by an archaeologist. The same applies to the historical kraal (DRN 15), which is well represented in the Karoo and protected under the NHRA.

The two possible graves (DRN 11 and DRN 14), both of which lie close to the edge of the PV Footprint, are best left in-situ in a small 10m buffer zone as the process of exhumation is time consuming, costly and requires its own public process in terms of section 36 of the National Heritage Resources Act 25 of 1999.
Figure 6.14  Key Archaeological Sites

Figure 6.15  A Piled Stone Kraal Typical of the Central Karoo

Source: Tim Hart, 2013
The Site is situated in a palaeontologically sensitive and important area of the ancient Karoo Basin (Johnson, et al. 2009; Rubidge, et al. 1995; Smith 1990). Fossilized plant remains are common in parts. Iziko South African Museum’s Karoo Palaeontology section holds Balfour and Katberg Formation vertebrate and plant fossils from the Cradock area in its collection (pers. Comm, S. Kaal, Iziko Museums of South Africa). Thus, excavations into sediments not normally accessible to palaeontologists should be seen as providing opportunities to recover potentially important fossil material that enable observations otherwise impossible to be made.

The rocks of the hills to the north of the Site belong to the Balfour Formation of the Beaufort Group which is world-renowned for its rich fossil record and contain some of the most significant evidence for the origins of dinosaurs, mammals and turtles. Fossils from this area could potentially be of great significance. However, the presence of dolerite extrusions and dykes as well as indurated rock means that well preserved fossils are an unlikely occurrence on the surface. Fossils are potentially present on exposures to the south-west of the Site, an area which will be unaffected by construction, but from where fossils may roll down slopes into the PV Footprint when they weather out.

In addition to the potential within the Balfour Formation rocks, small pockets of bone can occur, for instance, where bone accumulators like hyaenas, jackals or porcupines used holes/burrows dug by aardvarks; older and younger sediments, too, may contain ancient wetland deposits and/or more-recent fossils. In addition to fossil bones and molluscs, there is the potential
for encountering macro-plant remains and pollens of considerable age in wetland deposits. Thus, foundations excavated into rocks and sediments on the Site may intersect fossil-bearing deposits. If so, there is the potential to provide opportunities for observations not otherwise accessible to researchers.