

# ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED NUCLEAR POWER STATION ('NUCLEAR 1') AND ASSOCIATED INFRASTRUCTURE

## SOCIAL IMPACT ASSESSMENT

August 2015



Prepared by: Octagonal Development



Prepared for: Arcus GIBB Pty Ltd



On behalf of: Eskom Holdings Ltd





15 August 2010

**DECLARATION OF INDEPENDENCE**

I, Alewijn B.J.Dippenaar as duly authorised representative of Octagonal Development, hereby confirm my independence (as well as that of Octagonal Development]) as a specialist and declare that neither I nor Octagonal Development have any interest, be it business, financial, personal or other, in any proposed activity, application or appeal in respect of which Arcus GIBB was appointed as environmental assessment practitioner in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), other than fair remuneration for worked performed, specifically in connection with the Environmental Impact Assessment for the proposed conventional nuclear power station ('Nuclear-1'). I further declare that I am confident in the results of the studies undertaken and conclusions drawn as a result of it – as is described in my attached report.

Full Name: Alewijn Bernardus Jacobus Dippenaar  
Title / Position: Director  
Qualification(s): B.Diac Hon  
Experience (years/ months): 12 Years  
Registration(s): None

## EXECUTIVE SUMMARY

### ***Background***

Octagonal Development cc (Alewijn Dippenaar) has been appointed to conduct a Social Impact Assessment (SIA) for the proposed construction of a nuclear power station and associated infrastructure, on three sites with one being located in the Eastern Cape and a further two in the Western Cape Provinces. The three alternative sites identified are referred to as:

- Thyspunt;
- Bantamsklip and
- Duynefontein.

The report related to the SIA is divided into four chapters, viz.:

- Section 1: Introduction;
- Section 2: Description of the affected environment;
- Section 3: Impact identification, assessment and mitigation/ optimisation measures; and
- Section 4: Conclusions and recommendations

### ***The Project (Nuclear Power Station)***

Eskom proposes to construct a Nuclear Power Station, referred to as Nuclear-1, with a power generation capacity of up to 4 000 MW, using the Pressurised Water Reactor technology (PWR). In many ways the structure of the nuclear plant resembles that of a conventional thermal power plant. The difference between nuclear and conventional fossil fired power plants is the fuel source and the manner in which heat is produced. In a fossil plant oil, gas or coal is fired in the boiler, which means that the chemical energy of the fuel is converted into heat. In a nuclear power station the fuel source is enriched uranium and energy from the nuclear fission chain reaction is utilised.

A typical construction programme for Nuclear-1 could take up to 9 years to complete and includes aspects regarding site establishment, bulk excavation, civil works, access roads and construction of the reactor.

Information provided by Eskom (September, 2008) details the proposed accommodation required for the Nuclear-1 nuclear power station. It must be emphasised that the detail of accommodation requirements, and the integration into existing communities and towns, still need to be negotiated with respective municipalities and other role-players where relevant. The exact location of a possible construction village still needs to be determined after the preferred site has been identified.

The areas of the land will be finalised in terms of the residential densities prescribed by the Spatial Development Plan for the properties that are available. Eskom must provide rezoned land for the Vendor to build a Construction Village for migrant workers. It is Eskom's responsibility to facilitate the EIA process.

In addition, Eskom may provide serviced residential stands for the Vendor to build staff accommodation (Staff Village). The accommodation will be finalised once the Vendor is appointed, and the development of the land will be included in the overall community integration strategy for the Eskom residential developments.

## ***Purpose of the report***

The purpose of this report is to provide the findings of the SIA, specifically as it relates to the three sites, viz. Thyspunt, Bantamsklip and Duynefontein. It represents an in-depth assessment of the possible social impacts, including a rating of impacts as required by the EIA Regulations, the significance thereof and measures for mitigation through the enhancement of positive impacts and the mitigation of negative impacts.

## ***Assumptions and Limitations***

The following assumptions and limitations are taken into account in this report:

- The South African Government will continue with their intention to actively pursue nuclear energy over the next two decades as indicated in The Nuclear Energy Policy and Strategy for the Republic of South Africa (DME, 2007);
- Different people tend to view the realities of life differently and therefore the impact that may be perceived negatively by one individual or community could be perceived as the best and most positive impact by the next individual;
- Consultation with people, in order to gain an understanding of the issues, does have limitations, primarily due to the fact that individuals/parties are not always willing to attend and participate in discussions and consultation sessions. Often people are hesitant to contribute openly in group meetings and the conducting of individual interviews are not always possible or feasible;
- Although Statistics SA provides certain statistical updates on a regular basis, gaps do exist in the official data obtainable from this institution. Although this lack of more recent area-specific data has been a limiting factor, these limitations have not been insurmountable as a fair, if not relatively accurate, estimate, can be obtained by plotting the available data against updated Provincial and National trends;
- While every attempt was made to provide an opportunity for all affected and interested parties to participate in this study, the results of the study cannot be generalised to the entire research population. Therefore, in analysing the results, conclusions are drawn with regard to the characteristics and views of those interested and affected parties (I&APs) who participated in the study;
- The impact assessment tables pose a limitation for the social impacts in the sense that the tables do not allow for a comparison between the impacts with a weight attached and those without. Not all impacts have the same value and it is not part of the impact tables to assess the relative value of each impact towards an index figure.
- **An integration meeting was held on Monday 27 July 2015 between the following specialists to assess whether the recommendations of the Town Planning report, in terms of the restrictions to land use as a result of the operation of the Nuclear-1 Power Station, will require revisions to any of the other individual studies :**
  - Town Planning Specialist;
  - Agricultural Specialist;
  - Economic Specialist;
  - Social Impact Specialist; and
  - Transportation Specialist (telephonic conversation).

Revisions to this report have been made accordingly.

## ***Methodology and Study Approach***

A recognised methodology in the form of triangularisation, was applied in gathering and analysing data during this study, as was an accepted impact assessment technique.

The methodology employed for the SIA is in accordance with the International Association for Impact Assessment (IAIA) and guidelines outlined in the Western Cape Department of Environmental Affairs and Development Planning's Guidelines for involving Social Specialists in an EIA.

A mixed quantitative and qualitative methodological approach is employed and, in line with this methodology.

For each of the two primary project phases, viz. construction and operation, the existing and potential future impacts and benefits, associated only with the proposed development, were described and assessed, both prior too and after mitigation/optimisation, according to prescribed assessment criteria.

***Impact identification and assessment: for construction and operational phase:***

The following social impacts were identified and assessed:

- Accommodation of staff and construction workers;
- Influx of job seekers;
- Increase in number of informal illegal dwellings;
- Creation of employment opportunities;
- Business opportunities;
- Impact on criminal activities;
- Risk of STDs, HIV and AIDS;
- Municipal services;
- Traffic impacts;
- Noise and dust impact;
- Loss of employment after construction;
- Visual impacts;
- Impact on social infrastructure and facilities;
- Impact on sense of place;
- Future land use planning;
- Perceived risks associated with nuclear incidents;
- Assessment of no development option.

The assessment was based on a review of:

- Issues identified during the Scoping Process;
- Planning and policy documents pertaining to the area;
- Interviews with key interested and affected parties;
- Social issues associated with similar developments; and
- The experience of the author in the field of SIAs.

Each of these impacts is now briefly discussed.

**Accommodation of staff and construction workers**

Large numbers of workers will place tremendous strain on the provision of temporary and permanent accommodation. The Vendor and Eskom staff implicates an estimated influx of 3 837 workers (peak period) and their families to the nuclear power station project area. The total population influx is estimated at 10 500 people, to be accommodated on an area of approximately 167.2 ha.

The Construction Village will be required to accommodate approximately 3 750 people. The positioning of the Construction Village still needs to be determined, and is a sensitive issue

with valuable opportunities and benefits, but also the potential for negative impacts on human well-being.

Mitigation measures for the provisioning of sufficient accommodation should be implemented.

#### Influx of job seekers

This impact deals with the influx of job seekers to the site during the construction phase. These job seekers, including those from areas outside the “local” area, enter the area with the hope of securing employment. When they do not secure employment, the potential exists that they will contribute to problems experienced with informal settlement, pressure on existing resources, services and infrastructure. The possibility further exists that they may contribute towards crime and other social problems such as alcohol abuse and prostitution.

Mitigation measures are aimed at minimising the number of job seekers staying in the area.

#### Informal Development and Settlements

An increase in unplanned development and informal settlements surrounding the nuclear power station site is associated with perceived economic opportunities. If not carefully managed, this type of uncontrolled development is also likely to result in an increase in an array of social pathologies such as crime, prostitution and alcohol and drug abuse.

Mitigation measures are aimed at controlling the threat of an increase in unplanned development and the rise of informal settlements.

#### Creation of Employment Opportunities

The nuclear power station offers the potential for unemployed people to gain meaningful employment during the construction phase. It is estimated that the construction phase could take up to 9 years from the commencement of construction until commissioning. During this period it is foreseen that an estimated 8 737 staff, including construction workers, will be employed on site. It is envisaged that at least 25% of the construction workers will be sourced from the local labour force.

Optimisation measures are aimed at enhancing the benefits of employment creation.

#### Business opportunities

A significant number of business opportunities will be created for local companies / service providers and SMME's.

The utilisation of local suppliers and service providers must be promoted through local procurement and pro-active targeting processes via an open and transparent tender process for all construction related activities.

#### Impact on Criminal Activities

The result of a large influx of people into the area as employees or in search of work, could result in an increase in criminal activities. It is also possible that, during the construction phase of the project, an opportunistic criminal element may take advantage of increased activities in certain areas around construction sites.

Mitigation measures are aimed at reducing the risk of crime.

### Risk of STDs, HIV and AIDS

This impact refers to an increase in the risk of STDs and HIV and AIDS. It is well documented that an increase in the risk of STDs, HIV and AIDS is associated with an influx of workers, particularly migrant workers, and/or any increase in truck traffic into or through an area.

Mitigation measures are aimed at managing the risks associated with STDs, HIV and AIDS.

### Municipal Services

This impact deals with the probability of the new nuclear power station placing strain on municipal services such as water, sanitation, roads, waste and refuse removal.

Mitigation measures are aimed at provision of required services.

### *Roads and Transport*

The concern is the capacity of roads and transportation infrastructure required for the construction and operations of the nuclear power station.

Mitigation measures are aimed at planning, funding and developing roads and transportation infrastructure as required for the construction and operations of the nuclear power station, in addition to roads and transportation infrastructure to the residential areas to be developed to accommodate the staff and construction workers.

### *Waste and Refuse Removal*

This concerns the capacity of Land Fill Sites and Waste Transportation required for the construction and operations of the nuclear power station, as well as the services and infrastructure to the residential areas to be developed to accommodate the staff and construction workers.

Mitigation measures are aimed at providing sufficient Land Fill Sites and Waste Transportation for the construction and operations of the nuclear power station, as well as refuse removal services to the residential areas to be developed to accommodate the staff and construction workers

### *Traffic impacts*

Increased vehicular movement during the construction phase may influence daily living and movement patterns of community members in the surrounding communities.

Mitigation measures are aimed at optimising vehicular movement during the construction phase to minimize traffic congestion problems in the area, which in turn influences daily living and movement patterns of community members in the surrounding communities who make use of these roads.

### Noise and Dust Impacts

Increased levels of noise and dust may impact negatively on the quality of life of people living close to the proposed nuclear power station site.

Mitigation measures are aimed at limiting disturbance and the psychological effects of noise and dust pollution.

### Loss of Employment after Construction

A number of jobs will be lost once construction of the nuclear power station has been completed.

Mitigation measures are aimed at minimising the extent of jobs lost after construction

### Visual impacts

The nuclear power station will change the visual character and quality of the setting according to the Visual Specialist Study (September 2009).

Mitigation measures are aimed at limiting the negative effects and the disturbance on the sense of place that the nuclear power station may impose. The solution would be the implementation of the mitigation measures suggested by the visual impact study.

### Impact on Social Infrastructure / Facilities

This impact refers to the likelihood of the proposed nuclear power station placing strain on existing infrastructure such as medical facilities, police, schools and sport facilities.

Mitigation measures are aimed at making provision for adequate social infrastructure and facilities for growth in number people.

### Impact on sense of place

The proposed nuclear power station will possibly result in a change to the local sense of place.

This concern relates to the possibility that the nuclear power station may contribute negatively to the current characteristics, or feeling / perception held by people. Communities experience that their place have a special and unique character.

Mitigation measures are aimed at limiting the negative effects and the disturbance on the sense of place that the project may have on the environment.

### Future Land Use (Planning)

The proposed nuclear power station will impact on future land use and planning in the area.

Mitigation measures are aimed at minimising the impact of the proposed nuclear power station on future land use and planning.

### Perceived Risks Associated with Nuclear Incidents

During the process of public consultation, it was stated clearly by various participants that they fear the impact of possible risks related to nuclear incidents. These risks are related to the following:

- Design safety;
- Nuclear accidents;
- Potential terrorist acts;
- Capacity and capability of people operating the nuclear power station;
- Strikes and labour unrest affecting daily management; and
- Reliability of communication flow, especially with reference to perception on potential risks and negative impacts on good health.

Mitigation measures are aimed at ensuring that communities receive correct and reliable information regarding the real and perceived risks of nuclear power.

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## ABBREVIATIONS

AFCONE	-	African Commission on Nuclear Energy
ASSA	-	Actuarial Society of Southern Africa
CANE	-	Coalition against Nuclear Energy
CBD	-	Central Business District
City of CT	-	City of Cape Town
CPTR	-	Current Public Transport Record
DRC	-	Directorate of Radiation Control
DWA	-	Department of Water Affairs
DWAF	-	Department of Water Affairs and Forestry
EIA	-	Environmental Impact Assessment
EIR	-	Environmental Impact Report
EPZ	-	Emergency Planning Zone
Eskom	-	Eskom Holdings Limited
GDP	-	Gross Domestic Product
HLW	-	High-Level Radioactive Wastes
HSRC	-	Human Science Research Council
I&APs	-	Interested and Affected Parties
IAEA	-	International Atomic Energy Agency
IAIA	-	International Association for Impact Assessment
IDP	-	Integrated Development Plan
IRT	-	Integrated Rapid Transit
ITP	-	Integrated Transport Plan
<b>KNPS</b>	-	Koeberg Nuclear Power Station
LPZ	-	Long-term Planning Zone - traditionally 80 km radius
NNR	-	National Nuclear Regulator
<b>NPS</b>	-	Nuclear Power Station
PAZ	-	Protective Action Zone - traditionally 5 km radius
PWR	-	Pressurised Water Reactor
SASMIA	-	South African Squid Management Industrial Association
SDF	-	Spatial Development Framework
SIA	-	Social Impact Assessment
SMME	-	Small, Medium, and Micro Enterprises
TFTC	-	Test Flight and Development Centre
UPZ	-	Urgent Protective Zone - traditionally 16 km radius
WSDP	-	Water Services Delivery Plan
WWTW	-	Waste Water Treatment Works

---

# 1. INTRODUCTION

---

## 1.1. Background

---

In many countries, including South Africa, economic growth and social needs are resulting in substantially greater energy demands, taking into account continuing and accelerated energy efficiency improvements. Electricity demand is growing faster than overall energy demand. It is now common knowledge that the demand for electricity in South Africa is rapidly growing and that South Africa needs to expand its electricity generating capacity.

The result of this is that South Africa is faced with two key challenges that need to be addressed. Firstly, South Africa, and more specifically Eskom, will need to carefully consider the risk of mis-matching the requirements of supply and demand. Excess capacity generation would mean that additional electricity resources would be left stranded and therefore not be utilised. On the other hand a capacity shortage would have severe implications on the South African economy and limit the potential for growth within the country.

Eskom proposes to construct a nuclear power station, referred to as Nuclear-1, with a power generation capacity of up to 4 000 MW, using the Pressurised Water Reactor technology (PWR). In many ways the structure of the nuclear plant resembles that of a conventional thermal power plant. The difference between nuclear and conventional fossil fired power plants is the fuel source and the manner in which heat is produced. In *fossil* plant oil, gas or coal is fired in the boiler, which means that the chemical energy of the fuel is converted into heat. In an nuclear power station the fuel source is enriched uranium and energy from the nuclear fission chain reaction is utilised.

It is estimated that the entire development for nuclear power station will require in the order of 250-280 hectares (ha), including all auxiliary infrastructure. The proposed nuclear power station will include nuclear reactors, turbine complex, spent fuel and used nuclear fuel storage facilities, waste handling facilities, intake and outfall structures and various auxiliary service infrastructures.

In the event that the proposed project is authorised, it is estimated that the construction of the nuclear power station could commence in 2013 with commissioning of the first unit in **2020/21**.

ARCUS GIBB (Pty) Ltd has been appointed by Eskom Holdings Limited (Eskom), to undertake an Environmental Impact Assessment (EIA), and Environmental Management Plan (EMP), for the proposed construction of a nuclear power station, and associated infrastructure on one of three alternative sites which are located in the Eastern and Western Cape Provinces.

Three possible sites, as indicated in Figure 1.01, have been identified following intensive studies by others.

These sites are known as:

- Thyspunt :
- Bantamsklip and

- Duynefontein.

Thyspunt site is located in the Eastern Cape, between Oyster Bay and Cape St. Francis, 20 km south of the town of Humansdorp, and approximately 50 km west of Port Elizabeth, as shown in Figure 1.02.

Bantamsklip site is located on the southern Cape Coast between Pearly Beach and Quoin Point, as shown in Figure 1.03.

Duynefontein site is located on the Western Cape Coast due west of Atlantis and 2 km north of the existing Koeberg Power Station at Melkbosstrand, as shown in Figure 1.04.

Octagonal Development was appointed by Arcus Gibb (Pty) Ltd to conduct a Social Impact Assessment (SIA) as part of the EIA.

The SIA report forms part of the Environmental Impact Report (EIR). The EIR details the Impact Assessment Phase of the EIA process, which is aimed at investigating the potential impacts of the proposed nuclear power station on the receiving environment.

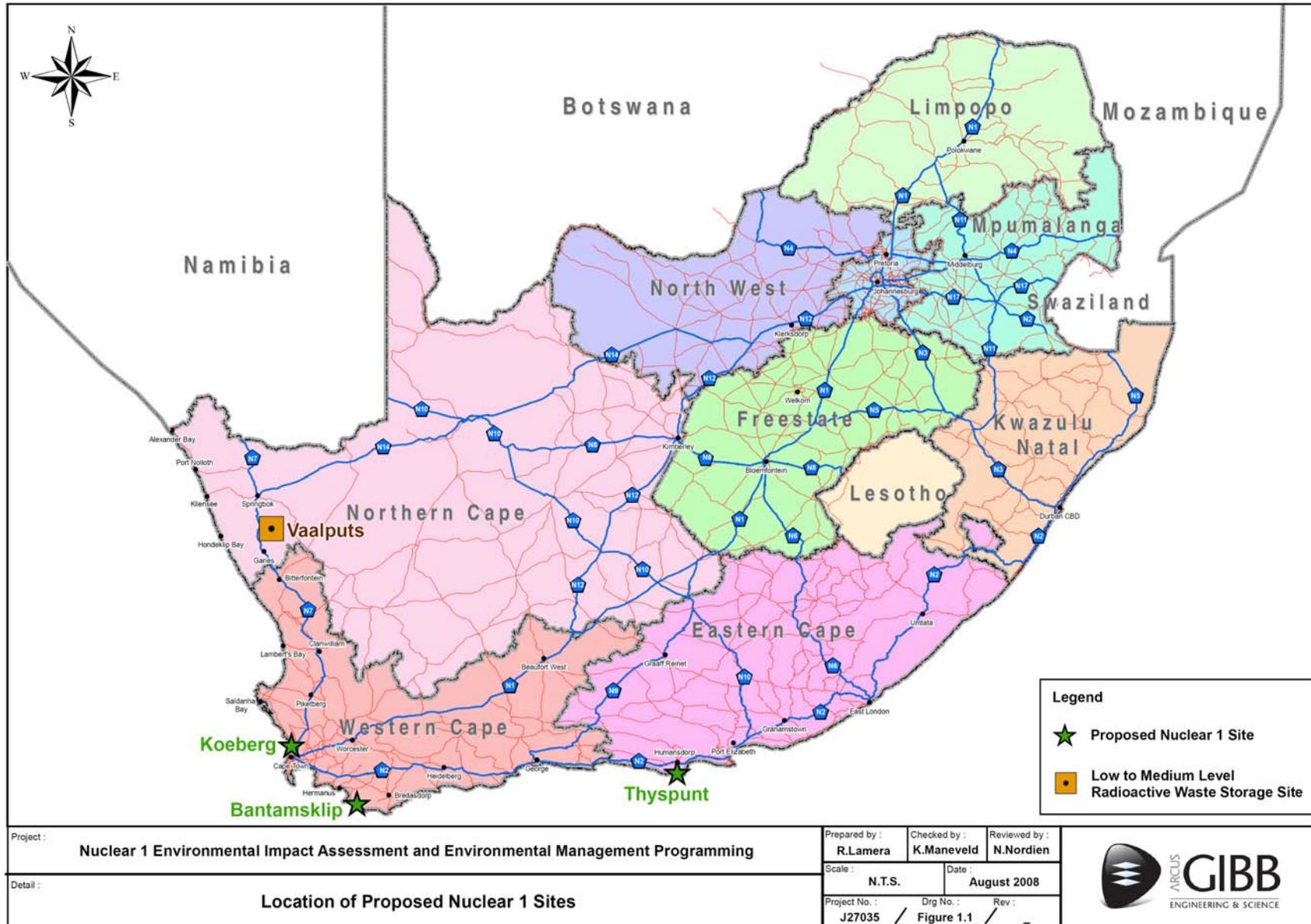


Figure 1.01 : Possible sites for Nuclear-1 marked with stars

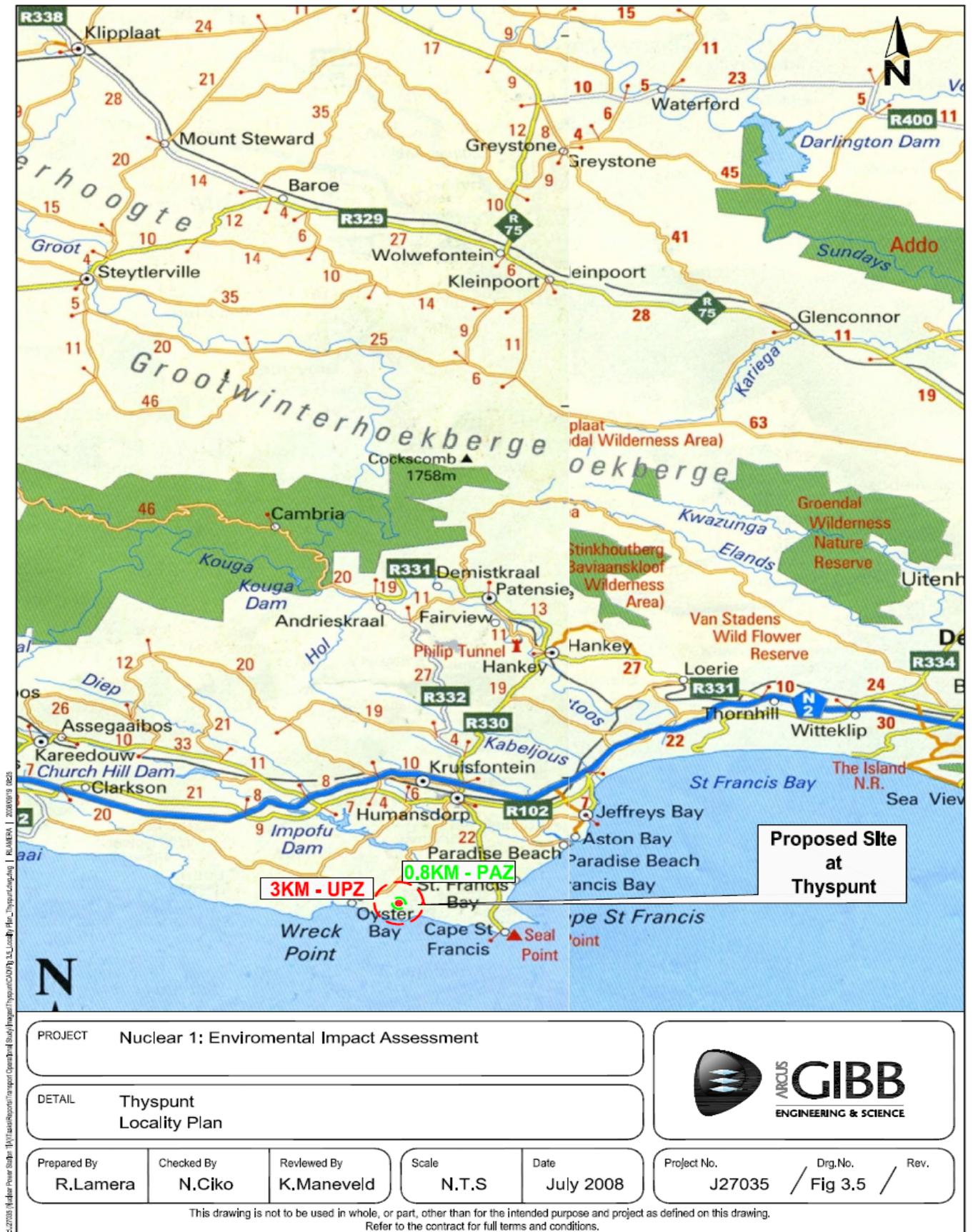


Figure 1.02 : Thyspunt Locality Plan



Figure 1.03 : Bantamsklip Locality Plan



Figure 1.04 : Dufnefontein Locality Plan

---

## 1.2. Project Description

---

The infrastructural requirements associated with the proposed nuclear power station will be similar to that of the Koeberg nuclear power station located in Dufnefontein, Western Cape Province. The Koeberg nuclear power station has operated safely and efficiently for over two decades. Koeberg has a design lifespan of 40 years, which may be extended subject to its financial viability and the acquisition of the necessary authorisations. The Koeberg Nuclear Power Station (KNPS) is producing approximately 14 191 GWh / year since 4 April 1984 (50 % for the first year when unit 2 was still under construction) using approximately seven and a half tonnes of uranium.



**Figure 1.05: Existing Koeberg Nuclear Power Station**

Source: <http://www.melkbos.net>

The following infrastructure as tabulated in Table 1.01 will (or could) be potential requirements:

**Table 1.01: Infrastructural Requirements associated with a Nuclear Power Station**

Item	Infrastructure	Brief Description
1	Containment/Reactor building	A containment building is a steel and/or reinforced concrete structure enclosing a Nuclear Steam Supply System. In an emergency it is the final barrier to a radioactive release.
2	Nuclear auxiliary building	Contains Nuclear process equipment associated with the Nuclear Steam Supply System
3	Fuel building	Storage of new and spent fuel
4	Turbine hall	Contains the turbines, generators and associated plant
5	Safeguard building	A building that contains safety equipment
6	Waste building	Temporary storage for Low and Intermediate Level radioactive Waste
7	Stack	Approximately 96 m tall
8	Diesel building	Houses the emergency diesel generators
9	Diesel storage tanks	Diesel storage
10	Desalination station	Desalinisation of sea water and storage thereof to create potable water
11	Water tank	Water storage container
12	Cooling water pump house	Infrastructure required to deliver cooling water from the intake canal to the condensers and other plant requiring cooling
13	Intake tunnels	Intake tunnels for delivery of cooling water to the intake canal
14	Intake area	Area storing cooling water
15	Outlet tunnel	Cooling water pumped through the condensers and other plant via these tunnels into the sea
16	Chlorination facility	Chemical process plant for production of chlorine
17	Sewage pump station	Underground sumps with pumps to evacuate sewage
18	Sewage treatment plant	Process plant to treat sewage
19	Waste water retention basin	Storage and cleaning of storm water runoff drains
20	Transformer Area	Contains transformers
21	High voltage yard	High voltage switchgear and associated systems
22	Central receiving building	Warehouse and stores
23	Administration building	Offices
24	Training centre	Offices
25	Emergency control and support centre	Offices
26	Estate complex	Offices and workshops
27	Contractor facility complex	Offices, stores and workshops
28	Access control points	Offices and security check points
29	Access Roads	Vehicle access paths to and on site

Item	Infrastructure	Brief Description
30	Parking / Lay down area during construction	Temporary storage of heavy plant during construction and parking during operation
31	Visitor's centre	Offices and information centre
32	Helipad	Designated area for helicopter landing and take-off
33	Weather station	Offices
34	Meteorological mast	Approximately 120 m high steel structure

During operations the nuclear power station will require significant volumes of water to cool the reactor. Water will be obtained from the ocean by means of intake tunnels and expelled via outfall tunnels. Construction of the marine works includes intake structures and outfall tunnels.

During the construction phase, water is primarily used for the manufacture of concrete in batching plants; earthworks, including the construction of roads; wetting the soil stockpiles to control the generation of dust; and potable water. To ensure a constant supply of water to the nuclear power station, a storage reservoir will be required on site. The capacity of the reservoir required is therefore approximately 20 million litres. Alternatively, two ten million litre reservoirs can be provided. The creation of reservoirs of this magnitude will require separate authorisation from the DWA.

It is envisaged that all the water required for the construction phase will be derived from the desalination plant. However, additional fresh water sources may be required for short periods of time during construction.

A high voltage yard will be constructed within the site boundary. When the foundations for the nuclear power station are completed, the high voltage yard will be constructed.

Transportation of heavy loads will take place to and from the closest suitable harbour to the selected Nuclear-1 site.

Two main types of conventional waste will be created during the construction phase i.e. general and hazardous waste. The waste typically produced during the construction phase is that resulting from the actual construction activities as well as the presence of numerous construction workers, who will generate domestic waste. Waste materials arise during the erection of reinforced concrete structures, installing of equipment and organizing of construction activities (i.e. construction debris, packaging material waste, polluted waste water), the operation of offices as well as the maintenance of vehicles, which generates hazardous waste. Solid waste will be transported to and disposed of at permitted off-site solid waste disposal sites.

The operational phase will result in the generation of general, hazardous and radioactive waste. Low Level Waste and Intermediate Level Waste will be stored within the radiological zones of the power plant and will be shipped to a long term storage site such as Vaalputs as prescribed by the Eskom operating procedures. The quantity of waste will depend on the operating procedures in force at the power plant.

An estimation may be based on the quantities generated by Koeberg nuclear power station scaled by the ratio of power output (for the entire year of 2008, 252 concrete drums, containing mostly Intermediate Level Waste, and 760 steel drums, containing Low Level Waste, will be removed from KNPS. South Africa is a member state of the International Atomic Energy Agency (IAEA) and therefore subscribes to the Transport Regulations set out by the IAEA for the safe transport of radioactive materials.

The new nuclear power station will store and managed High Level Waste, under the regulatory control of the NNR and subject to the requirements of the National Radioactive Waste Management Policy and Strategy and any associated legislation or regulations. At present, South Africa does not have an authorised facility for the disposal of used nuclear fuel and high-level radioactive wastes. The new nuclear power station will store HLW at the plant until a national policy surrounding the disposal of nuclear waste is finalised.

A typical construction programme for Nuclear-1 could take up to 9 years to complete and include aspects regarding site establishment, bulk excavation, civil works, access roads and construction of the reactor, as indicated in Figure 1.06.

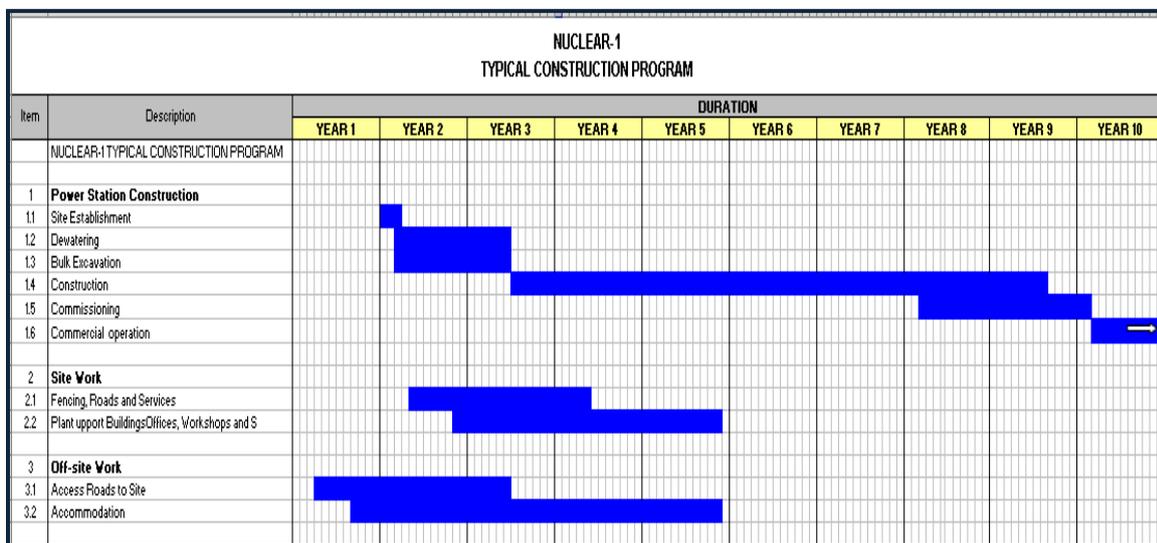


Figure 1.06: Typical Nuclear Power Station Construction Schedule

Source: Eskom

The estimated total number of construction and operational phase staff are reflected in the next table:

**Table 1.02: Estimated Total Staff Component**

Description	Estimated Number of staff	Status
Eskom Project Staff	140	Construction Period 8-10 years
Consultants	40	Construction Period 8-10 years
Vendor Staff	2 172	Construction Period 8-10 years
Vendor Construction Workers	5 000	Construction Period 8-10 years
Eskom Operational Staff	1 385	Permanent / Operational
<b>TOTAL</b>	<b>8 737</b>	

Source: Eskom: Nuclear-1: Consistent Data Set

Information provided by Eskom (September, 2008) details the proposed accommodation required for the Nuclear-1 nuclear power station. It must be emphasised that the accommodation requirements do not form part of this SIA/EIA and will therefore require a separate application for environmental authorisation, if required. **The present Eskom position on vendor accommodation is that the vendor is fully responsible for accommodation of all vendor staff, safe allocation of zoned land for the construction Village. "Breaking New Ground" is the National Governments policy on the provision of housing and forms the baseline for any housing development.** The accommodation required for the project is summarized in Table 1.03.

**Table 1.03: Accommodation Requirements for the Project**

Description	Units
Vendors Construction Camp for Migrant Workers	3 750 Beds
Vendor Staff Village	2 172 Units
Eskom Nuclear-1 Project Team	220 Units
Eskom Power Station Operational Team	1 000 Units

Source: Eskom: Nuclear-1: Consistent Data Set

The number of beds indicated above was reduced by 25 % to allow for labour sourced out of the local community. The accommodation project thus aims to provide accommodation for 1 400 staff members, to prevent over-supply as some of the staff may be married couples, workers from the local community and workers that may prefer private accommodation. The minimum land requirements for the accommodation are estimated in Table 1.04 below.

**Table 1.04: Minimum Land Required for Accommodation**

Description	Area (hectares)
Vendors Construction Camp for Migrant Workers	<b>50.9</b>
Vendor Staff Village:	89.5
Eskom Nuclear-1 Project Team	12.0
Eskom Power Station Operational Team	65.7
Sport and Recreation Facilities	18.0
Schools with sport facilities (3)	55.0
<b>Total area of land required</b>	<b>291.1</b>

Source: Eskom: Nuclear-1: Consistent Data Set

The construction camp for migrant workers will typically have the following facilities:

### **Housing**

- 12 bed Units (73 %);
- 8 Bed Units (27 %).

### **Support Facilities**

- Bus Terminus and parking Laundry;
- Canteen;
- Lapa with TV;
- Liquor Outlet;
- Administration Office;
- Clinic; and
- Sewage treatment.

### **Recreation**

- Tennis (x4);
- Basketball (x4);
- Soccer (x2);
- Rugby (x1);
- Swimming Pool (x1); and
- Cloak Rooms and Ablutions.

The areas of the land will be finalised in terms of the residential densities prescribed by the Spatial Development Plan for the properties that are available. Eskom must provide rezoned land for the Vendor to build a construction camp for migrant workers. Eskom' responsibility is to facilitate the EIA process.

In addition, Eskom may provide serviced residential stands for the Vendor to build staff accommodation. The accommodation will be finalised once the vendor is appointed, and the land development will be included in the overall community integration strategy for the Eskom residential developments.

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### 1.3. Purpose of the Report

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The purpose of this Report is to provide the findings of the SIA, specifically as it relates to three sites, namely Thyspunt, Bantamsklip and Duynefontein. It represents an in-depth assessment of the social impacts, including a rating of impacts as required by the EIA Regulations, the significance thereof and measures for mitigation through the enhancement of positive impacts and the amelioration or reduction of negative impacts.

The general terms of reference for the SIA include:

- Identify, assess and evaluate the possible impacts of Nuclear-1 during the construction and operation phase of the proposed project;
- Identify and assess any cumulative impacts arising from the proposed project;
- Determine the significance of assessed impacts according to the methodology provided by GIBB and provide a revised significance rating of assessed impacts after the implementation of mitigation measures;
- Undertake field surveys as appropriate to the requirements of the particular specialist study;
- Identify areas where integration of studies with other specialists would ensure a better assessment and co-ordinate with other specialists in this regard;

The specific terms of reference include the following:

- Identification and assessment of family, community and gender impacts;
- Identification of social trends (historic and current) and drivers in the affected area;
- Identification of main transient population nodes (spatial representation);
- Identification of special population groups, i.e. that portion of the population that could be difficult to shelter or vacate. This includes data obtained from places such as hospitals, schools, institutions for mentally or physically challenged, old age homes and prisons;
- Identification of social initiatives and opportunities;
- Identification of individuals, communities, organisations and institutions which are likely to be affected by the project/plan/policy, with specific emphasis on vulnerable individuals, communities, organisations and institutions;
- Review of census figures, based on rejection of 2001 census as being inadequately handled, and unprecedented growth of the population over the past five years;
- Identification and assessment of large scale social impacts, uncontrolled influx of unemployed and unskilled job-seekers; the likelihood of their remaining in informal settlements; the pressures arising on health, education, housing, police and other services; and responsibility for mitigation;
- Identification of potential corporate strategies to be undertaken in the areas affected by the development of the nuclear power station;
- Identification of institutional arrangements and structures; and
- Identification of cultural impacts, beliefs and value systems.

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## **1.4. Assumptions and Limitations**

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### **1.4.1. Assumptions**

#### ***South Africa's policy regarding nuclear energy***

A key assumption is that the South African Government will continue with its intention to actively pursue nuclear energy over the next two decades as indicated in The Nuclear Energy Policy and Strategy for the Republic of South Africa (*SA Dept of Minerals and Energy, 2007*)

#### ***Perceptions and human nature***

Human nature and the current challenging realities that people face contribute towards the subjective nature of socio-economic impact assessments. Different people tend to view the realities of life differently and therefore the impact that may be negative for one individual or community could be the best and most positive impact for the next. For example, people who trade in illegal substances such as drugs, may find that a large concentration of construction workers offer the opportunity to sell their products. For them it may be a positive economic income, but for the community this could be viewed as the breaking down of the basic fabric of human life and community values.

The far reaching impact of nuclear power places a huge responsibility on the social impact assessment process to identify the key and most important impacts valid to communities close to the site and in the broader South Africa context. The assumption therefore is that the issues identified are valid for the local communities but also valid for people who live elsewhere and those who may move into the area in the future. The selection of a representative group of people to consult with to gain understanding of the issues and affected environment does have limitations because people are not always willing to attend and participate in discussions and consultation sessions. Often people are hesitant to contribute openly in group meetings and it is not always possible to conduct individual interviews with them.

### **1.4.2. Limitations**

#### ***Availability of correct and up to date relevant data***

Although Stats SA provides certain statistical updates on a regular basis these updates are at the national and provincial levels, with some such as the Community Survey, 2007, extending to the municipal level. At the municipal and ward levels, however, there are gaps in the official data obtainable from Stats SA as data, at these levels, dates back to Census 2001. Although this lack of more recent area specific data has been a limiting factor these limitations have not been insurmountable as a fair, if not relatively accurate estimate, can be obtained by plotting the available data against updated provincial and national trends.

While every attempt was made to provide an opportunity for all affected and interested parties to participate in this study, what is usually the case with research of this nature is that only those people with fairly strong views about the proposed project are prepared to take the time and make the effort to participate. Consequently, the results of the study cannot be generalised to the entire research population and in analysing the results conclusions are drawn in regard to the characteristics and views of those interested and affected parties (I&APs) who participated in the study.

The social impact assessment must be seen and integrated into the broader EIA study to ensure a broader context for impacts mentioned.

The impact assessment tables pose a limitation for the social impacts in the sense that the tables do not allow for a comparison between the impacts with a weight attached and those without. Not all impacts have the same value and it is not part of the impact tables to assess the relative value of each impact towards an index figure.

### ***Confidentiality***

Due to the sensitivity and controversial nature of debate regarding nuclear power, it is often found in consultation sessions with members of the public and private sector, that people who contribute to a better understanding of the social and economic issues at hand, require confidentiality. A large number of people interviewed indicated that they do not want to be implicated in any way and would not like to see their names in any report. It is therefore not possible to publish a complete list of all individuals and organisations interviewed. A number of people in various private and public sector positions indicated that they do not mind if their names are published as being part of the consultation process, but that they want no direct link to their inputs and comments.

In a number of cases, it was found that the person interviewed had a different opinion than those of the institution he or she represents or works for, or the community he/she lives in. For example a person may be the owner of a business and feel that the development of nuclear power station will bring more guests to the business and hence they support the nuclear power station fully. The same person however, indicated that he/she would not like other business owners to know that he/she is in support, because not all business owners feel that way and that might cause conflict that he/she does not want.

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## **1.5. Study Approach**

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### **1.5.1. Introduction**

The methodology employed for the SIA is in accordance with the International Association for Impact Assessment (IAIA), "impact assessment, simply defined, is the process of identifying the future consequences of a current or proposed action". The approach to this study follows guidelines outlined in the Western Cape Department of Environmental Affairs and Development Planning's Guidelines for involving Social Specialists in an EIA.

Social impacts can be defined as: "The consequences to human populations of any public or private actions (these include policies, programmes, plans and/or projects) that alter the ways in which people live, work, play, relate to one another, organise to meet their needs and generally live and cope as members of society. These impacts are felt at various levels, including individual level, family or household level, community, organisation or society level. Some social impacts are felt by the body as a physical reality, while other social impacts are perceptual or emotional." (*Vanclay F. 2003*).

Different people from different cultural, ethnic, religious, gender, educational etc. backgrounds view the world differently. This is referred to as the "social construct of reality". The social construct of reality informs people's worldview and the way in which they react to changes.

There are essentially two basic approaches to undertaking SIAs, namely the Technocratic and Participatory approach. The technocratic approach relies on the interpretation of secondary data, while the participatory approach incorporates the knowledge and experiences of individuals most affected by the proposed changes into the assessment process. This SIA applied a combination of the two approaches.

The "Sustainable Livelihoods" approach was also used in the SIA for identifying and assessing key socio-economic impacts and issues. The approach focuses on the "assets" or "capital" that people have at their disposal to overcome their vulnerability to poverty. In doing so it considers both sustainability and vulnerability.

### **1.5.2. Methodology**

The SIA comprises nine distinctive steps or stages that are solidly rooted in international precedent and the IAIA (International Association on Impact Assessment), Guidelines and Principles for social Impact Assessment, 1994. Certain adaptations have been made to ensure applicability to the South African and project context.

The Public Participation Process, and the current EIA process managed by GIBB, served to identify the issues and concerns of a large number of Interested and Affected Parties (I&APs) regarding nuclear energy in general and the proposed development of the nuclear power station in particular.

A mixed quantitative and qualitative methodological approach is employed and in line with this methodology, data was collected through a combination of:

- a desk-top study in which available information was reviewed as well as a large number of written submissions (A full list of references consulted is provided at the end of this document.)
- Attendance of selected Public Participation meetings as part of the scoping assessment. The purpose of attending these sessions was to serve as introduction to key community stakeholders, as well as get an understanding of potential social impacts based on issues raised;
- Telephonic, focus groups and individual consultation with stakeholders to discuss potential impacts. A first round of consultation was conducted during May 2009 – August 2009 followed up by an additional process of consultation from September 2009 to November 2009. (A full list of persons consulted with is provided at the end of this document);

- The SIA also relies on information from other specialist studies e.g. economic, tourism, agriculture, transport, noise, health and safety, heritage, visual etc. in order to gain better understanding of the issues at hand. These specialist studies are included as part of the EIA Report by GIBB.

The analysis and presentation of findings in accordance with principles laid out in the Provincial Guidelines, and specific reporting requirements.

- **An integration meeting was held on Monday 27 July 2015 between the following specialists to assess whether the recommendations of the Town Planning report, in terms of the restrictions to land use as a result of the operation of the Nuclear-1 Power Station, will require revisions to any of the other individual studies :**
    - Town Planning Specialist;
    - Agricultural Specialist;
    - Economic Specialist;
    - Social Impact Specialist; and
    - Transportation Specialist (telephonic conversation).
- Revisions to this report have been made accordingly.

### 1.5.3. Presentation of SIA Results

The SIA and discussion is presented in the form of assessment tables (evaluation framework)

The objective of the assessment of impacts is to assess all the significant impacts that may arise as a result of the nuclear power station.

For each of the two main project phases (construction and operation), the existing and potential future impacts and benefits (associated only with the proposed development) were described using the criteria listed below.

In accordance with Government Notice R 385 of 2006, promulgated in terms of Section 24 of the NEMA and the criteria drawn from the IEM Guidelines Series, Guideline 5: Assessment of Alternatives and Impacts, published by the DEAT (April 1998) **as well as the Guideline Document on Impact Significance (DEAT 2002)**, specialists will be required to describe and assess the potential impacts in terms of the criteria **listed in Table 1.05 below**.

**Table 1.05: Impact Assessment criteria and Rating Scales**

<b>Criteria</b>	<b>Rating Scales</b>	<b>Notes</b>
<i>Nature</i>	<i>Positive</i>	<i>This is an evaluation of the type of effect the construction, operation and management of the proposed NPS development would have on the affected environment.</i>
	<i>Negative</i>	
	<i>Neutral</i>	
<i>Extent</i>	<i>Low</i>	<i>Site-specific, affects only the development footprint</i>
	<i>Medium</i>	<i>Local (limited to the site and its immediate surroundings, including the surrounding towns and settlements within a 10 km radius);</i>
	<i>High</i>	<i>Regional (beyond a 10 km radius) to national</i>
<i>Duration</i>	<i>Low</i>	<i>0-3 years</i>
	<i>Medium</i>	<i>4-8 years</i>

<b>Criteria</b>	<b>Rating Scales</b>	<b>Notes</b>
	<i>High</i>	<i>9 years to permanent</i>
<i>Intensity</i>	<i>Low</i>	<i>Where the impact affects the environment in such a way that natural, cultural and social functions and processes are minimally affected</i>
	<i>Medium</i>	<i>Where the affected environment is altered but natural, cultural and social functions and processes continue albeit in a modified way; and valued, important, sensitive or vulnerable systems or communities are negatively affected</i>
	<i>High</i>	<i>Where natural, cultural or social functions and processes are altered to the extent that the natural process will temporarily or permanently cease; and valued, important, sensitive or vulnerable systems or communities are substantially affected.</i>
<i>Potential for impact on irreplaceable resources</i>	<i>Low</i>	<i>No irreplaceable resources will be impacted.</i>
	<i>Medium</i>	<i>Resources that will be impacted can be replaced, with effort.</i>
	<i>High</i>	<i>There is a high potential that irreplaceable resources will be lost.</i>
<i>Consequence (a combination of extent, duration, intensity and the potential for impact on irreplaceable resources).</i>	<i>Low</i>	<i>A combination of any of the following</i> <ul style="list-style-type: none"> <li>• <i>Intensity, duration, extent and impact on irreplaceable resources are all rated low</i></li> <li>• <i>Intensity is low and up to two of the other criteria are rated medium</i></li> <li>• <i>Intensity is medium and all three other criteria are rated low</i></li> </ul>
	<i>Medium</i>	<ul style="list-style-type: none"> <li>• <i>Intensity is medium and at least two of the other criteria are rated medium</i></li> </ul>
	<i>High</i>	<ul style="list-style-type: none"> <li>• <i>Intensity and impact on irreplaceable resources are rated high, with any combination of extent and duration</i></li> <li>• <i>Intensity is rated high, with all of the other criteria being rated medium or higher.</i></li> </ul>
<i>Probability (the likelihood of the impact occurring)</i>	<i>Low</i>	<i>It is highly unlikely or less than 50 % likely that an impact will occur.</i>
	<i>Medium</i>	<i>It is between 50 and 74 % certain that the impact will occur.</i>
	<i>High</i>	<i>It is more than 75 % certain that the impact will occur or it is definite that the impact will occur.</i>
<i>Significance (all impacts including potential cumulative impacts)</i>	<i>Low</i>	<ul style="list-style-type: none"> <li>• <i>Low consequence and low probability</i></li> <li>• <i>Low consequence and medium probability</i></li> </ul>
	<i>Low to medium</i>	<ul style="list-style-type: none"> <li>• <i>Low consequence and high probability</i></li> <li>• <i>Medium consequence and low probability</i></li> </ul>
	<i>Medium</i>	<ul style="list-style-type: none"> <li>• <i>Medium consequence and medium probability</i></li> <li>• <i>Medium consequence and high probability</i></li> <li>• <i>High consequence and low probability</i></li> </ul>
	<i>Medium to high</i>	<ul style="list-style-type: none"> <li>• <i>High consequence and medium probability</i></li> </ul>

Criteria	Rating Scales	Notes
	High	<ul style="list-style-type: none"> <li>High consequence and high probability</li> </ul>

*An explanation of the above-mentioned impact criteria is provided below. Only the above-mentioned criteria were taken into account in the assessment of impact significance. In addition, the degree of confidence in the prediction of impacts, the nature of applicable mitigation measures and legal requirements applicable to the impacts have been described by the specialists.*

**1.5.3.1. Nature**

*This is an evaluation of the type of effect the construction, operation and management of the proposed NPS development would have on the affected environment. Will the impact change in the environment be positive, negative or neutral? This description must include what will be affected and the manner in which the effect will transpire.*

**1.5.3.2. Extent or scale**

*This refers to the spatial scale at which the impact will occur. Extent of the impact is described as: low (site-specific - affecting only the footprint of the development), medium (limited to the site and its immediate surroundings and closest towns) and high (regional and national).*

**1.5.3.3. Duration**

*The lifespan of the impact is indicated as low (short-term - 0-3 years, typically impacts that are quickly reversible within the construction phase of the project), medium-term (4-8 years, reversible over time) and high (long-term, 9 or more years, and continue for the operational life span of the power station).*

**1.5.3.4. Intensity or severity**

*This is a relative evaluation within the context of all the activities and the other impacts within the framework of the project. Does the activity destroy the impacted environment, alter its functioning, or render it slightly altered? The specialist studies must attempt to quantify the magnitude of the impacts and outline the rationale used.*

**1.5.3.5. Impact on irreplaceable resources**

*This refers to the potential for an environmental resource to be replaced, should it be impacted. A resource could possibly be replaced by natural processes (e.g. by natural colonisation from surrounding areas), through artificial means (e.g. by reseeded disturbed areas or replanting rescued species) or by providing a substitute resource, in certain cases. In natural systems, providing substitute resources is usually not possible, but in social systems substitutes are often possible (e.g. by constructing new social facilities for those that are lost). Should it not be possible to replace a resource, the resource is essentially irreplaceable e.g. red data species that are restricted to a particular site or habitat of very limited extent.*

**1.5.3.6. Consequence**

*The consequence of the potential impacts is a summation of above criteria, namely the extent, duration, intensity and impact on irreplaceable resources.*

**1.5.3.7. Probability of occurrence**

*The probability of the impact actually occurring based on professional experience of the specialist with environments of a similar nature to the site and/or with similar*

projects. Probability is described as low (improbable), medium (distinct possibility), and high (most likely). It is important to distinguish between probability of the impact occurring and probability that the activity causing a potential impact will occur. Probability is defined as the probability of the impact occurring, not as the probability of the activities that may result in the impact. The fact that an activity will occur does not necessarily imply that an impact will occur. For instance, the fact that a road will be built does not necessarily imply that it will impact on a wetland. If the road is properly routed to avoid the wetland, the impact may not occur at all, or the probability of the impact will be low, even though it is certain that the activity will occur.

#### **1.5.3.8. Significance**

*Impact significance is defined to be a combination of the consequence (as described below) and probability of the impact occurring. The relationship between consequence and probability highlights that the risk (or impact significance) must be evaluated in terms of the seriousness (consequence) of the impact, weighted by the probability of the impact actually occurring. The following analogy provides an illustration of the relationship between consequence and probability. The use of a vehicle may result in an accident (an impact) with multiple fatalities, not only for the driver of the vehicle, but also for passengers and other road users. There are certain mitigation measures (e.g. the use of seatbelts, adhering to speed limits, airbags, anti-lock braking, etc.) that may reduce the consequence or probability or both. The probability of the impact is low enough that millions of vehicle users are prepared to accept the risk of driving a vehicle on a daily basis. Similarly, the consequence of an aircraft crashing is very high, but the risk is low enough that thousands of passengers happily accept this risk to travel by air on a daily basis.*

*In simple terms, if the consequence and probability of an impact is high, then the impact will have a high significance. The significance defines the level to which the impact will influence the proposed development and/or environment. It determines whether mitigation measures need to be identified and implemented and whether the impact is important for decision-making..*

#### **1.5.3.9. Degree of confidence in predictions**

*Specialists were required to provide an indication of the degree of confidence (low, medium or high) that there is in the predictions made for each impact, based on the available information and their level of knowledge and expertise. Degree of confidence is not taken into account in the determination of consequence or probability.*

#### **1.5.3.10. Mitigation measures**

*Mitigation measures are designed to reduce the consequence or probability of an impact, or to reduce both consequence and probability. The significance of impacts has been assessed both with mitigation and without mitigation.*

#### **1.5.3.11. Legal requirements**

*The specialist identified and listed the relevant South African legislation and permit requirements pertaining to the development proposals. Reference must be provided to the procedures required to obtain permits and describe whether the development proposals have the potential to trigger applicable licensing or permit requirements.*

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## **1.6. Report structure**

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The report is divided into four chapters, namely:

- Section 1: Introduction;
- Section 2: Description of affected environment;
- Section 3: Impact identification, assessment and mitigation/optimization measures;  
and

Section 4: Conclusions and recommendations.

## 2. DESCRIPTION OF AFFECTED ENVIRONMENT

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At the provincial level, two of the proposed sites, Duynefontein and Bantamsklip, fall within the Western Cape Province. The third, Thyspunt falls within the Eastern Cape Province. Consequently a description of the Western Cape will be provided followed by the municipal description of the City of Cape Town and the Overstrand Municipality in which districts both Duynefontein and Bantamsklip falls.

With respect to Thyspunt, the population characteristics of the Eastern Cape Province will be described followed by a description of the Kouga Municipality, as it is within the municipal boundaries of Kouga that the Thyspunt site falls.

On a more specific level, in respect of all three sites, a description of the population in 16km and 80km radius zones is provided below. This description is relative to 5° and 22,5° radial grids and relative to the KNPS Emergency Planning Zone (EPZs) Historically Nuclear Power Stations had 4 Emergency Planning Zones (EPZs) namely the Owner Controlled Zone, the Protective Action Zone (traditionally 5km radius), the Urgent Protective Zone (traditionally 16km radius) and the Long-term Planning Zone (traditionally 80km radius) In terms of the European Utility Requirements guidelines for the latest generation nuclear power stations, the sizes of these zones can be drastically reduced. ***In terms of the more recent European Utility Requirements (EUR), a 800 m EPZ and a 3k m UPZ is required. See Chapter 3 of the Environmental Impact Report for a discussion on the zones applicable to Generation III Pressurized Water Reactors under the EUR***

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### 2.1. Demographic Description of the Western Cape

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The Western Cape Province has seen relatively rapid population growth over the past two decades, with an average growth rate of 3,0% per year between 1985 and 1995 and 2,1% per year between 1995 and 2005.

Projections suggest a marked slowing down of provincial population expansion over the next 10 years. It is estimated that by 2016, just less than 5,4 million people will live in the Western Cape of which just less than 4 million will live in the City of Cape Town. The expected headcount represents an increase of 428 000 individuals over the decade, equivalent to an average annual growth rate of 0,8 %.

The Province experienced net emigration between 1985 and 1990, totalling around 30 000 individuals. From 1991 to 2000, the removal of influx control legislation contributed to rapid in-migration of about 38 000 to 41 000 people a year.

However, from 2000 onwards the rate of migration has slowed and is projected to continue with this downward trend. Thus, while net in-migration between 1991 and 2000 is estimated to have added 394 000 individuals to the population, from 2001 to 2015 the Western Cape will gain only 177 000 people, or an average of 11 800 per year.

Internationally, migration is often seen as a threat by both sending and receiving regions. Receiving regions tend to feel that in-migrants represent a burden to their economies and government budgets, while sending regions often perceive a loss of scarce skills and expertise in the short term.

Not surprisingly, given their economic dominance, Gauteng and the Western Cape are major receiving regions for internal migration. In-migration both enhances and places demands on the receiving regions. These demands are often starkly experienced in the short term in the areas of service delivery and job creation where backlogs do exist, for instance housing, schooling and health services.

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## **2.2. Duynfontein**

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### **2.2.1. Demographic Profile: Duynfontein**

#### **2.2.1.1. Population of Cape Town**

It is estimated that about 3,5 million people resided in the 110 wards of the City of Cape Town in 2006, according to the Dorrington Report: Projection of the Population of the Cape Metropolitan Area 1996 – 2031 (Dorrington, 2000, Unpublished). This tally represents an increase of 935 000 over the 1995 headcount and over 1,9 million more than in 1985. Figures provided by the Centre for Actual Research (Population Projections for the Western Cape 2001 – 2025, 2005) indicated the total population for Cape Town as 2 994 779 for 2001, 3 239 768 for 2006 and 3 368 892 for 2010.

In terms of the geographical distribution of the population, Cape Town has historically dominated the Province, and is set to continue this trend. In 1985, the city accounted for just less than two-thirds of the Provincial population. This decreased to 65,0% in 1990 and is expected to remain around that level up to 2015.

The 2001 census figures have been utilised as the baseline data for the description of the population distribution within 80km of the Duynfontein site.

However, figures used for the jurisdictional area of Cape Town have been obtained from the City of Cape Town. The City of Cape Town has made certain corrections to the 2001 census figures, based on household surveys. Census figures as obtained from Statistics South Africa were utilised for areas outside of the metropolitan area.

#### **2.2.1.2. Population within the 80km radius of Duynfontein**

An analysis of the population distribution and growth in terms of the 80km, 16km and 5km radius included the following:

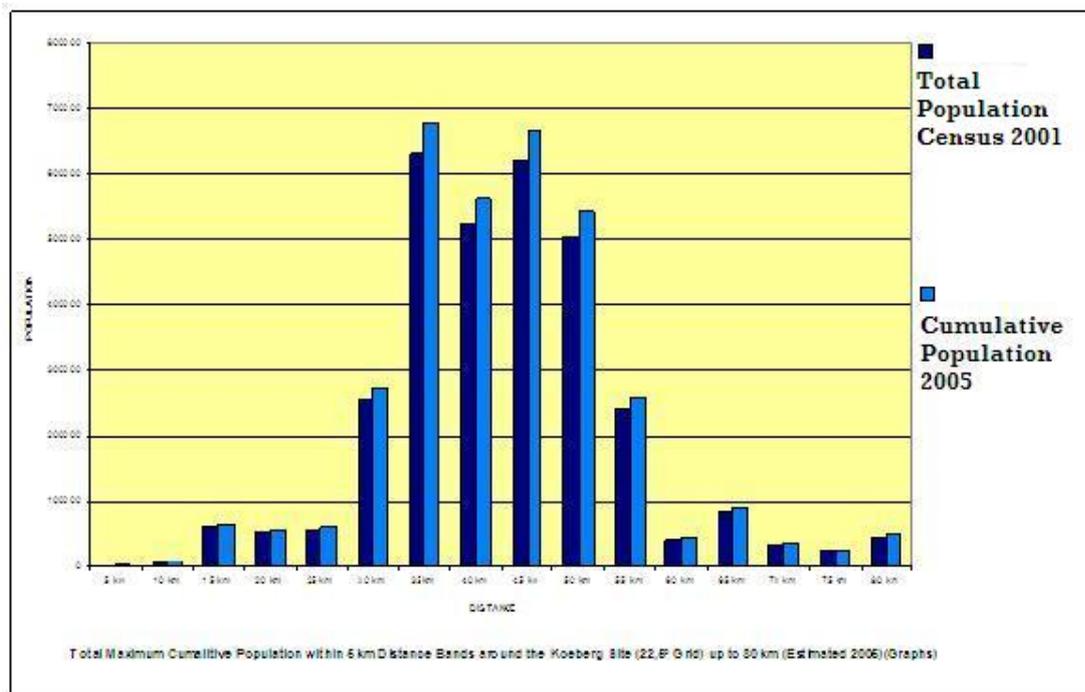
- population distribution (**Figure 2.02**);
- population density (**Figure 2.03**);
- population per suburb (**Figure 2.04**);
- gender per suburb (**Figure 2.05**);
- age per suburb (**Figure 2.06**);
- projected population in five year intervals until 2031 (**Table 2.02**).

All distances in the figures and tables in this report are measured in a straight line from the coordinate, which is located at a central position at the existing KNPS. **The centre of the new nuclear power plant is not known at this stage.**

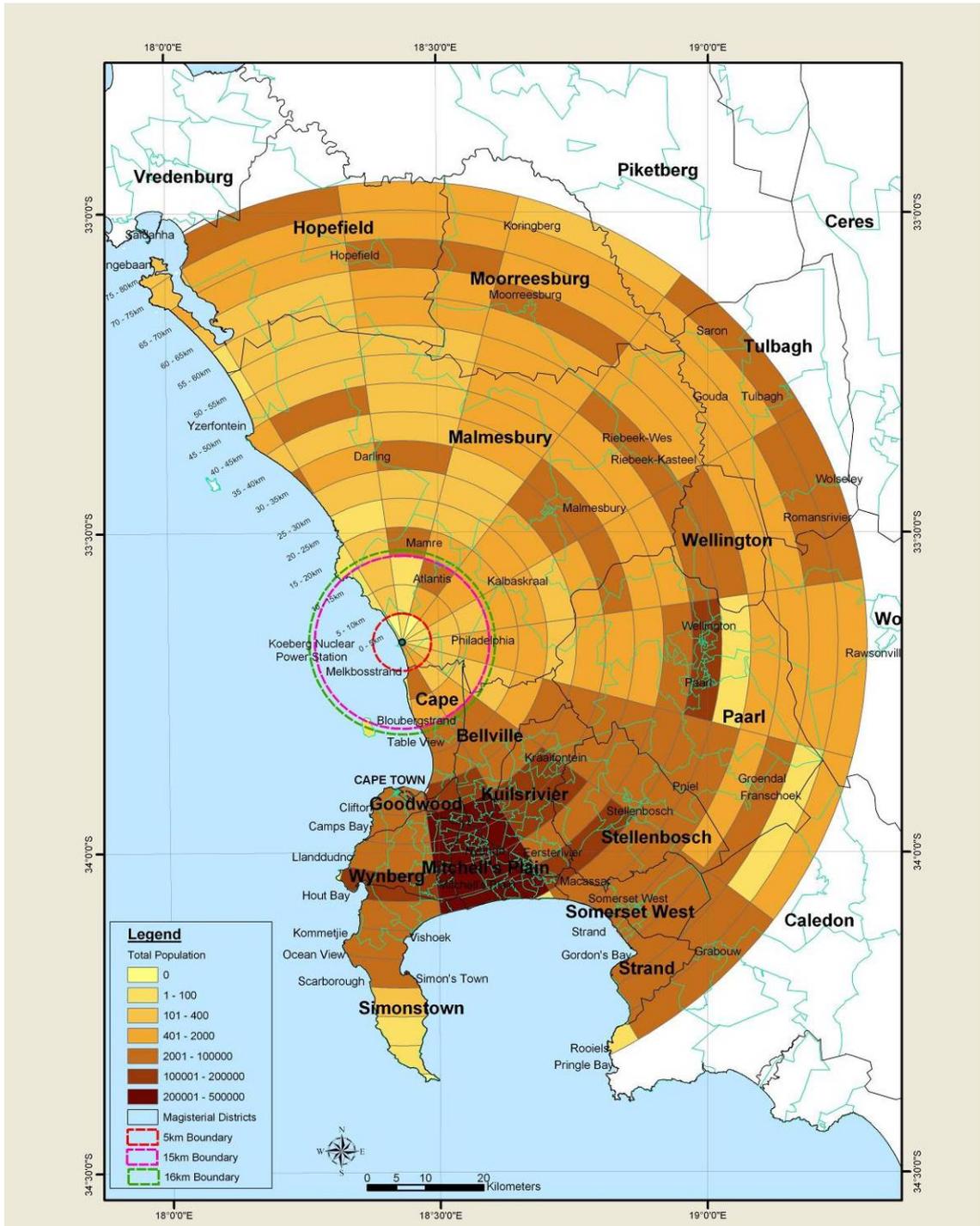
**Table 2.01: Population Distribution within 80km radius of Duynefontein (2001)**

Distance	NWN	NNW	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	TOT. CUM. POP	TOTAL 2005
0 - 5 km	0	0	79	0	16	32	79	150	1408	1340	0	0	3104	3334
5 -10 km	16	175	95	1270	619	175	127	190	222	3685	29	0	6603	7091
10-15 km	79	127	32	54855	1186	271	450	223	1349	1373	0	0	59945	64379
15-20 km	34	127	7273	1046	1093	556	587	317	13125	28937	0	0	53095	57022
20-25 km	0	67	159	112	1033	1302	621	968	2848	48961	0	32	56103	60253
25-30 km	0	113	253	317	1764	222	189	7466	58828	121104	64748	0	255004	273866
30-35 km	2063	793	6756	143	12637	445	603	63212	133888	368015	42692	0	631247	677939
35-40 km	206	270	302	524	9212	2031	762	3254	137432	313710	56837	0	524540	563339
40-45 km	511	14639	302	667	476	778	1635	13570	90052	387634	111164	0	621428	667393
45- 0 km	111	286	278	851	492	936	8817	69268	103255	289574	30982	0	504850	542192
50-55 km	16	223	333	540	4138	2761	125399	18176	41360	35	48038	0	241019	258847
55-60 km	48	235	460	728	1477	2175	65	6304	24450	0	4409	0	40351	43336
60-65 km	365	159	952	8568	1301	667	573	723	71371	0	252	0	84931	91213
65-70 km	889	1472	3266	1047	1078	603	715	7494	16638	0	1	0	33203	35659
70-75 km	150	852	619	1571	1500	3518	1440	12	14279	0	36	0	23977	25751
75-80 km	127	2576	667	354	12533	7685	1864	1734	17854	72	0	0	45466	48829

Source - Statistics South Africa: Census 2001



**Figure 2.01: Maximum Cumulative Population within 5 km radius of Duynefontein (2001)**



Population Distribution within 5km Distance Bands around Koeberg Site (22.5° Grid) up to 80 km (2001)

Figure 2.02: Population Distribution within 5km radii of Duynefontein (2001)

### 2.2.1.3. Projected Population

The population distribution has been projected in five-year intervals until 2031. This is depicted in Table 2.02.

It is assumed that the percentage increase in each sub-region or local municipality is evenly distributed. It could be expected that certain sectors within the same sub-region or local municipal area would have a higher percentage growth than others (such as urban areas compared to rural areas or neighbourhoods compared with each other within the same urban area). In this regard it should be noted that Bloubergstrand and Parklands (within the sub-region of Blaauwberg) have experienced a high level of growth during the recent past. In the case of rural areas the impact of this assumption is regarded as negligible as the rural areas contain a low percentage of the population distribution.

At a 1,8% growth rate the population in the 80km radius surrounding the Duynefontein site is projected to be currently (2008) at 3,6 million people and is projected to grow to approximately 5,5 million people by 2031, as indicated in Table 2.02.

**Table 2.02: Projected Population in 5 year intervals until 2031, within the 80km radius of Duynefontein**

Years Year	Population Growth @ 1.8% per year	Population Growth @ 2.4% per year	Population Growth 3.7% per year
2001	3 200 000	3 200 000	3 200 000
2006	3 498 556	3 602 880	3 837 459
2011	3 824 968	4 056 482	4 601 903
2016	4 181 833	4 567 193	5 518 631
2021	4 571 993	5 142 202	6 617 975
2026	4 998 555	5 789 604	7 936 315
2031	5 464 914	6 518 515	9 517 276

*(Source: Dorrington, 2000, Unpublished)*

If the average growth rate of 2,4% is utilised for projections within the 80km annulus surrounding the Duynefontein site, the 2008 population is estimated at 3,8 million people, with an estimated projection of 6,5 million people by 2031.

If the average of 3,7% growth rate is utilised for projections within the 80km annulus surrounding the Duynefontein site, the 2008 population is estimated at approximately 4,2 million people, with an estimated projection of 9,5 million people by 2031.

The higher growth rate of 3,7% could be applied for projections, but for all academic purposes, only for areas with higher growth potential, like the Bloubergstrand, Melkbosstrand and Sunningdale/Parklands areas, would this most likely apply.

### 2.2.1.4. Population Scenarios

An alternative population projection model (**Reflected in Figure 2.03**) has been suggested by the City of Cape Town as follows:

The population of Cape Town was estimated to be roughly 3,2 million people in 2006. Growth rates are projected to decrease from 1,6% per annum to 0,2% by 2021. The projected total number of people in Cape Town for the year 2021 is, at the high projection, close to 4,0 million people; while at the middle projection it is around 3,5 million people and at the low projection, will amount to approximately 3,3 million people. The middle projection indicates that, over the next 15 years, the growth of the City of Cape Town will slow dramatically (City of Cape Town: Cape Town Socio-Economic Profile, 2006:15)

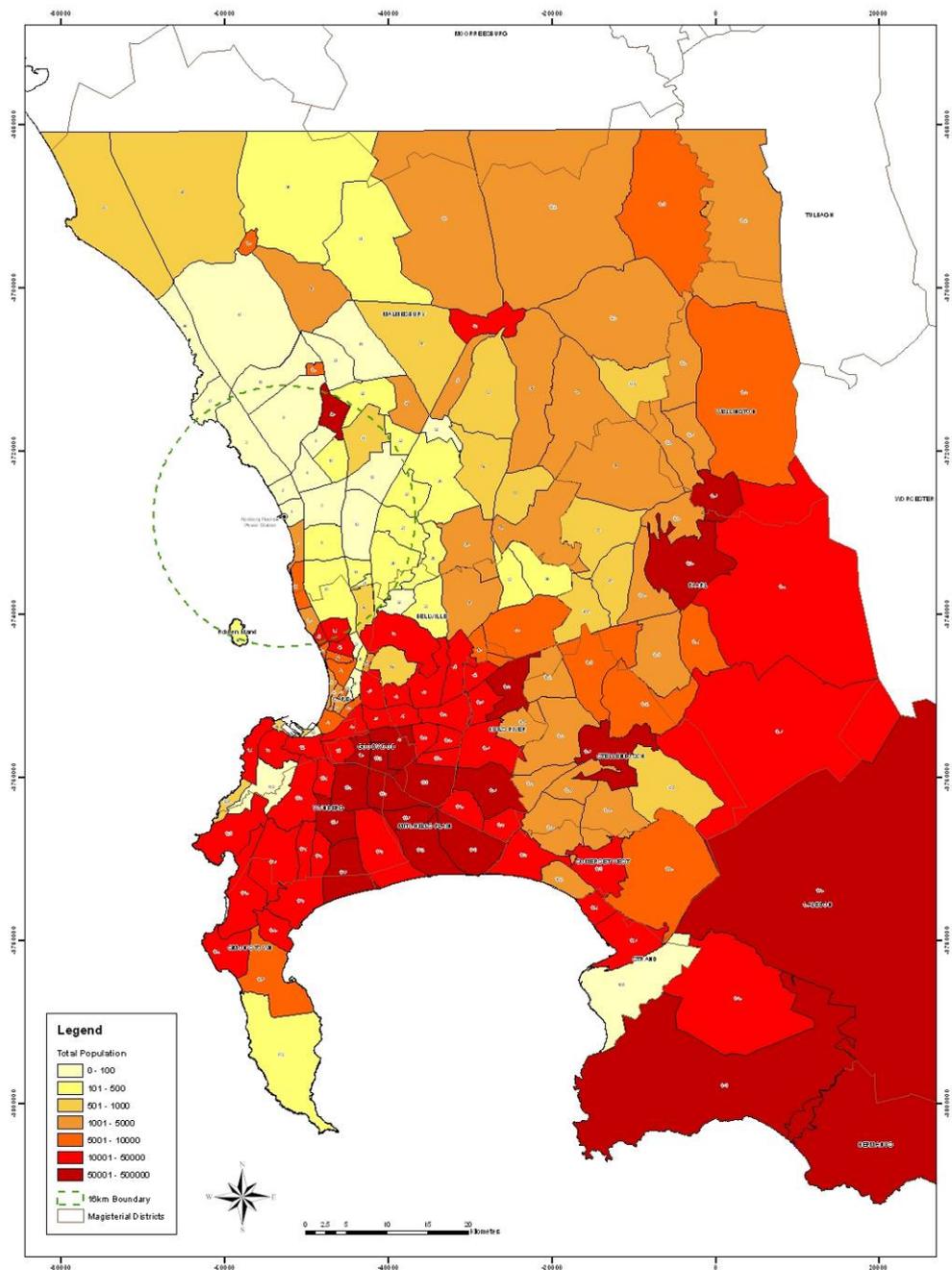


Figure 2.03: Population Density within the 80km radius of Duynfontein (2004)

### 2.2.1.5. Population Distribution per Sector

It has been estimated that a population of approximately 3,2 million resided within 80km of the Duynefontein site in 2001 and 3,5 million in 2006. The largest population concentrations are in an S, SSE (highest) and SE direction from Duynefontein, coinciding with the City of Cape Town. Further, the population distribution displays sharp spikes around main towns, i.e. Atlantis, between the distances 10km and 20km NNE, Moorreesburg, between the distances 60km and 65km NNE, Malmesbury, between the distances 30km and 40km NE, Paarl/Wellington, between the distances 45km and 55km E, Franschhoek, between the distances 65km and 75km ESE and Stellenbosch, between the distances 45km and 55km SE.

Data per suburb within 16km from the Duynefontein site is provided for the population, gender and age in Figures 2.04 and 2.05.

A population of approximately 79 000 people resided within 16km of the Duynefontein site in 2001, with Avondale and Saxonsea in Atlantis containing the highest population densities.

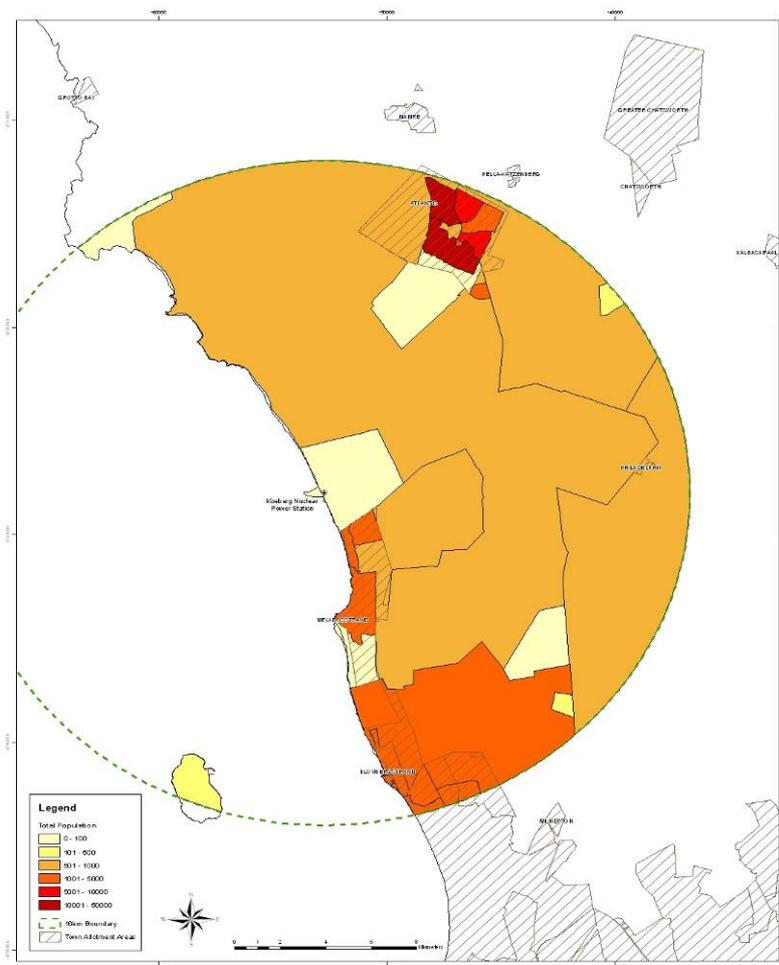


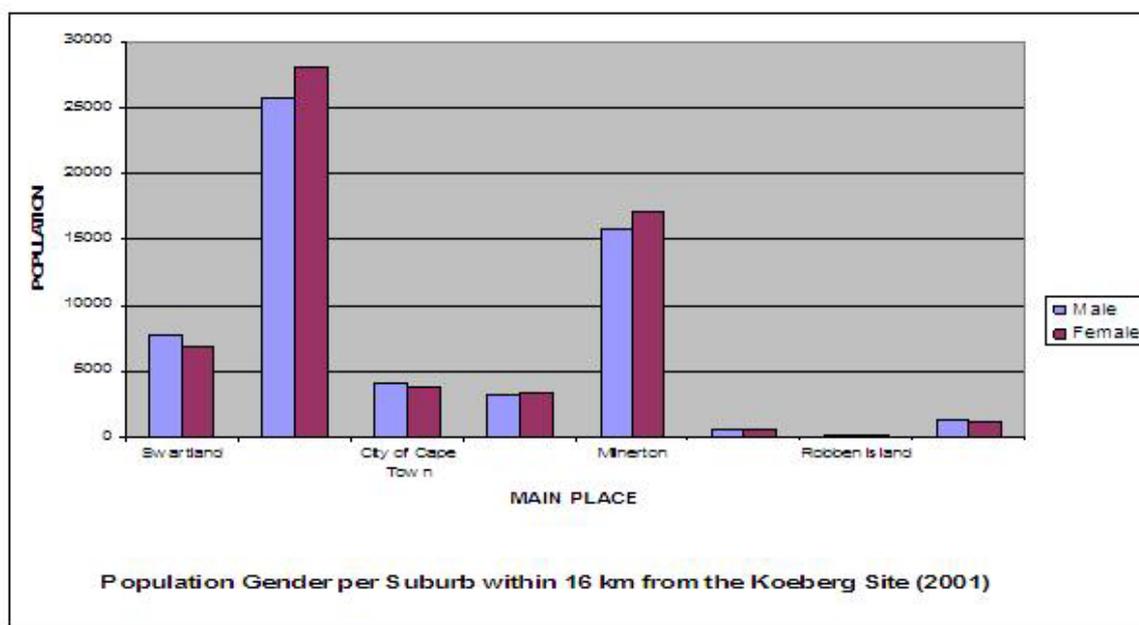
Figure 2.04: Population per Suburb within 16km radius of Duynefontein (2001)

**Table 2.03: Population Gender per Suburb within 16 km radius of Duynfontein (2001)**

Area	Male	Female	Total
Swartland	7 736	6 902	14 638
Atlantis	25 681	28 137	53 818
City of Cape Town	4141	3 833	7 974
Melkbosstrand	3171	3 349	6 520
Milnerton	15 834	17 173	33 007
Pella	529	516	1 045
Robben Island	116	58	174
Witsand	1 273	1 132	2 405

Source - Statistics South Africa: Census 2001

The population/gender distribution is relatively evenly distributed throughout the 16km radius with females experiencing a slightly higher count at approximately 40 900 females against approximately 38 200 males, as indicated in **Table 2.03 and** Figure 2.05.



**Figure 2.05: Population Gender per Suburb within 16km radius of Duynfontein (2001)**

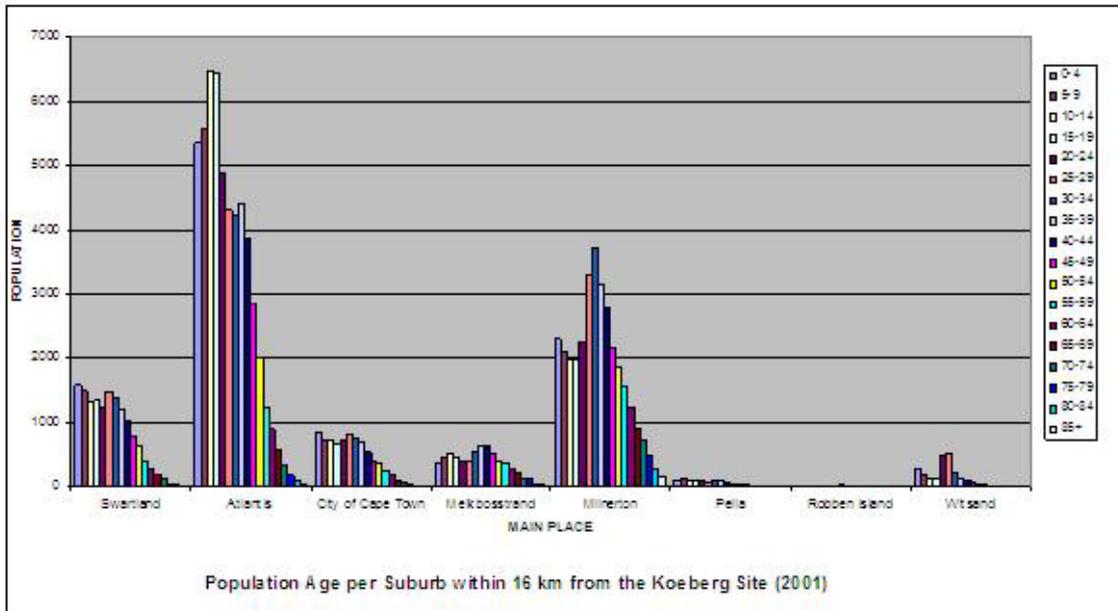
Source - Statistics South Africa: Census 2001

**Table 2.04 and Figure 2.06 indicate** a relatively young population is present in the 16 km radius, with the majority of the population being under the age of 40 years (approximately 74%) and with the highest percentage age distribution, approximately 10%, being between the ages of 10 and 14.

**Table 2.04: Population Age per Suburb within 16 km radius of Duynfontein (2001)**

Area Age	Swartland	Atlantis	City of CT	Melkbosstrand	Milnerton	Pella	Robben Is	Wtsand
0-4	1584	5357	840	364	2299	101	13	290
5-9	1496	5583	720	470	2117	122	12	204
10-14	1326	6478	629	513	1974	108	15	128
15-19	1339	6433	685	464	1992	114	4	140
20-24	1227	4866	734	387	2256	88	13	477
25-29	1483	4304	816	382	3281	80	18	506
30-34	1392	4230	777	552	3722	92	21	234
35-39	1222	4415	704	640	3155	89	24	134
40-44	1014	3871	535	639	2791	72	21	108
45-49	794	2852	401	513	2158	47	11	71
50-54	653	2007	353	388	1869	37	12	52
55-59	403	1253	251	365	1550	38	6	31
60-64	272	901	196	275	1240	21	3	14
65-69	202	579	109	209	916	12	3	12
70-74	140	346	66	145	733	11	0	0
75-79	46	180	36	122	498	9	0	0
80-84	25	113	19	47	293	3	0	0
85 +	21	53	7	37	166	0	0	0

Source - Statistics South Africa: Census 2001



**Figure 2.06: Population Age per Suburb within 16km radius of Duynefontein (2001)**

(Source - Statistics South Africa: Census 2001)

#### 2.2.1.6. Tourism Population

The data relating to the tourism population for both domestic and international tourists has primarily been sourced from South African Tourism and the Human Science Research Council (HSRC). (SA Tourism and DEAT, 2001)

The figures for the tourist population were only available as a total for the Western Cape and a percentage rate into the Cape Town area (totals per year for 2003/2004). To arrive at the number of tourists at any one day in the peak tourist period, the following assumptions have been made:

- The peak domestic tourist season is the 8 weeks over the December/January school holidays;
- The peak international tourist season ranges from October to February;
- The combined peak tourist season is the 8 weeks over December and January;
- Of the total number of domestic tourists that visit the Cape Town area, at least 60% visit over the peak domestic tourist season.
- Of the total number of international tourists that visit the Cape Town area, at least 60% visit over the peak international tourist season;
- The average time spent in the Cape Town area by domestic tourists is 10 days; and
- The average time spent in the Cape Town area by international tourists is 9 days.

### ***Domestic Tourists:***

It is estimated that the Western Cape received approximately 5,1 million domestic tourists during 2003 with an average penetration rate to the Cape Town area of 44,3%. The Cape Town area thus received close to 2,3 million domestic tourists.

Based on the assumption that 60% of all domestic tourists visit the Cape Town area over the peak domestic tourist season, one arrives at a figure of around 1,4 million people. The peak domestic tourism season is 8 weeks or 56 days, which when divided by the average time spent by domestic tourists, namely 10 days, provides a value of 5,6. Should 5,6 be divided into the actual number (1 376 837) of people visiting over the peak period, a figure of 245 864 people is obtained. Thus, on any one day in the peak domestic tourist season, there will be an estimated 245 864 domestic tourists in the Cape Town area. The above calculation rests on the assumption that the domestic tourist population is constant over the peak domestic period.

### ***International Tourists:***

It is estimated that the Western Cape received 1 543 993 international tourists during 2004 with an average penetration rate to the Cape Town area of approximately 91,26%. The Cape Town area thus received approximately 1 409 023 international tourists.

The following calculation has been made in order to calculate the international tourist population on any one day over the peak international tourist season:

Based on the assumption that 60% of all international tourists visit the Cape Town area over the period from October to February, one arrives at a figure of 845 414 people. The peak international tourism season is 22 weeks or 154 days, which when divided by the average time spent by international tourists, viz. 9 days, provides a value of 17,1. Should 17,1 be divided into 845 414 people visiting over the peak international period, a figure of 49 439 people is obtained. Thus, on any one day in the peak international tourist season, there will be an estimated 49 439 international tourists in the Cape Town area. Again the above calculation makes the assumption that the international tourist population is constant over the peak international period.

## **2.2.2. Social Character of Wards: Duynfontein**

The demographic characteristics and geographical orientation of those wards situated nearest to the Duynfontein site will be now be described. This includes wards 4, 23, 29, 32 and 104 of the City of Cape Town Metropolitan Municipality.

### 2.2.2.1. Geographical orientation of wards

Figure 2.07 below provides an indication of the geographical orientation of these wards in relation to the rest of the City of Cape Town and the Dуйnefontein site.

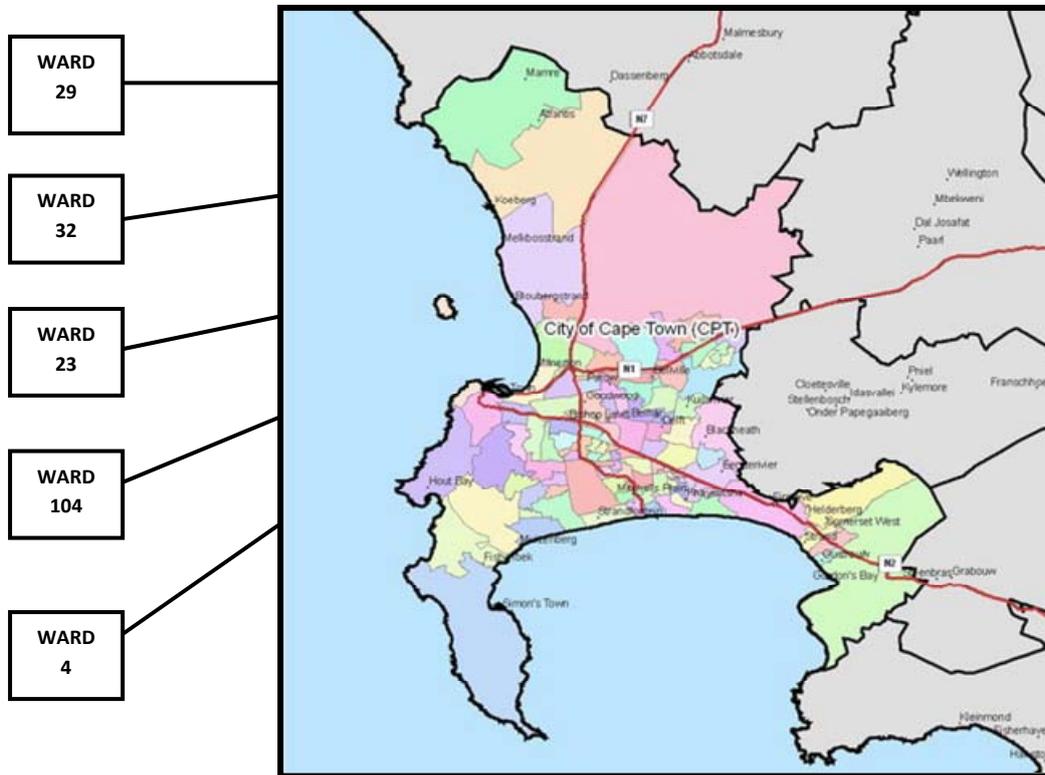


Figure 2.07: Geographical Orientation of Wards in relation to the Dуйnefontein

### 2.2.2.2. Age Structure

Table 2.05 depicts an evenly spread population distribution in the wards that would be directly influenced by the nuclear power station. However, Ward 29, to the north of the proposed site, and Ward 32, in which area the proposed site will be situated, contain approximately 10 000 people more than the remainder of the wards. The population group with ages between 0 and 14 does not form part of the economically active population, but it could be reasoned that due to the higher figures of these age groups, they also form part of the greater reproductive population of the wards. Ward 104 is characterised by a higher portion in the age group 25 to 29 than the other wards. This could be due to the fact that housing schemes are situated within in this ward, providing affordable accommodation for people in this age group.

**Table 2.05: Age Structure of Wards in relation to the Duynefontein Site (2001)**

Description (age group)	WARD				
	29	32	23	104	4
0-4	3 344	3 140	1 500	2 174	1 801
5-9	3 417	3 241	1 425	1 667	1 672
10-14	3 695	3 747	1 290	1 194	1 696
15-19	3 759	3 715	1 265	1 479	1 650
20-24	3 144	2 983	1 524	2 771	1 812
25-29	2 862	2 774	2 152	3 423	2 069
30-34	2 692	2 538	2 397	2 501	2 163
35-39	2 659	2 614	2 075	1 719	2 051
40-44	2 239	2 350	1 857	1 220	1 714
45-49	1 819	1 584	1 411	746	1 276
50-54	1 428	1 047	1 209	485	1 072
55-59	929	654	1 046	371	810
60-64	713	445	827	263	621
65-69	444	301	606	166	414
70-74	274	191	476	123	311
75-79	150	103	315	69	254
80 and over	129	83	193	79	220
<b>Total</b>	<b>33 697</b>	<b>31 510</b>	<b>21 568</b>	<b>20 450</b>	<b>21 606</b>

Source - Statistics South Africa: Census 2001

### 2.2.2.3. Education

Table 2.06 below signals an even spread of education standards of the population in these wards, with the higher figures in wards 29 and 32, due to the higher population numbers in these two wards. Ward 23 stands out with low “no schooling” figures, but with the larger figure on “higher” education. The assumption could be made that the more professional people are residing in the Melkbosstrand and Bloubergstrand areas, which fall within Ward 23.

**Table 2.06: Education Grouped per Ward, in relation to the Duynefontein Site (2001)**

Description	WARD				
	29	32	23	104	4
No schooling	634	775	230	910	269
Some primary	2 742	2 941	488	2 179	1 033
Complete primary	2 099	1 925	177	846	391
Some secondary	9 593	8 105	2 631	4 206	3 743
Std 10/Grade 12	3 753	3 303	6 360	3 611	5 727
Higher	661	618	6 201	2 183	3 624
<b>Total</b>	<b>19 482</b>	<b>17 667</b>	<b>16 087</b>	<b>13 935</b>	<b>14 787</b>

Source - Statistics South Africa: Census 2001

A high level of school attendance is detected in wards 29 and 32, whilst equally high level of tertiary education is evident in Ward 23. Table 2.07 below provides an illustration on this:

**Table 2.07: Educational Institutions per Ward, in relation to the Duynefontein Site (2001)**

Description	WARD				
	29	32	23	104	4
None	4 708	4 745	1 637	3 922	1 833
Pre - school	493	392	387	281	418
School	8 533	8 233	2 911	2 663	4 091
College	118	107	222	102	183
Technicon	72	60	120	51	123
University	25	46	157	63	150
Adult education	13	19	6	8	6
Other	0	84	66	22	26
<b>Total</b>	<b>13 962</b>	<b>13 686</b>	<b>5 506</b>	<b>7 112</b>	<b>6 830</b>

Source - Statistics South Africa: Census 2001

This is mainly ascribed to the larger portion of the population living in these two wards. More people attending tertiary education are found in wards 23 and 4, primarily because the higher income population groups are found here.

#### 2.2.2.4. Household Income

As illustrated in Table 2.08, Ward 23 has more residents in the higher income groups. This ward includes the Melkbosstrand and Bloubergstrand settlements. Ward 29 has a larger part of the population in the R9 601 to R76 800 income groups. This is attributed to the population living in the Atlantis settlement. Ward 4 constitutes of a smaller population compared to the other wards, and a higher percentage of the population falls in the R38 401 to R307 200 income groups.

**Table 2.08: Household Income per Ward, in relation to the Duynefontein Site (2001)**

Description	WARD				
	29	32	23	104	4
No income	582	610	452	1 688	501
R1 - R4 800	147	191	77	358	117
R4 801 – R 9 600	573	585	217	630	272
R9 601 – R 19 200	1 110	1 135	358	1 161	539
R19 201 - R 38 400	2 010	1 674	561	738	725
R38 401 - R 76 800	1 813	1 677	1 208	663	1 137
R76 801 - R153 600	833	679	1 898	815	1 429
R153601-R307200	152	135	2 131	848	1 330
R307201-R614400	16	20	1 026	314	584
R614401-R1228800	3	7	210	42	102
R1228801-R2457600	69	40	98	17	67
R2 457 601 , more	42	45	71	18	42
Not Applicable	7	3	20	1	8
<b>Total</b>	<b>7 357</b>	<b>6 801</b>	<b>8 327</b>	<b>7 293</b>	<b>6 853</b>

Source – Statistics South Africa: Census 2001

### 2.2.2.5. Industry

Table 2.09 contains a detailed breakdown of occupations and workforce according to industry. Manufacturing plays an important role in wards 29 and 32. This correlates with industries in the Atlantis area. Business services dominate in Ward 23, the Melkbosstrand / Bloubergstrand areas.

**Table 2.09: Industry per Ward in relation to the Duynfontein Site (2001)**

Description	WARD				
	29	32	23	104	4
Agric relate work	343	572	285	213	150
Mining, Quarrying	14	24	57	54	41
Manufacturing	3 766	3 881	1488	948	1 414
Electricity, gas, water	161	236	356	61	81
Construction	552	523	502	902	470
Wholesale, Retail	1 544	1343	1979	1 387	1 814
Transport, Communications	318	243	588	385	496
Business Services	668	616	2 314	1 116	1 828
Community Services	1 437	1113	1 923	1 061	1 823
Private Household	335	318	384	554	318
Undetermined	1 209	986	1 068	966	915
Extra Territ Orgs	3	0	0	0	0
Rep Foreign Gov	0	0	0	0	6
<b>Total</b>	<b>10 350</b>	<b>9 855</b>	<b>10 944</b>	<b>7 647</b>	<b>9 356</b>

Source - Statistics South Africa: Census 2001

### 2.2.2.6. Mode of Transport

According to Census (2001) figures and shown in Table 2.10, the most common mode of transport is "walking" in wards 29 and 32. The second most common mode of transport is the "minibus" or "taxi". It is also clear that travelling by bus in these two wards can also be regarded as an important mode of transport. In wards 23,104 and 4, the most common mode of transport is in a "car" as a driver or a passenger, followed by "walking" and "bus" transport.

**Table 2.10: Mode of Transport per Ward in relation to the Duynfontein Site (2001)**

Description	WARD				
	29	32	23	104	4
Not Applicable	13 556	12 196	7 034	9 562	7 367
On foot	8 818	10 476	1 072	2 711	2 905
Bicycle	70	113	143	205	116
Motorcycle	41	40	115	105	102
Car as a driver	1 305	985	8 151	3 279	5 650
Car passenger	1 879	1 563	3 730	2 144	3 000
Minibus/taxi	4 522	3 736	315	1 740	1 591
Bus	3 122	2 219	836	528	634
Train	78	17	37	76	152
Other (Transportation)	306	164	133	100	89
<b>Total</b>	<b>33 697</b>	<b>31 509</b>	<b>21 566</b>	<b>20 450</b>	<b>21 606</b>

Source - Statistics South Africa: Census 2001

### 2.2.2.7. Occupation

The category with the largest number of elementary and plant operator workers are found in wards 29 and 32, whilst high numbers of professionals are found in wards 23 and 4 (as illustrated in Table 2.11):

**Table 2.11: Occupation per Ward in relation to the Duynfontein Site (2001)**

Description	WARD				
	29	32	23	104	4
Senior Officials	287	238	1 926	834	1 342
Professionals	193	196	2 275	768	1 440
Technical and Associate Professionals	826	695	1 762	852	1 342
Clerks	1 467	1 007	1 307	814	1 317
Service workers	763	749	1 273	742	1 165
Skilled agricultural work	79	223	87	102	98
Other	1 729	1 664	478	911	685
Elementary occupation	2 295	2 612	848	1 732	1 023
Occupations unspecified and not elsewhere classified	839	650	840	559	621
Plant Operators	1870	1 819	149	333	322
<b>Total</b>	<b>10 348</b>	<b>9 853</b>	<b>10 945</b>	<b>7 647</b>	<b>9 355</b>

Source - Statistics South Africa: Census 2001

### 2.2.2.8. Personal income

Table 2.12 signals that the lower income groups are mainly detected in wards 29 and 32, and the higher income groups in wards 23, 104 and 4.

Personal income levels indicate that in wards 29, 32 and 104, just under 60% of the population have no income, while in Ward 4, 47.6% have no income and in ward 23, 38.5% of the population have no income.

**Table 2.12: Personal Income per Ward in relation to the Duynfontein Site (2001)**

Description	WARD				
	29	32	23	104	4
No income	20 131	18 599	8 299	11 792	10 290
R1 - R400	782	893	396	742	415
R401 - R800	3 028	3 245	786	1 255	963
R801 - R1 600	3 999	3 812	1 113	2 013	1 658
R1 601 – R3 200	3 868	3 400	1 747	1 011	1 949
R3 201 – R6 400	1 377	1 084	3 095	1 449	2 577
R6 401 – R12 800	298	271	3 135	1 252	2 058
R12 801 - R25 600	29	26	2 075	736	1 209
R25 601 - R51 200	10	13	609	133	304
R51 201 - R102 400	3	10	154	35	67
R102401-R204800	173	157	96	24	81
R204 801 or more	0	0	61	9	35
<b>Total</b>	<b>33 698</b>	<b>31 510</b>	<b>21 566</b>	<b>20 451</b>	<b>21 606</b>

Source - Statistics South Africa: Census 2001

### 2.2.2.9. Population: Grouped

On a racial group basis *in Table 2.13*, 96,7% and 87,5% of the population in wards 29 and 32 respectively, regard themselves as coloureds. In wards 4 and 23, whites are 58,9% and 85,7%, with black Africans in Ward 104 at 61,3%.

**Table 2.13: Grouped Population per Ward in relation to the Duynfontein Site (2001)**

Description	WARD				
	29	32	23	104	4
Black African	830	3 215	1 288	12 551	6 142
Coloured	32 599	27 581	1 574	1 336	2 439
Indian or Asian	172	121	215	125	301
White	96	592	18 490	6 439	12 723
<b>Total</b>	<b>33 697</b>	<b>31 509</b>	<b>21 567</b>	<b>20 451</b>	<b>21 605</b>

Source - Statistics South Africa: Census 2001

### 2.2.2.10. Work status

As depicted in Table 2.14 below, self-employment is most evident in wards 32 and 4, whilst Ward 104 hosts the largest number of employers.

**Table 2.14: Work Status per Ward in relation to the Duynfontein Site (2001)**

Description	WARD				
	29	32	23	104	4
Paid employee	9 631	8 853	8 277	6 416	7 427
Paid family worker	294	559	150	79	133
Self-employed	298	335	2 306	699	1 614
Employer	28	50	173	418	147
Unpaid worker	97	55	41	36	34
Not applicable	11 993	10 923	4 942	7 367	5 983
<b>Total</b>	<b>22 341</b>	<b>20 775</b>	<b>15 889</b>	<b>15 015</b>	<b>15 338</b>

Source - Statistics South Africa: Census 2001

### 2.2.2.11. Tenure status

As indicated by Table 2.15 below, ownership (fully paid or not paid up) is relatively high in Ward 29 (with 75%), followed by Ward 4 (with 69,4%), Ward 32 (with 66,4%), Ward 23 (with 64,1%) and Ward 104 (with 47,6%).

**Table 2.15: Tenure Status per Ward in relation to the Duynefontein Site (2001)**

Description	WARD				
	29	32	23	104	4
Owned, Fully Paid	2 940	1 050	2 234	1 530	1 784
Owned, Not Paid	2 629	3 469	3 110	1 940	2 974
Rented	1 573	1 347	2 324	1 045	1 330
Occupied rent-free	178	891	543	2 711	580
Not applicable	40	47	119	70	189
<b>Total</b>	<b>7 360</b>	<b>6 804</b>	<b>8 330</b>	<b>7 296</b>	<b>6 857</b>

Source - Statistics South Africa: Census 2001

### 2.2.2.12. Employment status

One should take cognisance of the fact that these unemployment figures are based on Statistics South Africa's official definition of unemployment, which excludes those persons whom had not taken active steps to seek work within the four week period leading up to the survey. In effect, this definition of unemployment excludes discouraged work-seekers from being counted amongst the unemployed and as such is considered by many to be a rather conservative estimate of actual levels of unemployment. Statistics South Africa's official definition of unemployment is utilised throughout this report.

A high rate of unemployment is found in wards 104 (30%), 32 (20,7%) and 29 (19,3%). In Ward 4 the unemployment is 10,3%, and the lowest rate of unemployment is found in Ward 23, with 4,7% *as indicated in Table 2.16.*

**Table 2.16: Employment Status per Ward in relation to the Duynefontein Site (2001)**

Description	WARD				
	29	32	23	104	4
Employed	10 347	9 853	10 946	7 647	9 355
Unemployed	4 311	4 293	743	4 491	1 583
Not Economic Active	7 681	6 630	4 199	2 876	4 399
<b>Total</b>	<b>22 339</b>	<b>20 776</b>	<b>15 888</b>	<b>15 014</b>	<b>15 337</b>

Source - Statistics South Africa: Census 2001

### 2.2.3. Community Facilities in relation to the Duynefontein Site

Table 2.17 indicates the community facilities that can be found within the 20km radius around Duynefontein, and Table 2.18 depicts community facilities outside the 20km radius, but within the 80km radius, around Duynefontein.

**Table 2.17: Community Facilities within 20 km radius of Duynefontein (2009)**

Facility	Atlantis	Melkbos-strand	Good-wood	Wyn-berg	Kuils-rivier	Bellville
Hotels, Motels, B&B, Caravan Parks etc	2	43	7	3	4	27
Police Stations	1	1	1	1	1	3
Sport & Recreation Facilities	10	2	3	3	3	11
Educational Facilities	16	3	7	13	8	106
Health, Hospitals, Clinics	3	1	3	4	3	9
Churches	42	3	28	23	28	75
Community Based Structures and Interest Groups	5	3	3	3	0	0

The following community facilities, illustrated in Table 2.18, are situated in the Duynefontein area: 870 Schools with a total population of 596 069, 17 Universities and Colleges with a population of 118 486, 19 Correctional Facilities (Prisons) with a population of 17 762, 24 Hospitals, 658 Old Age Homes, 24 Homes for Disabled People, 33 Children's Homes, 5 Places of safety for children, 5 Shelters for abused woman, 15 Shelters for adults and 13 Shelters for street children.

**Table 2.18: Community Facilities within the 20km to 80km radii of Duynefontein (2009)**

Facilities	Number of facilities	Population
Hospitals	24	
Universities	17	118 486
Schools	870	596 069
Correctional facilities	19	17 762

#### **Schools:**

There are 28 schools within a 20km radius of Duynefontein and 842 within a radius of between 20km and 80km. These schools are described in accordance with their location from Duynefontein and are listed below in Tables 2.19 and 2.20.

#### *Schools within 20km radius around Duynefontein:*

The nearest schools to the Koeberg site are Van Riebeeck Strand Primary School (3,39km SSE) and Melkbosstrand Pre-Primary (5,86km S) with 800 and 135 pupils respectively. A total of 16 schools in the Atlantis area are located within 15km of the Koeberg site to the NNE. These schools have a total enrolment of 13 572 pupils. The Blouberg Ridge Primary and the West coast Christian Academy schools are located at 15,72km and 15,22km SSE respectively. This data is illustrated by means of Table 2.19 below.

**Table 2.19: Schools within 20km distance radii of Duynfontein (2009)**

Area	Name	Distance (km)	Learners	Educators	
Melkbos	Van Riebeeck Strand Primary	3,39	800	35	
	Melkbosstrand Pre-Primary	5,86	135	7	
	Berzelia Primary	12,48	520	16	
	Avondale Primary	12,76	753	20	
	Wesfleur Primary	12,77	1370	38	
	Kerria Primary	12,81	770	20	
	Robinhood Pre-Primary	12,91	130	5	
	Proteus Secondary	13,00	1506	45	
	Protea Park Primary	13,13	809	22	
	Reygersdal Primary	13,18	878	22	
	Atlantis	Atlantis Secondary	13,27	1801	59
		Atlantis Skills School	13,28	220	17
		Parkview Primary	13,30	790	21
Wesfleur Primary		13,81	460	27	
Robinvale Secondary		13,99	1321	40	
Dawn Special School		14,40	120	10	
Saxonsea Primary		14,45	1395	35	
Elkanah House		14,71	172	9	
Saxonsea Secondary		15,00	1146	34	
Hermes Avenue Primary		15,13	545	18	
Grosvenor Primary		15,22	800	20	
Blouberg		West Coast Christian Academy	15,22	112	8
		Blouberg Ridge Primary	15,72	824	35
	Blouberggrant Pre-Primary	16,35	121	5	
	Parklands College	17,21	800	35	
	St Johns	N/A	N/A	N/A	
	Ryle College	17,53	130	15	
Milnerton	Sophakama Primary School	N/A	N/A	N/A	
<b>Total</b>			<b>18 428</b>	<b>618</b>	

(Source: Department of Education Western Cape)

Schools within 80km radius from site:

Table 2.20 represents the schools situated within an 80km radius from the site. These schools have a total enrolment of 596 069 pupils.

**Table 2.20: Schools between 20km and 80km radii of Duynfontein (2009)**

<b>Town</b>	<b>Number of Schools</b>	<b>Population</b>
Atlantis	15	13 965
Bellville	93	66 994
Bishops Lavis	1	741
Black Heath	7	8 002
Bonteheuwel	2	1031
Cape Town	166	92 623
Darling	7	1 835
Durbanville	4	3 662
Eersterivier	15	18 957
Elim	1	267
Elsiesrivier	31	18 199
Faure	3	1 005
Franschoek	6	3 385
Gordon's Bay	2	1 009
Gouda	2	694
Grabouw	13	6 501
Hopefield	3	1 435
Khayelitsha	69	62 592
Kraaifontein	22	19 463
Koringberg	1	208
Landsdown	2	1 461
Landsdowne	8	4 437
Langebaan	4	950
Malmesbury	20	10 225
Mitchellsplein	92	68 090
Mamre	2	820
Nanga	5	2 988
Paarl	59	36 470
Phillidelphia	1	150
Parow	21	16 078
Phillipi	8	5 143
Pniel	1	607
Saron	2	1 837
Saldanna	7	4 025
Somerset-West	24	15 581
Steenberg	1	1 160
Stellenbosch	28	20 022
Sunnydale	2	2 229
Strand	16	16 066
Tulbagh	7	2 276
Wynberg	97	62 886
<b>Total</b>	<b>870</b>	<b>596 069</b>

(Source: Department of Education Western Cape)

### **Hospitals:**

There are 35 hospitals located within 35km of the Dуйnefontein site. The nearest hospitals to the site are the Milnerton Medi-Clinic (22,04 km SSE) with 121 beds, and the Wesfleur Hospital in Atlantis (22,22 km NE) with 28 beds, and Blaauwberg Netcare Hospital (100 beds). **The Blaauwberg Netcare** Hospital is within a 16km radius from the site.

#### *District and provincial hospitals:*

There are 10 provincial hospitals within a 35 km location of the site. These hospitals are listed in Table 2.21 below

**Table 2.21: District and provincial hospitals within 35km radius of Dуйnefontein (2009)**

District/provincially aided hospitals
Sarah Fox Hospital - Athlone
Stellenbosch Hospital - Stellenbosch
Wesfleur Hospital - Atlantis
False Bay Hospital - Fishhoek
Maitland Cottage Home - Newlands
Swartland Hospital - Malmesbury
Booth Memorial Hospital - Oranjezicht, Cape Town
Three x TB Hospitals
Four x Psychiatric Hospitals

*(Source: Provincial Department of Health)*

**There are 3 tertiary hospitals within 80km radius of Dуйnefontein listed in Table 2.22,**

**Table 2.22: Tertiary Hospitals within 80km radius of Dуйnefontein (2009)**

Tertiary Hospitals		Beds	Staff
Grootte Schuur Hospital	<ul style="list-style-type: none"><li>Specialised and super-specialised care for patients</li><li>World class academic training for interns and residents</li><li>The institution is a world renowned research hospital.</li></ul>	893	3570
Red Cross Children's Hospital	Highly specialised children's healthcare facility	333	1100
Tygerberg Hospital	<ul style="list-style-type: none"><li>General Surgery and sub- disciplines, e.g. orthopaedics, ophthalmology, etc, Internal Medicine and sub- disciplines, e.g. cardiology and nephrology, as well as Obstetrics and Gynaecology.</li><li>Tygerberg is the leading health facility in the Western Cape for care of trauma and other acute cases.</li></ul>	1400	4000+

*(Source: Provincial Department of Health)*

*Maternity Hospitals:*

Only one Maternity Hospital is located within an 80 km radius of the Duynefontein site.

*Secondary Hospitals:*

Six (6) Secondary Hospitals are located within a 80km radius of the site. These hospitals are represented in Table 2.23

**Table 2.23: Secondary Hospitals within 80km distance radii of Duynefontein (2009)**

Six Secondary Hospitals
GF Jooste Hospital – Manenberg, Cape Town
Helderberg Hospital - Somerset-West
Karl Bremer Hospital – Bellville, Cape Town
Paarl Hospital - Paarl, Drakenstein
Somerset Hospital - Greenpoint, Cape Town
Victoria Hospital - Wynberg, Cape Town

*(Source: Provincial Department of Health)*

*Universities and Colleges:*

A total of 6 Universities and Colleges are situated within a 80km radius of the site. The respective academic institutions are depicted in Table 2.24.

**Table 2.24: Universities and Colleges within 80km radius of Duynefontein (2009)**

Town	Number	Population
Stellenbosch	1	24686
Rondebosch UCT	1	21800
Bellville UWC	1	15000
Technical Colleges	8	13000
Peninsula CPUT	5	29000
North. Tech. College	1	15000
<b>Total</b>	<b>17</b>	<b>118 486</b>

**Correctional Facilities:**

There is no Correctional Facility within the 16km radius of the site. The nearest Correctional Facility is Goodwood, which is 29km from the site.

**Table 2.25: Correctional Facilities in the Western Cape (2009)**

<b>Town</b>	<b>Number</b>	<b>Population</b>
Paarl - Allandale	1	579
Wellington - Hawequa	1	247
Wellington - Paardeberg	1	435
Paarl – Drakenstein	3	2067
Stellenbosch	1	115
Goodwood	1	2453
Malmesbury	2	1619
Riebeeck-Wes	1	235
Van Rhynsdorp	1	88
Porterville - Voorberg	2	2222
Pollsmoor Admin	1	4248
Pollsmoor A B C	3	3005
Pollsmoor Female	1	449
<b>Totals</b>	<b>19</b>	<b>17 762</b>

**Other facilities:**

Other facilities include:

- 658 x Accommodation for the Elderly;
- 24 x Homes for Disabled People;
- 33 x Children’s Homes;
- 5 x Places of Safety for Children;
- 5 x Shelters for Abused Women;
- 15 x Shelters for Adults; and
- 13 x Shelters for Street Children.

Table 2.26 contains information on the various community structures that are located in the 20km radius around the Duijfontein site. This information was collected from the Cape Town map book produced by Map Studio. Unfortunately, data on civil institutions is very scarce for the City of Cape Town. Thus, it is possible that the following table does not fully account for all the civil structures.

**Table 2.26: General community facilities within 20km distance radii of Duynefontein (2009)**

Facility	District B: West Coast
Hotel	7
Clinic	6
Hospital	5
Shopping Mall	29
Post Office	6
Court of Law	1
School	31
Service station	21
Religious site	9
Library	6
Caravan Park	2
Police Station	2
Fire Station	3
Traffic Department	1
Railway Station	2
Water Treatment Works	3
Country club	2
Airfield	1
Refinery	1
Cement factory	1
Guest cottage/conference centre	1
Bus terminal	1
Wine estate	5

*Police Station:*

Four (4) Police Stations are situated within a 16km radius of the site. The respective stations are illustrated in Table 2.27.

**Table 2.27: Police Stations within 16km radius of Duynefontein (2009)**

Police Station	Sector	Distance(km)
Melkbosstrand	SSE	2.74
Atlantis	NNE	13.67
Philadelphia	E	14.06
Table View	SSE	17.42

*Fire Stations:*

There are 2 fire stations within the 16km radius at Atlantis and Melkbosstrand respectively, and one just outside the 16km radius at Milnerton.

*Libraries:*

The following libraries are situated within the 16km radius:

- Wesfleur Public Library - Atlantis
- Avondale Public Library - Atlantis
- Bloubergstrand Public Library
- Duynefontein Library

### Golf Courses:

Only two (2) Golf Courses are located within the 20km radius from the site. They are:

- Melkbosstrand: Atlantic Beach Golf Course
- Milnerton : Milnerton Golf Course

### Churches:

Within the 20km radius from the site, a total of 6 Churches can be depicted, viz.:

- Dutch Reformed Church: Bloubergstrand Melkbosstrand
- Baptist Church: Melkbosstrand
- Apostolic Faith Mission: Bloubergstrand
- Nederduitsch Hervormde: Melkbosstrand Atlantis

## 2.2.4. Migration Patterns in relation to the Duynfontein Site

Current migration patterns reflect a net inflow of people from rural areas commencing as far as the Eastern Cape. The influence of migration patterns adds an even pressure on the provision of housing in Cape Town. The Western Cape is currently a net receiving province in South Africa. It is estimated that, on balance, approximately 48 000 people enter the province each year. This represents an increase (due to in-migration) of more than 1% of the total population.

Figure 2.08 below illustrates the projected net migration in Cape Town for the period 2001 to 2025. Following major policy changes in the country, total net migration was at high levels in 2001 and the succeeding years, but the general trend indicates a steady decline up to 2025. This suggests that migration has already peaked and no large influxes are expected in the near future. The highest net migration for the period 2001-2006 was amongst the African population group, whilst there was relatively low net migration for the remainder of the population groups. The abolition of restriction of movement has resulted in movement of African people to the City in search of improved prospects, i.e. employment, basic services and education (City of Cape Town; Socio-Economic Profile: 2006, p 16).

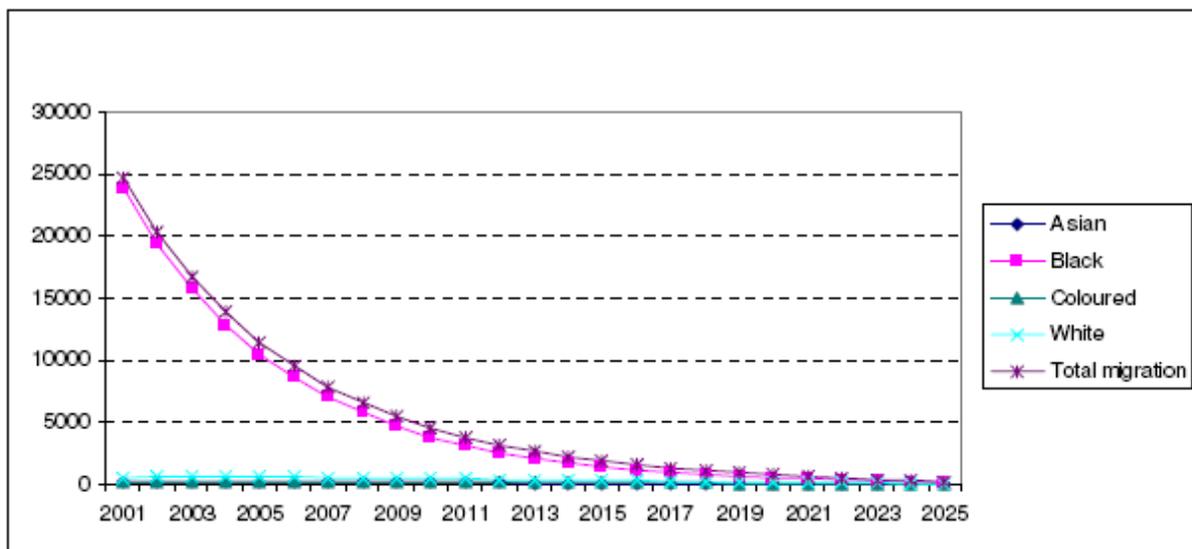


Figure 2.08: City of Cape Town Migration Trend per Racial Group, 2001-2025

(Source: Centre for Actuarial Research, 2005 Population projections for the Western Cape 2001 – 2025)

### 2.2.5. Land Use Patterns: Duynfontein

The “Nuclear-1: EIA, Agricultural Impact Assessment”, Sept 2009, prepared by Golder Associates/Imani Development, establishes that there is no agricultural production on the proposed site (EIA envelope). Potential for agricultural production on the proposed site is very limited, primarily as a result of the type of soil (sand dunes). No commercial cultivation can be detected within the 800 m emergency zone, but some mixed farming is being undertaken on the border of the 3km radius.

Broad bands of land use around the proposed site are evident, the first being bare open vegetation close to the coast, the second the farming areas, and thirdly the residential areas in and around Atlantis.

As shown in Figure 2.09, the majority (approximately 80%) of the northern area is dominated by scrublands. There is a large urban area in Atlantis with industrial activity around the residential areas, in addition to an area that has been prepared for residential development, marked on the map as land degraded in preparation for development.

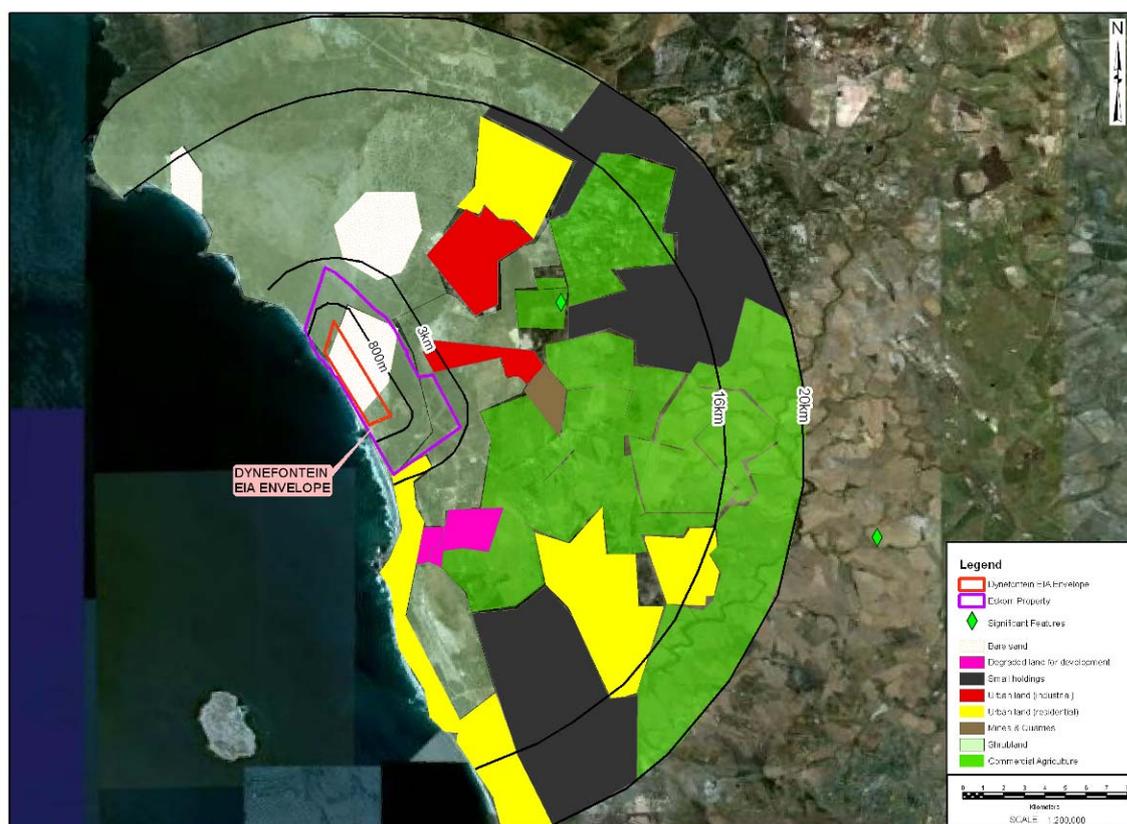


Figure 2.09: Land Use Map: Duynfontein (2009)

Two distinct areas, dominated by smallholdings where primarily subsistence farming is occurring, can be distinguished. A wide range of enterprises produce agricultural goods, but these are principally for home consumption with very little commercial production taking place.

On one farm, Vaaitjie, a sand mine and adjacent brick-making business with excavations for brick-making material, is located. Apollo Brickmakers produce an average of 3,5 million bricks per day.

### **2.2.6. Overview of the Economy: Duynfontein**

“Nuclear-1, EIA, Economic Impact Assessment”, by Imani Development (SA) (Pty) Ltd, Sept 2009, analyses the economy of the area as follows:

Cape Town has a relatively diverse economy, with approximately 93% of businesses constituting SMME's, contributing 50% of the total output and 40% of the total formal employment. However, there is a shift towards the services sector with the largest areas of growth being identified in finance, business services, trade, catering, accommodation, tourism, transport and communications. Manufacturing, which accounts for 19,4% of employment, is in decline. Unemployment has remained high at 20,7% (2005), but it appears as if the trend has been decreasing since 2003. The total population of the City of Cape Town for 2007 is estimated at 3,2 million of which District B accounts for approximately 5,3% (170 000). Unemployment in District B was around 15,6% in 2005 (significantly lower than the City's unemployment rate).

The Duynfontein site is located in District B within the City of Cape Town. District B is one of the largest in the city and has some of the fastest growing areas, including Big Bay, Melkbosstrand, West Beach, Century City, Sunningdale and Parklands. The area mix consists of urban, rural and farming areas. The largest part of the district is regarded as affluent, especially along the Atlantic coast. However, it also includes pockets of lower income areas such as Atlantis, and informal settlements with poor access to amenities and other services (especially economic opportunities). Century City is a key residential and commercial node in the city and will become increasingly so as the area is further developed. The majority of the land available for expansion of the City lies in the north. Thus, over the next 10 to 20 years, this area is likely to become of increased importance in the Cape Town economy.

The most significant economic activity areas in the district are Table View, Killarney and Montague Gardens. Killarney and Montague Gardens are two of the City's most important industrial areas. Apart from industrial activity, the other noteworthy sectors include agriculture, tourism and retail trade. The commercial sector is growing in importance in District B.

#### *Fishing*

The Eskom nuclear power station site at Koeberg and Duynfontein is not located in a major commercial fishing area. According to Marine and Coastal Management, the nuclear power station has had no discernible effect on localised stock, because of the absence of a reef; it is located on a sandy stretch of coastline.

#### *Industry*

The 20 km radius around Duynfontein, for the most part, includes small, rather than large, industries (such as light industry). However, these industries are not clustered, with the exception of those at Atlantis. Large industries are located primarily outside this radius in areas such as Epping.

The industrial sector, within a 20 km radius of Duynefontein, is dominated by the Chevron (Caltex) oil refinery and four cement companies. The Chevron refinery produces 74 000 barrels of refined product per day and employs 390 persons. In addition, there are 800 to 900 contractors at any given time, increasing to 2 000 during the six-week biennial turnaround. The cement industry estimates its production in the area at 2 million tons of aggregate and about 120 000 m<sup>3</sup> of cement per annum. The turnover is estimated at between R 300 - 350 million per annum, and total permanent employment at 150.

One of the largest industries at Atlantis is Bokomo Foods which operates two factories. These preceded the construction of the Koeberg nuclear power station. Bokomo employs 800 persons and has plans for expansion at Atlantis. With the closure of a number of industries since the withdrawal of incentives, serviced land at Atlantis is available at a reasonable price, and the Chamber of Commerce is attempting to promote the location. Although Atlantis was an artificial growth point and has not been an ideal location for industry, its appeal is likely to increase as the Cape Town metro region expands northwards.

The business sector is interested in securing a stable supply of power, and is not concerned about a second nuclear power station at Duynefontein, provided that safety measures are in place. Industries at Atlantis, including the food industry, adjoin the Duynefontein site but do not regard a nuclear power station there as negative. During field interviews, the business sector indicated that it believes that the technology will be more advanced than at Koeberg and that, therefore, the risk would be better managed. It further believes that it makes economic sense to provide new reticulation infrastructure parallel to that already existing at Koeberg. As the nuclear power station would be located in a zone that is already in effect an industrial area, the sense of place would not be a significant factor.

The only gas pipelines in the Koeberg area are related to the Chevron refinery. The largest is the 110 km pipeline from Saldanha Bay that transports crude oil into the refinery and storage tanks at Killarney. There are also two smaller pipelines from the refinery into Cape Town harbour. The Saldanha Bay 26" pipeline passes about 3 km away from the Koeberg nuclear power station. It carries 130 000 barrels per day, but this could be increased to 180 000 barrels per day. White oil is carried to Cape Town harbour by a 12 " pipeline and fuel oil by a 10" pipeline. Neither the refinery nor the municipality were able to provide data on the age, operating pressure, depth of burial, and type of isolation valves referred to in the Terms of Reference.

### ***Tourism***

Tourism around the Duynefontein site is largely represented by the Greater Northern Cape Town tourism region. This includes Atlantis, Bellville, Blaauwbergstrand, Century City, Durbanville, Edgemoed, Goodwood, Langa, Melkbosstrand, Milnerton, Parow, Pinelands, Sunset Beach and Table View.

This area is characterised by a wide diversity of enterprises in the tourism industry, and it is difficult to differentiate between the tourism assets of the area itself and those of the Greater Cape Town and West Coast destinations. However, within the immediate site proximity, activities are focused on sea and eco-tourism activities such as kite-surfing, windsailing, golf, hiking and mountain biking. The area has a well-developed tourism infrastructure with a strong supply of services, facilities and amenities, including up-market golf estates. A number of large hotel developments are currently underway, and there are plans for a further golf estate near Melkbosstrand. According to the "Nuclear-1, EIA, Tourist Assessment Study", by Imani Development (SA) (Pty) Ltd, Sept 2009, the annual turnover of accommodation establishments in the area is R497,8 million per annum.

Estate agents believe that the direction of city expansion will be to the north. Urban growth in the form of holiday resorts and retirement complexes has already leapfrogged from Melkbosstrand to Atlantis to Grotto Bay, Yzerfontein and Jakkalsfontein. The opening of the Koeberg nuclear power station in 1984 has not halted the growth of Blaauwbergstrand (which has been particularly rapid in the last 15 - 20 years) and Melkbosstrand where growth is of a more recent vintage. Beachfront houses at Blaauwbergstrand are popular buys for foreigners who have paid up to R16,5 million for a property. At Big Bay house prices have been in the R4 - 6 million ranges. The Atlantic Beach Golf Estate is a prime facility in Melkbosstrand with units selling for up to R3,5 million. Inland, the Durbanville area is highly sought after with property prices ranging from R2,0 – 4,5 million.

### **Agriculture**

A range of agricultural activities are evident in a 20 km radius of the Duynfontein site. In recent years there has been a shift from dairying and wheat farming to vineyards, and some up-market wine estates are located in the Durbanville and Vissershoeck areas. Based on responses collected during fieldwork, there has never been any concern that the Koeberg nuclear power station would adversely affect these estates. A game farm has been established north of Silverstream Road, and a number of equestrian stables have moved from Milnerton to Grotto Bay. Pig farming is conducted in the Philadelphia area.

#### **2.2.7. Municipal Infrastructure: Duynfontein**

A small percentage of the City's increasing population does not have access to basic services. Increasingly stressed infrastructure is impairing sustainable service delivery, social development and economic growth in Cape Town. The reality is that combined demand of infrastructure requirements cannot be met simultaneously, given the limitations of the current budget and the financing models. The City's objectives include: reducing services backlogs, giving bulk infrastructure priority and developing an integrated approach to infrastructure, service planning and budgeting. (*Dippenaar, A.J.B. "Nuclear-1 Environmental Impact Assessment and Environmental Management Plan: Specialist Socio-Economic study for Inception Report"; Octagonal. Cape Town, 2007*).

### **Water and Sanitation**

Cape Town and the immediate region's sustainable water supply are being threatened by a combination of growth and development, uncontained demand and unrealistically low tariffs. The Berg River supply dam will only satisfy demand until 2014. This requires alternative strategies. Many key bulk infrastructure upgrades or development projects cannot be prioritised due to budget limitations, and have severe service implications for both potable water supply and waste water treatment/sanitation services in the near future. Water demand management must reduce water consumption in view of the possible impacts of climate change, population growth and a pattern of increasing consumption.

#### *Catchment 4: Melkbos and Potsdam*

Waste Water: The Potsdam WWTW (Waste Water Treatment Works) has a capacity of 47 Ml/day, and thus, accommodate housing development in the Blaauwberg area. Projected continuing development in the area requires additional wastewater treatment capacity by 2011/12.

The lack of investment has resulted in effluent being below DWAF (Department of Water Affairs and Forestry) standards and a lack of treatment capacity in growth areas. The lack of

capacity has resulted in development applications not being approved e.g. in the northern areas (Catchment 1: Bellville, Kraaifontein, Scottsdene & Fisantekraal) and (Catchment 4: Melkbos and Potsdam).

**Bulk Water:** A significant amount of capital investment in infrastructure is required in the northern growth areas to ensure that these areas have sufficient supply in future and that the risk of imposing restrictions in the short to medium term is reduced. It is critical that sufficient funds be made available for the Northern areas Augmentation Scheme.

**Reticulation Infrastructure:** Major funding is required to replace and extend the reticulation infrastructure, especially in the growth areas (Water Services Delivery Plan 2009/2010: Cape Town).

### ***Refuse***

Quantities of waste being disposed per capita are increasing at an alarming rate, demonstrating a 60% increase since 1999. This may be indicative of excessively high consumption patterns as well as the impact of increased tourism and increased waste loads from outside the City. A significant amount of work is still required in order to implement alternatives to locating new and ever larger landfill sites, including retention of waste at source.

There are a range of threats to the environment, some of which could be addressed more directly by the City and its residents. Growing consumption and resulting waste disposal mean that the City requires more services and sites for disposal. Growing pollution is affecting the quality of air and water in the City with a direct impact on residents' health and well-being.

Global warming appears to be impacting on the region's ecology resulting in the reduction of water resources, agricultural land and increasing storm and flood damage. Bold and far-reaching measures are called for to mitigate the impact of environmental resource scarcity and to position the economy and society on a more sustainable footing.

### ***Storm Water***

Catchment, Storm Water and River Management involves both flood risk management and the protection of receiving waters (rivers, sea, etc.) from pollution conveyed by the storm water drainage system, in a manner that ensures public health and safety as well as the enhancement of both the built and natural environments. Formal risk reduction and mitigation programmes focusing on vulnerable communities are being prioritised, given the adverse socio-economic impacts of flooding. Although the City's recreational waters are generally considered safe for contact recreation, an integrated approach to the management of urban water is required to address deteriorating water quality in certain watercourses.

### ***Electricity***

Electricity service availability and access backlogs stem from the electrification programme for informal settlements and low-cost housing programmes. Bulk infrastructure backlogs relate to the ageing Medium Voltage infrastructure (switchgear), or to new growth in certain areas. The City's Electricity Department services approximately 75% of the City's customers, with areas in the north and the south being serviced by Eskom.

However, Eskom services approximately half of the poor households. This requires cooperation between the Electricity Department and Eskom with regard to the electrification programmes. The City will continue to engage with Eskom, Provincial and National

Government on energy matters to support the City's and the region's economic growth. An energy and climate change strategy, including energy demand management and investment in green energy, will be the key to sustainable growth and to prevent costly interruptions to the economy in Cape Town.

### **2.2.8. Roads and Transportation: Duynfontein**

#### ***Road Network:***

The West Coast Road (R27) and the N7 are primary regional and national distributors. The R27 runs in a north-south direction and links Cape Town with the west coast areas. It is located approximately 2,5km east of the site and provides the main access to the Duynfontein site.

The R27 links with the west coast towns of Langebaan, Vredenberg, Saldanha and Velddrif. The N7 also runs in a north-south direction linking the main towns of the Western Cape and Northern Cape.

#### ***Rail Network:***

There are two railway line branches, running in north-south directions from Cape Town. The line from Cape Town to Namaqualand runs past Kalbaskraal and has two branches to Malmesbury and towards Saldanha. This line is approximately 24km east of the site.

The Atlantis goods line runs approximately 6km east of the site, from Cape Town's CBD, traversing Table View, and ending in Atlantis. It connects with the suburban rail system at Chempet Station.

#### ***Airports:***

The location of existing major and minor airports and landing strips in the vicinity of the site are:

Major airports and landing strips:

- Cape Town International Airport (approximately 35km from the site)
- Ysterplaat (approximately 24km from the site)
- Stellenbosch airfield (approximately 49km from the site)
- Langebaanweg (Military airfields) (approximately 95 km from site)

Minor airports and landing strips:

- Diepkloof airfield (approximately 39km from the site)
- Rosenberg farm airstrip (approximately 30km from the site)
- Saldanha airfield (approximately 80km from the site)
- Kersefontein airfield (approximately 68km from the site)
- Fisantekraal Airfield (approximately 31km from the site)
- Morning Star (approximately 14km from the site)
- Delta 200 (approximately 3km from the site)

There are currently no new airports being planned within an 80 km radius of the site.

#### ***Harbours:***

The existing harbours in the vicinity of the proposed Nuclear-1 are the Port of Cape Town (approximately 26km from the site) and The Port of Saldanha (approximately 86km from the site).

#### ***Modal Split:***

The existing modal split to and from Koeberg Nuclear Power Station are currently 70% private transport and 30% public transport obtained from the “Koeberg Administrative Complex & Training Centre Campus TIA”. The existing vehicle occupancy is 1,42 for private transport and 5,12 for public transport.

The proposed West Coast Integrated Rapid Transit (IRT) system, which will connect the West Coast areas of Blaauwberg and Table View to Cape Town’s CBD, is currently in the planning stage for implementation.

#### ***Existing Bus Service:***

Data obtained from the “City of Cape Town’s 2003/2004 Current Public Transport Record (CPTR)” indicates that the site is located within easy access of the existing bus services. The main public transport mode is bus, serving the existing Koeberg Power Station via the Main Access Rd (Access 1) and the Duynfontein Access (Access 3).

The bus routes are concentrated along the R27. Two sheltered bus stops are located within 50m of Access 1 along the R27 and a transport interchange area is located on-site adjacent to the visitors parking.

The R27 has 51 bus routes with a maximum utilisation of 115% on the route to Hanover Park. Adequate capacity exists on the other routes on the R27 to accommodate additional trips to the site. However, additional services may be required on the Hanover Park route.

The routes operating along the Main Access Road and Ou Skip Road possess adequate capacity to accommodate additional passengers. However, the route from Koeberg Power Station to Pella is currently operating close to capacity and additional trips may need to be provided on this route.

The proposed restructuring of public transport and the introduction of IRT routes should, however, be taken into account before the introduction of new services.

### **Existing Minibus Taxi Service:**

The CPTR shows that the proposed Nuclear-1 site is also located within easy access of the existing minibus taxi routes. The secondary public transport mode is the minibus taxi service serving the existing Koeberg Power Station via the Main Access Rd (Access 1), and the Duynefontein Access.

The R27 has 26 minibus taxi routes, with the Main Access Road and Ou Skip Road with, respectively, 1 and 4 minibus taxi routes. However, the bus mode appears to dominate along the R27.

### **2.2.9. Housing: Duynefontein**

Housing backlogs and associated infrastructure backlogs are due to net migration into the City. New infrastructure is required to accommodate economic, urban and population growth. Tremendous strain is experienced on the current infrastructure, resulting from rapid growth in the urban centre (most acutely felt in services such as water, waste water, electricity, roads and storm water).

Several residential centres are located in the vicinity of Duynefontein. Melkbosstrand and Bloubergstrand are situated to the south and Atlantis is located approximately 15 km north of the site. Duynefontein is located on the outskirts of Cape Town, which is the largest centre in close proximity to the site. Saldanha is primarily an industrial centre and is located approximately 100 km north of Duynefontein.

Due to the existing nuclear power station on the Duynefontein site, the proposed Nuclear-1 exclusion and evacuation zones will be concurrent with Koeberg's existing exclusion and evacuation zones. Duynefontein Residential falls within this 5km PAZ radius of Duynefontein. Melkbosstrand and Bloubergstrand, however, fall within the 16km UPZ.

A total of 32 246 dwellings within 16km of Duynefontein (2001), with the majority of dwelling types (approximately 93%) being of a formal nature.

### **2.2.10. Waste Transport: Duynefontein**

Currently, approximately 48 low to medium radioactive waste consignments are transported from Koeberg Nuclear Power Station to Vaalputs in the Northern Cape Province annually as part of the normal operations of the existing nuclear power station.

***The proposed nuclear power station low to medium radioactive waste will be transported independently from the KNPS's current waste consignments to Vaalputs and will effectively double the current transport impact.***

The proposed nuclear power station Low Level Waste and Intermediate Level Waste will be stored within the radiological zones of the power plant, and will be shipped to a long term storage site such as Vaalputs as prescribed by the Eskom operating procedures. The quantity of waste will depend on the operating procedures in force at the power plant. An estimation could be founded on the quantities generated by Koeberg nuclear power station, scaled by the ratio of power output (for the entire year of 2008, 252 concrete drums, containing mostly Intermediate Level Waste, and 760 steel drums, containing Low Level Waste, will be removed from Koeberg nuclear power station.

### **2.2.11. Emergency Evacuation**

The Nuclear-1: Transport Specialist Study done by GIBB in 2010, **describe that a 0 to 0.8 km Protective Action Zone (PAZ) and a 0.8 to 3 km Urgent Protective Action Zone (UPZ) are required by the EUR to be implemented around a nuclear facility for safety purposes. No new developments are allowed to be located within the PAZ and existing and planned developments situated within UPZ are required to be included in the facility's emergency evacuation plan.**

**Koeberg NPS, however is required to have a 0 to 5 km Protective Action Zone (PAZ) and a 5 to 16 km Urgent Protective Action Zone (UPZ) by the National Nuclear Regulator (NNR) to be implemented around a nuclear facility for safety purposes. No new developments will be allowed to be built within the PAZ and existing and planned developments situated within UPZ are required to be included in the facility's emergency evacuation plan. The evacuation plan has to demonstrate the ability to evacuate of the public within the PAZ within 4 hours and UPZ within 16-hour periods.**

**The KNPS currently has an emergency evacuation plan, which complies with the evacuation time requirements for each zone (PAZ and UPZ), in place.**

**The Nuclear-1 evacuation zones will be concurrent with the Koeberg Power Station zones. Therefore if Nuclear-1 is built on the Duynefontein site the only additional persons who would need to be included in the existing emergency evacuation plan are the PBMR and Nuclear-1 staff and general public within 16 km of the site as a result of Nuclear-1 (visitors, etc.).**

**The Koeberg NPS 2005 Emergency Plan (HHO, 2005) states that "if the capacity of the road system is reduced by 60% of normal capacity the required population evacuation can still be evacuated within acceptable time limits".**

**During operational phases of the PBMR (150 staff) and Nuclear-1 (1 300 staff) facilities, the 3150 staff members would be evacuated, using approximately 1000 vehicles.**

**The transport network road capacity currently available to accommodate the planned evacuation is approximately 3600 vehicles per hour and the traffic generated by the PBMR and Nuclear-1 operational phases is approximately 30% of the current capacity. The operational phases of the PBMR and Nuclear-1 facilities are therefore not expected to affect the evacuation times assessed in the current Nuclear-1 Emergency Plan as it is located within the Nuclear-1, 5 km PAZ and 16 km UPZ evacuation zones.**

In Table 2.28 below, a summary of current evacuation time results for Koeberg Nuclear Power Stations are provided:

**Table 2.28: KNPS current evacuation time assessment results**

Legislative Requirements				Koeberg Nuclear Power Station Current Evacuation Assessment	
Persons	Area	Safety Zone	Time period	Assessment Period	Time (2005 to 2030)
All Public	360 degree radius	PAZ 0km to 5km	Within 4 hours	AM Peak "worst case"	1.8 to 2 hours
All Public	Any 67.5 degrees	UPZ 5km to 16km	Within 16 hours		8.2 to 14.3 hours

Source: *The Nuclear-1: Transport Specialist Study done by Arcus Gibb in 2009*

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## 2.3. Bantamsklip

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### 2.3.1. Demographic Profile: Bantamsklip

Bantamsklip (Overstrand Municipality) is situated in the Overberg District of the Western Cape.

The available population figures for the Overberg District Municipality are illustrated in Table 2.29.

**Table 2.29: Population: Overberg District Municipality (2001)**

Code	Municipality	Population 1996	Population 2001	Growth %	Households 1996	Households 2001
DC3	Overberg District	159 033	203 520	27,97	41 410	56 658
WC031	Theewaterskloof	74 272	93 276	25,6	18 062	23 045
WC032	Overstrand	37 315	55 738	49,4	11 658	18 657
WC03	Cape Agulhas	22 011	26 182	18,9	5 588	7 424
WC034	Swellendam	24 620	28 075	14,0	6 102	7 493

Source - Statistics South Africa: Census 2001

#### 2.3.1.1. Population of the Overstrand Municipality

The 2001 census figures have been utilised as the baseline data for the description of population distribution within 80km radius of the Bantamsklip site. However, additional figures have been obtained from the Demarcation Board of South Africa and Statistics SA, in addition to previous reports on these sites.

The Overstrand features an estimated population of 73 031 people, which accounted for approximately 30,7% of the District's population in 2007. It is expected that the Municipality's population will increase to 82 773 people by 2012, should the population growth rate projected at 3,7% in the period 2006 to 2007, be realised. The Actuarial Society of Southern Africa (ASSA) model estimates a marginal slowing of the population growth rate to 3,1% per annum in the period 2007 to 2012.

These growth rates are, however, more rapid than the District average of 1,8%. Consequently, it is expected that the Overstrand will become the most populous municipality within the Overberg in due course.

Children form a large portion of the Overstrand's population, with approximately 8,9% of the total population being under 4 years old. The youth (15 - 35 years) accounts for 30,1% of the Municipality's total population, a ratio that is not dissimilar to that of the District's youth population proportion of 33%. The aged currently account for 12% of Overstrand's population, reflecting the large number of retirees in the region.

### 2.3.1.2. Population within 80km and 16km radii of Bantamsklip

The population distribution is described relative to 5° and 22,5° radial grids and relative to the Small Area Statistics. The analysis of the population distribution and growth in terms of the 80km radius and 16km radius included the following:

- the population distribution within 5km distance radii around the Bantamsklip site (22,5° radial grid) up to 80km (**Table 2.30 and Figure 2.11**);
- the population per **suburb** within 16km from the Bantamsklip site (**Figure 2.13**);
- the population gender per **suburb** within 16km from the Bantamsklip site (**Table 2.32**);
- the population age per **suburb** within 16km from the Bantamsklip site (**Table 2.33 and Figure 2.14**);
- Total Maximum Cumulative Population within 5km distance radii around the Bantamsklip Site (22,5° Grid) up to 80km (Estimated 2005) (**Figure 2.10**); and
- the projected population in five year intervals until 2031 (**Table 2.31**).

All distances in the drawings, figures and tables are measured in a straight line from the coordinate below, which is located at a proposed central position of the site. ***The exact centre position of the site is not known at this stage.***

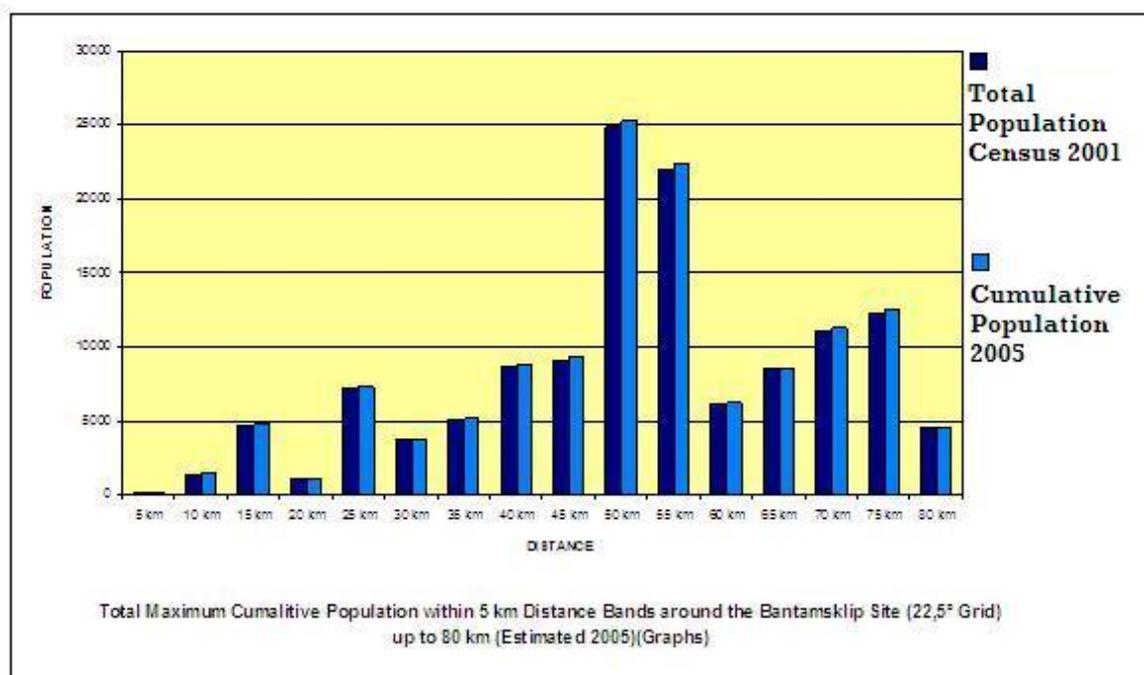
The population distribution data hereby presented was sourced essentially from the 2001 census data provided by Statistics South Africa, the Provincial Government of the Western Cape, the Demarcation Board of SA and Statistics SA.

Data per sub-place and small area was utilised to calculate the various population distributions per sector and suburb. This report provides sufficient spatial accuracy of the 2001 population distribution within 80km of the Bantamsklip site, suitable for the purposes of projections and emergency planning.

**Table 2.30: Population Distribution within 80km radius of Bantamsklip (2001)**

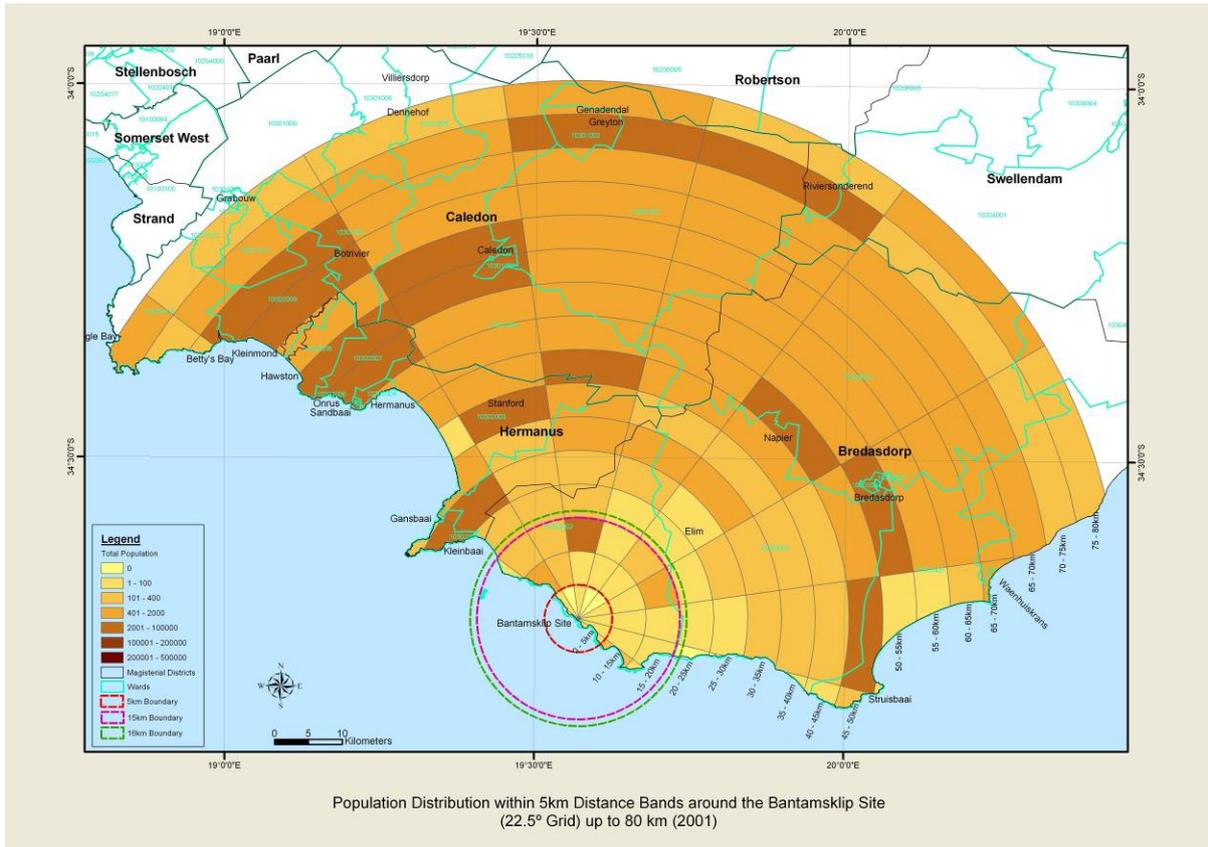
Distance	WNW	NW	NNW		NNE	NE	ENE	E	ESE	SE	SSE	S
0 - 5 km	0	44	0	15	0	0	44	15	44	44	0	0
5 -10 km	0	785	208	62	15	30	30	44	30	193	0	0
10-15 km	3	304	297	2951	59	148	771	59	59	44	0	0
15-20 km	0	150	356	267	44	89	89	59	0	0	0	0
20-25 km	3857	2197	386	252	104	44	311	74	0	0	0	0
25-30 km	0	1268	252	638	489	430	371	237	15	0	0	0
30-35 km	0	44	3459	519	282	222	267	222	11	0	0	0
35-40 km	0	623	1387	4746	445	529	297	267	378	0	0	0
40-45 km	0	934	712	830	712	2701	460	2766	0	0	0	0
45-50 km	0	10257	667	638	771	653	11870	7	0	0	0	0
50-55 km	0	8081	10646	875	801	578	880	59	0	0	0	0
55-60 km	0	502	2503	519	919	982	578	104	0	0	0	0
60-65 km	0	4051	816	578	504	771	489	1258	0	0	0	0
65-70 km	183	6491	756	742	960	1468	489	0	0	0	0	0
70-75 km	260	1898	771	5170	3606	371	208	0	0	0	0	0
75-80 km	1625	205	297	1402	371	564	105	0	0	0	0	0

Source - Statistics South Africa: Census 2001



**Figure 2.10: Maximum Cumulative Population within 5km distance radius of Bantamsklip (2005)**

Source - Statistics South Africa: Census 2001



**Figure 2.11: Population Distribution within 5km distance radii of Bantamsklip (2001)**

Source - Statistics South Africa: Census 2001

### 2.3.1.3. Projected Population

The population distribution was externalised in five-year intervals until 2031 around the Bantamsklip site.

With a growth of 1,8%, the population will increase with just more than 10 000 people, about 16 000 people with a growth of 2,4% in 2006 and with approximately 26 000 with a growth of 3,7% in 2006. A total of approximately 220 000 people are projected for 2031 at 1,8% growth, approximately 265 607 people are projected for 2031 at 2,4% growth and approximately 390 000 people for 2031 at 3,7% growth.

As already mentioned, the largest population concentrations are found in the NNW and NW area around the Hermanus/Kleinmond area. It is projected that this area will show the largest increase in future population growth. The remainder of the area along the coast will increase in population at the same or lower rate if the necessary infrastructure has been developed. This, however, will only be developed according to the spatial need, if and when it occurs. It is estimated that the remainder of the area will demonstrate an average population growth of between 1,8% and 2,4% until 2031.

**Table 2.31: Projected Population in 5 year intervals until 2031: Bantamsklip**

Year	Population Growth @ 1.8% per year	Population Growth @ 2.4% per year	Population Growth @ 3.7% per year
2001	130 389	130 389	130 389
2006	142 554	146 805	156 363
2011	155 854	165 288	187 512
2016	170 395	186 097	224 865
2021	186 293	209 527	269 660
2026	203 674	235 907	323 378
2031	222 677	265 607	387 796

Assuming that population growth will be evenly distributed within each sub-region and local municipality, certain sectors and sub-regions may have a different percentage growth than others, such as those between urban and rural growth. The Hermanus and Kleinmond areas indicated high levels of growth during the past 5 years. In the case of rural areas, the impact of this assumption is regarded as negligible, as the rural areas contain a low percentage of the population distribution.

#### **2.3.1.4. Population Distribution**

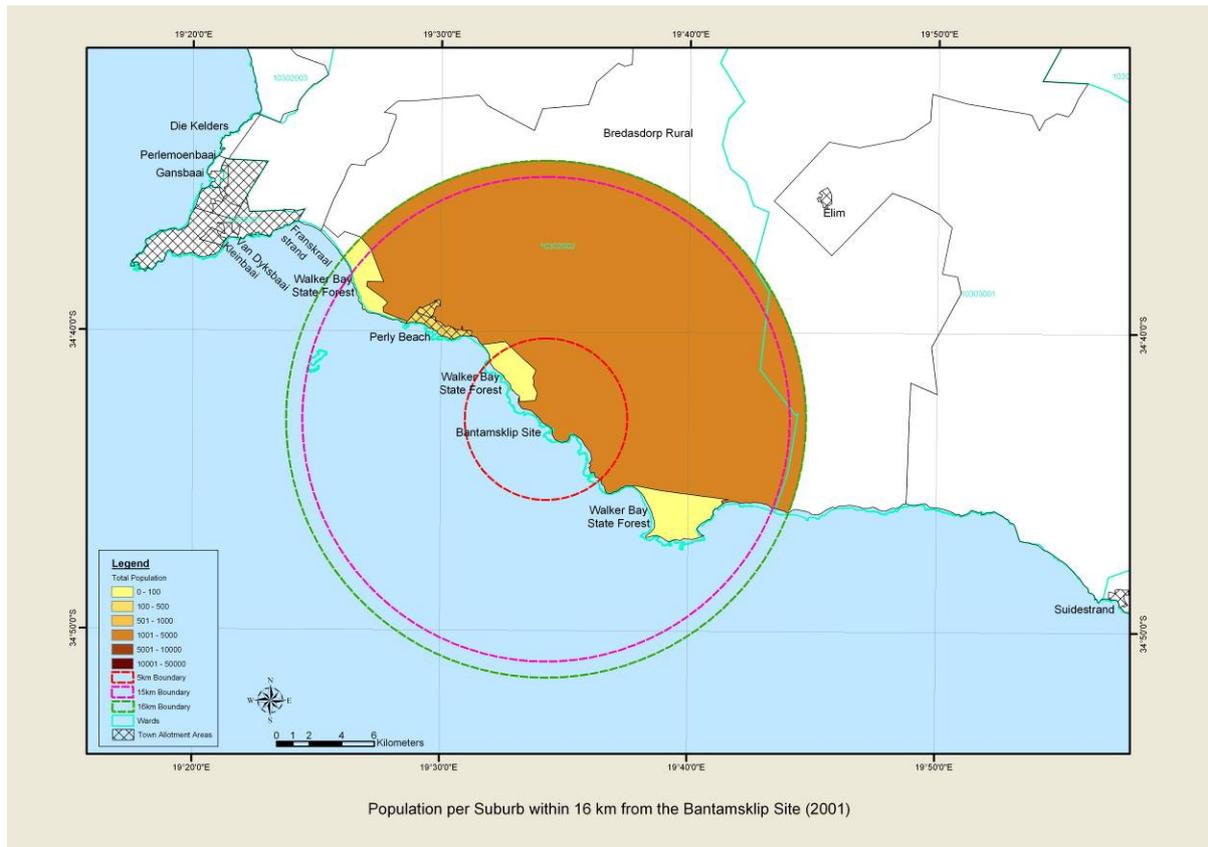
##### ***Population Distribution per Sector:***

The population data was tabled into segments defined by radial sectors (22,5° and 5°), and distance radii (5km and 2,5km) around the Bantamsklip site up to a distance of 80km. This data, arranged in the different radial sectors, was presented in previous tables and graphs.

A population of approximately 130 389 resided within 80km of the Bantamsklip site in 2001. The largest population concentrations are in a NNW, NW (highest) and ENE direction from Bantamsklip, coinciding with the Hermanus/Kleinmond area. Furthermore, the population distribution displays spikes around main towns, i.e. Bredasdorp between 50 to 55km distances ENE, Caledon between 50 to 60km distances NNW, Riviersonderend between 70 to 75km distances NNE, Napier between 45 to 50km distances NE, Botrivier between 60 to 65km distances NW and Greyton/Genadendal between 70 to 80km distances N.

##### ***Population per Suburb:***

Data per suburb, within 16km from the Bantamsklip site, is provided.



**Figure 2.12: Population Density within 16km radius of Bantamsklip (2001)**

Source - Statistics South Africa: Census 2001

A population of approximately 2 525 people resided within 16km of the Bantamsklip site in 2001, with Bredasdorp, Pearly Beach and Eluxolweni containing the highest population densities (Bredasdorp topping the list). **See Table 2.32**

**Table 2.32: Population Gender per Suburb within 16km radius of Bantamsklip (2001)**

Municipality Name	Main Place	Sub Place	Male	Female	Total
Overstrand	Eluxolweni	Eluxolweni SP	163	141	304
Overstrand	Overstrand	Bredasdorp NU	907	830	1 737
Overstrand	Pearly Beach	Pearly Beach SP	245	236	481
Overstrand	Walkers Bay State Forest	Walkers Bay State Forest SP	3	0	3

Source - Statistics South Africa: Census 2001

The population/gender distribution **in Table 2.13 and Figure 2.13** is relatively evenly distributed throughout the 16km radius, displaying a slightly higher count in men at approximately 1 318, against approximately 1 207 females.

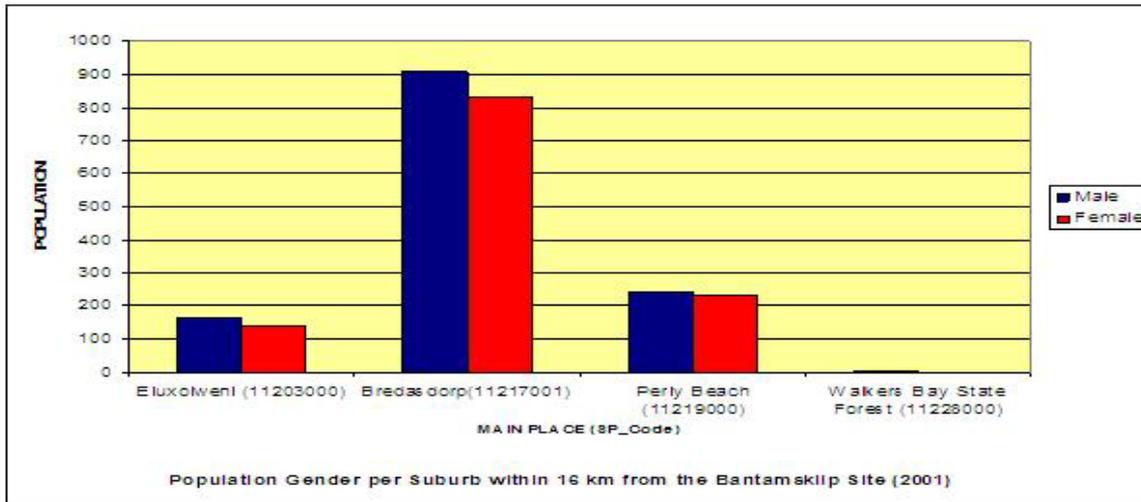


Figure 2.13 Population per Suburb (2001)

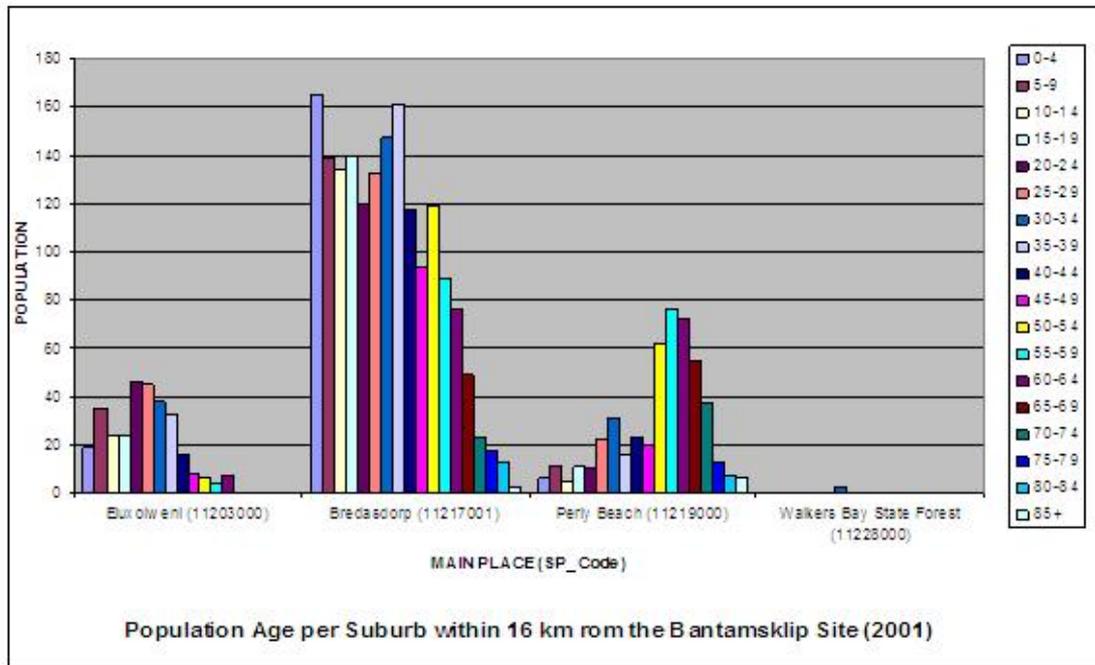
Source - Statistics South Africa: Census 2001

A young population is shown *in Table 2.33* for Eluxolweni and Pearly Beach, the only two towns in the 16km radius. An even distribution of the population is found up to the age of 64, which represent 91% of the population. The highest percentage age distribution (approximately 14%) is between the ages of 30 and 39.

Table 2.33: Population Age per Suburb within 16km radius of Bantamsklip (2001)

Age Group (years)	Walkers Bay State Forest	Pearly Beach	Bredasdorp	Eluxolweni
0-4	0	6	165	19
5-9	0	11	139	35
10-14	0	5	134	24
15-19	0	11	140	24
20-24	0	10	120	46
25-29	0	22	133	45
30-34	3	31	147	38
35-39	0	16	161	33
40-44	0	23	117	16
45-49	0	20	94	8
50-54	0	62	119	6
55-59	0	76	89	4
60-64	0	72	76	7
65-69	0	55	49	0
70-74	0	37	23	0
75-79	0	13	17	0
80-84	0	7	13	0
85+	0	6	3	0

Source - Statistics South Africa: Census 2001



**Figure 2.14: Population Age per Suburb (2001)**

Source - Statistics South Africa: Census 2001

### 2.3.1.5. Tourist Population

Data relating to the tourism population for both domestic and international tourists has mainly been sourced from Tourism Bureaus and Local Authorities in the area.

Figures obtained for the Hermanus/Kleinmond area were approximately 12 000 to 15 000 tourists per year and up to 25 000 tourists per season. The estimate for international tourists could be 3 000 per year and up to 4 500 per season. (This figure could be much higher).

Figures obtained for the Gansbaai area were, respectively, 10 000 tourists out of season and approximately 20 000 tourists in season per year.

Figures obtained for Stanford are 500 tourists out of season, and 2 500 tourists in season per year.

The following assumptions have been made:

- The peak domestic tourist season is the 8 weeks over the December/January school holidays; and
- The combined peak tourist season is the 8 weeks over December and January.

#### **Domestic Tourists:**

Eskom's policy is to maintain and expand the existing nature reserves at the three sites. It should utilise these parks as catalysts to increase tourism and overcome negative public perceptions. This could be accomplished by, for example, establishing visitor information centres with lectures and films, promoting hiking trails, funding eco-tourism and conservation

education and working in unison with the Agulhas National Park and Grootbos Private Nature Reserve in the Bantamsklip area, to further develop nature tourism.

Bantamsklip's relatively new and underdeveloped tourism industry accentuates the potential impacts of a nuclear power station, and may skew the economic figures toward a more positive image than which is actually perceived within the community. However, that does not detract from the large developments that a nuclear power station will bring. Objections are mostly limited to the main tourism agents in the area, viz. the shark-cage diving and whale-watching industries. Their influence in the area is considerable, and the economic importance of their operations is the primary reason for the development thus far experienced in the area.

However, the area of immediate impact on their operations is relatively small, and room is available for mitigation measures regarding access which reduces the localised negative impact to paint a predominantly positive picture for tourism impacts.

Furthermore, in the long term, a nuclear power station may limit the development of the regional tourism destination as an eco-tourism destination, with tourism opportunities being limited in the immediate vicinity of a nuclear power station. (Nuclear-1: EIA, Tourist Assessment Study", by Imani Development (SA) (Pty) Ltd, Sept 2009)

#### ***International Tourists:***

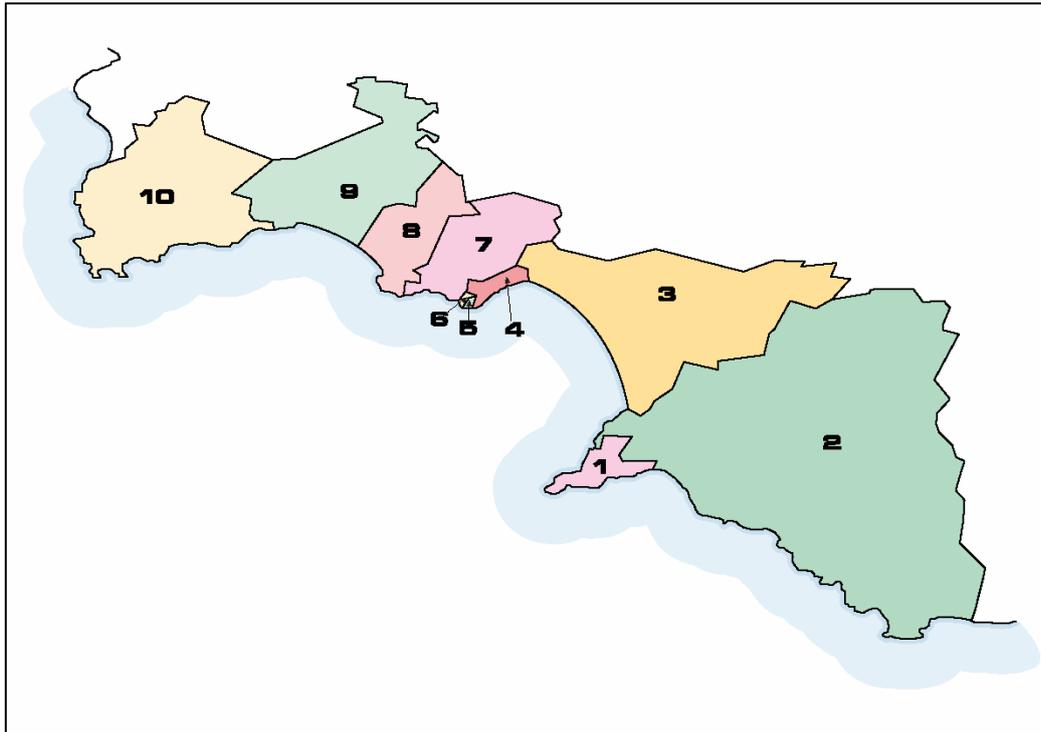
Approximately 500 international tourists per year and up to 500 in season, visit the Stanford area. The estimate at any given time is 1000 per year and up to 1500 international tourists per season. The peak international tourist season ranges from October to February.

### **2.3.2. Social Character of Wards: Bantamsklip**

The demographic characteristics and geographical orientation of those wards situated within 16km to 80 km radius of the Bantamsklip site will now be described.

#### **2.3.2.1. Geographical Orientation of Wards**

Figure 2.15 below provides an indication of the geographical orientation of these wards in relation to the proposed site at Bantamsklip. ***Table 2.34 provides the suburbs located in each ward.***



**Figure 2.15: Wards in the Overstrand Local Municipality**

**Table 2.34: Overstrand Wards**

Ward 1	Kleinbaai, Franskraal, Blompark, Masakhane and a portion of Gansbaai
Ward 2	The remainder of Gansbaai, De Kelders, Pearly Beach, Baardskeerdersbos, Viljoenshof and Withoogte.
Ward 3	Stanford and Voëlklip
Ward 4	Hermanus and Mount Pleasant
Ward 5	A portion of Zwelihle (Community Hall and Church of Christ)
Ward 6	The remainder of Zwelihle (Lukhanyo Primary School and Hou Moed)
Ward 7	Sandbaai, Onrus, Vermont and Ertjiesvlei
Ward 8	Hawston and Fisherhaven
Ward 9	Kleinmond, Proteadorp, Overhills and Honingklip
Ward 10	Palmiet, Betty Bay, Pringle Bay and Rooiels

Source : Overstrand Annual Report 2006/2007

### 2.3.2.2. Age Structure

The median age of the Overstrand population *as indicated in Table 2.35* for 2006 is 30. All age cohorts recorded positive growth between 2001 and 2006, for both males and females. Particularly fast growth occurred in the 85+ years of age-cohort, which grew at an average of 11% per annum, although stemming from a small base. Faster growth was also registered for the 70 - 74 (9,6%), 75 - 79 (8,5%) and 30 - 34 (7,1%) years of age-cohorts. Slower growth occurred for people aged between 55 and 59, and 20 and 24 years of age.

**Table 2.35: Age Structure per Ward in relation to the Bantamsklip Site (2001)**

DESCRIPTION	WARDS									
	1	2	3	4	5	6	7	8	9	10
0-4	608	241	496	454	572	486	380	743	560	88
5-9	514	247	446	497	447	354	337	764	446	75
10-14	441	243	457	531	425	284	343	691	450	66
15-19	543	273	439	580	467	350	352	790	437	73
20-24	767	229	436	457	749	653	301	582	680	82
25-29	793	251	403	418	656	752	393	636	739	107
30-34	556	283	397	449	482	444	467	697	616	119
35-39	440	295	348	473	368	331	454	576	485	121
40-44	356	250	343	510	246	169	373	485	401	130
45-49	305	267	242	371	159	130	381	407	345	126
50-54	339	290	238	329	100	92	434	350	281	182
55-59	346	307	209	314	52	76	474	288	331	280
60-64	311	284	236	365	53	46	597	200	361	300
65-69	245	244	233	342	16	28	455	157	305	231
70-74	144	137	154	336	16	22	397	93	222	147
75-79	79	74	90	237	5	6	253	60	147	57
80 & over	54	73	80	322	8	11	252	49	91	43
<b>Total</b>	<b>6841</b>	<b>3988</b>	<b>5247</b>	<b>6985</b>	<b>4821</b>	<b>4234</b>	<b>6643</b>	<b>7568</b>	<b>6897</b>	<b>2227</b>

Source - Statistics South Africa: Census 2001

### 2.3.2.3. Education

Table 2.36 illustrates an even spread of education grades of the population in the 10 wards of Overstrand. Lower figures are displayed with no schooling groups, complete primary and grade 12. Higher figures of some secondary qualification are evident in wards 1 and 8, which includes the towns of Gansbaai, Hawston and Fisherhaven. The low figures of no schooling at all, might be an indication that more parents send their children to school.

**Table 2.36: Level of Education per Ward in relation to the Bantamsklip Site (2001)**

Description	WARDS									
	1	2	3	4	5	6	7	8	9	10
No schooling	222	156	172	112	171	229	49	255	241	16
Some primary	897	292	562	599	800	656	177	846	766	50
Complete primary	397	183	259	302	254	293	56	464	492	48
Some secondary	1811	1118	1076	1509	1099	1078	1202	1999	1602	496
Std 10/Grade 12	1104	913	713	1459	551	434	2192	736	1292	887
Higher	305	323	628	943	34	70	1556	279	611	428

Source - Statistics South Africa: Census 2001

Table 2.37 below displays lower figures for children attending school in all wards, except Ward 8, with a higher population of Hawston and Fisherhaven. The low figures for post-school education are the result of no grade 12 and/or higher education institutions in the area. Most pupils attending educational institutions are in Ward 8, where Hawston and Fisherhaven are situated, and a large number of pupils attend school in ward 4 where Hermanus is situated. The Overstrand Local Municipality has 27% of the 77 schools in the Overberg District and an educator: learner ratio of 39, which is higher than the District average of 37. The illiteracy rate (i.e. the percentage of people over 14 years of age with

less than Grade 7) is fairly low at 19, 0% in the Overstrand, compared to the corresponding rate of 27% for the Overberg District.

Census 2001 results confirm the above assessment, which shows that only 4,2% of the population in the Overstrand had no schooling, compared to 7,3% for the Overberg District and 5,7% for the Western Cape.

**Table 2.37: Educational Institutions per Ward in relation to the Bantamsklip Site (2001)**

Description	WARDS									
	1	2	3	4	5	6	7	8	9	10
None	1246	422	818	812	893	839	435	1100	1110	107
Pre-School	68	29	35	67	89	86	89	105	61	14
School	929	520	905	1154	1100	708	756	1599	800	157
College	17	6	3	6	0	0	13	10	9	6
Technicon	3	0	0	6	0	0	6	7	3	6
University	0	6	8	13	0	0	19	3	12	0
Adult Education	0	4	6	3	0	3	5	0	0	3
Other	0	4	3	7	4	6	10	0	18	0

Source - Statistics South Africa: Census 2001

#### 2.3.2.4. Household Income

Table 2.38 illustrates that the income between R 4 801 – R 153 000 per annum is evenly spread among the 10 wards. The average income of wards 4, 7, 8 and 9, which represent the majority of the coastal towns, appears to be slightly higher than the remainder. Ward 1, which represents Gansbaai, shows a less than average income and this might be indicative of the rural nature of Gansbaai; consequently, salaries and income are not equal to those in the more affluent towns such as Hermanus, Kleinmond and Onrus.

**Table 2.38: Household Income per Ward in relation to the Bantamsklip Site (2001)**

Description	WARDS									
	1	2	3	4	5	6	7	8	9	10
No income	286	40	99	268	260	366	265	172	363	79
R1 - R4 800	155	40	60	34	43	85	21	57	113	7
R4 801 - R 9 600	351	175	195	240	187	322	110	217	298	58
R9 601 - R 19 200	425	269	357	358	444	410	191	403	336	98
R19 201 - R 38 400	480	353	358	480	270	205	477	474	441	193
R38 401 - R 76 800	367	332	265	450	117	53	768	301	435	249
R76 801 - R153 600	172	208	219	336	11	19	702	137	292	200
R153601-R307200	67	73	89	166	3	8	250	44	113	102
R307201-R614400	12	13	37	43	1	0	61	7	16	32
R614401-R1228800	6	7	9	15	0	1	16	6	10	9
R1228801-R2457600	0	2	6	8	0	1	16	6	5	2
R2 457 601 , more	0	3	8	10	0	0	3	1	2	3
Not Applicable	0	5	4	20	0	0	14	0	10	1
<b>Total</b>	<b>2321</b>	<b>1520</b>	<b>1706</b>	<b>2428</b>	<b>1336</b>	<b>1470</b>	<b>2894</b>	<b>1825</b>	<b>2434</b>	<b>1033</b>

Source - Statistics South Africa: Census 2001

#### Industry

Table 2.39 illustrates above average activity in the agricultural, construction, wholesale and community service sectors in all the wards, in relation to the remainder of industrial activity. Mining, External Territorial Organisations and Representatives from Foreign Governments are almost non-existent in the area. The two main contributors to the economy of the area are agriculture and community services.

**Table 2.39: Industry per Ward in relation to the Bantamsklip Site (2001)**

Description	WARDS									
	1	2	3	4	5	6	7	8	9	10
Agric relate work	356	590	490	144	116	143	368	244	401	18
Mining, Quarrying	0	0	0	6	3	0	9	0	9	3
Manufacturing	296	87	83	173	83	96	145	219	108	39
Electricity, gas, water	4	0	6	4	7	5	7	11	0	7
Construction	308	60	333	243	288	285	167	424	361	70
Wholesale, Retail	325	398	241	517	301	297	526	395	433	139
Transport, Communications	30	24	41	70	21	21	108	48	32	22
Business Services	79	63	111	220	179	59	353	138	122	86
Community Services	246	177	249	404	146	133	586	396	352	128
Private Household	215	38	152	311	293	246	69	322	228	42
Undetermined	281	135	128	256	111	71	107	233	161	79
ExtraTerrit Orgs	0	0	0	0	0	0	0	0	0	0
Rep Foreign Gov	0	0	0	0	0	0	0	0	0	0
<b>Total</b>	<b>2140</b>	<b>1572</b>	<b>1834</b>	<b>2348</b>	<b>1548</b>	<b>1356</b>	<b>2445</b>	<b>2430</b>	<b>2207</b>	<b>633</b>

Source - Statistics South Africa: Census 2001

### 2.3.2.5. Mode of Transport

According to Census (2001), represented in Table 2.40, the most common mode of transport is walking in all the wards. The second most common mode of transport is in a car as a driver or a passenger, followed by minibus and taxi.

**Table 2.40: Mode of Transport per Ward in relation to the Bantamsklip Site (2001)**

Description	WARDS									
	1	2	3	4	5	6	7	8	9	10
Not applicable	3530	1894	2403	3381	2003	1982	3521	3552	3717	1463
On foot	1766	886	1320	1407	2064	1401	498	1696	1631	92
Bicycle	16	22	33	120	61	59	16	23	64	13
Motorcycle	5	17	3	20	5	3	20	7	16	11
Car as a driver	343	495	380	708	36	84	1397	436	454	377
Car passenger	610	328	644	785	291	362	998	788	538	142
Minibus/taxi	41	42	183	321	313	295	23	901	136	16
Bus	496	283	271	209	31	44	146	123	253	86
Train	8	6	0	9	5	3	6	8	12	0
Other	27	14	12	24	11	0	19	33	76	24
<b>Total</b>	<b>6 842</b>	<b>3987</b>	<b>5249</b>	<b>6984</b>	<b>4820</b>	<b>4233</b>	<b>6644</b>	<b>7567</b>	<b>6897</b>	<b>2224</b>

Source - Statistics South Africa: Census 2001

### 2.3.2.6. Occupation

Table 2.41 clearly indicates that the largest portion of the economically active population is found in Ward 7, in the fields of senior officials, service workers, skilled agricultural workers, clerks, etc. Hermanus falls in this ward, explaining the phenomenon.

**Table 2.41: Occupation per Ward in relation to the Bantamsklip Site (2001)**

Description	WARDS									
	1	2	3	4	5	6	7	8	9	10
Senior Officials	66	120	105	207	18	22	2770	64	130	85
Professionals	32	52	67	166	11	19	100	49	84	68
Tech/Assoc Prof	114	80	89	163	72	37	390	182	101	77
Clerks	118	102	113	278	53	29	533	210	136	51
Service workers	147	172	111	351	200	112	890	242	212	125
Skilled agric work	143	317	150	51	52	33	1161	122	102	7
Other	247	155	307	289	179	180	553	457	316	69
Elementary occupation	1059	443	714	561	809	819	161	812	975	89
Occupations NEC	139	97	114	191	83	63	48	135	99	48
Plant Operators	74	35	64	90	72	40	20	157	53	10
<b>Total</b>	<b>2139</b>	<b>1573</b>	<b>1834</b>	<b>2347</b>	<b>1549</b>	<b>1354</b>	<b>6626</b>	<b>2430</b>	<b>2208</b>	<b>629</b>

Source - Statistics South Africa: Census 2001

### 2.3.2.7. Personal Income

Table 2.42 demonstrates that the largest segment of the population of the area has no income. The next income group is the one between R 401 to R 6 400, an indication of unskilled workers. One can assume that it would refer to the agricultural sector. Income higher than R 12 800 is found primarily in the Hermanus wards, but overall in not a large portion of the population. In ward 1, 54% of the people do not have any income.

**Table 2.42: Personal Income per Ward in relation to the Bantamsklip Site (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
No income	3721	1440	2227	3101	3156	2666	2770	4528	3675	802
R1 - R400	516	256	547	369	107	234	100	253	251	56
R401 - R800	826	718	850	906	497	629	390	954	843	190
R801 - R1 600	690	529	630	828	802	547	533	1013	730	224
R1 601 - R3 200	536	432	362	736	234	102	890	455	544	350
R3 201 - R6 400	342	376	316	503	18	36	1161	242	475	317
R6 401 - R12 800	157	157	198	323	0	14	553	90	279	185
R12 801 - R25 600	36	55	79	143	4	4	161	13	61	66
R25 601 - R51 200	8	12	19	38	0	0	48	8	17	21
R51 201 - R102 400	3	6	7	23	0	0	20	5	13	10
R102 401-R204 800	0	5	6	6	0	6	15	6	5	3
R204 801 or more	0	3	6	9	0	0	0	0	5	4
<b>Total</b>	<b>6835</b>	<b>3989</b>	<b>5247</b>	<b>6985</b>	<b>4818</b>	<b>4238</b>	<b>6641</b>	<b>7567</b>	<b>6898</b>	<b>2228</b>

Source - Statistics South Africa: Census 2001

### 2.3.2.8. Population Grouped

On a racial group basis, **Table 2.43 indicates that** 93% and 52% of the population in wards 8 and 2 respectively, regard themselves as coloureds. In wards 7 and 10, whites are represented as 89% and 82% respectively, with Black Africans in ward 5 and 6 at 99% and 96%.

The large portion of the black population of the Overstrand resides in wards 5 and 6, which include the towns of Zwelihle and Mount Pleasant. The largest portion of the coloured population lives in ward 8, which includes the towns of Hawston and Fisherhaven. The largest portion of the white population resides in ward 7, which includes Sandbaai, Onrus, a portion of Hermanus, Vermont and Ertjiesvlei. The largest portion of the Indian and Asian population is present in Ward 7.

**Table 2.43: Grouped Population per Ward in relation to the Bantamsklip Site (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Black African	2459	213	1054	160	4760	4077	193	90	2001	58
Coloured	2619	1153	2609	3616	58	39	524	7023	2582	342
Indian or Asian	0	0	6	6	0	6	11	5	7	4
White	1763	2622	1579	3202	0	117	5915	449	2306	1824
<b>Total</b>	<b>6841</b>	<b>3988</b>	<b>5248</b>	<b>6984</b>	<b>4818</b>	<b>4239</b>	<b>6643</b>	<b>7567</b>	<b>6896</b>	<b>2228</b>

Source - Statistics South Africa: Census 2001

### 2.3.2.9. Work status

The economic portion of the population constitutes 53% of the total population, the remainder being jobless or unemployed. Ward 8 stands out to be hosting the most economically active population, which incorporates Hawston and Fisherhaven, but also includes the most jobless and unemployed portions of the population. A large number of the populace in Hawston and Fisherhaven are employed either in Hermanus or in other towns in the area. **See Table 2.44**

**Table 2.44: Work status per Ward in relation to the Bantamsklip Site (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Paid employee	1946	1075	1429	1585	1391	1267	1618	2102	1935	378
Paid family worker	19	118	95	42	133	15	26	14	12	27
Self-employed	158	339	281	400	18	62	762	247	230	217
Employer	16	26	27	318	4	12	32	67	25	8
Unpaid worker	0	14	3	3	0	0	9	0	7	0
Not applicable	2684	1213	1522	1976	1785	1695	1864	2620	2535	940
<b>Total</b>	<b>4823</b>	<b>2785</b>	<b>3357</b>	<b>4324</b>	<b>3331</b>	<b>3051</b>	<b>4311</b>	<b>5050</b>	<b>4744</b>	<b>1570</b>

Source - Statistics South Africa: Census 2001

### 2.3.2.10. Tenure status

**Table 2.45 reflects** ownership (fully paid or not paid up) is high in Ward 10 (with 74%), followed by Ward 8 (with 69%), Ward 7 (with 68%), Ward 9 (with 63%). The remainder of the wards is below 60%, with the lowest Ward 6 (with 21%).

**Table 2.45: Tenure status per Ward in relation to the Bantamsklip Site (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Owned, Fully Paid	1083	660	890	1002	432	289	1455	813	1347	601
Owned, Not Paid	121	147	105	324	147	17	522	459	206	171
Rented	293	276	446	792	483	580	563	418	455	185
Occupied rent-free	796	434	258	192	253	451	298	131	394	63
Not applicable	30	10	9	123	22	135	59	6	36	18
<b>Total</b>	<b>2322</b>	<b>1527</b>	<b>1708</b>	<b>2433</b>	<b>1337</b>	<b>1472</b>	<b>2897</b>	<b>1827</b>	<b>2438</b>	<b>1038</b>

Source - Statistics South Africa: Census 2001

The largest portion of the population lives in fully paid, owned dwellings, of which Ward 7 is the highest and includes the towns of Sandbaai, Onrus, Vermont and Ertjiesvlei. Rented living is the second highest form of living in the area, of which wards 6 and 7 are the highest and includes the towns of Zwelihle, Sandbaai, Onrus, Vermont and Ertjiesvlei.

### 2.3.2.11. Employment status

The underneath Table 2.46 illustrates the higher trend of employment in the larger towns such as Gansbaai and Hermanus. As mentioned, 53% of the total population is economically active and the highest of this portion is found in Ward 8. A very large portion of the population is not economically active.

High unemployment is found in Wards 6 (37%) and 5 (32%), with the remainder of the wards under 20%. The lowest figure of unemployment is present in Ward 2 (with 2%). Ward 1 has an unemployment figure of 17%.

**Table 2.46: Employment status per Ward in relation to the Bantamsklip Site (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Employed	2139	1572	1835	2347	1548	1355	2446	2431	2209	630
Unemployed	824	51	220	388	1080	1145	156	607	614	77
Not Economic Active	1859	1162	1303	1588	705	550	1708	2014	1921	863
<b>Total</b>	<b>4822</b>	<b>2785</b>	<b>3358</b>	<b>4323</b>	<b>3333</b>	<b>3050</b>	<b>4310</b>	<b>5052</b>	<b>4744</b>	<b>1570</b>

Source - Statistics South Africa: Census 2001

### 2.3.3. Community Facilities in relation to the Bantamsklip Site

The Community Facilities in the vicinity of a 30km radius of the Bantamsklip site, are illustrated in Table 2.47.

**Table 2.47: Community Facilities within 30km radius of Bantamsklip (2004)**

Facility	Stanford	Gansbaai	Baard-skeer derbos	Buffel-jags	Viljoens hof	Total
Health service/clinic	1	2	1	0	0	4
Churches	6	13	1	0	0	20
Primary school	3	3	0	0	0	6
Secondary school	0	0	0	0	0	0

Sports fields	1	6	0	0	0	7
Golf course	0	1	0	0	0	1
Community hall	0	3	1	0	0	4
Police office	1	1	0	0	0	2
Taxi rank	0	0	0	0	0	0
Cemetery	3	5	1	0	0	9
Municipal office	1	1	0	0	0	2
Crèche	0	3	0	0	0	3
Library	1	1	0	0	0	2
Hospital	0	0	0	0	0	0
Community centre	0	0	0	0	0	0
Post office	1	1	0	0	0	2

(Source: Overstrand Spatial Development Framework - Volume 1: Development Perspective, 2004)

The Gansbaai Communal Sport Centre in Gansbaai offers the following facilities:

- 2 combined netball and tennis courts
- 2 combined rugby and soccer field
- 1 hockey field and one in progress
- Tiger turf soccer field
- Clubhouse with two ablution facilities
- Mobile gym
- Cricket pitch with 3 cricket practise nets

Other Facilities:

- Maskhane – 1 soccer field and 1 clubhouse
- Blompark – rugby field and clubhouse
- Pearly beach – soccer field

### **Schools**

A total of 62 schools are situated within a 80km radius of the Bantamsklip site, the total number of pupils of the three schools just outside the 16km radius is 1240 and 20 Schools in the Overstrand Municipal Area (also within the 80km radius). There are no figures available of pupils for the other schools.

**Table 2.48: Schools within Overstrand Municipal Area (2009)**

Kleinmond Laer
Houw Hoek EK Primary
Hermanus Christian Academy
Berghof School
Lukhanyo Primary
Gansbaai Primary
Hermanus Primary
Okkie Smuts Primary
Hermanus High School
Bosko Christian School
Hermanus Montessori School
Mount Pleasant Primary
Hawston Primary
Die Bron Primary
Gansbaai Primary
Hawston Secondary School.
Qhayiya Secondary School
St. Paul's Primary
Uilkraal Primary
Kleinmond Primary

*Source: Provincial Department of Education*

### **Schools in Nearest Town**

No schools are located within the 16km radius. However, 3 schools, as well as one opening soon, are situated in Gansbaai just outside the 16km radius. Growth in the area will put pressure on existing schools, especially in Gansbaai.

**Table 2.49: Schools outside the 16km radius of the Bantamsklip Site (2009)**

<b>Town</b>	<b>Staff</b>	<b>Learners</b>
Gansbaai- Nearest town with schools	Just outside the 16 Km zone	
Masakhane Primary	17	380
Gansbaai High School	20	430
Gansbaai Primary	24	430

*Source: Provincial Department of Education*

A new High School is opening its doors in January 2010 opposite the Masakhane residential area, Gansbaai. This is a welcome development to satisfy the need for higher education in the area.

A total number of 45 schools are found within the 20km to 80km radius around Bantamsklip.

**Table 2.50 Schools between 20km and 80km radius of Bantamsklip (2009)**

<b>Stanford</b>	<b>Owner</b>
Okkie Smuts Primary	Public
Die Bron Primary	Public
St Paul's Primary	Public

<b>Hermanus</b>	<b>Owner</b>
Babbel en Krabbel Pre-Primary	Independent
Bosko Christian School	Independent
Hermanus Montessori School	Independent
Overstrand Learning Academy	Independent
Hermanus Waldorf School	Independent
Northcliff House College	Independent
Hermanus Primary	Public
Hermanus High School	Public
Mount Pleasant Primary	Public
Hermanus Christian Academy	Independent
Lukhanyo Primary	Public
Qhayiya Sec School	Public
<b>Bredasdorp</b>	
Bredasdorp Primary	Public
Ruens College	Independent
Ouplaas Primary	Public
Bredasdorp High School	Public
De Heide Primary	Public
Albert Myburgh Secondary School	Public
Klipdal EK Primary	Public
Wagenhuiskrantz Primary	Public
Protem NGK Primary	Public
Struisbaai Primary	Public
<b>Caledon</b>	
Swartberg Primary	Public
Swartberg Secondary School	Public
Vyeboom Christian school	Independent
Overberg Pre-Primary	Independent
Jongensklip Primary	Public
Overberg Primary	Public
Overberg High School	Public
Teslaarsdal Primary	Public
Bissetsdrift Primary	Public
Sonskyn Pre Primary	Independent
Arieskraal Primary	Public
Diepgat NGK Primary	Public
Boontjieskraal Primary	Public
Glen Elgin Primary	Public
The Glebe Primary	Public

Source: Provincial Department of Education

### **Hospitals:**

The number of Hospital and Clinic facilities within the Overstrand Municipality's Management Area is as follows:

- Hermanus Provincial Hospital and Hermanus Medi-Clinic. Hermanus has a Provincial Hospital which is rated as one of the best in the country, a world-class Medi-Clinic and six primary health-care clinics;
- Clinics in Hermanus, Hawston, Mount Pleasant, Onrus, Zwelihle, Stanford, Gansbaai and Kleinmond; and

- Satellite clinics in Baardskeerdersbos and Eluxolweni.

The following table illustrates the Health Facilities within the Overstrand Municipal Area:

**Table 2.51: Hospitals within the 80km radius of Bantamsklip (2009)**

Hospitals	Service	Beds	Staff
Provincial Hospital Hermanus			
Hermanus Medi-clinic	Hermanus Medi-Clinic offers the following medical facilities: Emergency unit, Intensive care unit High care unit, Day unit, Pharmacy	45	N/A
Caledon Hospital	Facilities for minor surgery, a casualty department and an occupational therapist.	75	6
Otto du Plessis Hospital Bredasdorp			

The only clinic available within the 16km radius is a satellite clinic at Baardskeerdersbos, east of Gansbaai and west of Elim. The location of the possible construction village will determine if a hospital is required in Gansbaai to accommodate additional health needs.

**Correctional Facilities:**

There are a total of 2 750 prisoners in 3 Correctional Facilities located in Caledon, within the 80km radius, with 490 staff members employed by these facilities. About 50% of these staff members are living on the premises, where on-facility accommodation is available. Impact will be affected only for evacuation purposes. Mitigation measures would include proper evacuation procedures and alternative facilities for evacuated prisoners.

Table 2.52 displays the Correctional Facilities in this area:

**Table 2.52 Correctional Facilities within 80km radius of Bantamsklip (2009)**

Town	Population	Staff
Caledon Correctional Centre	500	90
Helderstroom Medium	1 300	250
Helderstroom Maximum	950	150

**Community Hall:**

The Pearly Beach Angling Club has a large hall facility where social gatherings take place.

No sport facilities, other than recreational facilities, are located within the 16km radius.

**Police station:**

The nearest Police Station is in Gansbaai. An influx of people will require satellite stations in Pearly beach.

**Fire station:**

The nearest fire station is in Gansbaai just outside the 16 km zone.

**Golf course:**

Golf (in Kleinbaai - 15 minute drive)

**Churches:**

Pearly Beach has its own Dutch Reformed Church with the nearby town of Gansbaai catering to a wider variety of denominations.

**2.3.4. Migration Patterns in relation to the Bantamsklip Site**

It is important to understand the dynamics of the demography and to assess the temporary fluctuations and permanent population trends resulting from population growth, migration, disease and other social aspects.

Table 2.53 depicts the area’s Migration Patterns.

**Table 2.53: Migration Patterns in relation to Bantamsklip**

Distribution System	Projected Permanent Residential Population	Peak Daily Labour Migration (-) out / (+) in	Peak Long-term Labour Migration (-) out / (+) in	Permanent Population Changes (-) out / (+) in	Estimated Additional Holiday Population
Buffels River	2786	Quantities not available but the impact of daily labour migration on the existing water sources and the capacities of the existing infrastructure is very small and can be ignored.	Annual in-migration of 2400 persons in 2008, declining relatively steady, but slow to 1450 persons per annum in 2024.	(+) 9.0%	Detailed information per distribution system is not available.
Kleinmond	9310			(+) 5.5%	
Greater Hermanus	40980			(+) 4.5%	
Stanford	5038			(+) 5.5%	
Greater Gansbaai	14744			(+) 8.0%	
Pearly Beach	831			(+) 8.0%	
Farms	5292			(+) 0.3%	
Total	78980			(+) 5.1%	

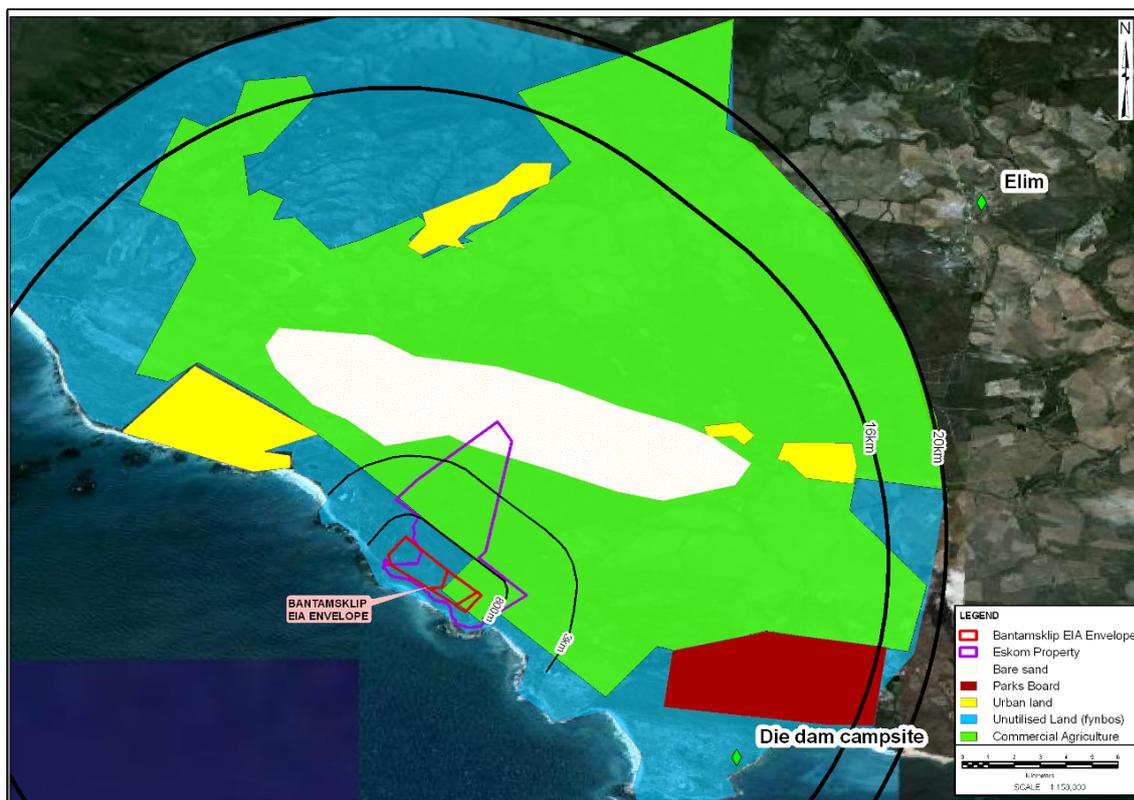
The bulk of in-migration is low-skilled work-seekers from the Eastern Cape. The economy of the Eastern Cape therefore also has a significant impact on the Overstrand economy.

**2.3.5. Land Use Patterns: Bantamsklip**

A large majority of the area surrounding the proposed site *as illustrated in Figure 2.16*, comprises land currently utilised for fynbos harvesting, with some commercial agricultural production taking place on a few farms. The main activity in this area is fynbos harvesting. Only farmers that have planted pastures with irrigation that can supplement the natural

grazing, have livestock on their farms. Therefore, for agricultural production to increase in this area, more irrigation and cultivated pastures would need to be established.

The permanent residential areas in this area are relatively small in population size. Pearly Beach, for example, is a holiday location, occupied seasonally during peak tourist times. (Nuclear-1 EIA: Agricultural Impact Assessment; by Golder and Imani Development (SA) (Pty) Ltd.; 2010)



**Figure 2.16: Land Use Patterns: Bantamsklip (2009)**

### **2.3.6. Overview of the Economy: Bantamsklip**

The Bantamsklip site is located within the Overstrand Local Municipality, which forms part of the Overberg District Municipality in the Western Cape. Provincially, the Western Cape recorded a growth rate of 5,9% in 2006. This was above the country's growth rate of 5,4% for the year. The provincial GDP of R174,303 million was the third largest in the country. The Western Cape has an estimated population of between 5,18 and 5,30 million. The province's main economic activities are finance and business services, manufacturing, and wholesale and retail trade. Tourism is a very important sector, but is split between several of Statistics South Africa's broad industrial classifications.

The Overstrand economy is fairly diversified. The growth rate of the economy is reasonably high at 5,9% for the 2007/08 year. However, there has been a constant gradual decline in the growth rate from the 2004/05 high of 8,1%, but the Overstrand Municipality has consistently exceeded the district's growth rate over this period. The population of approximately 73 000, makes Overstrand the second largest of the municipalities within the Overberg District Municipality (30,7% of the District population). In 2001, the rate of unemployment 21,7%. A significant in-migration of low-skilled work-seekers from the Eastern Cape could be detected. It is likely that the lower unemployment levels in the Western Cape, and the consequent higher possibility of finding a job, is what has caused the immigration of workers.

According to Statistics South Africa (2007), key sectors contributing to the Overstrand GGP are trade and catering, finance and business services, manufacturing, construction, government services and transport sectors. The trade and catering and transport sectors have been the fastest growing, followed by business services and construction. Government services and manufacturing displayed declining growth rates. The sectors employing the largest number of people include trade and catering, community services, agriculture, government and construction. The largest job losses were experienced in the agricultural and manufacturing sectors.

Two dominant features of the local economy warrant attention. First, the municipality has a fairly diversified economy and a great potential for tourism. The natural assets of the area (in terms of eco-tourism) are its single biggest asset, but the natural resource base may also limit growth if resources are not effectively managed. The Overstrand economy and its ecology are inseparable. Secondly, the highly geographically concentrated poverty of the area is a cause for concern. Economic forces (e.g. the decline in fishing and the seasonality of tourism and agriculture) negatively affect the semi-skilled and unskilled workforce, while the growth sectors have mainly benefited skilled workers. In-migration of poor and unskilled people to the area is associated with rising rates of poverty and inequality. Other than the formal safety nets of grants, the poor depend on informal work (construction) or on the third economy of illegal livelihoods (e.g., abalone poaching). A significant proportion of the population (particularly the African) are below the household subsistence level of R1 600 per month. (Nuclear-1 EIA: Economic Impact Assessment Prepared by: Imani Development (SA) (Pty) Ltd, Sept 2009).

### ***Fishing:***

Gansbaai is an important centre of the pelagic fishing industry. A factory (Gansbaai Marine) was established in 1962 and, until 1994 when tourism started growing and the area started attracting retirees, the local economy consisted of little else except the said company. Gansbaai Marine is the only pelagic factory located between Mossel Bay and Hout Bay. The factory produces canned fish for major brands, as well as fishmeal and fish oil, which are supplied to the agricultural sector. There are 12 local boats that use the harbour. The capital cost of a fully equipped boat is between R10 and 12 million. There are some smaller firms as well, and the local industry has a turnover averaging approximately R100 million per annum with 500 jobs and a salary bill of R30 million per annum. The gross mark-up averages 12%. The catch fluctuates according to weather conditions, but the output averages about 20 000 tons of canned fish and 38 000 tons of fishmeal per annum.

The fishing industry is the major employer in Gansbaai, and its salaries and wages are higher than in construction and retail. This industry does not view a nuclear power station as a problem, directing attention to the experience in the Koeberg area where fishing has continued. However, it stresses the importance of good maintenance and management.

The impact of an exclusion zone on communities will be experienced more at Bantamsklip than at Thyspunt or Duynefontein. This is due to the fact that the communities at Kleinbaai and Buffeljagsbaai are heavily dependent on fishing; there is no equivalent dependence at Thyspunt. (Nuclear-1 EIA: Economic Impact Assessment Prepared by: Imani Development (SA) (Pty) Ltd, Sept 2009).

**Industry:**

The only significant retail establishments in the area between Die Kelders and Quoin Point are at Gansbaai where a shopping centre was opened in 2007. The two major retail chains each independently estimated the total turnover in the sector at an annual average of R120 million. This includes Spaza and small shops as well as the building industry (brick makers and building materials suppliers), in addition to panel beaters. The holiday peaks are over a three-week period in December-January and then again at Easter. Average growth in turnover in real terms over the last four years has been between 7 and 10% per annum. The opening of the shopping centre has reduced the leakage of local spending power to Hermanus, which used to attract many shoppers from the Gansbaai area. (Nuclear EIA: Economic Impact Assessment Prepared by: Imani Development (SA) (Pty) Ltd, Sept 2009).

**Tourism:**

Bantamsklip falls under the Overberg Municipality, where the Integrated Development Plan clearly outlines the importance of tourism and more specifically environmental and conservation oriented tourism. Sustainable environmental management and bio-regional planning are identified as specific elements in future tourism development plans for the area.

The Bantamsklip site is surrounded by the Greater Gansbaai tourism region. This includes De Kelders, Gansbaai, Kleinbaai, Franskraal, Pearly Beach, Buffeljagsbaai and Die Dam.

The Greater Gansbaai tourism region stretches from Die Kelders past Pearly Beach to Die Dam. The area is a sea-based attraction centre with a clear focus on eco-tourism. The general tourism product is relatively underdeveloped with respect to basic services and facilities, and is overwhelmingly dominated by the whale-watching and shark-cage diving industries. These marine assets draw the majority of visitors and are largely responsible for driving the local tourism economy and associated industry. Accommodation is provided by the B&B/guesthouses sector and house lets. According to the Tourism Impact Report (2008), the total turnover of accommodation establishments amounts to R62.2 million per annum, while the revenue from shark-cage diving and whale-watching tourism amounts to R56.4 million per annum.

The area from Gansbaai to Cape Agulhas has become a major tourism draw card for the Western Cape in the last few years. Gansbaai is famous for being both the best land-based whale-watching spot and the prime location for cage diving to see the Great White Shark. Most boat operators launch from Kleinbaai on the Danger Point Peninsula and cruise for whales and sharks in the waters off Pearly Beach (including Dyer Island and Geyser Rock).

There is a strong drive for conservationism in the region. The coastal area, roughly from Hermanus to Cape Agulhas, is gradually being converted into a conservation area. SAN Parks is buying out a number of farms and other plots of land in this area, and planning is in motion to incorporate both the public sector (SAN Parks) and several private farms by removing the barriers and allowing the newly reintroduced animals to move freely and create a large nature reserve. This will adjoin, but be far larger than, the land Eskom will conserve. Long-term plans are in the making to build a fence along the perimeter and around towns such as Gansbaai that fall within the reserve. Because there is a move towards flower and wine fields, and much of the output is exported to Europe, a general belief/understanding exists that, by helping the environment/biosphere, the creation of a large reserve will help enterprises to fetch higher prices and set themselves apart from other rivals.

A move towards ecotourism can be discerned, involving the establishment of nature reserves and fynbos estates, amongst which are: the 5-star Klein Paradys Country House near Pearly Beach, the 5-star Grootbos Private Nature Reserve near Gansbaai, and the 4-star Farm 215 Fynbos Reserve between Gansbaai and Elim. The Agulhas National Park is an important future development for tourism.

In order to stimulate tourism development in the area, the Western Cape Government resolved to tar the road between Gansbaai and Bredasdorp, connecting the Whale Coast to Cape Agulhas. The first phase of this project (Bredasdorp to Elim) was completed in 2008 and the second phase (Elim to Gansbaai) is scheduled to be completed sometime between 2008 and 2010.

A strong speculative element is evident in the property markets, based on the potential of the area to become increasingly attractive for holiday homes for people from Cape Town. However, the government's new policy of restricting building development on the coastal edge could limit the growth of the Gansbaai area. Property prices have remained robust and have survived the 2008 national dip better than the Cape Town housing market has. (Nuclear-1 EIA: Economic Impact Assessment Prepared by: Imani Development (SA) (Pty) Ltd, Sept 2009).

#### ***Agriculture:***

There is no agricultural production on the proposed site (EIA envelope). The potential for agricultural production is very limited. This is mainly due to the lack of available irrigation water from surface and ground water sources. Soil samples were taken within the EIA envelope and are being analysed at Cedara. (Nuclear-1 EIA: Agricultural Impact Assessment: Prepared by Golder and Imani Development (SA) (Pty) Ltd, Sept 2009).

#### **2.3.7. Municipal Infrastructure: Bantamsklip**

Investing in infrastructure creates an enabling environment for economic growth and is an important precondition for sustainable growth. Overstrand Municipality has harbours at Hermanus and Gansbaai that are predominantly utilised by small and medium-sized fishing vessels. These harbours are relatively under-developed, but have the potential to boost economic growth in the Overstrand if they are further developed.

Although the Overstrand has a potential for growth at much higher rates, failure to improve the current state of infrastructure poses a serious threat to the local economy. The deterioration of networks in the coastal areas and rapid development, which is not matched by growing capital expenditure, further exacerbates the situation. Adequate rehabilitation and maintenance of the existing infrastructure is critical in order to ensure the medium to long term sustainability of the existing infrastructure. Overstrand Municipality is currently also busy with the development of groundwater sources for the Greater Hermanus area, in order to address the water shortages threat of the area. (*Overstrand WSDP 2009/2010*).

### Water and Sanitation:

The current service levels within Overstrand Municipality Management Area are depicted in Table 2.54 below:

**Table 2.54: Water service levels within Overstrand Municipality (2009)**

Water Service Levels						
Distribution System	1. None or inadequate	2. Communal water supply	3. Controlled volume supply	4. Uncontrolled volume supply: yard tap or house	5. Total served (2+3+4)	6. Total (1+5)
Buffels River	0	0	0	2 058	2 058	2 058
Kleinmond	0	350	0	2 139	2 489	2 489
Greater	0	0	0	14 164	14 164	14 164
Stanford	0	100	0	880	980	980
Greater	0	1 008	0	4 951	5 959	5 959
Pearly Beach	0	100	0	378	478	478
Farms	203	145	0	1 378	1 523	1 726
<b>Total</b>	<b>203</b>	<b>1 703</b>	<b>0</b>	<b>25 948</b>	<b>27 651</b>	<b>27 54</b>

(Source: Overstrand WSDP 2009/2010)

Sanitation Service Levels are illustrated in Table 2.55 below:

**Table 2.55: Sanitation service levels within Overstrand Municipality (2009)**

Sanitation Service Levels							
Distribution System	1. None or inadequate : below RDP : Pit	2. None or inadequate : below RDP : Bucket	3. Consumer installation : On site (Ablution Blocks)	4. Consumer installations: Wet (Septic tanks, digester or tanker	5. Discharge to water treatment works (intermediate or full	6. Total served (3+4+5)	7. Total (1+2+6)
Buffels	0	0	0	2 058	0	2 058	2 058
Kleinmond	0	0	350	1 020	1 119	2 489	2 489
Greater	0	0	0	1 774	12 390	14 164	14 164
Stanford	0	0	100	611	269	980	980
Greater	0	0	1 008	4 027	924	5 959	5 959
Pearly	0	0	100	378	0	478	478
Farms	255	127	90	1 254	0	1 344	1 726
<b>Total</b>	<b>255</b>	<b>127</b>	<b>1 648</b>	<b>11 122</b>	<b>14 702</b>	<b>27 472</b>	<b>27 854</b>

(Source: Overstrand WSDP 2009/2010)

The clinics and hospitals in Overstrand Municipality Management Area have adequate and safe water supply and sanitation services. All the schools in Overstrand Municipality Management Area also feature adequate and safe water supply and sanitation services. (Overstrand WSDP 2009/2010).

The shortage in reservoir storage capacity for the Greater Gansbaai is 7 Ml. New reservoirs are required for De Kelders, Gansbaai, Kleinbaai and Franskraal.

### *Pump Stations and Water Reticulation Network (Potable):*

Low residual pressures are experienced in peak demand periods in various towns such as Pringle Bay, Hangklip, Betty's Bay, Kleinmond, Sandbaai, Hermanus, Gansbaai, Kleinbaai and Pearly Beach.

No revision of the existing distribution operation is proposed. Additional reservoir capacity of 1.6 MI will be required for the anticipated full development to accommodate the anticipated future water demand.

### *Sewer Reticulation Network:*

Table 2.56 below gives a summary of the capacity of the existing WWTWs (kl/day):

**Table 2.56: Sewerage capacity levels within Overstrand Municipality (2009)**

<b>WWTWs</b>	<b>Existing Capacity</b>	<b>ADWF during the peak month (Aug. 07 to Jul. 08)</b>	<b>Future projected flow ADWF (Report on Overstrand Wastewater Treatment, SSI)</b>
Kleinmond	2 000	995 (July 2008)	1 81 0
Hawston	1 000	385 (July 2008)	3 380
Hermanus	7 300	6 766 (August 2007)	11 400
Stanford	500	270 (SSI, Holiday)	1 220
Gansbaai	4 000	729 (December 2007)	6 480

(Source: Overstrand WSDP 2009/2010)

### **Refuse Removal / Waste Disposal:**

Disposal of municipal solid waste in Overstrand is practiced at the regional Karwyderskraal as well as the local Gansbaai Landfills in accordance with all the relevant legislation. A number of closed waste sites are still to be rehabilitated.

The communities of Greater Hermanus and Greater Kleinmond have access to a waste transfer station for convenient drop-off of their non-collected wastes, such as garden wastes, general "Saturday-wastes" and household hazardous wastes.

A waste collection service is provided by the municipality for all residents in urban areas. All formal residential erven are receiving a weekly door-to-door collection service.

Overstrand Municipality currently utilises two licensed landfills for general waste, i.e. the Gansbaai Landfill and the regional Karwyderskraal Landfill. The Gansbaai landfill is located on Part of Portion 210 of Gansbaai and obtained an operating permit in accordance with the Environmental Conservation Act on 30 March 1999 and is classified as a G:M:B - landfill.

### **Electricity:**

The existing 22 kV supply at Bredasdorp, 5 km from the site, will require extension for the initial power supply. This network can only provide 1.5MVA and therefore a 66 kV line, approximately 25 km, also needs to be provided from Gansbaai to the site. A 132 kV supply to site is required from Jan 2012, which requires a new line from Vryheid sub-station to the site. Both the 66 kV and 132 kV lines require EIAs.

### **2.3.8. Roads and Transportation: Bantamsklip**

A transport specialist study, focusing on roads, airports and public transportation was undertaken by GIBB in 2009, (Nuclear-1, EIA, Transportation Specialist Study Assessment Phase, Sept 2009) and updated for the Revised Draft EIR Version 2. A brief overview of the key findings of this study is provided below.

#### ***Roads:***

The N2 runs in an east-west direction approximately 60 km north of Bantamsklip and links to the N7 via Cape Town. The N2 can be accessed from Bantamsklip via several routes along the R43, R326 and the R320. The R43 is a surfaced road, which runs adjacent to the Bantamsklip site and gives direct access to the site. The site can currently be traversed via off-road tracks.

The Overstrand Local Municipality experiences a large influx of holiday makers during the summer holidays. On average a 50% increase in vehicular traffic and a 100% increase in pedestrians are experienced in this period.

The existing road network has sufficient capacity to carry existing traffic and should be able to do so for the foreseeable future. One outstanding exception, however, is the portion of the R43, between Hawston and Hermanus. Delays in excess of 30 minutes are experienced during weekday peak hours, with increasing delays during holiday periods.

The Overstrand Municipality and the Provincial Government of the Western Cape are in discussion over the upgrading of this road section. Delays are also experienced on the N2, in the Grabouw / Sir Lowry's Pass region, but this is generally limited to holiday periods.

#### ***Airports:***

The Overberg District Municipality has a number of airstrips. The largest is located at the Test Flight and Development Centre (TFTC) Air force base between Bredasdorp and Waenhuiskrans in the Cape Agulhus municipal area, which is 65 km from Bantamsklip.

The closest major commercial airport is at Cape Town International Airport, which is 119 km from Bantamsklip.

The TFTC Airfield is planned to be upgraded to provide domestic and international aeronautical transportation capacity for the development of the region's tourism and industrial sectors for the increased economic and social development growth through sustainable development.

#### ***Public Transport:***

Public transport in the Overstrand Local Municipality is exclusively road-based and is more prominent in the major towns and almost non-existent in the smaller towns.

Only 30% of residents use public transport, while the remainder prefers to walk, cycle or use private transport. The following problems have added to the low levels of public transport usage in the region:

- The high costs of public transport
- The high levels of unemployment
- The unavailability of public transport
- Safety / driver behaviour

The main public transport mode within the area is minibus taxi, which serves the beach resort towns of Gansbaai and Pearly Beach.

Buses are for the most part utilised for the transportation of learners and organised parties; they do not fulfill a commuter function as minibus taxis do. Buses are also contracted to transport employees. Tour buses are used for the transportation of exclusive groups. Public transport facilities are currently provided in Hawston and Hermanus. No formal public transport facilities are provided in Gansbaai or Pearly Beach or in close proximity to Bantamsklip. Where required, workers are primarily transported by their employers in light delivery vehicles or trucks.

### **2.3.9. Housing: Bantamsklip**

The demand for low income housing is particularly driven by the lower income groups. Overstrand Municipality 2007 verified waiting housing list recorded 4 051 persons. Overstrand Municipality's Management of Informal Settlement Programme informed them that they currently have 3 039 squatters in ten informal settlements. It is estimated that a total backlog of 4 051 houses exist based on the 2007/08 Municipal Verification Process.

Overstrand Municipality's Housing Plan aims to provide human settlement development, within the broader context of the promotion of social and economic development. The number of houses included in the 5 Year Master Housing Plan for new Housing Development is as follows (*Sept 2008*):

**Table 2.57: Housing in relation to the Bantamsklip Site (2008)**

Category	Priority	Town	2008/2009	2009/20 10	2010/2011
Low Income Projects	1	Hawston	NA	NA	NA
	2	Kleinmond	NA	200	206
	3	Stanford: Ph 1	NA	88	NA
	4	Betty's Bay	13	NA	NA
	5	Betty's Bay	NA	NA	35
	6	Swartdam	50	860	NA
	7	Pearly Beach	NA	NA	100
Middle Income / GAP Housing Projects	1	Hawston	NA	NA	NA
	2	Upper MT	NA	NA	NA
	3	Kleinmond	NA	100	NA
	4	Gansbaai	NA	NA	70
	5	Upper MT	NA	70	NA
	6	Hawston	NA	NA	80
Social Housing Projects	1	Kleinmond	NA	46	NA
	2	Swartdam	NA	300	610
	3	Pearly Beach	NA	NA	10
Open Market, Business / Residential Option	1	Kleinmond		33	

Source: Overstrand Municipal 5 Year Master Housing Plan for new Housing Development, 2008

### 2.3.10. Emergency Evacuation: Bantamsklip

*The Transport Specialist Study (2010) indicates that a 0 to 0.8 km Protective Action Zone (PAZ) and a 0.8 to 3 km Urgent Protective Action Zone (UPZ) are required by the EUR to be implemented around a nuclear facility for safety purposes. No new developments are allowed to be located within the PAZ and existing and planned developments situated within UPZ are required to be included in the facility's emergency evacuation plan.*

*The Nuclear-1's Emergency Plan must be compiled to include non-nuclear and nuclear accidents occurring at the Nuclear-1. During the operational phase, the 1 300 staff would be evacuated using approximately 434 vehicles.*

*A single lane road capacity is approximately 1 500 vehicles per hour. This initial assessment indicates that the road capacity is sufficient to evacuate 434 vehicles an hour.*

*From a contingency plan point of view the upgrading of the DR 1206 gravel road which links the R43 to Bredasdorp should be considered, since the R43 heading west towards Pearly beach is the only current exit route.*

*However, a detailed Emergency Plan (including a Transport Model and an Evacuation Management Plan), should be compiled to enable testing of different scenarios.*

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## 2.4. Thyspunt

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### 2.4.1. Demographic Profile: Thyspunt

#### 2.4.1.1. Population of the Eastern Cape

Provincially, the Eastern Cape recorded a growth rate of 2.4% in 2014. This was marginally below the country's growth rate of 2.8% for the year. The Eastern Cape has an estimated population of between 6,34 and 6,60 million.

#### 2.4.1.2. Population of the Kouga Municipality

The Thyspunt site is situated within the Kouga Local Municipality which falls within the Cacadu District Municipality in the Eastern Cape Province.

#### Cacadu District Municipality

Local Municipality	Seat	Population (2011)	Area (km <sup>2</sup> )	Density (inhabitants/km <sup>2</sup> )
<u>Camdeboo</u>	<u>Graaff-Reinet</u>	50,993	12,422	4.1
<u>Blue Crane Route</u>	<u>Somerset East</u>	36,002	11,068	3.3
<u>Ikwezi</u>	<u>Jansenville</u>	10,537	4,563	2.3
<u>Makana</u>	<u>Grahamstown</u>	80,390	4,376	18.4
<u>Ndlambe</u>	<u>Port Alfred</u>	61,176	1,841	33.2
<u>Sundays River Valley</u>	<u>Kirkwood</u>	54,504	5,994	9.1
<u>Baviaans</u>	<u>Willowmore</u>	17,761	11,668	1.5
<u>Kouga</u>	<u>Jeffreys Bay</u>	98,558	2,670	36.9
<u>Kou-Kamma</u>	<u>Kareedouw</u>	40,663	3,642	11.2
<i>Total</i>		<i>450,584</i>	<i>58,243</i>	<i>7.7</i>

The total population of the Kouga Municipality was documented as 98 558 in 2011, 70 695 in 2001, compared to 62 542 in 1996. The CSIR, DBSA and National Department of Provincial and Local Government estimate the population growth for the Kouga Municipality on 2.4% per annum between 2000 and 2010. Growth and development around coastal towns since 2005 was phenomenal and it is suggested that this figure is much higher than was indicated.

The District Municipality also deals with vast differences in population density from one area to the next, for example Jansenville (2.3km<sup>2</sup>) has a total population of 10,537 compared to Kouga (36.9km<sup>2</sup>), which has a population of 98 558. Kouga has the highest population density in the District.

The variations in density have an impact on the cost of service delivery (appropriate level of services) and puts pressure on existing infrastructure and housing delivery requirements.

The Municipality also deals with vast differences in population density from one area to the next, for example Ward 2 (1,2km<sup>2</sup>) has a total population of 7 871 compared to Ward 1 (579,6km<sup>2</sup>), which has a population of 4 967. Kouga has the highest population density in the District at 24 persons per m<sup>2</sup>.

The variations in density have an impact on the cost of service delivery (appropriate level of services) and puts pressure on existing infrastructure and housing delivery requirements. The migration patterns are placing additional pressure on areas which already have a high-density population, for example Ward 2.

#### 2.4.1.3. Population within 80km and 16km radii of Thyspunt

The 2001 census figures were utilised as the baseline data for the description of population distribution within 80km of the Thyspunt site. However, additional figures have been obtained from the Demarcation Board of South Africa and Statistics SA, as well as previous reports on these sites.

The population distribution is described relative to 5° and 22,5° radial grids and relative to the Small Area Statistics. An analysis of the population distribution and growth in terms of the 80km radius and 16km radius included the following:

- the population distribution within 5 km distance radii around the Thyspunt site (22,5° radial grid) up to 80 km (**Table 2.59**);
- the population distribution within 5km distance radii around the Thyspunt site (22,5° radial grid) up to 80km (**Figure 2.18**);
- the population **density** per **suburb** within 16km from the Thyspunt site (**Figure 2.19**);
- the population gender per **suburb** within 16km from the Thyspunt site (**Table 2.61 and Figure 2.20**);
- the population age per ward within 16km from the Thyspunt site (**Table 2.61 and Figure 2.21**);
- Total Maximum Cumulative Population within 5km distance radii around the Thyspunt Site (22,5° Grid) up to 80km (Estimated 2005) (**Figure 2.17**); and
- the projected population in five year intervals until 2031 (**Table 2.59**).

All distances in the drawings, figures and tables are measured in a straight line from the co-ordinate, which is located at a proposed central position of the site. **The exact centre of the site is not yet known.** There is a predominance of population concentration in the urban areas, with more than 70% of the population living in urban areas **as illustrated in Table 2.59**. This is a variation from the Eastern Cape pattern, where less than 40% of the population resides in urban areas.

**Table 2.59: Population Distribution within 5 km distance radii of Thyspunt (2001)**

Distance	E	ENE	N	NE	NNE	NNW	NW	W	WNW
0 - 5km	32	55	14	18	18	9	9	5	41
5 -10km	37	46	23	147	115	41	46	60	425
10-15km	167	2413	46	225	115	92	46	41	83
15- 0km	0	14	6401	570	6699	101	101	23	69
20-25km	0	0	6313	11323	2748	428	175	0	55
25-30km	0	0	106	7085	0	0	156	0	115
30-35km	0	0	0	120	74	156	0	0	193
35-40km	0	0	64	170	304	152	184	0	175
40-45km	0	0	87	460	10140	83	184	0	313
45-50km	0	0	1201	2744	598	156	179	0	2894
50-55km	0	28	4819	1708	83	115	133	0	1626
55-60km	0	731	230	1041	37	281	78	0	199
60-65km	0	1231	156	773	313	170	110	0	225
65-70km	0	8952	78	777	156	110	51	5	460
70- 75km	0	5358	138	54413	129	225	101	5	2421
75- 80km	0	71438	207	100241	78	198	120	23	317

Source - Statistics South Africa: Census 2001

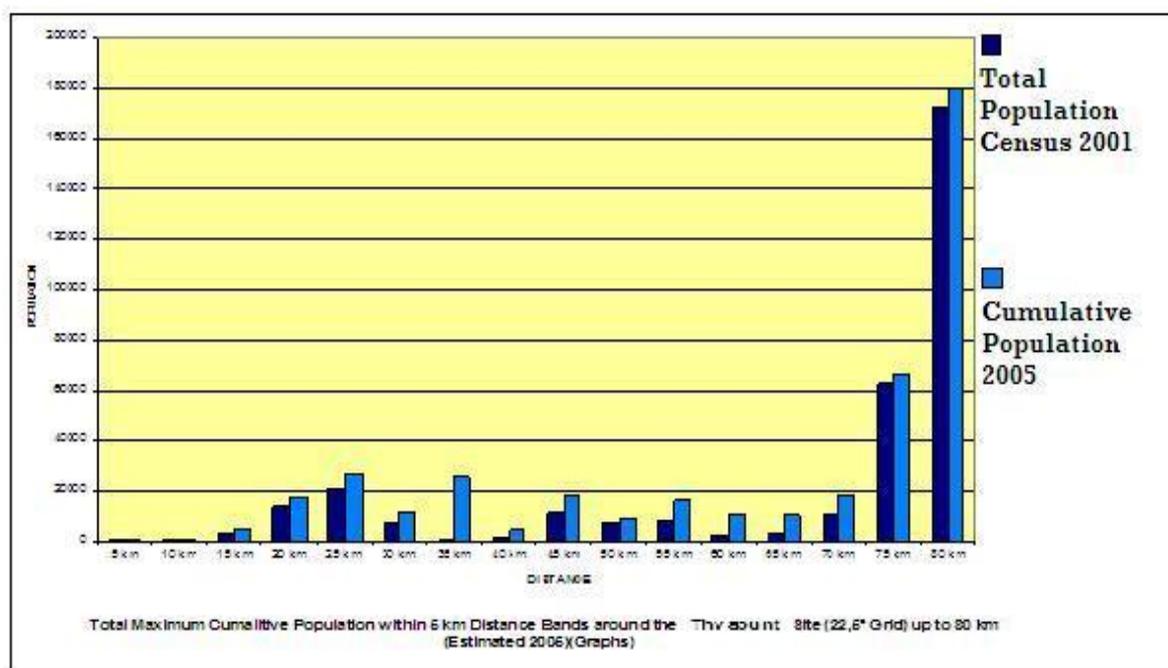


Figure 2.17: Maximum Cumulative Population within 5km distance radii of Thyspunt (2001)

Source - Statistics South Africa: Census 2001

#### 2.4.1.4. Projected Population

At a growth rate of 2,4%, the population will increase by just less than 10 000 people in 2006 and by approximately 15 000 people at a growth rate of 3,7% in 2006. A total of approximately 145 000 people are projected for 2031 at a 2,4% growth rate and approximately 210 000 people for 2031 at a 3,7% growth rate. See Table 2.59.

As mentioned previously, the largest population concentrations are found in the NE and ENE area around the PE/Uitenhage and Humansdorp/ Jeffreys Bay area. It is projected that this area will show the largest increase in future population growth. The population of the rest of the area, adjacent to the sea, will increase in population at the same, or lower, rate if the necessary infrastructure has been developed. It is estimated that the rest of the area will show an average population growth of approximately 2,4% and higher until 2031.

**Table 2.59: Projected Population in 5 year intervals until 2031: Thyspunt**

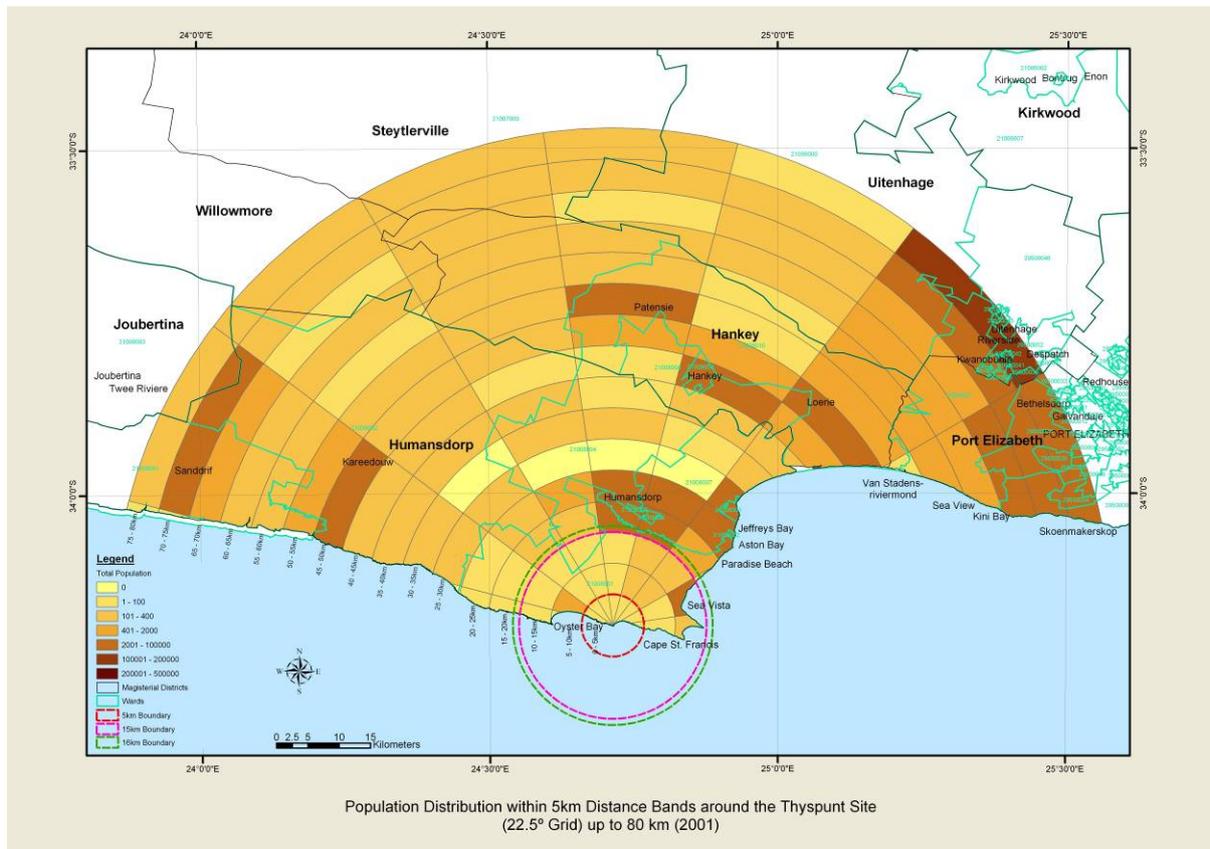
Years	Population Growth @ 1.8% per year	Population Growth @ 2.4% per year	Population Growth @ 3.7% per year
2001	70695	70 695	70 695
2006	77291	79596	84778
2011	84502	89617	101666
2016	92386	100899	121919
2021	101005	113603	146206
2026	110429	127905	175331
2031	120732	144008	210258

In the above table it is assumed that the population growth will be evenly distributed within each sub-region and local municipality. Certain sectors and sub-regions may have different percentage growth than others, such as the difference between urban and rural growth. The Jeffreys Bay area displayed a high level of growth in the past 5 years. In the case of rural areas, the impact of this assumption is regarded as negligible as the rural areas contain a low percentage of the population distribution.

#### **2.4.1.5. Population Distribution**

##### ***Population Distribution per Sector:***

The population data was organised into segments defined by radial sectors (22,5° and 5°) and distance radii (5km and 2,5km) around the Thyspunt site up to a distance of 80km. The population data, arranged in the different radial sectors, is presented in Figure 2.18 and Figure 2.19.



**Figure 2.18: Population Distribution within 5km distance radii of Thyspunt (2001)**

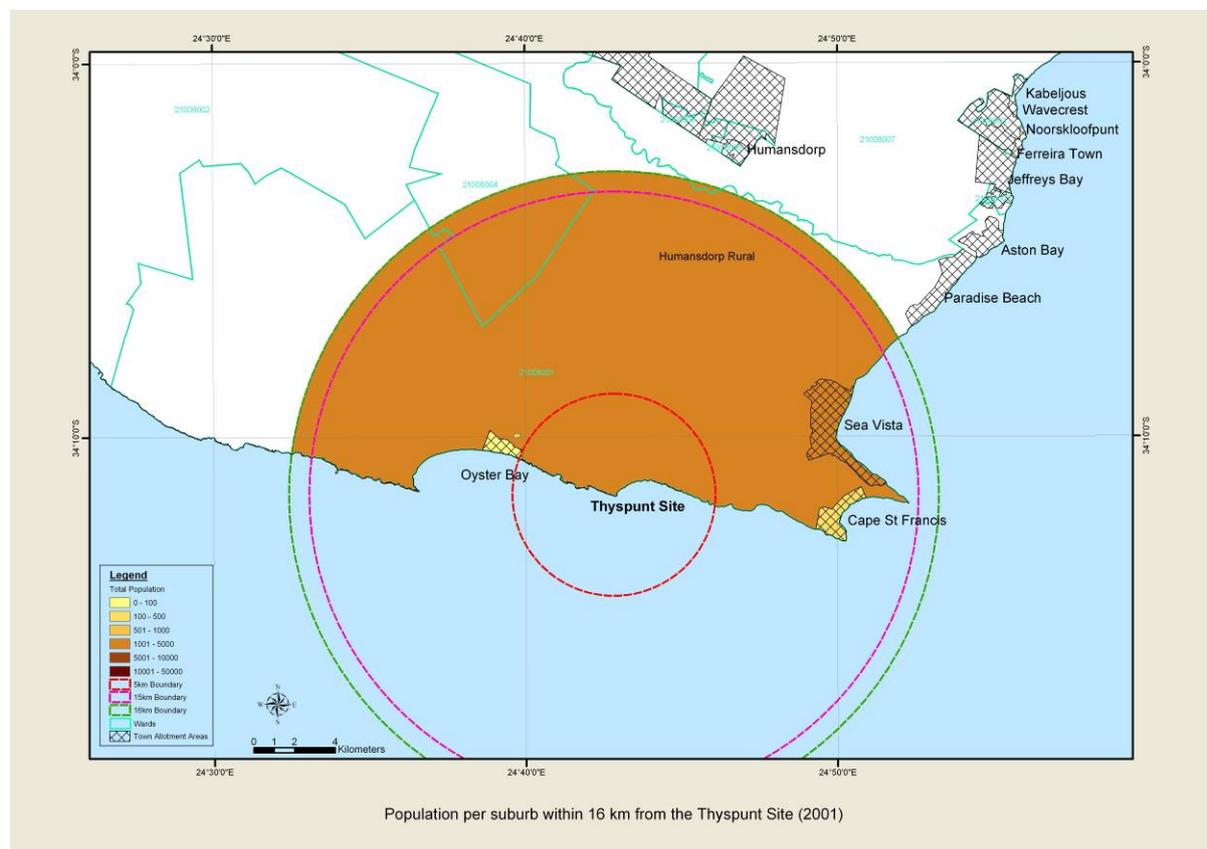
Source - Statistics South Africa: Census 2001

A population of approximately 70 695 resided within 80km of the Thyspunt site in 2001. The largest population concentrations are in an NE (highest) and ENE direction from Thyspunt, coinciding with the Port Elizabeth/Uitenhage and Humansdorp/ Jeffreys Bay areas. Further, the population distribution displays spikes around main towns, i.e. Loerie between 45 to 50km distances NE, Hankey between 40 to 45km distances NNE, Patensie between 50 to 55km distances N, Kareedouw between 45 to 50km distances WNW and Sanddrif between 70 to 75km distances WNW.

**Population per Suburb:**

Data per suburb within 16km from the Thyspunt site is provided for the population, gender and age in figure 2.19 and Figure 2.20.

A population of approximately 6 812 people resided within 16km of the Thyspunt site in 2001, with Oyster Bay, Cape St. Francis and Sea Vista containing the highest population densities, with Cape St. Francis (St. Francis Bay) the highest with 3 000.



**Figure 2.19: Population Density per Suburb within 16km of Thyspunt (2001)**

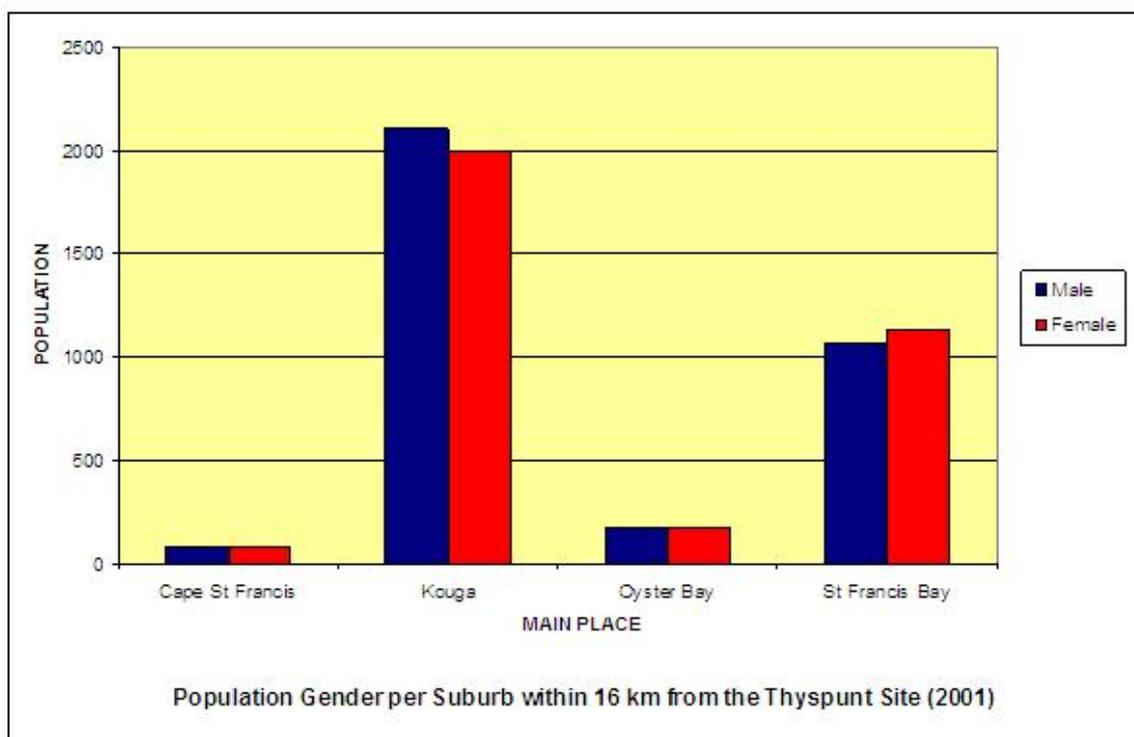
Source - Statistics South Africa: Census 2001

The population gender distribution is relatively evenly distributed throughout the 16km zone with females having a slightly higher count at approximately 1 133, against approximately 1 065 men *in St. Francis Bay*. See Table 2.61 and Figure 2.20

**Table 2.61: Population Gender per Suburb within 16 km from the Thyspunt Site (2001)**

Town	Male	Female	Total
Cape St. Francis	83	85	168
Kouga	2104	2001	4105
Oyster Bay	172	170	342
St. Francis Bay	1065	1133	2198

Source - Statistics South Africa: Census 2001



**Figure 2.20: Population Gender per Suburb within 16km radius of Thyspunt (2001)**

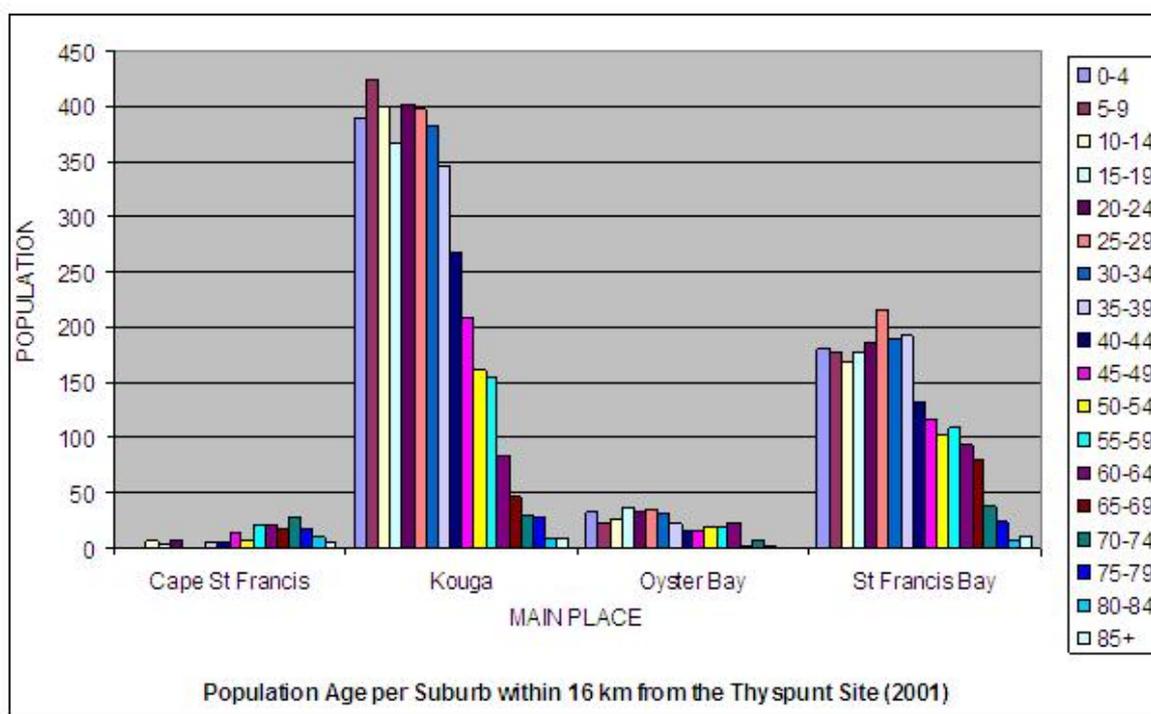
Source - Statistics South Africa: Census 2001

**A young population is shown in Table 2.61 and Figure 2.21 for Oyster Bay, Cape St. Francis and Sea Vista in the 16km radius. An even distribution of the population is detected up to the age of 59 which represents 91% of the population. The highest percentage age distribution, approximately 27%, is between the ages of 20 and 34.**

**Table 2.61: Population Age per Suburb within 16 km radius of Thyspunt (2001)**

Age group	Cape St. Francis	Kouga	Oyster Bay	St. Francis Bay
0-4	0	390	32	180
5-9	0	424	23	177
10-14	6	399	26	169
15-19	4	366	36	178
20-24	6	401	34	186
25-29	0	397	35	216
30-34	0	383	31	189
35-39	5	346	23	193
40-44	5	268	16	131
45-49	14	209	16	116
50-54	6	161	19	103
55-59	21	155	19	109
60-64	21	84	22	94
65-69	17	46	3	80
70-74	28	30	8	37
75-79	18	27	3	24
80-84	10	9	0	7
85+	5	9	0	10

Source - Statistics South Africa: Census 2001



**Figure 2.21: Population Age per Suburb within 16km of Thyspunt (2001)**

Source - Statistics South Africa: Census 2001

#### **2.4.1.6. Tourism Population**

The data relating to the tourism population for both domestic and international tourists has mainly been sourced from South African Tourism, the Human Science Research Council (HSRC), Tourism Bureaus and Local Authorities of the area.

Figures obtained for the 16km zone were approximately 11 200 tourists per year for the Cape St. Francis area and 321 624 for the Jeffreys Bay area (which is highly debatable). The tourist figure for Jeffreys Bay is much the same as the total population within the 80km annulus around the Thyspunt site. No other figures are available on tourism in this area.

These figures must be investigated in more detail for future reference.

***The Tourism Impact Assessment Study (2010,p11) indicated that: “The tourist season at St. Francis is extremely short, being concentrated into a ten-day period in December-January and over the Easter week-end. The normal population of 4,000 rises to 30,000 over Christmas and New Year and perhaps to 8,000 over Easter.”***

The following assumptions have been made:

- The peak domestic tourist season is the 8 weeks over the December/January school holidays;
- The peak international tourist season ranges from October to February; and
- The combined peak tourist season is the 8 weeks over December and January.

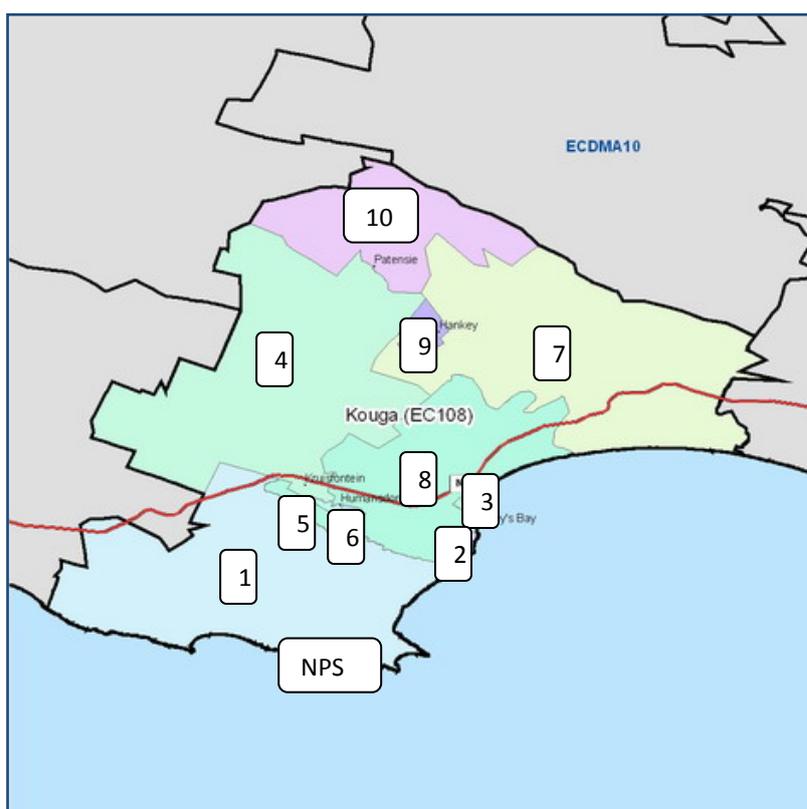
#### **2.4.2. Social Character of Wards: Thyspunt**

The demographic characteristics and geographical orientation of those wards situated within 80km to the Thyspunt site will be now be described.

##### **2.4.2.1. Geographical orientation of Wards**

Figure 2.22 below provides an indication of the geographical orientation of these wards in relation to the area.

**Figure 2.22: Kouga Municipality: Wards**



**Table 2.62: Kouga Municipality Wards description**

	Area Description
Ward 1	St. Francis Bay, Sea Vista, Cape St. Francis, Oyster Bay, Umzamowethu, Paradise, Aston Bay, Farms
Ward 2	Pellsrus, Tokyo Sexwale
Ward 3	Wave Crest, Kabeljous
Ward 4	Kruisfontein, Die Berg, Maak 'n Las, Andrieskraal
Ward 5	Humansdorp CBD & Old town, Arcadia, Part of Kruisfontein
Ward 6	Kwanomzamo, Boskloof to Safety Street
Ward 7	Weston, Rooidraai, Loerie, Thomhill, Sunnyside
Ward 8	C – Place, Ocean View, Gamtoos farms, part of Golf Course in Humansdorp, Panorama
Ward 9	Phillipsville, Centerton, Hankey town
Ward 10	Patensie, Ramaphosa

Source: Draft Kouga Local Municipality IDP, 28 April 2009

#### 2.4.2.2. Age Structure

Table 2.63 below indicates that Kouga has a relatively young population with Ward 4 recording the highest population (including Humansdorp). More than 50% of the population is within the economically active group (19 - 64 years) and 28% of the population is of school going age (5 - 19 years). The Municipality also deals with vast differences in population density from one area to the next, for example Ward 2 (1,2km<sup>2</sup>) has a total population of 7 871 compared to Ward 1 (579,6km<sup>2</sup>), which has a population of 4 967. Kouga has the highest population density in the District at 24 persons per m<sup>2</sup>.

**Table 2.63: Age Structure per Ward: Thyspunt (2001)**

Age Groups	WARD									
	1	2	3	4	5	6	7	8	9	10
0-4	350	774	172	1030	549	569	746	300	707	591
5-9	346	668	188	1103	549	596	940	324	799	711
10-14	343	716	227	1233	688	683	989	360	941	729
15-19	340	703	232	1079	940	697	931	354	967	636
20-24	365	833	170	1027	629	573	803	323	725	581
25-29	395	1033	194	1084	504	567	693	403	649	607
30-34	399	866	244	1008	450	603	679	381	647	472
35-39	373	721	257	919	408	634	706	337	591	445
40-44	293	506	266	699	398	496	554	295	503	412
45-49	274	364	284	609	405	366	460	249	449	290
50-54	266	260	362	391	313	311	389	221	317	268
55-59	354	174	539	278	223	219	300	212	283	194
60-64	291	106	586	252	181	214	266	228	238	171
65-69	234	70	522	137	154	159	170	200	182	113
70-74	169	41	321	115	113	84	125	197	113	73
75-79	102	21	175	67	101	59	64	141	90	58
80 and over	71	15	121	64	180	64	85	127	80	40
<b>Totals</b>	<b>4965</b>	<b>7871</b>	<b>4860</b>	<b>11095</b>	<b>6785</b>	<b>6894</b>	<b>8900</b>	<b>4652</b>	<b>8281</b>	<b>6391</b>

Sources - Statistics South Africa: Census 2001 and Draft Kouga Local Municipality IDP, 28 April 2009

#### 2.4.2.3. Education Grouped

Ward 9, which includes Phillipsville, Centerton and Hankey Town, stands out with the highest form of no schooling. Table 2.64 indicates the highest grade 12 education level as well as higher education. Ward 9 is prominent with the lowest form of education in total.

**Table 2.64: Education Grouped per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
No schooling	169	331	22	745	337	589	729	180	8271	653
Some primary	488	1190	28	1917	729	750	1630	529	0	1267
Complete primary	215	647	14	810	361	350	608	194	3	412
Some secondary	1063	2034	1021	2163	1523	1438	1609	943	4	1001
Std 10/Grade 12	1018	747	2087	810	986	942	602	1168	0	344
Higher	634	60	870	204	123	280	115	301	0	47
<b>Totals</b>	<b>3587</b>	<b>5009</b>	<b>4042</b>	<b>6649</b>	<b>4059</b>	<b>4349</b>	<b>5293</b>	<b>3315</b>	<b>8278</b>	<b>3724</b>

Source - Statistics South Africa: Census 2001

#### Education Institutions:

Table 2.65 illustrates that all wards have a good average of pupils attending school. A large portion of the population is not receiving any form of education. A very small portion of the total population attends higher education institutions.

**Table 2.65: Education Institutions per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
None	628	1 365	227	1 722	960	754	1 617	417	1 119	1 090
Pre - school	61	93	37	132	66	120	97	46	85	59
School	680	1 449	516	2 566	1 747	1 654	1 925	859	2 206	1 494
College	14	6	11	3	14	9	10	0	3	4
Technicon	0	3	7	3	6	0	5	12	9	3
University	6	0	8	7	8	4	4	13	5	0
Adult education	0	0	11	3	3	6	3	0	0	0
Other	4	3	0	6	0	6	5	9	5	12
<b>Totals</b>	<b>1 393</b>	<b>2 919</b>	<b>817</b>	<b>4 442</b>	<b>2 804</b>	<b>2 553</b>	<b>3 666</b>	<b>1 356</b>	<b>3 432</b>	<b>2 662</b>

Source - Statistics South Africa: Census 2001

#### 2.4.2.4. Household income

Table 2.66 postulates that the largest portion of the population receives an income lower than R 76 800 per year. The largest portion of the population receives an income between R 9 601 and R 38 400, the second largest between R 4 801 and R 9 600 and the third has no income. A larger group of the population receives an income of R 153 601 to 307 200. This could be attributed to the high income groups residing at locations such as Cape St. Francis and St. Francis Bay.

**Table 2.66: Household Income per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
No income	131	347	76	164	123	298	375	97	519	123
R1 - R4 800	44	97	23	127	36	134	156	67	105	113
R4 801 - R 9 600	186	473	91	458	204	352	506	220	386	366
R9 601 - R 19 200	358	589	144	782	299	488	639	356	421	549
R19 201 - R 38 400	386	464	284	613	384	307	407	302	291	270
R38 401 - R 76 800	252	188	550	235	262	149	159	293	133	94
R76 801 - R153 600	223	62	492	65	126	120	70	211	81	44
R153601-R307200	108	8	201	35	23	85	29	61	41	20
R307201-R614400	44	2	55	8	6	27	8	10	4	2
R614401-R1228800	16	8	23	2	1	4	6	5	1	0
R1228801-R2457600	14	2	18	0	2	11	4	13	2	1
R2 457 601 , more	10	2	0	1	1	3	0	2	0	1
Not Applicable	1	5	4	3	4	3	0	3	3	1
<b>Totals</b>	<b>1 773</b>	<b>2 247</b>	<b>1 961</b>	<b>2 493</b>	<b>1 471</b>	<b>1 981</b>	<b>2 359</b>	<b>1 640</b>	<b>1 987</b>	<b>1 584</b>

Source - Statistics South Africa: Census 2001

#### 2.4.2.5. Industry

Table 2.67 signals that the agricultural and related sectors are the larger employers. The construction, wholesale and manufacturing sectors falls within the second category of employment.

**Table 2.67: Industry per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Agric/and related	442	225	66	1 465	66	245	1 269	377	297	1371
Mining, Quarrying	0	0	7	0	0	0	3	5	6	0
Manufacturing	67	206	132	152	81	106	183	143	88	69
Elec,gas,water	3	5	5	7	3	3	21	4	13	17
Construction	223	449	86	361	323	149	97	59	106	35
Wholesale,Retail	303	494	238	293	299	304	248	233	186	81
Transport, Communication	34	31	42	37	29	41	26	41	41	14
Business Services	123	129	220	73	94	131	65	111	39	60
Community Services	178	284	334	288	232	355	150	213	254	141
Private Household	253	555	43	255	121	195	154	124	60	148
Undetermined	176	323	112	483	489	286	323	221	216	94
Extra Territ Orgs	0	0	0	0	0	0	0	0	0	0
Rep Foreign Gov	0	0	0	0	0	0	0	0	0	0
<b>Totals</b>	<b>1802</b>	<b>2701</b>	<b>1285</b>	<b>3414</b>	<b>1737</b>	<b>1815</b>	<b>2539</b>	<b>1531</b>	<b>1306</b>	<b>2030</b>

Source - Statistics South Africa: Census 2001

#### 2.4.2.6. Mode of Transport

According to Census 2001, represented in Table 2.68, the most common mode of transport is walking in all the wards except for Ward 3. The second most common mode of transport is in a car as a driver or a passenger, followed by minibus and taxi.

**Table 2.68: Mode of Transport per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Not applicable	2567	3394	3210	4898	3442	3412	4411	2344	4532	2606
On foot	1190	3286	77	4254	1701	2128	2887	1298	2771	2823
Bicycle	28	54	28	50	31	9	22	38	7	24
Motorcycle	21	5	10	9	7	3	14	9	8	14
Car as a driver	432	98	861	274	321	334	217	350	221	145
Car passenger	420	497	425	679	438	428	808	273	412	534
Minibus/taxi	93	237	44	554	472	470	155	153	146	59
Bus	123	210	198	156	194	91	350	143	132	55
Train	0	3	0	11	8	5	7	4	6	6
Other	92	87	7	209	171	16	30	39	46	125
<b>Totals</b>	<b>4966</b>	<b>7871</b>	<b>4860</b>	<b>11094</b>	<b>6785</b>	<b>6896</b>	<b>8901</b>	<b>4651</b>	<b>8281</b>	<b>6391</b>

Source - Statistics South Africa: Census 2001

#### 2.4.2.7. Occupation

Elementary occupation, as indicated in Table 2.69, is the largest form of occupation. The lowest occurrence of an occupation is that of professionals.

**Table 2.69: Occupation per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Senior Officials	137	32	153	45	57	89	78	89	34	41
Professionals	84	30	182	34	43	72	33	40	41	17
Tech/Assoc Prof	81	80	188	100	100	147	40	77	77	45
Clerks	98	151	209	127	168	133	89	133	102	79
Service workers	160	393	194	160	187	218	91	135	115	62
Skilled agric work	191	280	28	270	18	207	194	220	34	111
Other	151	520	111	339	207	160	182	105	150	75
Elementary occupation	711	961	99	1766	496	577	1340	495	494	1368
Occupations NEC	150	150	103	369	394	122	270	194	164	94
Plant Operators	41	105	18	204	66	89	220	45	95	137
<b>Totals</b>	<b>1804</b>	<b>2702</b>	<b>1285</b>	<b>3414</b>	<b>1736</b>	<b>1814</b>	<b>2537</b>	<b>1533</b>	<b>1306</b>	<b>2029</b>

Source - Statistics South Africa: Census 2001

#### 2.4.2.8. Personal Income

Table 2.70 below illustrates that the largest number of people with no income is residing in Ward 4, which includes townships like Kruisfontein, Die Berg, Maak 'n Las and Andrieskraal. In Ward 1, 43% of the people are recorded not having any income.

**Table 2.70: Personal Income per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
No income	2160	4549	1864	6223	3963	4204	5246	1996	5641	3539
R1 - R400	244	445	80	1173	278	393	935	295	490	758
R401 - R800	749	1411	427	2177	1069	926	1867	887	1323	1600
R801 - R1 600	632	1032	324	958	706	630	404	496	358	237
R1 601 - R3 200	441	290	627	340	452	279	229	369	204	114
R3 201 - R6 400	317	82	844	145	240	187	124	376	144	94
R6 401 - R12 800	251	43	466	51	64	182	58	170	103	35
R12 801 - R25 600	93	4	155	15	0	66	19	32	13	11
R25 601 - R51 200	37	0	31	5	7	8	11	10	0	0
R51 201 - R102 400	19	10	23	3	0	6	3	7	0	0
R102401-R204800	15	3	18	0	0	9	4	11	3	5
R204 801 or more	9	3	0	4	6	4	0	3	0	0
<b>Totals</b>	<b>4967</b>	<b>7872</b>	<b>4859</b>	<b>11094</b>	<b>6785</b>	<b>6894</b>	<b>8900</b>	<b>4652</b>	<b>8279</b>	<b>6393</b>

Source - Statistics South Africa: Census 2001

#### 2.4.2.9. Population Grouped

Table 2.71 indicates that the largest black population is found in Ward 6 (81%), which includes Kwanomzamo and Boskloof. The highest occurrence of the coloured population is found in Ward 5 (85%), which includes Humansdorp CBD, Old Town, Arcadia and Kruisfontein. The largest component of the white population can be detected in Ward 3 (96%), which includes Wave Crest and Kabeljous. The largest portion of the Indian and Asian population is evident in Ward 2, which includes Pellsrus and Tokyo Sexwale.

**Table 2.71: Grouped Population per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Black African	1 366	3 787	110	1 694	165	5 568	3 874	1 298	3 515	2 258
Coloured	1 269	4 013	87	9 065	5 741	158	4 305	952	4 380	3 743
Indian or Asian	0	32	0	5	11	6	5	6	15	17
White	2 332	38	4 662	331	868	1 162	716	2 395	372	374
<b>Totals</b>	<b>4 967</b>	<b>7 870</b>	<b>4 859</b>	<b>11 095</b>	<b>6 785</b>	<b>6 894</b>	<b>8 900</b>	<b>4 651</b>	<b>8 282</b>	<b>6 392</b>

Source - Statistics South Africa: Census 2001

#### 2.4.2.10. Work status

Table 2.72 indicates a high level of self-employment and employer status in wards 1, 3, 6 and 8. The largest number of self-employed people resides in Ward 3, followed by Ward 1. Paid employees are the largest portion of the working population, of which the larger number lives in Ward 4.

**Table 2.72: Work Status per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Paid employee	1 445	2 666	914	3 302	1 609	1 580	2 315	1 309	1 182	1 963
Paid family worker	38	8	16	14	5	77	112	10	18	16
Self-employed	277	24	341	75	93	144	89	192	73	31
Employer	40	0	8	16	20	11	17	13	5	19
Unpaid worker	5	3	6	6	10	3	4	9	27	0
Not applicable	1 600	2 873	1 972	3 971	2 746	2 903	3 279	1 526	4 099	2 073
<b>Totals</b>	<b>3 405</b>	<b>5 574</b>	<b>3 257</b>	<b>7 384</b>	<b>4 483</b>	<b>4 718</b>	<b>5 816</b>	<b>3 059</b>	<b>5 404</b>	<b>4102</b>

Source - Statistics South Africa: Census 2001

#### 2.4.2.11. Tenure Status

**Table 2.73 indicates** ownership (fully paid or not paid up) is high in Ward 5 (with 76%), followed by Ward 3 (with 73%), Ward 1 (with 54%), Ward 4 (with 52%). The remainder of the wards are below 50% with the lowest Ward 2 (with 29%).

**Table 2.73: Tenure Status per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Owned, Fully Paid	823	582	1 167	1 189	1 040	744	593	621	755	586
Owned, Not Paid	143	66	281	113	70	120	159	87	104	48
Rented	414	643	378	219	317	511	634	296	542	148
Occupied rent-free	380	931	106	902	32	574	957	603	570	786
Not applicable	17	27	31	73	14	35	20	36	18	17
<b>Totals</b>	<b>1 777</b>	<b>2 249</b>	<b>1 963</b>	<b>2 496</b>	<b>1 473</b>	<b>1 984</b>	<b>2 363</b>	<b>1 643</b>	<b>1 989</b>	<b>1 585</b>

Source - Statistics South Africa: Census 2001

### 2.4.2.12. Employment Status

High unemployment *as illustrated in Table 2.74* is found in wards 2 (28%) and 6 (24%), with the remainder of the wards under 20%. The lowest figure of unemployment is displayed in Ward 3 (with 4%). Ward 1 has an unemployment figure of 10%.

**Table 2.74: Employment Status per Ward: Thyspunt (2001)**

Description	WARD									
	1	2	3	4	5	6	7	8	9	10
Employed	1 805	2 702	1 285	3 413	1 737	1 815	2 538	1 532	1 305	2 030
Unemployed	343	1 567	135	990	851	1 111	814	274	871	318
Not Economically Active	1 257	1 306	1 837	2 981	1 895	1 792	2 465	1 252	3 228	1 755
<b>Total</b>	<b>3 405</b>	<b>5 575</b>	<b>3 257</b>	<b>7 384</b>	<b>4 483</b>	<b>4 718</b>	<b>5 817</b>	<b>3 058</b>	<b>5 404</b>	<b>4 103</b>

Source - Statistics South Africa: Census 2001

The above table indicates that 42% of the population is employed and 58% of the population is either unemployed or not economically active. The employed population is evenly spread amongst all wards. The non-economically active portion of the population is also evenly spread amongst all wards.

### 2.4.3. Community Facilities in relation to the Thyspunt Site

The following section deals with the spread of Community Facilities in a radius of 80km from the Thyspunt site. Table 2.75 illustrates the Community Facilities within the Kouga Municipal Area.

**Table 2.75: Community Facilities: Thyspunt (2009)**

	Humans-dorp	Jeffreys Bay	St. Francis Bay & Oyster Bay	Hankey	Patensie	Loerie
Primary school	5	3	5	4	2	2
Secondary School	3	0	0	1	0	0
Police Station	1	1	0	1	0	0
Clinic / Hospital / Mobile	4	2	1	4	2	1
Cemerty	4	3	0	2	2	2
Community Centre	4	5	2	3	1	1

Source: Kouga IDP Review 2009

**Schools:**

Table 2.76 depict the Schools within the 80km radius from the Thyspunt site.

**Table 2.76: Schools within the Kouga Municipal Area (2009)**

Town	Schools	Number
Humansdorp	Nico Malan High School Lungiso High Humansdorp High Stulting Primary Kruisfontein Primary	5
Patensie	Patensie High Patensie Primary	2
Hankey	Hankey Secondary School Hankey Primary	2
Kareedouw	Paul Sauer High School Paul Sauer Primary	2
Loerie		0
Thornhill	Woodridge Private School	2
Jeffreys Bay	Jeffreys Bay Primary Pellsrus Primary Victory Christian School	3

*Source: Provincial Department of Education*

There is no high school within the 16km radius but Nico Malan- and Lungiso High are the only schools fed by Jeffreys Bay, Oyster Bay, Cape St. Francis and St. Francis Bay.

The Sandwater Primary School as well as the Kokkewiet Crèche is approximately 6km's from Thyspunt, in Umzamowethu near Oyster Bay, with 159 pre-school children and 21 crèche children. Regarding the social impact on education, schools run at full capacity and any growth in the population would require additional schools or upgrading of existing schools. Table 2.77 displays the Schools situated within 20km from the Thyspunt site.

**Table 2.77: Schools within 20km radius of Thyspunt (2009)**

Town	School Name	Pupils	Teachers	Avail Space?
Umzamowethu	Sandwater Primary	159	4	no
	Kokkewiet Crèche	21	2	no
Sea Vista	Sea Vista Disney Crèche	100	4	no
	Sea Vista Primary School	280	6	no
	Thalado Children's Haven Pre- Primary	80	5	no
St. Francis Bay	Village Tots	40	4	no
	Farm Crèche	Info not available	Info not available	Info not available
	St. Francis College	30	4	no
<b>Total</b>		<b>710</b>	<b>29</b>	

*Source: Provincial Department of Education*

There are 287 schools in Port Elizabeth, most of which is just outside of the 80km radius.

### ***Hospitals:***

This section deals with the Health Facilities within an 80km radius from the Thyspunt site.

Hospitals within an 80 km radius from the Thyspunt site include:

#### ***Kareedouw:***

B.J.Vorster Hospital, Kareedouw, is situated in the Eastern Cape, between Humansdorp and Joubertina. The hospital is a 20 - 45 bed hospital, with the facilities of a theatre/x-ray department, maternity unit and casualty. The population served totals 20 442.

#### ***Humansdorp:***

Humansdorp Hospital is a Public Private Partnership Hospital with 33 private beds and 70 general bed facilities. There are about 35 nurses and 15 doctors on the staff. Humansdorp Hospital is about 20 km's from the proposed Thyspunt Nuclear Power Station. It is the only hospital for patients from Oyster Bay, Cape St. Francis, St. Francis Bay, Jeffreys Bay and the rural areas.

The private public partnership hospital in Humansdorp is the only hospital within the Kouga municipal area.

#### ***Clinics:***

The clinic in St. Francis Bay is serviced by 2 clinic sisters, dealing with up to 1 800 patients per month. Any influx of more people will put additional pressure on the already over-burdened health service.

Health services are impacted upon by limited staff being available at the various facilities. The Cacadu clinics have a vacancy rate of 45% (70 out of 128 positions), resulting in the second highest nurse working load in the Province (44,4%). Kouga currently has 14 330 TB patients, 20,3% of the total population. Due to the linkages between TB rates and HIV/AIDS, this should raise concerns for the delivery of primary health care. (*Kouga Draft IDP 2009*)

#### ***Hospitals outside the 80km radius:***

Information on these hospitals is important regarding a disaster in terms of the nearest available beds from the proposed Thyspunt Nuclear Power Station. Table 2.78 provides an illustration of the relevant information:

**Table 2.78: Hospitals in Port Elizabeth just outside 80km radius of Thyspunt (2009)**

Hospitals	Service	Beds
Dora Nginza Hospital	Emergency, OPD services, Surgical Services, Medical etc. Offers Level 2 & Level 3 health care services to the community of Port Elizabeth and surrounding areas.	570
Provincial Hospital	Emergency, OPD services, Surgical Services, Medical etc.	NA
Livingstone Hospital	Emergency, OPD services, Surgical Services, Medical etc.	576
Uitenhage Hospital	Emergency Services, O.P.D. Services, Surgical Services, Medical Services, Paediatrics, Maternity Services, Gynaecology Services,	203
Elizabeth Donkin Hospital	Anti-Retroviral Treatment Services (ARVs), Occupational Services, Pharmacy Services,	130
Netcare Green Acres Hospital	Hospital has 14 operating theatres and a Day/GIT Unit, provides a full range of medical and surgical facilities, boasting specialist areas such as an Intensive Care Unit, Coronary Care Unit, Neonatal Intensive Care Unit, High Care, Neuro High Care Wards and two Catheterisation laboratories.	324
St. Georges Hospital	Anaesthesiology, Dentistry ENT ,surgery, Gastroenterology, General surgery, Gynaecology, Internal medicine, Maxillofacial surgery ,Neurosurgery, Obstetrics, Oncology ,Ophthalmology, Orthopaedic surgery ,Paediatrics, Pathology, Plastic and reconstructive surgery, Radioisotope laboratory, Radiology including mammography and MRI ,Urology including lithotripsy	216

**Universities:**

The Nelson Mandela Metropolitan University (**NMMU**) is just outside the 80 Km zone **in Port Elizabeth**. Established in 2005, the NMMU is the result of the merging of three educational institutions viz.: the University of Port Elizabeth, Vista University and the Port Elizabeth Technicon.

### **Other Facilities:**

Table 2.79 illustrates information regarding other community facilities included within the 16km radius:

**Table 2.79: Community Facilities within 16km radius of Thyspunt (2009)**

Facility	Oyster Bay	Umzamo - wethu	St. Francis Bay	Sea Vista	Cape St. Francis	Total
Crèche	NA	1	2	3	NA	6
Community centre	NA	NA	NA	NA	NA	NA
Police office	NA	NA	1	NA	NA	1
Fire Station	NA	NA	NA	NA	NA	NA
Library	1	NA	1	NA	NA	2
Golf course	NA	NA	2	NA	NA	2
Churches	NA	4	NA	6	NA	10
Community hall	1	NA	1	NA	NA	2
Sports facilities	1	2	2	2	1	8
Municipal office	NA	NA	1	NA	NA	1
Post office	NA	NA	1	NA	NA	1

### **Police Stations:**

The one office in St. Francis Bay is very busy and any new developments in terms of population growth would require more staff and satellite offices in the area. Crime is on the rise as a result of an influx of squatters into the Sea Vista area. Drug and alcohol related incidences are primarily responsible for the rise in crime.

#### **2.4.4. Migration Patterns in relation to Thyspunt**

The migration patterns are placing additional pressure on areas which already have a high density population, for example Ward 2.

#### **2.4.5. Land Use Patterns: Thyspunt**

The Thyspunt site, west of Cape St. Francis, has been acquired by ESKOM for possible future power generation purposes. As a result, the Kouga Coast Sub-Regional Structure Plan was prepared based on the need to maintain the viability of the Thyspunt site for possible future nuclear power generation. Subsequently, with the preparation of the St. Francis Bay Spatial Development Framework and approval of same by the Kouga Council, the Kouga Coast Sub-Regional Structure Plan was replaced by the recommendations of the Greater St. Francis Bay Spatial Development Plan.

With respect to the Thyspunt site, the following land use principles apply:

- To ensure the viability of the Thyspunt site for future possible power generation, development of the surrounding areas must be carefully managed;
- Any proposed changes to current land uses, in terms of standard rezoning procedures within the 16km monitoring and emergency zone, must be brought to the attention of Eskom Nuclear Sites Department at Koeberg Nuclear Power Station, for their consideration and comment;
- Urban expansion of Oyster Bay and Umzamo, which falls within the 0 - 5km radius should not be permitted;
- The provision of a small school (without a hostel) to cater for local children may be supported in Oyster Bay;
- Institutional land uses such as prisons, old age homes and hospitals that may result in the concentration of a resident population should not be developed within 16km radius of the Thyspunt site, because of potential evacuation difficulties;
- No new food processing plants should be allowed to be developed within the 16km radius; and
- Agricultural activities should be monitored within the 16km radius.

With respect to the future development of the Thyspunt site for power generating purposes, all National, Provincial and Local Legislative processes should be followed, with specific reference to relevant permits, environmental approval, implementation, design and development parameters. The management of this site should be subject to all required approvals and international protocol associated with the land use type. Future development of the Thyspunt site should take cognisance of bulk infrastructure and development of supporting land uses, with specific reference to housing, social facilities, etc.

**Humansdorp** functions as the largest commercial and industrial centre in the region and the town fulfils a centrally placed function with a large residential and commercial component. A large portion of the town's residential erven is for high density / low income purposes, with specific reference to Kruisfontein and Kwanomzamo. Lower density, high income residential areas are mostly situated in Humansdorp Central, Boskloof and Panorama. Business is mainly concentrated in the Humansdorp town centre along the main road and main access road between Jeffreys Bay and Humansdorp. In addition, a number of house shops, informal traders and spaza shops are located in the residential areas of Kruisfontein and Kwanomzamo. Humansdorp retains its strong regional function with established business infrastructure and acts as a regional service centre, supplying the surrounding agricultural communities and coastal towns with business commodities and services. The majority of the commercial and industrial activities of the region are centred in Humansdorp.

*Spatial Development Principles (Humansdorp):*

- Promote and encourage administrative, commercial and industrial development;
- Promote integration of previously segregated areas and residential densification. Upgrade informal residential areas;
- Promote utilisation of vacant, derelict, degraded and under-utilised land to accommodate new development; and
- Provision of infrastructure that will meet internal and external need of Humansdorp. The existing built environment is ideally suited for a policy of infill and densification.

Initial investigations indicated that sufficient land is available to accommodate the low income housing need, north of Kruisfontein, south of the N2 and east and south-west of Kwanomzamo.

The residential areas of St. Francis **Bay and Cape St. Francis** are generally characterized by low density, up-market residential developments which include Golf Estates and the Marina Development. Business and industrial components in these areas are limited and dependant on Humansdorp and Jeffreys Bay as regional service centres. The low income residential segment is accommodated in the Sea Vista area with a critical demand for future expansion.

*Spatial Development Principles (Cape St. Francis):*

- The motto of Cape St. Francis is “Keep it green, keep it clean and keep it small”;
- Do not want *large* new developments next to or inside Cape St. Francis. No direct link road between St. Francis Bay and Cape St. Francis;
- Low density is the norm for development and 750 square meter plot sizes are the minimum allowed when subdivisions are requested;
- No industries;
- Existing commercial nodes should not be expanded; and
- All building additions should be of the same finish as the original building and the height restriction is 8,5 m.

As indicated, with respect to low income/high density residential demand, the expansion of Sea Vista is inevitable. The Municipality is currently negotiating with the Department of Environmental Affairs to obtain the land south of the Sea Vista residential area. Housing demand in this area can grow up to 1000 units and this should be accommodated east of the Cape St. Francis access road. Detailed planning should dictate the provision of non-residential uses and integration with higher income areas to the east.

**Oyster Bay** is predominantly a holiday town with a very small permanent population and is characterized by a low density residential fabric. Adjacent to Oyster Bay, Umzamowethu has a higher density character with a demand for subsidised housing.

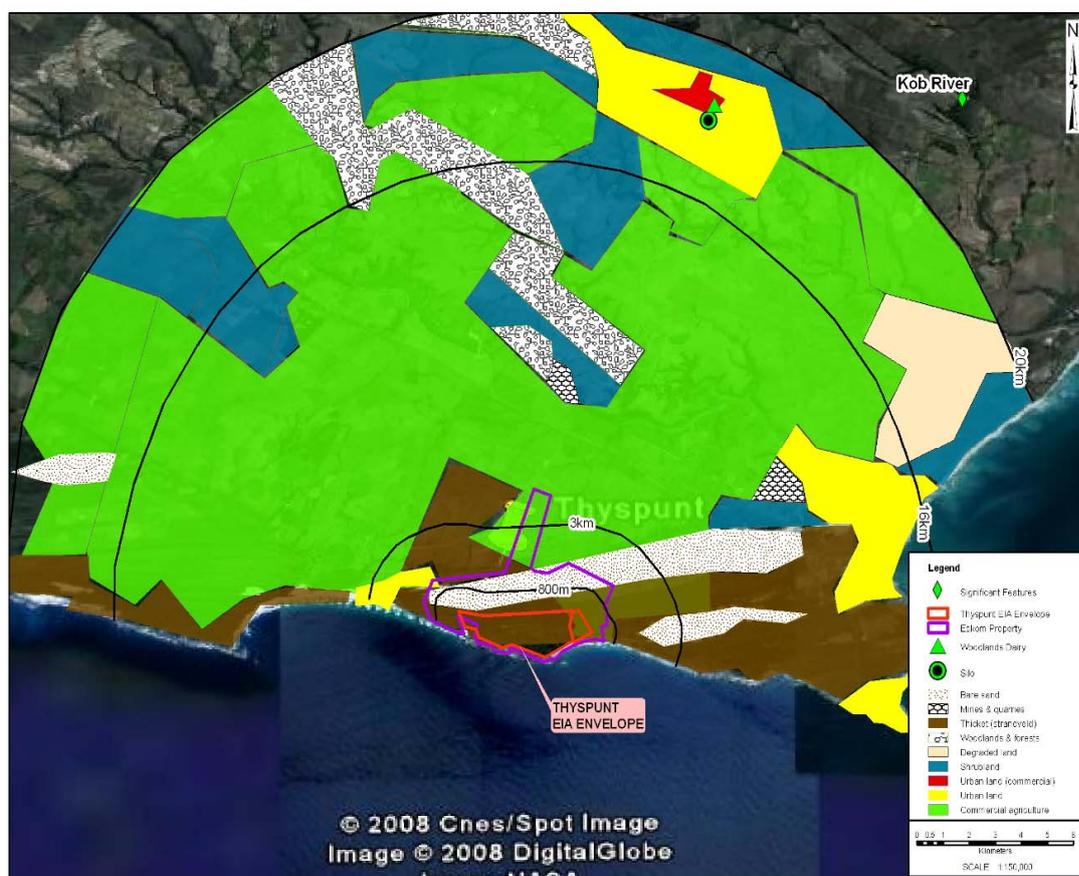
The small settlement of Oyster Bay is situated west of Thyspunt and includes the small residential area of Umzamowethu. The town has limited commercial and non-residential activity and a number of residential erven are still undeveloped.

*Spatial Development Principles (Oyster Bay):*

1. Limited development within the urban edge;
2. Discourage future expansion of the Oyster Bay / Umzamowethu area, subject to ESKOM comment and support; and
3. Densification of existing residential erven can be supported on a limited scale.

(Source: Kouga SDF, Second Draft, 2009)

Figure 2.23 provides an illustration of the land use patterns in a 20km radius from the Thyspunt site.



**Figure 2.23: Land Use Patterns: Thyspunt (2008)**

According to the Nuclear-1: EIA: Agricultural Study undertaken by Golder Associates and Imani Development, August 2010, land use within a 20km radius of the nuclear power station site is dominated by commercial dairy farming, indicated by the map in Figure 2.23. Approximately 65% of the entire body of land within the radius is utilised for commercial agriculture. Strandveld (thicket) is found along the coastline together with a larger portion of bare sand in the form of dunes (the Sand River). The residential areas are Humansdorp, St. Francis, Cape St. Francis and Oyster Bay. Humansdorp is the most populated residential area as the other areas are predominantly holiday homes, occupied only seasonally. A large area of degraded land is detected. The causes of degradation appear to be wind erosion and perhaps overgrazing in the past. The remainder of the area is reasonably well vegetated and no significant degradation was evident. The Red-listed conservation area runs along the southern part, and other portions of the Sand River dune area are in the process of being registered as a conservancy. A borrow pit is located in this area, previously utilised for road construction and ongoing maintenance work. The only sand mine in the area is next to St. Francis which has also been used for local road-building work. The Krom River catchment is within the 20km radius, and supplies most of the local area's fresh water."

Some of the land close to the shoreline is residential, specifically in Oyster Bay which is situated about 5km from the proposed nuclear power station site. There are holiday

residential houses along the Krom River, most of which are unoccupied out of peak holiday season.

Existing agro-industrial developments are the Woodlands Dairy in Humansdorp (which markets its products nationally) and large silos situated near Humansdorp. These silos are utilised for storing wheat; however, due to the changing regional trend from wheat to dairy, they are not fully utilised.

Further afield, within a 30km radius, scattered natural forest outcrops are included in addition to the Kob River close to Jeffreys Bay (which is a tourist attraction in-season for recreational camping and fishing activities).

#### **2.4.6. Overview of the Economy: Thyspunt**

The Nuclear-1, EIA, Economic Impact Assessment, done by Imani Development (SA) (Pty) Ltd, Sept 2009, analyses the economy of the area as follows:

The Thyspunt site is located within the Kouga Local Municipality, which forms part of the Cacadu District Municipality in the Eastern Cape. A 20km radius encompasses parts of wards 1 - 6. According to the 2008 to 2012 Integrated Development Plan (IDP), a population of approximately 28 000 is residing in this area. Not included in this is Jeffreys Bay, which is reputed to be the fastest growing town in South Africa.

Provincially, the Eastern Cape recorded a growth rate of 5,2% in 2006. This was marginally below the country's growth rate of 5,4% for the year. The provincial GDP of R 92 551 million in 2006 was the fourth largest in the country. The Eastern Cape has an estimated population of between 6,34 – 6,60 million. The province's main economic activities are finance and business services, general government services and manufacturing. Tourism is a very important sector, but is split between several of Statistics South Africa's broad industrial classifications. The Kouga economy is fairly diversified.

#### ***Fishing:***

#### ***Information in this section is drawn from the EIA Economic Specialist Study (2010)***

Fishing activities around St. Francis Bay are part of an industry which exploits the area between Port Alfred and Plettenberg Bay, utilising the harbours at Port Elizabeth and Port St. Francis. The fleet consists of 136 vessels of which 36 are based at Port St. Francis and the balance at Port Elizabeth. The capital cost of a fully equipped vessel is between R2,5 - R6,0 million with an average cost of R3 million for boats in Port St. Francis.

The industry does not have sufficient information on the effects of an nuclear power station on marine life, but is concerned about possible impacts on pelagic (hake) and inshore (squid) catches. It does not believe there would be any effect on demersal (deep-sea) fishing. One of its concerns relates to the demarcation of an exclusion zone at Thyspunt of an assumed similar size to that at Koeberg which is 3,2 m wide and extends 2km into the ocean from the shore. ***However, the exclusion zone at Thyspunt will not exceed the length of the site and will not extend more than 1 km out to sea.***

The closure of such an area off Thyspunt would have ***no more than*** a slight impact on pelagic fishing. Long line catches of hake have averaged 2 500 tons per annum in the Eastern Cape and 800 tons per annum for Port St. Francis-based vessels. During field interviews with the local fishing industry, it was found that two of the richest fishing grounds

are in Thysbaai and Oyster Bay, and catching occurs between 500 metres and 4 - 5km offshore.

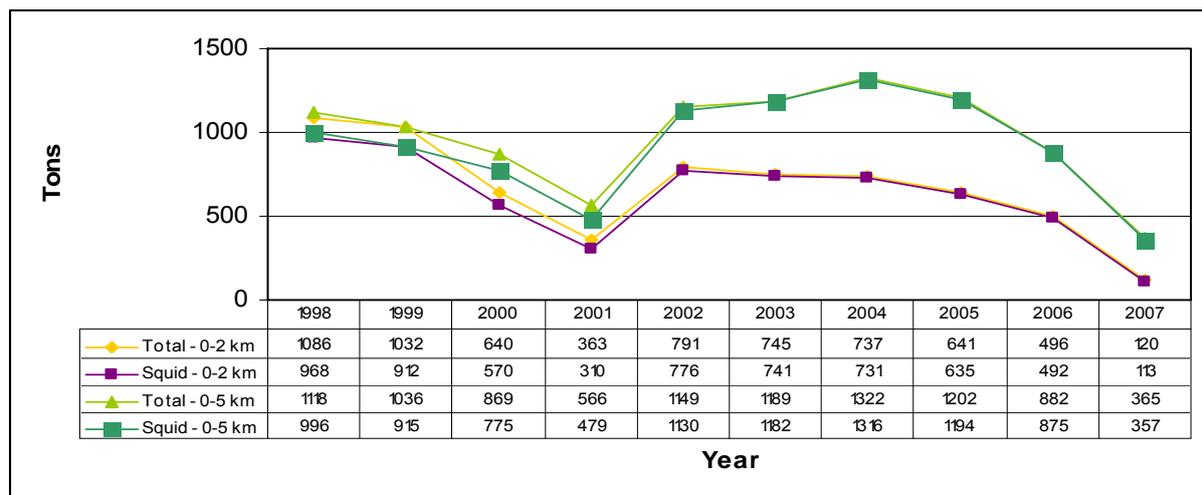
However, the impact would be more significant on the “chokka” squid industry. **But even then it would be slight.** The concentration of squid shifts according to month and weather conditions, and the “chokka” squid catch fluctuates from year to year depending on sea temperature and wind conditions.

Over the last 20 years the annual catch has ranged between 2 000 – 14 000 tons in the Eastern Cape with an average of 7 000 tons. The Port St. Francis-based companies average about 1 000 tons per annum. Squid is the most viable fishing industry in the area, almost the entire catch being exported to the EU.

According to the information supplied by the South African Squid Management Industrial Association (SASMIA), between 1999 and 2005 an average of 33,2% of the total annual Eastern Cape catch originated in the area between 10 nautical miles (18,52 km) east and west of the proposed Thyspunt nuclear power station site. Thus, an exclusion zone of 1 km width would account for roughly **1.8% of the total average catch of 7 000 tons per annum.** This would amount to about **127 tons per annum.**

Data for commercial fishing in the area between Seal Point and Slang River, of which Thyspunt is the midpoint, is depicted in Figure 2.24.

**Figure 2.24: Commercial Fishing, Seal Point-Slang River, 1998-2007 (Kg)**



(Source: Imani Development (SA) (Pty) Ltd, Nuclear-1, EIA, Economic Impact Assessment, 2010)

Port St. Francis has a small harbour that cannot accommodate the larger vessels, which catch an average of 250 tons each per annum; entry is restricted to smaller vessels catching an average of 50 tons each per annum. Port Elizabeth, by contrast, can accommodate larger vessels. If the Thyspunt fishing grounds were to be closed off as part of the exclusion zone, the vessels based at Port St. Francis would have to venture further afield and therefore the companies would have to acquire larger vessels, which would not be able to enter Port St. Francis. Thus, these companies would have to relocate their operations. However, vessels based in Port Elizabeth also fish off Thyspunt, and therefore any restrictions on access would also affect these vessels and not only those based in Port St. Francis.

**Data from SASMIA show that in 2005 the Eastern Cape squid industry employed 2,300 fishing crew, 150 management staff and 1,500 factory staff. The industry generated approximately R400 million in foreign exchange per annum.** Fishing activities have

significant linkages in terms of local employment and procurement of provisions, the effects **of a potential decline in catches for** labour and supplies would be serious. The industry at Port St. Francis consists largely of small, medium and micro enterprises which depend entirely on squid fishing and would not be able to divert their vessels so as to capture trawl and other (demersal or pelagic) revenue streams.

The largest company at Port St. Francis also operates a fish processing factory in Humansdorp. **There are two other fish processing plants in Humansdorp and one at the port.** The capital cost of a fully equipped factory (including cold storage) is between R 8 - 10 million. The Humansdorp factory salts, grades, packs and freezes fish. Hake is trucked to Johannesburg and air freighted to EU markets (mainly Spain and Portugal) while squid is exported by sea, mainly to Europe. The factory employs primarily females with the number varying between 20 to 140 workers at any one time depending on the work load.

The Port St. Francis boats are manned by local (St Francis-Humansdorp-Jeffreys Bay) fishermen while Port Elizabeth's fishing companies also draw some of their crew from the St. Francis area. Altogether, an estimated 1 000 fishermen are from the local area. The number of men per boat ranges from 12 - 24 depending on the size of the vessels. All groceries for the Port St. Francis vessels are purchased locally, as are fuel, engineering services, fishing tackle and some transport services. The impact of the fishing industry on the local economy is felt during the closed season when employment falls, turnover of supplier's declines, spending power in the village falls and the incidence of housebreaking rises.

The other major concern of the industry regarding a nuclear power station at Thyspunt relates to perceptions in the foreign market with regard to fish caught in the vicinity of a nuclear facility. South African squid are regarded as the second best in the world behind Morocco. The industry stressed that perceptions rule in the marketplace. "Chokka" squid is a high-value commodity and is very sensitive to market perceptions. The industry points out that the lobby **(driven by the growing consumer movement and improved consumer knowledge as a result of environmental education and awareness)** in foreign markets for environmentally friendly and contaminate-free fish products are growing.

#### **Industry:**

The largest retail sector in **the general area, although outside a 20km radius** of the Thyspunt nuclear power station is at Jeffreys Bay. This sector is being up-scaled with two shopping malls; total a major retail chain estimates the total turnover of the sector at R250 million per annum. The largest single enterprise in the town is the leisure apparel manufacturer and trader, Billabong, which employs 400 persons in its operations consisting of a factory print shop (finishing and embroidering imported surfing and leisure apparel) as well as wholesale and retail outlets. This enterprise estimates the total turnover in the Jeffreys Bay economy at a minimum of R500 million per annum.

The trading sector in Humansdorp consists largely of food and clothing retail stores but features no shopping centre. A major retailer estimates the total annual turnover at R168 million.

In the St. Francis area (including Cape St. Francis and Oyster Bay), the total turnover is estimated at R70 million per annum. Turnover shows large seasonal variations in line with the seasonal variation in population size. The sector is dominated by food stores but there are some clothing and boutique outlets. A new shopping centre opened in July 2008 but is not yet fully let.

#### **Tourism:**

The tourism market around the Thyspunt site includes Oyster Bay, St. Francis, Cape St. Francis and Port St. Francis. The tourism asset is predominately centred in St. Francis, and the area in fact was founded as a tourism destination. It has a strong eco-tourism brand with an emphasis on water sports, golf and hiking. The tourist season is extremely short, being concentrated in a ten-day period in December - January and over the Easter weekend. According to the local municipality, the normal population of 4 000 rises to 30 000 over Christmas and New Year, and perhaps 8 000 over Easter. There is no hotel, and accommodation is based on bed-and-breakfast establishments (B&Bs), guesthouses and house lets. According to the Tourism Impact Report (2010), the turnover of accommodation establishments is R77.7 million per annum.

Although Jeffreys Bay is beyond the 20km radius of Thyspunt, there are strong negative perceptions in sections of the population in this area, about the impact of an nuclear power station. This was ascertained both during field interviews and through the comments in the interested and affected parties' response trail. Thus, Jeffreys Bay is dealt with briefly ***despite the fact that, according to the Marine Ecology(2010) and Visual Impact Assessment(2010) studies, a nuclear power station at Thyspunt would have no impact on the sea in the bay, while the town would lie outside the area of visual impact.*** Tourism dominates the economy of Jeffreys Bay, and is heavily based on surfing. The normal population of 40 000 swells to 100 000 over Christmas and New Year and to 50 000 during the Billabong Pro- International surfing competition over ten days in July. This is one of eleven world championship events, and is the most important surfing event in the country. Jeffreys Bay is widely recognised as South Africa's premier surfing spot with the world's longest right-hand wave break. According to the Tourism Impact report (2010), the annual turnover of accommodation establishments in Jeffreys Bay amounts to R633 million per annum.

In normal years property prices have reflected the premium market that is the St. Francis brand, but in 2008 prices were hit by the national economic downturn. A number of new premium housing estate developments have found it difficult to sell units, and one planned development has been abandoned. Prices over the last few years have ranged from R 3 - R7 million for canal houses, up to R7 million for beachfront houses, and R 1 - R3 million for houses in the village of St. Francis.

### ***Agriculture:***

There is currently no agricultural production on the proposed site (EIA envelope). Given the land use on surrounding farms there is the potential for agricultural development. This would primarily be the allocation of planted pastures for dairy production.

For a detailed description of the vegetation found on the proposed site the reader is referred to the Flora and Vertebrate Fauna Specialist Reports.

No agricultural production takes place within the 800m emergency zone. The 3km emergency zone borders onto a dairy farm on the northern side of the proposed site.

### 2.4.7. Municipal Infrastructure: Thyspunt

This section deals with the Municipal Infrastructure in the 80km radius of the Thyspunt site.

#### **Water and Sanitation:**

##### *Water:*

The region generally relies largely on springs and water from underground aquifers for its supply. In addition, the Mpofu and Churchill Dams, which provide treated water to Port Elizabeth via the Churchill pipeline, supply water to a number of towns in the planning areas during peak consumption periods. These towns include Humansdorp, St. Francis Bay, Cape St. Francis and Jeffreys Bay. The Kouga Dam is the main source of water supply to Hankey and Patensie. The rapid population growth in the Kouga region over the last 10 years is placing increased pressure on the region's water resources, resulting in shortages during peak holiday seasons. Approximately 22% of the population of the Kouga Municipality do not have access to water on site and make use of public taps, standpipes or rainwater.

When considering the backlog, the municipality has to take into account an additional element, viz. the ability to maintain the existing infrastructure. Subsequently, operational budget to attain effective repairs and maintenance programmes has been allocated.

**Table 2.80: Kouga Water Supply**

Humansdorp	Main water supply to Humansdorp is from aquifers (fountains), augmented by water from the Mpofu and Churchill Dams. Studies have been undertaken to assess additional water sources to improve the bulk supply.
Jeffreys Bay	Bulk supply is mainly from underground aquifers (boreholes), augmented in the peak period from water in the Mpofu and Churchill Dams via the Churchill pipeline. Plans are underway to improve the bulk water supply network through service contributions through large developments.
St. Francis Bay / Cape St. Francis	Water can be extracted from several boreholes and is pumped to water treatment works. Water is further purchased from the Churchill pipeline.
Hankey / Patensie / Loerie	Raw water mainly obtained from the Gamtoos irrigation board canal and the Klein River (Hankey). Existing water supply infrastructure comprises open canals, pipelines, reservoirs and treatment works.
Thornhill	Water obtained from the Summit / Chelsea pipeline in treated form.

The following table indicates the project list and the budget required to eradicate the water treatment backlogs in each of the Local Municipal areas.

**Table 2.81: Water Treatment Projects and budget required for Kouga Municipality**

Name of WTW	Condition	Refurbishment need as % of replacement	Estimated % of Refurbishment
Humansdorp	Average	50	100
Hankey	Average	50	100
Jeffreys Bay	Average	50	100
Oyster Bay	Average	50	100
Patensie	Average	50	100
Greater St. Francis Bay	Good	50	100

**Sanitation:**

Methods of sewerage reticulation and treatment in the various urban and rural areas differ substantially. Most of the formal and middle to high income residential areas are equipped with waterborne sanitation systems. In some cases informal areas are still served with buckets or pit latrines. It is estimated that approximately 1 181 households do not have access to sanitation services in the Kouga region. A further 5 156 households make use of pit latrines and bucket systems. Pit latrines and septic tanks are the most common methods in the non-urban areas.

**Refuse:**

There are no official records of waste generation volumes for the Kouga Municipality as there is no electronic data information system in place. The temporary visitors over the Christmas holiday period have a large influence on the waste generated and an estimate for the waste they generated was also determined. The tables below suggest possibilities in terms of recycling and waste reduction.

Illegal disposal of waste occurs within all wards of the Kouga Municipality. The impact of the weekly collection programme of domestic waste hardly impacts on the illegal disposals. Waste is also burnt. The lack of a proper by-law system on solid waste prohibited policing on the indiscriminating of illegal waste disposal activities.

**Electricity:**

The Kouga Municipality has a distribution license and electricity in most of the urban areas is provided by the Municipality. Future bulk supply of electricity for new developments is uncertain, given the limited supply capacity from ESKOM. (Source: Kouga IDP 2009 – 2012).

**2.4.8. Roads and Transportation : Thyspunt**

According to the Nuclear-1, EIA, Transportation Specialist Study Assessment Phase, done by GIBB, Sept 2009 and updated from the Revised Draft EIR Version 2, Thyspunt requires significant transport upgrades with regard to public transport and access during the construction phases. The Thyspunt site requires transport route upgrades with regard to public roads, access and emergency evacuation during the construction phase. The recommended routes in Version 9 of Transport Report were revised after the Revised Draft EIR was provided for public comment in May 2011. Based on this revision, the R330 is now

proposed to be used only for passenger vehicle traffic and abnormal load transport, and sections will require upgrading for this purpose. The Oyster Bay Road is now proposed to be upgraded to a surfaced road to be used during the construction and operations phases for staff access and heavy vehicle traffic and as an emergency evacuation route for areas such as Oyster Bay. The DR1762, which links the R330 and Oyster Bay Road is now proposed to be surfaced to provide improved east-west connectivity. Bypass roads to the east and west of Humansdorp are also now proposed to be constructed to reduce the traffic impact on central Humansdorp.

### ***Road Network:***

The N2 runs in an east-west direction connecting the main centres along the east coast, such as Port Elizabeth, George and Cape Town.

The N2 links to the N7 via Cape Town. Access to the N2 from Thyspunt is via Humansdorp along the R330 or the un-surfaced Oyster Bay Road. The R330 is a surfaced road that runs from Humansdorp in a southerly direction past St. Francis Bay to Seal Point on the coast. The existing un-surfaced road, which runs from Humansdorp south to Oyster Bay, is in fairly good condition during the dry season and requires more maintenance during the wet season.

### ***Public Transport:***

Only 30% of residents use private transport, 13% use public transport and the remainder walk or use other means of transport.

The existing public transportation infrastructure within the Cacadu District is dominated by the use of minibus taxis. Of this usage, 83% of minibus taxi commuters utilise transportation by way of taxi for long distance travelling (defined as a route travelling outside a town's boundary) and 17% for local / commuter routes (defined as a route not travelling outside a town's boundary).

Predominant minibus taxi ranks within the Cacadu District are contained within the towns, and the determining factor of the predominance is the utilization of the rank in the form of more than ten outgoing trips a day.

Current trends within the Cacadu District suggest that the utilisation of the bus as a mode of public transportation is declining rapidly. This is particularly evident in the form of local / commuter travel, due to the operation of taxis being far more lucrative and feasible. Long distance bus travel is still typically undertaken by operations such as City to City, Greyhound, Intercape and Translux which only travel on national routes.

In terms of rail transportation only two passenger rail services exist, viz.:

- The Alicedale / Grahamstown route; and
- The Port Alfred / Bathurst route.

## **2.4.9. Housing: Thyspunt**

### **Housing Backlog:**

The provision of subsidised housing for the lower income portion of the community is an important National priority for service delivery. Public land requirements are important indicators for future growth of urban areas and these are based on the demand for subsidised housing purposes. In addition, based on the subsidised housing demand over a medium to short term basis, land requirements for Municipal and State development are identified.

The following table outlines existing projects in the Kouga Municipality, emphasising houses completed and houses under construction. In addition, the Integrated Development Plan and previous Spatial Development Framework processes identified current short and medium term housing demand and shortages. It is noted that the estimated current demand for future subsidised housing in Kouga is approximately 11 440 units. This excludes existing and approved projects. Land requirements are based on a residential density of 40 units per hectare. However, this is determined by terrain characteristics, land cost and land availability. In addition, the short and medium term housing demand is based on a population growth rate of 4,5%. (Source: Kouga SDF, Second Draft, 2009.)

**Table 2.82: Housing in relation to the Thyspunt Site (2009)**

<b>Major Towns &amp; Settlements</b>	<b>Housing demand (short/medium term) (SDF / IDP)</b>	<b>Additional land requirements (SDF / IDP)</b>
Hankey	1840 units	46ha
Humansdorp	3720 units	93ha
Jeffreys Bay	3390 units	84ha
Loerie	410 units	10ha
Oyster Bay	0 units	0ha
Patensie	740 units	18ha
St. Francis Bay	840 units	21ha
Thornhill	500 units	12ha
<b>Total</b>	<b>11440 units</b>	<b>303ha</b>

Sources : Department of Housing and Local Government & Kouga SDF, 2009

#### **2.4.10. Waste: Thyspunt**

Low Level Waste and Intermediate Level Waste will be stored within the radiological zones of the power plant and will be shipped to a long term storage site such as Vaalputs as prescribed by the Eskom operating procedures. The quantity of waste will depend on the operating procedures in force at the power plant. Estimation may be based on the quantities generated by Koeberg nuclear power station scaled by the ratio of power output (for the entire year of 2008, 252 concrete drums, containing mostly Intermediate Level Waste, and 760 steel drums, containing Low Level Waste, will be removed from Koeberg nuclear power station).

#### **2.4.11 Emergency Evacuation: Thyspunt**

The Transport Specialist Study (September 2010) concluded as follows:

***“A 0 to 0.8 km Protective Action Zone (PAZ) and a 0.8 to 3 km Urgent Protective Action Zone (UPZ) are required by the EUR to be implemented around a nuclear facility for safety purposes. No new developments are allowed to be located within the PAZ and existing and planned developments situated within UPZ are required to be included in the facility’s emergency evacuation plan.***

***The Nuclear-1’s Emergency Plan must be compiled to include non-nuclear and nuclear accidents occurring at the Nuclear-1. During the operational phase, the 1 300 staff would be evacuated using approximately 434 vehicles.***

***A single lane road capacity is approximately 1 500 vehicles per hour. This initial assessment indicates that the road capacity is sufficient to evacuate 434 vehicles an hour. However, a detailed Emergency Evacuation Plan must be compiled that includes a Transport Model to test the different scenarios and their effects on critical intersection capacities during the evacuation period.”***

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### 3. IMPACT IDENTIFICATION AND ASSESSMENT

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Section 3 outlines the list of key impacts that has been identified in association with the various sites for proposed development. These impacts include:

- Accommodation of staff and construction workers
- Influx of job seekers
- Increase in number of informal illegal dwellings
- Creation of employment opportunities
- Business opportunities
- Impact on criminal activities
- Risk of SDTs, HIV and AIDS
- Municipal services
- Traffic impacts
- Noise and dust impacts
- Loss of employment after construction
- Visual impacts
- Impact on social infrastructure /facilities
- Impact on sense of place
- Future land use planning
- Perceived risks associated with nuclear incidents
- Assessment of no development option

Each of the abovementioned impacts will be assessed in respect of both the construction and operational phases of the project. See Addendum A for detail impact assessment rating.

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#### 3.1. Accommodation of staff and construction workers

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##### ***Description of the impact***

Large numbers of temporary and permanent workers will place tremendous strain on the provision of temporary and permanent accommodation.

It is intended by Eskom that all housing requirements will be integrated into existing communities and towns. In this regard, once the preferred site has been identified, Eskom will collaborate closely with the respective municipalities to ensure that such integrations are optimised to the benefit of all parties.

Although the housing arrangements for each of the sites is not yet finalised, it is clear that the Vendor and Eskom staff implicates an estimated influx of 3 837 workers (peak period) and their families to the nuclear power station project area. The total population influx is estimated at 10 500 people, to be accommodated on an area of approximately 167.2 ha.

These staff members will primarily be accommodated in single residential units (4, 3, 2 and 1 bedroom units), and will thus have a significant impact on the housing sector and the property market.

It should be mentioned that all the housing provision for the Vendor and Eskom Staff will not be located in one area as a “greenfields” development. It is foreseen that some housing will be integrated within existing developed areas (infill), and distributed in pockets throughout the area.

The estimated area requirements to accommodate the staff and construction workers in terms of housing and community facilities are listed in the following two tables.

**Table 3.01: Estimated Total Area Requirement for Staff Accommodation**

Description	Purpose/Land Use	Estimated Area Requirement
Staff Village	Community and Recreational Facilities	44.2 ha
Vendor Staff	Housing for 2 172 staff	89.5 ha
Eskom Project Staff	Housing for 280 staff	12.0 ha
Eskom Staff	Housing for 1 385 staff	65.7 ha
Construction Village	Housing and Facilities for 3 750 staff	50.9 ha
<b>TOTAL</b>		<b>262.3 ha</b>

Source: Nuclear-1 –Consistent Data Set, Eskom

**Table 3.02: Vendor and Eskom Staff, population and area estimations**

Description	Purpose/Land Use	Estimated Total Population	Estimated Area Requirement
Vendor Staff	Housing for 2 172 staff	5 162	89.5 ha
Eskom Project Staff	Housing for 280 staff	603	12.0 ha
Eskom Staff	Housing for 1 385 staff	4 753	65.7 ha
<b>TOTAL</b>	<b>Housing for 3 837 staff</b>	<b>10 518</b>	<b>167.2 ha</b>

Source: Nuclear-1 – Consistency Data Set, Eskom (Based on House Hold Size of 3.5)

***The type of residential accommodation for the total staff and construction workers, and the estimated total number of such units is summarised in the next table.***

**Table 3.03: Type and Estimated Number of Residential Units for Staff Accommodation**

Description	Unit Description / Housing Type	Estimated Number of Units
Vendor Staff	4 bedroom	540
	3 bedroom	345
	2 bedroom	307
	single	990
<b>TOTAL</b>		<b>2 170</b>
Eskom Project Staff	4 bedroom	18
	3 bedroom	50
	2 bedroom	45
	single	67
<b>TOTAL</b>		<b>180</b>
Eskom Staff	5 bedroom (Top Management)	1
	4 bedroom (Management)	489
	3 bedroom (Supervisor / Artisans)	495
	2 bedroom (Supervisor / Artisans)	400
<b>TOTAL</b>		<b>1 385</b>
Construction Village	12 bed units	250
	8 bed units	94

Source: Nuclear-1 –Consistent ant Data Set, Eskom

The determination of the location of residential units will need to take the following into account:

- Spatial Planning Policy;
- Water and Sanitation Planning and Integrated Waste Management Planning, and any other Municipal Infrastructure planning;
- Access, Traffic and Public Transport;
- The principles of integration and sustainability, especially “Breaking New Ground”;
- and
- Local Economic Development and SMME policies.

### **Duynefontein**

Due to the exact location and area of land needed for new residential development, the social impact of the actual footprint could not be assessed at this stage. A detailed assessment should be conducted once the preferred nuclear power station location, as well as the location for residential and accommodation needs are finalised. The level of the social impact of a Construction Village in the Melkbosstrand area will differ from the Atlantis area.

Provision for future residential development has been identified in the Draft Spatial Development Plan for Blaauwberg (2009), in the Atlantis - and east of Melkbosstrand area.

## **Bantamsklip**

Due to the exact location and area of land needed for new residential development, the social impact of the actual footprint could not be assessed at this stage. A detailed assessment should be conducted once the preferred nuclear power station location, as well as the location for residential and accommodation needs are finalised. The level of the social impact of a Construction Village in the Gansbaai area will differ from the Pearly Beach area.

Provision for future residential development has been made in the Overstrand Spatial Development Plan (2009), in and around Pearly Beach, Gansbaai (Masakhane) and Hermanus.

A written submission made by the Pearly Beach Conservation Society Chairperson, dated 14 June 2007, raised the concern of housing as follows:

*“Another point of extreme concern is where the construction people and eventually the operational staff will be housed, as Pearly Beach is the nearest town to Bantamsklip, but as this town was developed as a holiday destination, we are very concerned that the internal services of the town will not be adequate to cater for a huge influx of permanent residents.”*

The establishment of a Construction Village (where construction workers will reside), will have a major impact on the social environment, especially in Pearly Beach and Gansbaai. These towns are situated in fairly rural and remote areas with a limited number of permanent residences and a large number of tourists and holiday makers, especially in season.

## **Thyspunt**

Due to the exact location and area of land needed for new residential development, the social impact of the actual footprint could not be assessed at this stage. A detailed assessment should be conducted once the preferred nuclear power station location, as well as the location for residential and accommodation needs are finalised. The level of the social impact of the Construction Village in the Humansdorp area will differ from the Sea Vista area.

Provision for future residential development has been made in the Kouga Spatial Development Plan (2009), in and around Sea Vista, Cape St. Francis, Oyster Bay and Humansdorp.

### ***Assessment of the impact***

*Construction phase without mitigation:*

#### *Duynefontein*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative and the intensity medium. This impact is probable, of medium-term duration, medium reversibility, of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.04 below

Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the extent negative and the intensity high. This impact is definite, of medium-term duration, medium reversibility, of high consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.04 below.

*Operational phase without mitigation:*

This impact only applies to the construction phase of the development due to the fact that temporary and permanent accommodation requirements will be addressed during the operational phase.

**Table 3.04: Accommodation without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Site	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip
Cumulative	Low	Medium	Medium	N/A	N/A	N/A
Nature	Negative	Negative	Negative	N/A	N/A	N/A
Extent	Local	Local	Local	N/A	N/A	N/A
Duration	Medium term	Medium term	Medium term	N/A	N/A	N/A
Intensity	Medium	High	High	N/A	N/A	N/A
Consequence	Medium	High	High	N/A	N/A	N/A
Probability	Probable	Definite	Definite	N/A	N/A	N/A
Significance	Medium	High	High	N/A	N/A	N/A
Reversibility	Medium	Medium	Medium	N/A	N/A	N/A
Irreplaceable	No	No	No	N/A	N/A	N/A
Confidence	Medium	High	High	N/A	N/A	N/A

**Mitigation objective:** Provision of sufficient accommodation.

**Mitigation measures:**

Construction Village

- Draw up the development and location criteria / conditions for the establishment of the Construction Village;
- Investigate possible locations for the Construction Village;
- Identify the suitable location and draw up a Site Development Plan in line with development planning legislation, policies and guidelines;
- Follow a transparent public participation process with role-players and interested and affected parties;
- Make use of local labour and local suppliers of material for the construction as far as possible;
- Monitor the situation after the occupation of the Construction Village, and involve the relevant role-players in such processes; and

- The Construction Village (including all the facilities) should be located in such a manner that the buildings and facilities can be utilised by the surrounding community after the construction period, in order to ensure sustainability of such infrastructure.

#### Staff and vendor housing

- Draw up the development and locative criteria / conditions for the establishment of the total housing need for Vendor and Eskom Staff (Partnerships will be important for the planning phase);
- Investigate possible locations for the provision of housing according to the needs;
- Identify the suitable locations and draw up a Site Development Plan in line with development planning legislation, policies and guidelines;
- Obtain approval for the development from the appropriate authorities (e.g. town planning procedures);
- Follow a transparent public participation process with role-players and interested and affected parties;
- Make use of local labour and local suppliers of material for the construction as far as possible;
- Monitor the situation once the housing units are occupied; and
- The housing units for construction staff should be located as such that the houses can be integrated into the normal property market once construction is complete and houses become available, in order to ensure integration and sustainability.

#### Staff Village

- Draw up the development and locative criteria / conditions for the establishment of the Staff Village;
- Investigate possible locations for the Staff Village;
- Identify the suitable location and draw up a Site Development Plan in line with development planning legislation, policies and guidelines;
- Follow a transparent public participation process with role-players and interested and affected parties; and
- Make use of local labour and local suppliers of material for the construction as far as possible.

#### *Construction phase with mitigation:*

If mitigation measures are successfully implemented then the significance of the impact should revert to medium.

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## 3.2. Influx of job seekers

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### ***Description of the impact***

This impact deals with the influx of job seekers to the site during the construction phase.

These job seekers, including those from areas outside the “local” area, enter the area with the hope of securing employment. When they do not secure employment, the potential exists that they will add to the usual difficulties related to informal settlement, pressure on existing resources, services and infrastructure. The possibility also exist that “new” job seekers may contribute towards crime and other social problems such as alcohol abuse and prostitution. Even if particular instances of crime are not as a result of the job seekers, these may still be attributed to them by local communities.

Democratic principles and freedom of movement should be respected with regard to all job seekers, irrespective of whether they are local or from outside the area. However, competition regarding employment opportunities may give rise to conflict between local residents and newcomers, especially if unemployed people in these areas do not have the required skills and knowledge to take advantage of employment opportunities. The influx of job seekers will lead to an increased demand on local services but will not necessarily lead to a boost in the local economy because these job seekers are unemployed.

It should further be noted that this influx could lead to an even bigger demand on housing and other services.

The possibility exists that job seekers entering the area will add to the influx problem, as illustrated by the following comments made by interested and affected parties.

*“ This[the Nuclear Power Plant] will probably bring with it a short-term influx of foreign technicians and skilled workers (mostly from abroad), as well as a **myriad of unskilled hopefuls**, but will actively destroy any attempt at consolidating the biosphere initiatives and force European and other tourists to look elsewhere for recreation.” The perception in the above comment that (influx of people)” will actively destroy any attempt at consolidating the biosphere initiatives and force European and other tourists to look elsewhere for recreation.” Does not have to become a reality if mitigation measures are implemented successfully. The Greater Hermanus Environmental Action group (GHEAG) fully endorses the contents, viewpoint as presented by Mike Kantey (National Chairperson for Coalition Against Nuclear Energy – CANE) in an open letter addressed to the Western Cape Provincial Government. National Chairperson for CANE.*

### *Unplanned influx*

*This is not speculation, it is a certainty. Every time there has been a major development in this area, it has been accompanied by an influx of unskilled job-seekers, most of whom fail to obtain employment, and many of whom remain in what they consider to be a more pleasant environment. This is their legal right. However, they live in abject squalor in informal settlements, with no proper accommodation, water or sanitation provision. Not surprisingly, they become a major security problem, since their only recourse, in order to scratch out some sort of survival, is through crime. This is already a significant problem in the area, especially for the established population of Sea Vista, but also spilling over into the up-market residential areas.*

*The last thing that should happen is to create a new attraction to such people, who simply become a liability to the local authorities and community. This community is simply not large enough to accommodate a significant additional influx of this nature. If Thyspunt goes ahead, Eskom or the government must take full responsibility for handling this potentially explosive problem.” St. Francis Bay Residents Association and St. Francis Kromme Trust, 15 October 2009.”*

### **Duynefontein**

The proposed nuclear power station should be viewed within the broader developmental context for the area, especially Atlantis, where properties are available to draw investors in a drive to create employment in the area.

The proposed nuclear power station must not be considered in isolation to the proposed PBMR and other electricity related developments. The cumulative potential of these proposed developments could contribute positively to the creation of job opportunities, and therefore lower the number of unsuccessful job seekers.

Job seekers could also move to other development projects elsewhere in the City of Cape Town.

### **Bantamsklip**

The same arguments as mentioned above may be applied to Bantamsklip, the difference being that the total population of the area around the proposed nuclear power station is much smaller. The combination of the construction and other workers on the development, and unsuccessful job seekers, could increase the number of new residents to the area to a level that could threaten the existing social and community life in the area. The towns of Pearly Beach and Gansbaai may experience a total change in the way people live their lives. The rural relaxed lifestyle of many people could be threatened.

Depending on the placement of the Construction Village, the interaction between construction workers and job seekers could further contribute to possible conflicts over resources and opportunities.

### **Thyspunt**

Unsuccessful job seekers from outside the area could explore possibilities in neighbouring towns such as Humansdorp and Jeffreys Bay. This will contribute to the already high unemployment levels in the area, with negative impacts on the general fabric of community. Accommodation opportunities near the proposed nuclear power station are limited. Expansion of the existing informal settlements is not a feasible or desirable option. New housing schemes planned for the area focus on existing people already living in the area in informal settlements or backyard shacks.

The general notion amongst residents of St. Francis, Cape St. Francis and Oyster Bay indicated that normal growth of communities and neighbourhoods are acceptable as an evolving process that flow with other developments within the area. Large numbers of job seekers could only disturb the existing lifestyle, peace and feeling of safety and sense of place. Job seekers hanging around in the area will only contribute negatively towards the way people perceive the area in accordance with local residence. The possibility of a rise in anti-social behaviour and crime with the presence of large numbers of job seekers, is considered to be a given by local residents.

## Assessment of the impact

*Construction phase without mitigation:*

### Duynefontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative and the intensity low. This impact is highly probable, of medium-term duration, low reversibility and of low consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.05 below

### Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative and the intensity medium. This impact is highly probable, of medium-term duration, medium reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.05 below

*Operational phase without mitigation:*

This impact only applies to the construction phase of the development.

**Table 3.05:** Influx of job seekers **without** mitigation

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	Low	Medium	Medium	N/A	N/A	N/A
Nature	Negative	Negative	Negative	N/A	N/A	N/A
Extent	Local	Local	Local	N/A	N/A	N/A
Duration	Medium-term	Medium-term	Medium-term	N/A	N/A	N/A
Intensity	Low	Medium	Medium	N/A	N/A	N/A
Consequence	Low	Medium	Medium	N/A	N/A	N/A
Probability	Highly probable	Highly probable	Highly probable	N/A	N/A	N/A
Significance	Low	Medium	Medium	N/A	N/A	N/A
Reversibility	Low	Medium	Medium	N/A	N/A	N/A
Irreplaceable	No	No	No	N/A	N/A	N/A
Confidence	High	High	High	N/A	N/A	N/A

**Mitigation objective:** Minimise number of job seekers staying in the area

*Mitigation measures:*

- A proactive, broad-based information campaign (including site notices) to clarify the number of job opportunities that will be available. The objective is to dispel rumours and unrealistic expectations and thereby seek to curtail the inflow/settlement of job seekers;
- Proactive engagement by the appointed contractor(s) with local authorities/SAPS/CPFs to ensure that job seekers do not settle in the vicinity of Construction Villages or the construction terrain;

- Follow a transparent public participation process with role-players and interested and affected parties;
- Make use of local labour and local suppliers of material for the construction as far as possible; and
- Monitor the situation after the occupation of the Construction Village, Staff Village and housing projects, and involve the relevant role-players in such process.

*Construction phase with mitigation:*

If mitigation measures are successfully implemented, the likelihood of the impact occurring should revert to that of probable.

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### **3.3. Increase in number of informal illegal dwellings**

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#### **Description of the impact**

It is anticipated that there will be an increase in informal illegal dwellings surrounding the nuclear power station site associated with perceived economic opportunities.

The new nuclear power station will result in an influx of job seekers and those in pursuit of economic gain that may arise from an increase in economic activity in the area. In particular, construction activities and a perception that these activities are associated with job opportunities, is likely to attract work seekers who do not have accommodation and who may illegally occupy land and set up illegal informal structures while seeking employment. The nature of these illegal informal dwellings is such that they can be erected and populated rather rapidly, making it difficult for the authorities to control or reverse. If not carefully managed, this type of uncontrolled development is also likely to result in an increase in an array of social pathologies such as crime, prostitution and alcohol and drug abuse.

#### **Bantamsklip**

Residents in the area around Pearly Beach are concerned that the development will result in growth in the number of illegal informal dwellings. It is feared that the likelihood of illegal squatting and the growth of informal settlements in the neighbourhood, could increase. The Masakhane neighbourhood in Gansbaai may also experience additional growth in informal and illegal squatting.

#### **Thyspunt**

The residential areas of Sea Vista and Umzamowethu are vulnerable for any extension of their existing informal settlements. The existing informal areas of Humansdorp and Jeffreys Bay may also experience an increase in illegal squatting.

#### **Duynefontein**

The two informal settlements in the immediate area include Oogies Kraal and Rietbosvlei. These are vulnerable for any extension of their existing informal settlements. The nearby Atlantis, however, cannot be excluded from the possibility of growth in number of illegal dwellings.

#### **Assessment of the impact**

*Construction phase without mitigation:*

Duynefontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative and the intensity low. This impact is possible, of short-term duration, low reversibility and of low consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.06 below

Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative and the intensity medium. This impact is probable, of medium-term duration, medium reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.06 below

*Operational phase without mitigation:*

This impact only applies to the construction phase of the development.

**Table 3.06: Increase in number of informal illegal dwellings without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Site	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip
Cumulative	Low	Medium	Medium	N/A	N/A	N/A
Nature	Negative	Negative	Negative	N/A	N/A	N/A
Extent	Local	Local	Local	N/A	N/A	N/A
Duration	Short-term	Medium-term	Medium-term	N/A	N/A	N/A
Intensity	Low	Medium	Medium	N/A	N/A	N/A
Consequence	Low	Medium	Medium	N/A	N/A	N/A
Probability	Possible	Probable	Probable	N/A	N/A	N/A
Significance	Low	Medium	Medium	N/A	N/A	N/A
Reversibility	Low	Medium	Medium	N/A	N/A	N/A
Irreplaceable	No	No	No	N/A	N/A	N/A
Confidence	Medium	Medium	Medium	N/A	N/A	N/A

**Mitigation objective:** To control the threat of an increase in unplanned development and the rise of informal settlements.

*Mitigation measures:*

- Ensure that all discarded construction material that can be utilised to build informal structures, is properly disposed of after construction;
- Ensure that any temporary accommodation utilised to house construction workers, is completely dismantled and properly disposed of after use, unless a different alternative exist;
- Cooperate with local authorities to ensure that all legislation preventing illegal settlement, is enforced at all times; and

- Ensure appropriate housing is available for staff.

*Construction phase with mitigation:*

If mitigation measures are successfully implemented, the significance of the impact should revert to that of low.

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### **3.4. Creation of Employment Opportunities**

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#### **Description of the impact**

The nuclear power station offers the potential for unemployed people to gain meaningful employment during the construction phase. It also provides the opportunity for improvement to employed people, who may regard employment opportunities with the nuclear power station as better for their future, in comparison to their existing positions.

The construction and subsequent operation of the proposed nuclear plant would create new jobs in three different ways:

- *Direct employment:* labour employed to construct and then operate the plant,
- *Indirect employment:* jobs created in other sectors as a result of initial expenditures on plant construction and operation, and
- *Induced employment:* jobs created as a result of new expenditures in other sectors that come about because of higher total labour income.

Construction activities will create a large number of temporary employment opportunities for construction workers. The result would be a positive impact on unemployment at a local level, which in turn may positively affect the local economy in the short term, depending on where workers come from and where they live. This would have a particular impact on the down turning in construction related employment opportunities and the levels of unemployment amongst unskilled and semi-skilled workers. The majority of employees will be drawn from the predominant pool of unskilled and semi-skilled persons.

It can also be accepted that the provision of housing will have a cumulative effect on the provision of a large number of employment opportunities in the housing and related facilities infrastructure. Housing development will contribute towards the creation of a large number of secondary employment opportunities such as informal trading, domestic workers, gardeners, security personnel, etc.

A further cumulative effect follows the need for the expansion or creation of social infrastructure for purposes such as education, sport, law enforcement, recreation, etc., that could create a number of new employment opportunities in the construction of these facilities, in addition to the operation of these facilities.

It is estimated that the construction phase of the proposed nuclear power station could take up to 10 years from the commencement of construction until commissioning. During this period it is foreseen that an estimated 8 737 staff, including construction workers, will be employed on site. It is envisaged that at least 25% of the construction workers will be sourced from the local labour force. Democratic principles and freedom of movement must be respected regarding all workers, irrespective of whether they are local or from outside the area. However, workers from outside could create dissatisfaction amongst local people.

The estimated total number of staff and construction workers is reflected in the next table. It should be noted that the Eskom Operational Staff (1 385) is included in this table due to their involvement as operational staff from commencement of the 8 to 10 years construction period.

**Table 3.07: Estimated Total Staff Component**

Description	Estimated Number of staff	Status
Eskom Project Staff	140	Construction Period 8-10 years
Consultants	40	Construction Period 8-10 years
Vendor Staff	2 172	Construction Period 8-10 years
Vendor Construction Workers	5 000	Construction Period 8-10 years
Eskom Operational Staff	1 385	Permanent / Operational
<b>TOTAL</b>	<b>8 737</b>	

*(Source: Nuclear-1 – Consistent Data Set, Eskom)*

It is further important to note that there are mixed perceptions attached to job creation amongst some interested and affected parties. In this regard some, such as the Strandveld Farmers Association, even fear that the cost of acquiring labour may increase. These perceptions are reflected in the following comments received at public meetings, interviews or written submissions:

*" It is a myth that it will provide job creation because the building of a nuclear plant requires specialised "labour" and it is unlikely that local communities will be eligible."*

*" Economically, the short term benefits for a relatively small number of local people who might be employed in the construction, would certainly not outweigh the negative aspects of the project in the long term."*

*" This project is not conducive to job creation".*

*" On a more general point the power station will create jobs in an area of high unemployment and we would like to say at this stage that we expect work to be made available for the local population." Written submission on nuclear energy in South Africa, Pearly Beach Conservation Society, 14 June 2007.*

*" Once again, detail is difficult to obtain, but it is reasonable to suppose that a labour force of some 8 – 10000 people will be employed, over a period of ten years or so for the first 4000 Mw. Most of these will be skilled and semi-skilled personnel who will be recruited from outside the area, since these skills are not available in the local populace." St. Francis Bay Residents Association and St. Francis Kromme Trust 15 October 2009.*

*“The recent increases in production costs would make it very difficult to match wages paid by any construction company. Farmers are worried that their labourers would be lured away by the higher wages.” Strandveld Farmers Association – Bantamsklip, 9 September 2008.*

*“On a more general point the power station will create jobs in an area of high unemployment and we would like to say at this stage that we expect work to be made available for the local population.” Pearly Beach Conservation Society, 14 June 2007.*

These opportunities would present employment within a context where significant downsizing as well as the closure of some industries in Atlantis, inter alia, has taken place.

### **Assessment of the impact**

*Construction phase without optimisation measures:*

#### Duynefontein, Bantamsklip and Thyspunt

Without optimisation measures, it is anticipated that the scale of this impact will be local to regional, the nature positive, and the occurrence definite. This impact is of medium-term duration, medium reversibility and high significance and consequence. The degree of confidence in the assessment is fairly confident. A summary of the impact is provided in Table 3.08 below

*Operational phase without optimisation:*

This impact only applies to the construction phase of the development.

**Table 3.08: Creation of Employment Opportunities *without* optimisation**

Phase	Construction Phase <u>without</u> Optimisation Measures			Operational phase <u>without</u> Optimisation Measures		
	Site	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip
Cumulative	Medium	Medium	Medium	Low	Low	Low
Nature	Positive	Positive	Positive	Positive	Positive	Positive
Extent	Local	Local	Local	Low	Low	Low
Duration	Medium-term	Medium-term	Medium-term	Low	Low	Low
Intensity	High	High	High	Low	Low	Low
Consequence	High	High	High	Low	Low	Low
Probability	Definite	Definite	Definite	Possible	Possible	Possible
Significance	High	High	High	Low	Low	Low
Reversibility	Medium	Medium	Medium	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	High	High	High	Medium	Medium	Medium

**Optimisation of benefits:** To enhance the benefits of employment creation.

*Optimisation measures:*

- Establish a labour policy to facilitate the employment of locals where feasible and as far as possible, **as well as clear gender equity criteria**. The appointment of local labour should be a priority issue, with clear targets during the pre-construction phase. Targets must be clear for B-BBEE **compliant suppliers** and local employment. Care should be taken to avoid potential conflict between people in the immediate surroundings seeking employment and those from elsewhere. Therefore, the criteria for “local” must be clearly stated. **Local can be defined as people living within the borders of the local municipality or within a specified distance from the site e.g. 20km Criteria for 'local labour' be agreed in consultation with local community stakeholders and communicated before construction commences;**
- The number of workers required, as well as the specific skills required in respect of each worker, should be specified as soon as possible before the commencement of construction. An employment/skills registration agency or 'labour desk' should be established to identify prospective candidates who would meet the job specifications in consultation with the relevant local authorities. Such an agency/desk will need to take responsibility for accurate information dissemination at community level. It is important to determine the available skills in the area and the level of training required. Experience has shown that formalizing this process through such an agency avoids duplication, misrepresentation, confusion and unrealistic expectations. It is further important to clarify project time frames and when candidates from local communities are anticipated to be needed. The identification of such an agency must be done in consultation with the local community stakeholders;
- **Recruitment, and the placement of recruitment offices, must be done in such a way that nobody is excluded from the opportunity to apply for a job. Recruitment must be done in a way that is transparent, fair, equitable, cost-effective, competitive and without any favoritism and nepotism;**
- A labour skills, grading and assessment centre should be established to provide specific and relevant information on available employment. This should include the number and type of jobs, skills requirements for the jobs, duration of the jobs, remuneration scales, hours of work, conditions of work, procedures for the application of jobs, procedures for selecting job applicants, and training and certification available on the job. Where possible, on-the-job training should be provided to locals, to develop their existing skills and to ensure that they receive skills that are transferable to other sectors. Besides training directly done by Eskom, a process of coordination must be facilitated by Eskom to involve appropriate training providers with regards to targeting of employment and skills development initiatives;
- Cooperation with provincial and district authorities is crucial;
- Where feasible, create opportunities for the employment of women;
- Where possible, use labour-intensive methods of construction;
- Develop a community labour agreement with targets for employment and for career progression;
- Remunerate beyond the minimum wage rate and invest in local staff and
- **The Medupi Power Station Legacy Programme Mission must also apply to the new nuclear power station: “To ensure that the immediate socio-economic concerns of the local community are addressed. These being health and education infrastructure development, employment creation and procurement opportunities. At the same time the foundation for sustainable growth and development is laid through skills, enterprise and general infrastructure development.”**

*Construction phase with optimisation measures:*

The fact that jobs will stretch over a period of up to 10 years is unlikely to result in the impact changing significantly.

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### **3.5. Business Opportunities**

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#### ***Description of the impact***

A significant number of business opportunities will be created for local companies / service providers and SMME's.

In addition to employment created during construction and operations, the community can also benefit from business opportunities for local contractors and service providers. These opportunities include, inter alia, the provision of catering, security services, accommodation facilities, etc. Residential development will create a wide variety of SMME opportunities such as gardening services, cleaning services, building and related services, etc.

The following observation was made by a member of the community:

*"The power station planned at Bantamsklip could have a great positive impact on the area. It will open a lot of markets for agricultural products. It will also provide a large financial injection into the area. It could provide jobs to unemployed people, e.g. in agriculture and businesses in town."*

The utilisation of local suppliers and service providers must be enhanced through local procurement and pro-active targeting processes via an open and transparent tender process for all construction related activities.

As mentioned previously, the possible cumulative impact on opportunities for SMME's related to the provision of housing and social infrastructure must be noted.

#### ***Assessment of the impact***

*Construction phase without optimisation measures:*

##### **Duynefontein**

Without optimisation measures, it is anticipated that the scale of this impact will be local to regional, the nature positive, and the occurrence definite. This impact is of medium-term duration, medium reversibility and medium significance and consequence. The degree of confidence in the assessment is fairly confident. A summary of the impact is provided in Table 3.09 below

##### **Bantamsklip and Thyspunt**

Without optimisation measures, it is anticipated that the scale of this impact will be local to regional, the nature positive, and the occurrence definite. This impact is of medium-term duration, medium reversibility and medium significance and consequence. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.09 below

Operational phase without optimisation measures:

Duynefontein, Bantamsklip and Thyspunt

Without optimisation measures, it is anticipated that the scale of this impact will be local, the nature positive, and the occurrence probable. This impact is of long-term duration, low reversibility and medium significance and consequence. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.09 below

**Table 3.09: Business opportunities without optimisation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
Site	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	Medium	Medium	Medium	Low	Low	Low
Nature	Positive	Positive	Positive	Positive	Positive	Positive
Extent	Local	Local	Local	Local	Local	Local
Duration	Medium-term	Medium-term	Medium-term	Long-term	Long-term	Long-term
Intensity	Medium	Medium	Medium	Medium	Medium	Medium
Consequence	Medium	Medium	Medium	Medium	Medium	Medium
Probability	Definite	Definite	Definite	Probable	Probable	Probable
Significance	Medium	Medium	Medium	Medium	Medium	Medium
Reversibility	Medium	Medium	Medium	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	High	High	High	High	High	High

**Optimisation objective:** Maximize the benefits related to the use of local suppliers of goods and services.

**Optimisation measures:**

The following specific measures are suggested before commencement of construction in addition to during the construction process:

- Open tender processes, which include improved communication of tender opportunities through advertising in local community media (including the local radio station). Eskom and the main contractor must take up this responsibility before and during construction;
- Expedite the process of registering local service providers on Eskom's procurement database as an ongoing concern. A supplier development programme can go a long way to assist local suppliers of goods and services with registration on Eskom's database. Assistance is required with meeting compliance standards and understanding tender requirements. **Establish a Contractor Academy and incubator program as in the case at Medupi Power Station;**
- Provide information **and create networks (e.g. through supplier forums and information office)** regarding the types of business opportunities and economic spin-offs that may arise from the proposed development to the various structures and institutions actively involved in the first and second economy;
- Eskom must set clear targets for B-BBEE **compliance as a minimum requirement** & local procurement; Include basic business and entrepreneurial skills as part of a skills development component of the development to ensure social capital development and empowerment of the local entrepreneurs;

- Eskom must engage in participatory workshops in which interested members of local communities can be guided regarding types of business opportunities that could arise;
- Investigate ways of enabling potential subcontractors from low-income areas to tender with the support of Red Door and other economic institutions;
- Set up linkages for small business loans, as well as small business skills training. In this regard, the role of partnerships with other role-players who could assist in these matters, should be considered, (i.e. Red Door);
- Closer interaction with institutions that could assist with provision of support to small businesses, including the possible identification of agencies that could assist with the provision of seed finance and entrepreneurial counseling (Red Door, LED Forum, Local Council); and
- Feedback by Eskom to local suppliers and the broader community on numbers of local people employed, tenders awarded and business opportunities created to the advantage of the local community. This could strengthen the relationship between Eskom and the various role-players around the proposed nuclear power station.

*Construction and operational phase with optimisation:*

If optimisation measures are successfully implemented, the probability impact should revert to that of highly probable.

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### **3.6. Impact on Criminal Activities**

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#### ***Description of the impact***

The large influx of people into the area as employees or in search of work could result in an increase in criminal activities.

It is also possible that, during the construction phase of the project, an opportunistic criminal element may take advantage of increased activities in certain areas around construction sites.

#### **Bantamsklip**

The area surrounding this site is relatively remote with normal levels of crime in the area. Large numbers of people flowing into the area, especially during the construction phase supported by legal as well as illegal business opportunities and the possible impact of unemployed job seekers and opportunity seekers, may increase various criminal activities in the area. Not only does the possibility exist for an increase in petty theft, but also more violent crimes, rape, murder, etc. With large concentrations of people together, there is also the possibility of gangsterism, alcohol misuse and smuggling. Even with crime prevention strategies in place and a high level of visibility of law enforcement, community members may feel unsafe in their houses and start to embark on various methods to safeguard their properties and lives. Increase in crime may also prevent people from moving around freely.

Community members have raised their concern that the large number of people involved in the development can contribute towards an increase in criminal activities and the enhancement of a feeling amongst community members that they do not feel safe anymore.

*" I am raising my concern regarding this power station to be erected seeing that we are regular visitors to the uninterrupted area of Pearly Beach. If this project goes ahead the Pearly Beach area will lose all its magic to visitors, there will be much more movement (people) in the area; **crime rate will raise**; infrastructure will not be suitable; the natural environment of the area will be lost."*

*"The increase in labour would certainly add to the **stock theft problem** in the area."*

*"Most farm are in remote areas with few neighbours, poor telephone service and no cell phone reception, and the influx of workers would most certainly compromise the **security of the area**." Strandveld Farmers Association September 2008*

Due to the fact that needed residential development for staff will be incorporated within existing urban areas, an increase of criminal activities during operation is not foreseen.

### **Thyspunt**

It is likely that the same will apply as in the case with Bantamsklip. Currently, due to various factors such as the downswing in the economy, the community do experience an increase in criminal activities. In general the community experience limited crime levels due to the fact that the population numbers are small and strangers are easily recognised.

### **Duynefontein**

In this area the communities will also experience, especially during construction phase the possibility of higher crime levels if the proposed development continues, especially combined with the cumulative impact of the proposed PBMR DPP.

### **Assessment of the impact**

*Construction phase without mitigation:*

#### Duynefontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of medium-term duration, reversible and of medium consequence and low significance. The degree of confidence in the assessment is medium.

#### Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of medium-term duration, reversible and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.10 below.

*Operational phase without mitigation:*

Duynefontein, Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity low. This impact is possible, of medium-term duration, reversible and of low consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.10 below.

**Table 3.10: Impact on Criminal Activities without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Site	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip
Cumulative	Medium	Medium	Medium	Low	Low	Low
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Extent	Local	Local	Local	Local	Local	Local
Duration	Medium-term	Medium-term	Medium-term	Medium-term	Medium-term	Medium-term
Intensity	Medium	Medium	Medium	Low	Low	Low
Consequence	Medium	Medium	Medium	Low	Low	Low
Probability	Probable	Highly Probable	Highly Probable	Possible	Possible	Possible
Significance	Low	Medium	Medium	Low	Low	Low
Reversibility	Low	Medium	Medium	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	Medium	Medium	Medium	Medium	Medium	Medium

**Mitigation objective:** To reduce the risk of crime.

**Mitigation measures:**

- The need to establish a Community Monitoring Committee (CMC) for the construction phase should be discussed with representatives from the local community. The role of the CMC would be to ensure that the conditions set out in the EMP are implemented and that they address any problems that arise, such as increase in thefts and burglaries associated with the construction workers. The South African Police Services (SAPS) as well as local appropriate policing should be urged by Eskom and the community forum, or a Social Monitoring and Steering Committee, to ensure that baseline statistics are available on a monthly basis regarding existing crime rates. This forum or committee should proactively engage with Eskom in developing mechanisms for the monitoring and distribution of information to counter potential community perceptions that there are perceived changes in the crime rate directly as a result of construction workers being in the immediate area;
- Eskom should arrange meetings with residents associations, community-policing forums, as well as the local police staff to discuss contractors' plans, procedures, schedules and possible difficulties, and safety and security concerns. The number of meetings and the timing of these meetings need to be discussed with the interested and affected parties and a work plan needs to be put forward. Experience in other projects has shown that members of the community readily attribute crimes committed to the presence of construction workers, particularly where there are

significant pre-existing levels of crime. This perception is entrenched by the actions of workers who may enter private properties to access taps or to ask domestic workers for water. Pro-active discussions between the contractor(s) and project proponent have proved effective in addressing concerns and putting possible preventative measures in place. Despite being simple, cheap and effective, a measure such as compelling workers to wear identification badges at all times is often not instituted or enforced by contractors to the discontent of local residents who find it impossible to separate workers from possible criminal 'elements';

- Should a CMC be established the option of drafting a code of conduct for contractors and construction workers should be considered;
- The conduct of contract workers will have to be specified in worker related management plans and employment contracts by contractors and service providers. It is recommended that a peer-group based incentive/fine scheme, which has been successfully used in other projects to achieve compliance, be introduced. Schoeman, PBMR Social Impact Assessment Report– (October 2002) explains that this scheme involves the introduction of a bonus before commencement of construction. A pre-designated group, e.g. the environmental officer and/or the local community/property owners and/or fellow workers, monitor compliance/transgressions. Every transgression carries a fine with a pre-determined value. These fines are subtracted from the bonus and the balance is divided between workers at the end of the construction period. All contraventions are displayed in the site-office together with the name of the “offender”. The rationale for this system is to promote peer-group monitoring and penalizing. According to Schoeman this is usually effective, as all would benefit from keeping the bonus at the maximum. In order to keep motivation levels high it could be a consideration that the bonus period be reduced to one year, or even six months.

*Construction phase with mitigation:*

It is unlikely that mitigation measure will significantly change this impact.

*Operational phase with mitigation:*

It is unlikely that mitigation measure will significantly change this impact.

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### 3.7. Risk of STDs, HIV and AIDS

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#### ***Description of the impact***

An increase in the risk of sexually transmitted diseases, HIV and AIDS.

It is well documented that an increase in the risk of STDs, HIV and AIDS is associated with an influx of workers, particularly migrant workers, and/or any increase in truck traffic into or through an area (Alam M.K., Undated) as well as )Kulis M. C Koziarkiewicz M & Subata E. Undated). These risks are usually particularly high in 'greenfield' areas and are compounded by high levels of poverty. Apart from this the possibility of recruiting a significant number of workers from outside of the local area, exists. Consequently, the likelihood of the nuclear power station having any significant negative impact on the prevalence of STDs, HIV and AIDS in the areas, is possible.

The perception that the proposed nuclear power station could contribute to the occurrence of HIV and AIDS is clear in the following statement:

*"We have a relatively low incidence of Aids in this area (Bantamsklip) because of our isolated situation, and an increase in the numbers of people from other areas would most certainly exacerbate this problem." Strandveld Farmers Association September 2008.*

#### ***Assessment of the impact***

*Construction phase without mitigation:*

##### *Duynefontein*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of medium-term duration, irreversible and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.11 below.

##### *Bantamsklip and Thyspunt*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of medium-term duration, irreversible and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.11 below.

*Operational phase without mitigation:*

This impact only applies to the construction phase of the development. During the operation phase the staff of Eskom will function in an integrated way as part of existing communities. It is therefore not foreseen that there will be an increase the the risk of sexually transmitted diseases, HIV and AIDS.

**Table 3.11: Risk of STDs, HIV and AIDS without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Site	Duynfontein	Bantamsklip	Thyspunt	Duynfontein	Bantamsklip
Cumulative	Medium	Medium	Medium	N/A	N/A	N/A
Nature	Negative	Negative	Negative	N/A	N/A	N/A
Extent	Local	Local	Local	N/A	N/A	N/A
Duration	Medium-term	Medium-term	Medium-term	N/A	N/A	N/A
Intensity	Medium	Medium	Medium	N/A	N/A	N/A
Consequence	Medium	Medium	Medium	N/A	N/A	N/A
Probability	Probable	Highly Probable	Highly Probable	N/A	N/A	N/A
Significance	Medium	Medium	Medium	N/A	N/A	N/A
Reversibility	High	High	High	N/A	N/A	N/A
Irreplaceable	No	No	No	N/A	N/A	N/A
Confidence	Medium	Medium	Medium	N/A	N/A	N/A

**Mitigation objective:** To manage risks associated with STDs, HIV and AIDS.

*Mitigation measures:*

- In consultation with local and international HIV and AIDS organisations and government structures, design and implement an STD, HIV and AIDS awareness and prevention campaign. This campaign should utilise various common practice methodologies in order to ensure social and cultural sensitivity;
- Where possible, attempt to minimise population influx by utilising local labour;
- State STD and HIV and AIDS awareness and prevention programmes as a condition of contract for all suppliers and sub-operators;
- Provide an adequate supply of free condoms to all workers. Condoms should be located in the bathrooms and other communal areas on the construction site;
- A voluntary counselling and testing programme should be introduced during the construction phase and should continue during operations; and
- Undertake a voluntary STD and HIV and AIDS prevalence survey amongst all workers on a regular basis. This would involve a voluntary test made available to 100% of the workforce. The results of the survey will assist in determining the HIV and AIDS and STD strategy. When results are obtained (on assumption that the results are statistically representative), the results should be made available to management and workers at the same time. Results should be presented as statistical returns that ensure confidentiality.

*Construction phase with mitigation:*

If, during the construction phase, mitigation measures are successfully implemented, this may result in the significance changing from medium to low.

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## 3.8. Municipal Services

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### Description of the impact

It is probable that the new nuclear power station and residential development will place strain on municipal services such as water, sanitation, roads, waste and refuse removal.

***It is generally accepted fact that local municipalities have limited capacity and resources to cope with the growing demand, and therefore additional support and investment is needed when large projects are initiated.***

***The costs of providing local services would be part of the costs associated with the normal incremental growth of a town. Municipalities are responsible for providing specific services, but these costs are covered by user charges (the monthly municipal bills to householders and firms. New houses would have to pay municipal rates which would result in an enhanced revenue stream to the municipality. In addition to this, Eskom is willing to invest in the upgrade of infrastructure such as sewerage treatment facilities.***

#### *Water and Sanitation*

Increasingly stressed water and sewer infrastructure are impairing sustainable service delivery, social development and economic growth within the three study areas.

Based on an estimated 8 737 housing opportunities, the total initial additional water demand on the system is an estimated 4 000 kl/day. The permanent housing opportunities, once the nuclear power station becomes operational, will reduce the additional demand to 1 000 kl/day.

The initial additional domestic sewerage production is estimated at 3 200 kl/day.

The reality is that all the infrastructure requirements cannot be met simultaneously, given the limitations of the current budget and the financing models of municipalities. The objectives include: reducing services backlogs, giving bulk water and sewer infrastructure priority and developing an integrated approach to infrastructure, service planning and budgeting.

The concern raised is the capacity of water and sanitation services required for the construction and operations of the nuclear power station as well as the services and infrastructure to the residential areas to be developed to accommodate the staff and construction workers.

### Duynfontein

#### Water and sanitation infrastructure for residential development:

Cape Town and the immediate region's sustainable water supply are being threatened by a combination of growth and development, uncontained demand and unrealistically low tariffs. Water demand management must reduce water consumption in view of the possible impacts of climate change, population growth and a pattern of increasing consumption

#### Bulk Water:

A significant amount of capital investment in infrastructure is required in the northern growth areas to ensure that these areas have sufficient supply for the future and that the risk of imposing restrictions in the short to medium term is reduced. It is critical that sufficient funds be made available for the Northern areas Augmentation Scheme.

#### Reticulation Infrastructure:

Major funding is required to replace and extend the reticulation infrastructure, especially in the growth areas. (Sources: WSDP Cape Town and Draft Blaauwberg Spatial Development Plan, 2009).

### **Bantamsklip**

#### Water and sanitation infrastructure for residential development:

Although the Overstrand has a potential for growth at much higher rates, failure to improve the current state of infrastructure poses a serious threat to the local economy. The deterioration of networks in the coastal areas and rapid development, which is not matched by growing capital expenditure, further exacerbates the situation. Adequate rehabilitation and maintenance of the existing infrastructure is critical in order to ensure the medium to long term sustainability of the existing infrastructure. The Overstrand Municipality is currently also busy with the development of groundwater sources for the Greater Hermanus area, in order to address the water shortages threat of the area. (Overstrand Water and Sanitation Development Plan, 2009/2010).

Pearly Beach and Buffelsjag are supplied with water from boreholes. Gansbaai and Franskraal are supplied from the Kraaibos Dam treatment works. No spare capacity exists for supply of water to Bantamsklip. (Civil Engineering Technical Report: Bantamsklip Site, Eskom, 2008).

The current Water Master Plan for the Overstrand Municipality does not include the development of a nuclear power station at Bantamsklip. It is therefore assumed that:

- Additional water supply capacity will have to be provided at the Kraaibos Dam treatment works;
- The existing waste water treatment facility at Gansbaai will have to be augmented to cater for the increased load;
- The peak freshwater requirement for the site is taken as 100 l/s, which gives 8 640 kl/day; and
- To ensure a constant supply to the nuclear power station, a 48 h storage reservoir is required on site. The capacity of the reservoir is therefore  $\approx$  20 MI.

(Input to EIA Regarding the Fresh Water Requirements of Nuclear-1 on the Bantamsklip Site, Eskom, 2008.)

### **Thyspunt**

#### Water and sanitation infrastructure for residential development:

The following two statements were made by the St. Francis Bay Residents Association and the St. Francis Kromme Trust to emphasise their concern:

*“The Greater St. Francis area is not well served in terms of infra-structure. Its water supply is dependent on two sources, namely the pipeline from the Churchill dam, and a series of*

*vulnerable boreholes. The pipeline is dependent on the good will of the NM Metro, who has the right to refuse supply under drought conditions.*

*Prior to installation of the pipeline, the boreholes were not well maintained by the local authority, and responsibility for this was passed on to the Links Golfing Estate, under conditions which have never been revealed to the local community. Furthermore, some of these boreholes are situated on an aquifer immediately below the area currently used as a bush toilet by the present informal community, in the absence of suitable sanitary facilities! The two communities cannot afford to have a huge population influx without significant up-grade of fresh water supply. The potential source is not immediately apparent and in fact it seems impossible to provide the requirements when the current shortages in the area are considered.”*

*“Only a small portion of the town is currently on water-borne sewerage, and the existing plant is already over-stretched. Any significant increase in population will overload this facility unless it is substantially up-graded.”*

#### Water:

The region generally relies largely on springs and water from underground aquifers for its supply. In addition, the Impofu and Churchill Dams, which provide treated water to Port Elizabeth via the Churchill pipeline, supply water to a number of towns in the planning areas during peak consumption periods. These towns include Humansdorp, St. Francis Bay, Cape St. Francis and Jeffery’s Bay. The Kouga Dam is the main source of water supply to Hankey and Patensie. The rapid population growth in the Kouga region over the last 10 years is placing increased pressure on the region’s water resources, resulting in shortages during peak holiday seasons. Approximately 22% of the population of the Kouga Municipality do not have access to water on site and make use of public taps, standpipes or rainwater.

When considering the backlog, the municipality has taken cognisance of an additional element, viz. the ability to maintain the existing infrastructure. Subsequently, operational budget to attain effective repairs and maintenance programmes has been allocated.

#### Sanitation:

Methods of sewerage reticulation and treatment in the various urban and rural areas differ substantially. Most of the formal and middle to high income residential areas are equipped with waterborne sanitation systems. In some cases informal areas are still served with buckets or pit latrines. It is estimated that approximately 1 181 households do not have access to sanitation services in the Kouga region. A further 5 156 households make use of pit latrines and bucket systems. Pit latrines and septic tanks are the most common methods in the non-urban areas. (Kouga Integrated Development Plan 2009 – 2012).

### **Assessment of the impact**

*Construction phase without mitigation:*

#### Duynefontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of medium-term duration, reversible and of medium consequence and significance. The degree of confidence in the assessment is high.

### Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is definite, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.12 below.

*Operational phase without mitigation:*

### Duynefontein, Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity low. This impact is possible, of short-term duration, high reversibility and of low consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.12 below.

**Table 3.12:** Water and sanitation without mitigation

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	Medium	Medium	Medium	Low	Low	Low
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Extent	Local	Local	Local	Local	Local	Local
Duration	Medium-term	Medium-term	Medium-term	Short-term	Short-term	Short-term
Intensity	Medium	Medium	Medium	Low	Low	Low
Consequence	Medium	Medium	Medium	Low	Low	Low
Probability	Probable	Definite	Definite	Possible	Possible	Possible
Significance	Medium	Medium	Medium	Low	Low	Low
Reversibility	Low	Low	Low	High	High	High
Irreplaceable	No	No	No	No	No	No
Confidence	Medium	High	High	Medium	High	High

### **Mitigation objective:**

To reduce services backlogs, give bulk water and sewer infrastructure priority and develop an integrated approach to infrastructure, service planning and budgeting in such a way that the proposed nuclear power station do not cause capacity problems.

### *Mitigation measures:*

- Liaise closely with the appropriate municipal, provincial and other relevant authorities;
- Ensure that a proper plan is in place well before any development process commences;
- Ensure that all essential services are in place prior to the development;
- Ensure that non-essential facilities are upgraded in accordance with the development;
- Ensure that the implementation process is carefully monitored and that any disruptions are immediately identified and appropriately managed; and
- Ensure that all affected communities is kept well informed of the process and of all significant dates attached to the development process.

### *Construction and operational phase with mitigation:*

If mitigation measures are effectively implemented, it is likely that the significance will be reduced to low.

### **Description of the impact**

#### *Roads and Transport*

The concern is the capacity of roads and transportation infrastructure required for the construction and operations of the nuclear power station.

The following information was obtained from the Transport Specialist Study, September 2009:

#### Duynefontein

Proper planning for the internal road network to accommodate future residential development will need to be performed once the location of such development areas is known. Existing road networks are servicing currently developed areas and new infrastructure will need to be created.

#### Existing Bus Service:

Data obtained from the City of Cape Town's 2003/2004 Current Public Transport Record indicates that the site is located within easy access of the existing bus services. The main public transport mode is bus, serving the existing Koeberg Power Station via the Main Access Road and the Duynefontein Access.

The bus routes are concentrated along the R27. Two sheltered bus stops are located within 50 m of Access 1 along the R27 and a transport interchange area is located on-site adjacent to the visitors parking.

The R27 has 51 bus routes with a maximum utilisation of 115% on the route to Hanover Park. There is adequate capacity on the other routes on the R27 to accommodate additional trips to the site. However, additional services may need to be provided on the Hanover Park route.

The routes operating along the Main Access Road and Ou Skip Road have adequate capacity to accommodate additional passengers. However, the route from Koeberg Power Station to Pella is currently operating close to capacity and additional trips may need to be provided on this route.

The proposed restructuring of public transport and the introduction of IRT routes should, however, be taken into account before the introduction of new services.

#### Existing Minibus Taxi Service:

The CPTR shows that the proposed Nuclear-1 site is also located within easy access of the existing minibus taxi routes. The secondary public transport mode is the minibus taxi service serving the existing Koeberg Power Station via the Main Access Road and the Duynefontein Access.

The R27 has 26 minibus taxi routes, with the Main Access Road and Ou Skip Road with 1 and 4 minibus taxi routes respectively. However, the bus mode appears to dominate along the R27.

### Access to the nuclear power station:

Construction vehicle access is proposed to be via the existing R27 / Emergency Access Road intersection (Access 2) to isolate the Nuclear-1 construction vehicle impact on the normal traffic operations of the Koeberg Nuclear Power Station as well as from the proposed PBMR construction traffic.

A modal split of 30% private transport, 20% minibus taxis and 50% buses was utilised. It was assumed that special transport services, such as contract bus services would be used as a result of the nature the area and the nature of the operations of the construction phase. These services would have to be provided by Eskom for the duration of the construction phase, thereby reducing the usage of private vehicles.

Intersection analysis was performed and the following main intersections need upgrading:

- R27 / Main Access Road (Access 1);
- R27 / Napoleon Street;
- Ou Skip Road / Narcissus Avenue (Access 3);
- Ou Skip Road / Main Access Road;
- R27 / Access 2; and
- Ou Skip / Access 2.

Detailed traffic detours and logistics should be investigated in a comprehensive Traffic Management Plan, which should also include a specific plan for transporting at night. The frequency of the exceptionally heavy load trips is currently unknown.

The R27 can be considered as an existing heavy load road. The expected daily trip frequency of normal heavy loads during the construction period is currently unknown. The suitability of the R27 to accommodate the increased normal heavy load trips should be investigated once this information is available.

The 30% private transport and 70% public transport modal split results in approximately 900 temporary parking bays required for the duration of the Nuclear-1 construction phase.

This parking requirement is dependent on the public transport service in operation during the construction phase and the type of special transport shuttle services which should be provided by Eskom for the construction workers.

A total of 38 minibus taxis and 24 buses are required to transport workers to the site during the AM and PM peak periods.

### Bantamsklip

Proper planning for the internal road network to accommodate future residential development will need to be performed once the location of such development areas is known. Existing road networks are servicing currently developed areas and new infrastructure will need to be created.

The main public transport mode within the area is minibus taxi, which serves the beach resort towns of Gansbaai and Pearly Beach.

Buses are predominantly utilised for the transportation of learners and organised parties and do not fulfil a commuter function as minibus taxis do. Buses are also contracted to transport employees. Tour buses are used for the transportation of exclusive groups.

Public transport facilities are currently provided in Hawston and Hermanus. No formal public transport facilities are provided in Gansbaai or Pearly Beach or in close proximity to Bantamsklip. Where required, workers are mostly transported by their employers in light delivery vehicles or trucks.

The Overberg District Municipality's Integrated Transport Plan found that 58% of people who travel use non-motorised transport (bicycle or walking). However, there is a lack of non-motorised transport facilities like pedestrian routes and cycle routes. It has identified that the promotion of public transport and non-motorised transport is a priority.

Transport of the exceptionally heavy loads via a barge will have to be considered from Table Bay Harbour directly to a suitable area on the beach close to the Nuclear-1 site at Bantamsklip. The distance from Cape Town Harbour to Bantamsklip is approximately 150 km. Suitable landing and loading / off-loading facilities, appropriate for a barge, would have to be constructed along the beach. ***This is one option amongst various other possibilities that need to be considered.***

During the construction phase, construction workers will not use public transport, but will utilise contracted buses. A total of 38 minibus taxis and 24 buses are required to transport workers to site during the AM and PM peak periods.

#### Thyspunt

The following two statements were made by the St. Francis Bay Residents Association and the St. Francis Kromme Trust to emphasise their concern:

*"This [road access] is one of the key areas affecting social impact. Here again, we are surrounded with uncertainties and rumours. On probing from Eskom officials, it emerged that access to the site may be via the Oyster Bay Road, or via St. Francis Bay, or that there may be more than one route, one for heavy transport and one for commuter and lighter traffic. The heavy transport will include occasional loads of up to 750 tons, but a continuous stream of building materials, concrete mixers, steel etc 24 hours a day, seven days a week for ten years."*

*"Should a decision be made to access the site via the Kromme River Bridge and St. Francis Bay, to include heavy transport, it will virtually render properties along the route unfit for human habitation. This will impact on properties situated on the Kromme River and close to the bridge, lower parts of the Links Golf Estate, Homestead Village and parts of Sea Vista RDP housing area. This would be intolerable."*

Proper planning for the internal road network to accommodate future residential development will need to be performed once the location of such development areas is known. Existing road networks are servicing currently developed areas and new infrastructure will need to be created.

#### Access to the nuclear power station:

The NSIP Eastern Cape Summary Report identified two access routing options from Humansdorp to Thyspunt. One of the access route options identified, is via the un-surfaced Oyster Bay Road from Humansdorp towards Oyster Bay (Route 1). A new road will then

have to be constructed from the Oyster Bay Road, approximately 5 km from Oyster Bay, crossing the mobile dune system towards the site.

If the movement of exceptionally heavy loads is required, Eskom will undertake a detailed study of the transportation route from Port Elizabeth harbour to the Thyspunt site.

However, a preliminary assessment of the route from Port Elizabeth Harbour to the site was undertaken as part of the Transport Specialist study.

A comprehensive traffic management plan will be required to minimise the impacts on normal daily traffic.

Internal pedestrian trips are expected to increase during the construction phase; low speeds should be maintained to ensure safety.

### ***Assessment of the impact***

*Construction phase without mitigation:*

#### *Duynefontein*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 6.13 below.

#### *Bantamsklip and Thyspunt*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.13 below.

*Operational phase without mitigation:*

#### *Duynefontein, Bantamsklip and Thyspunt*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity low to medium. This impact is probable, of long-term duration, low reversibility and of low consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.13 below.

**Table 3.13: Roads and transport without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Site	Duynfontein	Bantamsklip	Thyspunt	Duynfontein	Bantamsklip
Cumulative	Low	Medium	Medium	Low	Low	Low
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Extent	Local	Local	Local	Local	Local	Local
Duration	Medium-term	Medium-term	Medium-term	Long-term	Long-term	Long-term
Intensity	Medium	Medium	Medium	Low	Medium	Medium
Consequence	Medium	Medium	Medium	Low	Low	Low
Probability	Probable	Highly probable	Highly probable	Probable	Probable	Probable
Significance	Medium	Medium	Medium	Low	Low	Low
Reversibility	Low	Low	Low	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	Medium	High	High	High	High	High

**Mitigation objective:**

To plan, fund and develop roads and transportation infrastructure as required for the construction and operations of the nuclear power station as well as roads and transportation infrastructure to the residential areas to be developed to accommodate the staff and construction workers.

*Mitigation measures:*

- Proper planning (ITP – Integrated Transport Plan) for the internal road network to accommodate future residential development will need to be performed once the location of such development areas is known;
- Liaise closely with the appropriate municipal, provincial and other roads and transport authorities such as Taxi Associations;
- Provision of special transport services, such as bus services would be required during the construction phase; and
- Provision of parking and stop facilities for public transport services in operation during the construction phase and the type of special transport shuttle services which could be provided by Eskom for the construction workers.

*Construction phase with mitigation:*

If mitigation measures are successfully implemented, the significance of the impact should revert to that of low.

## **Description of the impact**

### **Waste and Refuse Removal**

The concern deals with the capacity of Land Fill Sites and Waste Transportation required for the construction and operations of the nuclear power station, as well as the services and infrastructure to the residential areas to be developed to accommodate the staff and construction workers.

### **Duynefontein**

Two waste disposal sites exist in District B, one operated by the City of Cape Town and the other by Waste-Tech (Pty) Ltd. A buffer zone of 800 m, limiting residential development, is implemented for health reasons and unacceptable nuisance levels emanating from the site. Recent correspondence from Waste-Tech (Pty) Ltd has indicated that further limits on types of industrial use within the buffer zone may be required to ensure compatibility with the operations of the waste site. In addition, the City of Cape Town has submitted an application to expand the disposal site northwards.

There is a critical shortage of landfill space in the City of Cape Town, as a number of existing facilities are rapidly reaching capacity. As a result, there is a dire need to establish new landfill sites for this area to accommodate its waste. The City of Cape Town embarked on a process to identify suitable new landfill sites. This process identified a preferred site (as a result of an EIA process) to the south of Atlantis. However, the final record of decision from the Department of Environmental Affairs and Development Planning has approved the alternative site at Kalbaskraal. (Draft Blaauwberg Spatial Development Framework, 2009).

Solid waste, excluding radioactive waste, will be transported to and disposed of, at off-site solid waste dumps. A number of waste dumps may need to be identified depending on the type of materials being discarded. This waste relates to construction debris (generated during the construction of the power plant and which comprises concrete and steel) as well as domestic waste generated from the canteens on site (which will cater for the construction workers).

Low Level Waste and Intermediate Level Waste will be controlled within the radiological zones of the power plant and will be shipped to a long term storage site such as Vaalputs, as prescribed by the Eskom operating procedures. The quantity of waste will depend on the operating procedures in force at the power plant. Estimation may be based on the quantities generated by Koeberg nuclear power station scaled by the ratio of power output (for the entire year of 2008, 252 concrete drums, containing mostly Intermediate Level Waste, and 760 steel drums, containing Low Level Waste, will be removed from Koeberg nuclear power station. (Civil Engineering Technical Report: Duynefontein Site, Eskom, 2008).

### **Bantamsklip**

Disposal of municipal solid waste in Overstrand is practiced at the regional Karwyderskraal as well as the local Gansbaai Landfills in accordance with all the relevant legislation. A number of closed waste sites are still to be rehabilitated.

The communities of Greater Hermanus and Greater Kleinmond have access to a waste transfer station for convenient drop-off of their non-collected wastes, such as garden wastes, general "Saturday-wastes" and household hazardous wastes.

A waste collection service is provided by the municipality for all residents in urban areas. All formal residential erven are receiving a weekly door-to-door collection service.

Overstrand Municipality currently utilises two licensed landfills for general waste, i.e. the Gansbaai Landfill and the regional Karwyderskraal Landfill. The Gansbaai landfill is located on Part of Portion 210 of Gansbaai and obtained an operating permit in accordance with the Environmental Conservation Act on 30 March 1999 and is classified as a G:M:B- landfill. (Overstrand IDP, 2009 2012).

The situation regarding the impact of solid waste generated at the nuclear power station in Bantamsklip, is the same as the case for Duynefontein as mentioned in the previous paragraph.

### **Thyspunt**

There are no official records of waste generation volumes for the Kouga Municipality as there is no electronic data information system in place. The temporary visitors over the Christmas holiday period had a large influence on the waste generated and an estimate for the waste they generated was also determined.

Illegal disposal of waste occurs within all wards of the Kouga Municipality. The impact of the weekly collection programme of domestic waste hardly impacts on the illegal disposals. Waste is also burnt. The lack of a proper by-law system on solid waste prohibited policing on the indiscriminating of illegal waste disposal activities.

The situation regarding the impact of solid waste generated at the nuclear power station in Thyspunt, is the same as the case for Duynefontein and Bantamsklip as mentioned in the previous paragraphs.

### ***Assessment of the impact***

*Construction phase without mitigation:*

#### *Duynefontein, Bantamsklip and Thyspunt*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of medium-term duration, reversible and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.14 below.

*Operational phase without mitigation:*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of long-term duration, low reversibility and of low consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.14 below.

**Table 3.14: Waste and refuse removal without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Site	Duynfontein	Bantamsklip	Thyspunt	Duynfontein	Bantamsklip
Cumulative	Low	Medium	Medium	Low	Low	Low
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Extent	Local	Local	Local	Local	Local	Local
Duration	Medium-term	Medium-term	Medium-term	Long-term	Long-term	Long-term
Intensity	Medium	Medium	Medium	Medium	Medium	Medium
Consequence	Medium	Medium	Medium	Low	Low	Low
Probability	Highly Probable	Highly probable	Highly probable	Probable	Probable	Probable
Significance	Medium	Medium	Medium	Low	Low	Low
Reversibility	Low	Low	Low	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	Medium	Medium	Medium	Medium	Medium	Medium

**Mitigation objective:**

To provide sufficient Land Fill Sites and Waste Transportation for the construction and operations of the nuclear power station, as well as refuse removal services to the residential areas to be developed to accommodate the staff and construction workers.

*Mitigation measures:*

- Municipality need to update the Municipal IWMP (Integrated Waste Management Plan) to provide for all the waste needs; and
- Ensure that proper public participation processes are followed during the IWMP update (as prescribed in provincial and national guidelines for IWMPs)

*Construction and operational phase with mitigation:*

If mitigation measures are successfully implemented, the significance of the impact should revert to that of low.

**3.9. Traffic impacts**

***Description of the impact***

Increased vehicular movement during the construction phase may influence daily living and movement patterns of community members in the surrounding communities.

Depending on the access routes that are utilised, construction vehicles could impact on safety and daily movement patterns of residents in surrounding communities. The magnitude of this impact will depend on current traffic volumes, traffic volumes that will be associated with construction activities, as well as construction schedules.

A separate transport study was conducted to assess the impact of construction activities on traffic as part of the EIA.

### **Duynefontein**

The main public transport mode is by bus, with a secondary minibus taxi service serving the existing KPS via the Main Access Road and the Duynefontein Access. The existing nodal split to and from the KNPS is currently 70% private transport and 30% public transport. Two bus stops are located within 50 m of Access 1 along the R27 and a transport interchange area is located onsite adjacent to the visitors parking (Transportation Impact Assessment, July 2008).

It will be required that Site Contractors supply their employees at all times with safe bus transport that complies with all relevant legal requirements. The Site Contractors will transport local and seconded employees, from pre-arranged collection and drop-off points, to and from the Project Site daily.

Vehicular movement during the construction phase is likely to exacerbate existing traffic congestion problems, notably during peak hour traffic (thus impeding daily living and movement patterns). The intensity of obstruction of normal traffic flow will depend on whether traffic associated with construction activity coincides with peak periods and which routes will be used.

### **Bantamsklip**

The Overstrand Local Municipality experiences a large influx of holiday makers during the summer holidays. On average, a 50% increase in vehicular traffic and a 100% increase in pedestrians are experienced in this period.

The existing road network has sufficient capacity to carry existing traffic and should be able to do so for the foreseeable future. One outstanding exception, however, is the portion of the R43, between Hawston and Hermanus. Delays in excess of 30 minutes are experienced during weekday peak hours, with increasing delays during holiday periods.

Public transport facilities are currently provided in Hawston and Hermanus. No formal public transport facilities are provided in Gansbaai or Pearly Beach or in close proximity to Bantamsklip. Where required, workers are mostly transported by their employers in light delivery vehicles or trucks.

As with Duynefontein, it will be required that Site Contractors supply their employees at all times with safe bus transport that complies with all relevant legal requirements. The Site Contractors will transport local and seconded employees, from pre-arranged collection and drop-off points, to and from the Project Site daily.

### **Thyspunt**

Thyspunt requires significant transport upgrades with regard to public transport and access during the construction phases.

The western access road may have an impact on the Umzamuwethu settlement due to its proximity and the fact that a large number of residents do not make use of motorised transport. ***Recommended safety and mitigation measures of Traffic Study will ensure safety of people crossing the road.***

As with the two other sites, it will be required that Site Contractors supply their employees at all times with safe bus transport that complies with all relevant legal requirements. The Site Contractors will transport local and seconded employees, from pre-arranged collection and drop-off points, to and from the Project Site daily.

### **Assessment of the impact**

*Construction phase without mitigation:*

#### Duynfontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of medium-term duration, reversible and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.15 below.

#### Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of medium-term duration, reversible and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.15 below.

**Table 3.15: Traffic impact without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Duynfontein	Bantamsklip	Thyspunt	Duynfontein	Bantamsklip	Thyspunt
Cumulative	Medium	Medium	Medium	N/A	N/A	N/A
Nature	Negative	Negative	Negative	N/A	N/A	N/A
Extent	Local	Local	Local	N/A	N/A	N/A
Duration	Medium-term	Medium-term	Medium-term	N/A	N/A	N/A
Intensity	Medium	Medium	Medium	N/A	N/A	N/A
Consequence	Medium	Medium	Medium	N/A	N/A	N/A
Probability	Probable	Highly probable	Highly probable	N/A	N/A	N/A
Significance	Medium	Medium	Medium	N/A	N/A	N/A
Reversibility	Low	Low	Low	N/A	N/A	N/A
Irreplaceable	No	No	No	N/A	N/A	N/A
Confidence	Medium	Medium	Medium	N/A	N/A	N/A

### **Mitigation objective:**

To optimise vehicular movement during the construction phase and minimize traffic congestion problems in the area, which in turn influences daily living and movement patterns of community members in the surrounding communities who make use of these roads.

*Mitigation measures:*

- Construction activities should be planned to minimise added disruption of traffic, especially during peak hours;

- Workshops with relevant parties (i.e. Contractors, sub contractors, Eskom, Municipality, Community Liaison Forum, etc.) should be held to discuss problems and implement relevant improvements, especially during construction phases;
- Mitigation measures listed in the traffic impact assessment should be implemented and monitored; and
- Impacts on pavement loading should be mitigated after completion of construction by possible contribution to the roads rehabilitation programme by Eskom.

*Construction phase with mitigation:*

If mitigation measures are successfully implemented, the significance of the impact should revert to that of low.

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### **3.10. Noise and dust Impact**

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#### ***Description of the impact***

Increased levels of noise and dust may impact negatively on the quality of life of people living close to the proposed nuclear power station site.

The movement of construction vehicles could contribute to increased levels of dust in the area and could further be aggravated by strong winds blowing in the area. Excavation and spoil dumps during construction may also contribute towards increased dust levels.

These impacts are assessed in separate specialist studies but noted here for social significance.

#### **Duynefontein**

The following information was obtained from the Noise Impact Study undertaken by Jongens, Keet Associates (September 2009):

#### **Construction and operation activities:**

The closest occupied noise sensitive land that might potentially be impacted upon by the proposed nuclear power station, is the residential suburb of Duynefontein, with the nearest residences approximately 1 800 m south of the existing nuclear plant and approximately 2 900 m south of the proposed Nuclear-1 infrastructure area. The closest distance of the infrastructure area to the R27 National Road would be 2 000 m.

The results of the study indicated that there would be no noise impact on land surrounding the property during site construction and operation of the nuclear power station. No noise mitigation procedures would therefore be required.

#### Transportation activities:

The impact of noise associated with transportation of materials and equipment to the site would have a low impact on the nearest residences located along the R27 leading to the Duynefontein site. No noise mitigation procedures would be required in terms of the NCR.

The transportation of heavy machinery on extra-heavy-duty vehicles travelling very slowly on roads within 1 000 m of residences is likely to result in a noise impact of medium intensity but of very short duration. Little can be done to reduce the levels of noise emitted by extra-heavy-duty vehicles. In order to minimize the noise impact on affected communities it is recommended that they be informed prior to any such transportation taking place.

#### Road construction activities:

Noise impact associated with the construction of new roads to the site was anticipated.

Dust generated from the area will be seen, particularly at night, as it will diffuse the light. Correct and effective dust suppression methods will reduce this visible element. The suppression techniques will include wetting down traffic areas and the paving of frequently used roads.

### **Bantamsklip**

#### Construction and operation activities:

The shortest distance to the property boundary is 1 125 m. The distance to the nearest noise sensitive land appears to be a farm with the farm boundary 3 200 m northeast of the Nuclear-1 infrastructure site. The nearest residential suburb of Pearly Beach is located some 7 350 m northwest of the infrastructure site.

The results of the study indicated that there would be no noise impact on land surrounding the property during site construction and operation of nuclear power station. No noise mitigation procedures would therefore be required.

#### Transportation activities:

The impact of noise associated with transportation of materials and equipment to site would have a medium impact on the nearest residences along the R43 to the Bantamsklip site. The impact on the nearest informal settlements along the R330 would be high. No noise mitigation procedures would be required in terms of the NCR.

#### Road construction activities:

No noise impact associated with the construction of new roads to the site was anticipated.

### **Thyspunt**

#### Construction and operation activities:

The nuclear power station site would be 4 200 m east of residential land at Oyster Bay. One farm residence is situated just outside of the HV yard boundary. The remaining two farm residences are each situated approximately 1 000 m from the proposed HV yard.

The results of the study indicated that there would be no noise impact on land surrounding the property during site construction and operation of nuclear power station. No noise mitigation procedures would therefore be required.

Transportation activities:

The impact of noise associated with transportation of materials and equipment to site would have a high impact on the nearest informal settlement, Umzamuwethu, along the R330. No noise mitigation procedures would be required in terms of the NCR.

Road construction activities:

No noise impact associated with the construction of new roads was anticipated for the western access road to the Thyspunt site that would pass within 230 m of the Umzamuwethu Township.

**Assessment of the impact**

*Construction phase without mitigation:*

Duynefontein, Bantamsklip

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature neutral, and the intensity low. This impact is improbable, of short duration, reversible and of low consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.16 below.

Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of short duration, reversible and of low consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.16 below.

**Table 3.16: Noise and dust impact without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
Site	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	Low	Low	Medium	N/A	N/A	N/A
Nature	Neutral	Neutral	Negative	N/A	N/A	N/A
Extent	Local	Local	Local	N/A	N/A	N/A
Duration	Short-term	Short-term	Medium-term	N/A	N/A	N/A
Intensity	Low	Low	Medium	N/A	N/A	N/A
Consequence	Low	Low	Medium	N/A	N/A	N/A
Probability	Improbable	Improbable	Probable	N/A	N/A	N/A
Significance	Low	Low	Medium	N/A	N/A	N/A
Reversibility	Low	Low	Low	N/A	N/A	N/A
Irreplaceable	No	No	No	N/A	N/A	N/A
Confidence	Medium	Medium	Medium	N/A	N/A	N/A

**Mitigation objective:** To limit disturbance and psychological effects of noise and dust pollution.

*Mitigation measures:*

- ***Detail mitigation measures are described in the Noise and Air Quality Specialist Reports (2010).***

*Construction phase with mitigation:*

If mitigation measures are successfully implemented, the significance of the impact should revert to that of low.

*Operational phase without mitigation:*

This impact only applies to the construction phase of the development. . The results of the environmental noise impact study, September 2009 indicated that there would be no noise impact on land surrounding any of the three properties during site construction and operation of Nuclear-1.

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### **3.11. Loss of Employment after Construction**

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#### ***Description of the impact***

A number of jobs will be lost once construction of the nuclear power station has been completed.

The construction phase of the nuclear power station could stretch over a possible 10 year period after which certain construction related jobs, which require a different range of skills than those of operational phase jobs, will be lost. This is likely to result in an increase in unemployment as construction nears completion.

#### **Bantamsklip and Thyspunt**

Depending on the state of the economy at the time and, how other construction projects in the area unfold, it is possible that at some stage there will be a surplus of construction related skills in the job market which could possibly aggravate the unemployment situation amongst the local population.

#### **Duynefontein**

Although the area around the Duynefontein site is not excluded from the possibility of a surplus of construction related skills in the job market, with unemployment related effects, the assumption can be made that in the case of Duynefontein the impact will be less due to the higher economic growth trend and the possibility of new construction projects.

## Assessment of the impact

### Construction phase without mitigation:

#### Duynefontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of short-term duration, medium reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.17 below.

#### Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is definite, of short-term duration, medium reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.17 below.

### Operational phase without mitigation:

This impact only applies to the construction phase of the development.

**Table 3.17: Loss of employment after construction without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures			
	Site	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative		Medium	Medium	Medium	N/A	N/A	N/A
Nature		Negative	Negative	Negative	N/A	N/A	N/A
Extent		Local	Local	Local	N/A	N/A	N/A
Duration		Short-term	Short-term	Short-term	N/A	N/A	N/A
Intensity		Medium	Medium	Medium	N/A	N/A	N/A
Consequence		Medium	Medium	Medium	N/A	N/A	N/A
Probability		Highly probable	Definite	Definite	N/A	N/A	N/A
Significance		Medium	Medium	Medium	N/A	N/A	N/A
Reversibility		Medium	Medium	Medium	N/A	N/A	N/A
Irreplaceable		No	No	No	N/A	N/A	N/A
Confidence		Medium	Medium	Medium	N/A	N/A	N/A

**Mitigation objective:** To minimise the extent of jobs lost after construction.

*Mitigation measures:*

- Introduce training initiatives aimed at up-skilling, particularly unskilled and semi-skilled workers, during construction;
- Absorb as many workers into the operational phase of the project as is feasible;
- Transfer as many workers as possible to other related projects available;
- Eskom's declared policy is to transfer construction workers from Nuclear-1 to Nuclear 2 as the construction phases are likely to overlap. Such transfers might not always be possible, depending on the location of Nuclear 2, but should nevertheless be maximised wherever possible in order to mitigate the perceived adverse impacts of unemployment once the construction phase of Nuclear-1 is completed; and
- Introduce community self-help projects as part of the corporate social investment programme.

*Construction phase with mitigation:*

If mitigation measures are successfully implemented, the intensity of the impact should revert to that of medium.

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### **3.12. Visual impacts**

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#### ***Description of the impact***

The nuclear power station will change the visual character and quality of the setting according to the Visual Specialist Study (September 2009).

This change is due to the scale, the height above ground and the lateral extent of ancillary buildings. These large and extensive industrial type structures are located near existing large structures, the Koeberg nuclear power station, the associated transmission lines and the central store. Consideration needs to be given to how the new structures will compare to the existing plant; for example: will they be bigger or smaller?

The proposed structures can have the effect of compounding the visual impact or of reducing the contrast in scale of the buildings relative to the surrounding landscape and setting.

Ancillary structures and features were also assessed for their influence on the visual sense of place and their visual intrusion of the setting. These elements are the meteorological mast (120 m) and the radio mast (45 m), the transmission lines within the EIA corridor, the spoil and rock dumps and the access roads to the site from the provincial road.

The nuclear power station visual impact on the community is only one part of the impact. The visual impact of a possible Construction Village must also be considered, as well as the normal movement of large numbers of people in towns, community facilities, visits to recreational facilities etc.

## **Duynefontein**

The Visual Impact Assessment Study (September 2010) concluded that the Duynefontein nuclear power station will exert a significant visual impact on the existing visual condition and character of the local setting within a radius of 5 km. The meteorological and radio masts will be clearly visible on a cloudless day from at least 10 km away. The red light on top of the 120 m high meteorological mast will be visible at night from beyond 10 km. The climatic conditions will influence the masts' visibility as cloudy or misty conditions can almost totally obscure these elements.

Depending on the position of the Construction Village, the communities close to the Construction Village as well as visitors to the area may experience a Construction Village in a negative light.

## **Bantamsklip**

The Visual Impact Assessment Study (September 2010) concluded that the Bantamsklip Nuclear Power Station will exert a significant visual impact on the existing visual condition and character of the local setting within a radius of 5 km. The meteorological and radio masts will be clearly visible on a cloudless day from at least 10 km away. The red light on top of the 120 m high meteorological mast will be visible at night from beyond 10 km. The climatic conditions will influence the masts' visibility as cloudy or misty conditions can almost totally obscure these elements.

The main aspect that influenced this conclusion is the presence of the visually dominant nuclear power station and the associated transmission lines and buildings, all of which are visible to some degree from within a 10 km radius of the site. This is due to the landform that slopes towards the coastline and the prominent seaward location of the site on a coastal terrace. The visibility referred to here will be extended at night by the illumination of the plant.

The visual impact of a Construction Village close to any of the towns of Pearly Beach or Gansbaai will definitely impact on how people perceive the town or neighbourhood. The extent to which the Construction Village complies with the basic principles of sustainable human settlements, will further influence people's perception. The design and management of such a facility contribute towards the level of acceptance of such a large housing development with related facilities.

## **Thyspunt**

The Visual Impact Assessment Study (September 2010) concluded that the Thyspunt nuclear power station will exert a significant visual impact on the existing visual condition and character of the local setting within a radius of 5 km. The meteorological and radio masts will be clearly visible on a cloudless day from at least 10 km away. The red light on top of the 120 m high meteorological mast will be visible at night from beyond 10 km. The climatic conditions will influence the masts' visibility as cloudy or misty conditions can almost totally obscure these elements.

The visibility is contained along the coast by east-west oriented dune fields. This limits the visual exposure of the nuclear power station to the towns of Oyster Bay and Cape St. Francis. The main aspect that influenced the above conclusion is the presence of the visually dominant and the associated transmission lines and buildings, all of which are visible to some degree from within a 10 km radius of the site, but mainly along the coastal edge. This is due to the landform that includes vegetated and moving dunes that trend east-

west, almost parallel to the coastline and the extended visibility at night due to intense illumination of that site.

However the general existing coastal night scene is disturbed by the intense incandescent lights on the “chokka” boats as they fish for squid near the shore. The light intensity varies according to the season for “chokka” fishing.

Due to similar, and even enhancing, factors related to a Construction Village, careful selection of the site will be required. Placing a Construction Village close to Sea Vista may be perceived by community members that the neighbourhood is growing out of proportion if compared to the rest of the residential and natural area. Humansdorp as an alternative option may also have limitations depending on the design and placement of the Construction Village.

### **Assessment of the impact**

*Construction and operational phase without mitigation:*

#### Duynefontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is definite, of long-term duration, irreversible and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.18 below.

#### Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is definite, of long-term duration, irreversible and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.18 below.

**Table 3.18: Visual impact without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
Site	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	Low	Medium	Medium	Low	Medium	Medium
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Extent	Local	Local	Local	Local	Local	Local
Duration	Long-term	Long-term	Long-term	Long-term	Long-term	Long-term
Intensity	Medium	Medium	Medium	Medium	Medium	Medium
Consequence	Medium	Medium	Medium	Medium	Medium	Medium
Probability	Definite	Definite	Definite	Definite	Definite	Definite
Significance	Medium	Medium	Medium	Medium	Medium	Medium
Reversibility	Low	Low	Low	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	Medium	High	High	Medium	High	High

**Mitigation objective:** To limit the negative effects and the disturbance on the sense of place that the nuclear power station may have.

*Mitigation measures:*

- Implementation of the mitigation measures suggested by the visual impact study.

*Construction and operational phase with mitigation:*

The impact will not change during the operational phase.

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### **3.13. Impact on Social Infrastructure / Facilities**

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#### ***Description of the impact***

The likelihood of the proposed nuclear power station and residential development placing strain during construction and operation, on existing infrastructure such as medical facilities, police, schools and sport facilities.

#### ***Medical Facilities***

The findings of the baseline survey indicate that growth in the population will probably impact on the capacity of medical facilities within the local communities. The existing capacity of medical facilities is an issue that will need to be dealt with.

It is estimated that approximately 15 000 additional people will move into the proposed area of development. They will consist of construction workers, operational workers, administration and management staff during construction as well as during the operational phase.

There are shortcomings in existing medical services and facilities especially at Thyspunt and Bantamsklip.

#### **Duynefontein**

There are 35 hospitals located within 35km of the Duynefontein site. The nearest hospitals to the site are the Milnerton Medi-Clinic (22,04 km SSE) with 121 beds, and the Wesfleur Hospital in Atlantis (22,22 km NE) with 28 beds, and Blaauwberg Netcare Hospital (100 beds) The **Netcare** Hospital is within a 16km radius from the site.

It seems that the City of Cape Town has enough medical facilities to accommodate the need for day to day medical needs of the people. There will probably be more pressure on existing facilities but Cape Town has the potential to best absorb the additional workers. A considerable percentage of workers will be sourced from areas in Cape Town as they reside there.

## **Bantamsklip**

There are 4 hospitals within 80 km of Bantamsklip, two in Hermanus and two each in Caledon and Bredasdorp. One clinic is located in Stanford and one in Gansbaai. Two satellite clinics are operated in Baardskeerderbos and Eluxolweni.

An influx of 15 000 people into the area will have a considerable impact on the medical facilities' capacity in the Overstrand Area.

## **Thyspunt**

Humansdorp Hospital is a Public Private Partnership Hospital with 33 private beds and 70 general bed facilities. Approximately 35 nurses and 15 doctors are on the staff. Humansdorp Hospital is 20 km from the proposed Thyspunt site. It is the only hospital that serves patients from Oyster Bay, Cape St. Francis, St. Francis Bay, Jeffreys Bay and the rural areas.

The following statement, made by the St. Francis Bay Residents Association and St. Francis Kromme Trust, illustrates the level of concern amongst the community concerning the ability of existing medical facilities to cope with an influx of population likely to be brought about through the project.

*“Medical and other social services would be completely inundated. It would be necessary to increase these by about 50%, simply to maintain the status quo, which is already inadequate.”*

One clinic is situated in St. Francis Bay, which is utilized to its full capacity. It is serviced by two nurses who assist between 1 600 and 1 800 patients per month. Oyster Bay and Umzamuwethu receive one visit each, every three weeks, by a mobile unit.

## **Assessment of the impact**

*Construction phase without mitigation:*

### Duynfontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.19 below.

### Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.19 below.

*Operational phase without mitigation:*

*Duynefontein*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity low. This impact is possible, of long-term duration, low reversibility and of low consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 6.19 below.

*Bantamsklip and Thyspunt*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of long-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 6.19 below.

**Table 3.19: Impact on medical infrastructure/ facilities without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	Low	Medium	Medium	Low	Medium	Medium
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Extent	Local	Local	Local	Local	Local	Local
Duration	Medium-term	Medium-term	Medium-term	Long-term	Long-term	Long-term
Intensity	Medium	Medium	Medium	Low	Medium	Medium
Consequence	Medium	Medium	Medium	Low	Medium	Medium
Probability	Probable	Highly probable	Highly probable	Possible	Probable	Probable
Significance	Medium	Medium	Medium	Low	Medium	Medium
Reversibility	Low	Low	Low	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	High	High	High	High	High	High

**Mitigation objective:** Ensure sufficient medical facilities for growth in population.

*Mitigation measures:*

- The involved authorities, local municipality as well as the Department of Health should be notified about additional needs for medical care;
- Proper planning processes should be followed and provision of medical facilities should be based on the sustainable human settlement strategy; and
- The provision of health facilities for all staff involved as proposed for the Construction Village and Staff Village will be vital to ensure a sustainable human settlement;
- ***As in the case of the Medupi Legacy Programme, Eskom with Government Partnerships could invest in health and related services***

*Construction and operational phase with mitigation:*

If mitigation measures are successfully implemented, the significance of the impact should revert to that of low.

### **Description of the impact**

#### *Capacity of law enforcement agencies*

The existing law enforcement agencies do not have the capacity to deal with the increasing need for law enforcement services that growth in population numbers and residential development will bring. The existing capacity of Police Services in the different areas is an issue that will need to be addressed.

Based on interviews with Rate Payers Associations, landowners, farmers and members of the local communities, it is evident that the **capacity of Police Services is** currently under pressure.

#### **Duynefontein**

The closest Police Station to Koeberg is the Melkbosstrand Station, 7.5 km from the site. There is one Police Station at Atlantis, 13,67 km from the site, one station at Philadelphia, 14,06 km from the site and Table View Police Station, just outside the 16 km zone at 17,42 km.

#### **Bantamsklip**

The nearest Police Station to the Bantamsklip site is the one at Gansbaai **further than** 16 km. A possibility is the establishment of a Police Station at Pearly Beach, or a satellite station in close proximity of the proposed construction site.

#### **Thyspunt**

The one Police Station within 16 km in St. Francis Bay is very busy and any new developments in terms of population growth would require more staff and satellite offices in the area.

### **Assessment of the impact**

*Construction phase without mitigation:*

#### Duynefontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.20 below.

Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.20 below.

*Operational phase without mitigation:*

*This impact predominantly relates to the construction phase.*

**Table 3.20: Impact on social law enforcement services without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Duynfontein	Bantamsklip	Thyspunt	Duynfontein	Bantamsklip	Thyspunt
Cumulative	Low	Medium	Medium	N/A	N/A	N/A
Nature	Negative	Negative	Negative	N/A	N/A	N/A
Extent	Local	Local	Local	N/A	N/A	N/A
Duration	Medium-term	Medium-term	Medium-term	N/A	N/A	N/A
Intensity	Medium	Medium	Medium	N/A	N/A	N/A
Consequence	Medium	Medium	Medium	N/A	N/A	N/A
Probability	Probable	Highly probable	Highly probable	N/A	N/A	N/A
Significance	Medium	Medium	Medium	N/A	N/A	N/A
Reversibility	Low	Low	Low	N/A	N/A	N/A
Irreplaceable	No	No	No	N/A	N/A	N/A
Confidence	Medium	High	High	N/A	N/A	N/A

**Mitigation objective:** Ensure sufficient law enforcement services for growth in population.

*Mitigation measures:*

- The involved authorities, local municipality as well as the SAPS should be notified about additional needs for law enforcement services; and
- Proper planning processes should be followed and provision of law enforcement services should be based on the sustainable human settlement strategy.

*Construction phase with mitigation:*

If mitigation measures are successfully implemented, the significance and consequence of the impact should revert to that of low.

## **Description of the impact**

### *Capacity of local schools*

The findings of the baseline survey indicate that growth in the population will probably impact on the available capacity of local schools. Due to the influx of people into the area, the existing capacity of schools in the area is an issue that will need to be addressed.

It is estimated that 4 500 children will be present during the peak construction period of the nuclear power station. (Based on estimated construction workers and staff figures for the project: Nuclear-1, Consistent Dataset Eskom). If one therefore act upon a conservative figure of 2 500 children in need of education throughout the duration of the project, there is a shortage of capacity of two to three schools to accommodate their needs. A total of 1 629 children will probably attend primary schools and 871 children, secondary schools.

Some of the children will be sent to private schools and other schools. It is proposed that two schools, one primary and one secondary school, be built in the planned Staff Village for the nuclear power station (Nuclear-1 Consistent Dataset Eskom). It will then be possible that the secondary school in the staff village could absorb the need for secondary education.

The primary school would probably accommodate 500 to 700 children, which leaves a possible deficit of 929 children in need of schooling. These children should be absorbed either into existing schools in the area or more schools should be built.

However, it must be stated clearly that the position of the Department of Education is currently not known.

### **Duynfontein**

There are a total of 870 schools in the 80 km zone around Duynfontein. Within the 16 km zone there are 28 schools that accommodate 18 428 children. Schools are operating mostly at almost full capacity but it would probably be easier to absorb 929 children (based on the assumption that two schools are being built in the Staff Village) into the many available schools of Cape Town, but this would result in additional pressure being placed on these existing schools.

### **Bantamsklip**

The nearest schools in the Bantamsklip area are situated in Gansbaai. There are two primary schools and one secondary school in Gansbaai.

#### Masakhane Primary School:

The community of Masakhane is growing. The primary school in the township has 124 pupils and 3 fulltime teachers. The school operates at full capacity.

#### Gansbaai Primary:

Gansbaai Primary has 430 children and 24 teachers. The school operates at full capacity. Provision should be made for the development of more classes to accommodate more children.

### Gansbaai High School:

Gansbaai High School has 430 children and 20 teachers and operates at full capacity.

The schools in Gansbaai would not be able to absorb additional children from the nuclear power station.

### **Thyspunt**

A total of 710 children attend schools within 16 km from Thyspunt. There are only two primary schools within 16 km.

### Sandwater Primary:

Sandwater Primary school is situated in Umzamuwethu near Oyster Bay.

### Sea Vista Primary School

Sea Vista Primary is situated near Sea Vista in St. Francis Bay.

### Nico Malan High School:

A total of 1000 children attend the Nico Malan High School, and it operates at full capacity.

### Lungiso High:

This high school in Kwanomzamo, Humansdorp operates at full capacity of 950 children.

All other primary schools in Jeffreys Bay and Humansdorp operate at full capacity.

The existing schools are already operating at full capacity and some are over-populated with a 1/60 teacher-learner ratio. The schools within the Kouga Municipal Area will not be able to accommodate additional learners if the status quo is maintained.

The impact on Thyspunt can be emphasised by the following statement made by the St. Francis Bay Residents Association and the St. Francis Kromme Trust:

*“There is absolutely no way in which the local schools, which are already under-resourced, could cope. It would be necessary to build and staff several schools to accommodate such an influx. They would, of course, become redundant once the construction phase is over.”*

### **Assessment of the impact**

*Construction phase without mitigation:*

#### Duynefontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.21 below.

Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.21 below.

*Operational phase without mitigation:*

Duynefontein

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of long-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.21 below.

Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of long-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.21 below.

**Table 3.21: Impact on school infrastructure/ facilities without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	Low	Medium	Medium	Low	Medium	Medium
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Extent	Local	Local	Local	Local	Local	Local
Duration	Medium-term	Medium-term	Medium-term	Long-term	Long-term	Long-term
Intensity	Medium	Medium	Medium	Medium	Medium	Medium
Consequence	Medium	Medium	Medium	Medium	Medium	Medium
Probability	Probable	Highly probable	Highly probable	Probable	Highly probable	Highly probable
Significance	Medium	Medium	Medium	Medium	Medium	Medium
Reversibility	Low	Low	Low	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	Medium	High	High	High	High	High

**Mitigation objective:** Ensure sufficient school facilities for growth in learner population.

*Mitigation measures:*

- Provision should be made for schools to accommodate approximately 950 children into the area of the nuclear power station. This signifies that either existing schools should be enlarged, or a new schools should be built in the area where staff will be residing;
- ***Eskom could continue with their investment in school development based on the example of the Medupi Legacy Programme;***
- The provision of schools for the children of all staff involved, as proposed for the Staff Village (and possible other areas), will be vital to ensure a sustainable human settlement; and
- The relevant Department of Education should be made aware of the current schooling needs in the area as well as the potential impact that the proposed development will have on the status quo.

*Construction and operation phase with mitigation:*

If mitigation measures are successfully implemented, the significance of the impact should revert to that of low.

### ***Description of the impact***

#### *Capacity of Sport Facilities*

Sports facilities in the areas are unlikely to cope with the anticipated influx of people.

The findings of the baseline survey indicate that the growth in the population will possibly impact on the capacity of sport facilities in the different areas. Due to the inflow of people into the areas, the existing capacity of sport facilities is probably an issue to be dealt with.

The influx of an estimated 15 000 additional people in a relative short period of time would probably impact on the capacity of sport facilities. Based on interviews with Rate Payers Associations, landowners, farmers and members of the local communities, the capacity of sport and recreational facilities will be under pressure.

#### **Duynefontein**

There are 12 sport and recreational facilities in the immediate vicinity of the KNPS, ten in Atlantis and two in Melkbosstrand. This excludes a few smaller sport fraternities, such as cycling clubs, karate clubs, swimming clubs, judo and boxing clubs.

#### **Bantamsklip**

There is one soccer field and clubhouse at Pearly Beach within the 16 km area surrounding the Bantamsklip site. At Gansbaai, which falls just outside the 16 km zone, there is one soccer field and clubhouse at Masakhane, a rugby field and clubhouse at Blompark and a multi-functional sports facility.

## **Thyspunt**

At Oyster Bay, there is 1 tennis court. At Umzamuwethu, 6 km from the site, there is 1 rudimentary rugby field and 1 rudimentary soccer field. Cape St. Francis, 15 km from the site, has 2 tennis courts. Sea Vista, 15 km from the site, has a sport complex with two rugby/soccer fields, 2 netball courts and 1 spectator pavilion. St. Francis Bay, 14 km from the site, has 1 bowling green, 2 golf courses, 2 squash courts, 1 spinning centre and 1 links golf estate.

### ***Assessment of the impact***

*Construction phase without mitigation:*

#### *Duynefontein*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.22 below.

#### *Bantamsklip and Thyspunt*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of long-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.22 below.

*Operational phase without mitigation:*

#### *Duynefontein*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of long-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.22 below.

#### *Bantamsklip and Thyspunt*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of long-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.22 below.

**Table 3.22: Impact on sport infrastructure/ facilities without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Site	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip
Cumulative	Low	Medium	Medium	Low	Medium	Medium
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Extent	Local	Local	Local	Local	Local	Local
Duration	Medium-term	Medium-term	Medium-term	Long-term	Long-term	Long-term
Intensity	Medium	Medium	Medium	Medium	Medium	Medium
Consequence	Medium	Medium	Medium	Medium	Medium	Medium
Probability	Probable	Highly probable	Highly probable	Probable	Highly probable	Highly probable
Significance	Medium	Medium	Medium	Medium	Medium	Medium
Reversibility	Low	Low	Low	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	Medium	High	High	Medium	High	High

**Mitigation objective:** Provision of adequate sport facilities.

*Mitigation measures:*

- The provision of sport facilities for all staff involved as proposed for the Construction Village and Staff Village will be vital to ensure a sustainable human settlement; and
- Recreational facilities and sport facilities should be developed or contributed to, in order to cater for the increase in population in specific areas.

*Construction and operation phase with mitigation:*

If mitigation measures are successfully implemented then the significance of the impact should revert to that of low.

### 3.14. Impact on sense of place

#### ***Description of the impact***

The proposed nuclear power station will possibly result in a change to the local sense of place which is typically defined as:

A “sense of place is a social phenomenon that exists independently of any one individual's perceptions or experiences, yet is dependent on human engagement for its existence. Such a feeling may be derived from the natural environment, but is more often made up of a mix of natural and cultural features in the landscape, and generally includes the people who occupy the place” (Wikipedia: [http://en.wikipedia.org/wiki/Sense of place](http://en.wikipedia.org/wiki/Sense_of_place) [Accessed 19 September, 2009]).

The sense of place may be affected by real or perceived impacts from the new development, changes in the character of the area due to increased urbanisation, increased settlement densities, noise levels and traffic, and the change to visual character of the surrounds.

This concern relates to the possibility that the nuclear power station may contribute negatively to the current characteristics, or feeling / perception held by people. Communities experience that their place have a special and unique character.

***The Visual Impact Assessment Study (2010) concluded in general that: “The landscape character and sense of place of the landscape setting will be irrevocably changed by the nuclear power station.”***

### **Duynfontein**

Although the area around the proposed Nuclear power station is part of the City of Cape Town, demarcated within a number of wards, the sense of place is still very strong within communities. This is clear when people are asked where they live and they do not answer Cape Town but rather Blaauwbergstrand, Duynfontein, Melkbosstrand, Milnerton, etc. The informal settlements follow the same procedure and refer to the name of the settlement and not to the neighbourhood or ward name. Residents will refer to living in Rietbosvlei and not Melkbosstrand.

As the proposed nuclear power station would take place on a site currently occupied by the KNPS, impact on sense of place can be expected to be limited. However, the surrounding communities of Atlantis, Melkbosstrand and Duynfontein must perceive that they are recognized as a host community that should benefit from the development as much as possible. Increasing perceptions of being a “dumping ground”, particularly for energy generation projects, would contribute negatively to the impingement more power developments have on people’s “sense of place”. Good relations and communication with the affected communities must be maintained.

Visible benefits of the proposed nuclear power station and the perception of the area as an “energy hub” for South Africa, may acquire a positive connotation which could change the status of this impact.

“Sense of place” essentially alters over time. The proposed nuclear power station is situated next to Koeberg nuclear power station, in a region increasingly characterized by industrial and other power developments such as Atlantis Industria and Gas turbines. This will eventually become part of the area’s “sense of place”.

### **Bantamsklip**

Communities experience the natural unspoiled beauty of the area combined with the rural lifestyle as something they wish to protect. A nuclear power station could impact negatively on this feeling of sense of place. There are obviously those who foster a sense of authentic human attachment and belonging to their neighbourhoods as is indicated by the following statements:

*“We do not want nuclear power contaminating this area. This area is of outstanding natural beauty, which attracts many tourists. It is not an industrial area.” Resident of Pearly Beach”*

*“Our family have owned property near Gans Bay in the Overberg since the early 1940’s (so know area very well) and we are very concerned about the proposed erection of a nuclear power station in the area. A great attraction of the Overberg for tourists is the fact that it has a relatively unspoilt coastline and large spaces of veld covered with indigenous fynbos.*

Visitors come from all over the country and overseas to enjoy the whale watching and shark cage diving. This area needs tourists to be sustainable as there are no big industrial developments in the Overberg.”

“This area is where my family (on my father's side) originally comes from. We holiday in the area and believe that building a nuclear station will harm the environment and the entire character of this beautiful part of our country.”

“ As so aptly stated at the beginning of the Visual Impact Assessment, "The project needs to be assessed in the context of the regional landscape character and "sense of place" which is defined as the unique quality or character of a place, whether natural, rural or urban, relating to its uniqueness, distinctiveness or strong identity, the "spirit of the place"." The varied uniqueness, distinctness, strong identity and sense of place throughout our region cannot be disputed, and as such requires our commitment to protect its integrity for the future - there is simply nothing else like it anywhere else.” TAG – Tesselaarsdal Action Group, Courier, 2009/04/30, 1 June 2009 Draft EIR Issues Report.

“ Bantamsklip is one of the last remaining “untouched” and wilderness areas on our coastline. It offers a unique opportunity for people to enjoy unspoilt landscape.” Flower Valley Conservation Trust.

“ The Overstrand is a haven of peace and beauty for both the residents and visitors to this area - to spoil this corner of our country by erecting an enormous nuclear power plant would be most detrimental to the flora, fauna, populace and the country's income from the tourist trade.” - Flower Valley Conservation Trust.

**The Visual Study (2010) concluded as follows: “The scale of the physical change required of the site and surroundings to accommodate the Bantamsklip nuclear power station will be extensive. It will therefore be very difficult to retain the current ambience and sense of place.**

## **Thyspunt**

Community members, especially between Oyster Bay and St. Francis, have strong opinions that the area must remain as is, viz. primarily a tourist and natural attraction environment. They have very strong feelings that if this unique setting is contaminated by the presence of a nuclear power station, local and foreign people will lose interest in the place. Local people who currently enjoy this special lifestyle, may also leave, or stay, but with a price attached to it. This is emphasised by the following statements:

“ St. Francis attraction is built on a number of critical factors namely:

*Its natural beauty*

*Its unique character created by the building code and architecture  
The “village” atmosphere, with minimal traffic and congestion, and  
The feeling of peace and security which prevails.*

*Whilst such large scale projects will bring development to any region, it is not the sort of development which will benefit St. Francis. It was stated that it may sound elitist, but it is realistic that the unique character of St. Francis will be destroyed, and St. Francis will lose the appeal, which makes it attractive to foreign investment. St. Francis will just become another coastal town.” Mr C Horlock, President: St. Francis Bay, Correspondence: 30 October 2008*

## ***Assessment of the impact***

### *Construction phase without mitigation:*

#### *Duynefontein*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of medium-term duration, low reversibility and of medium consequence and significance.

The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.23 below.

#### *Bantamsklip and Thyspunt*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of medium-term duration, low reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.23 below.

### *Operational phase without mitigation:*

#### *Duynefontein*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is probable, of long-term duration, irreversible and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.23 below.

#### *Bantamsklip and Thyspunt*

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of long-term duration, irreversible and of medium consequence and significance. The degree of confidence in the assessment is high. A summary of the impact is provided in Table 3.23 below.

**Table 3.23: Sense of place without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	Low	Medium	Medium	Low	Medium	Medium
Nature	Negative	Negative	Negative	Negative	Negative	Negative
Extent	Local	Local	Local	Local	Local	Local
Duration	Short-term	Short-term	Short-term	Long-term	Long-term	Long-term
Intensity	Medium	Medium	Medium	Medium	Medium	Medium
Consequence	Medium	Medium	Medium	Medium	Medium	Medium
Probability	Probable	Highly probable	Highly probable	Probable	Highly probable	Highly probable
Significance	Medium	Medium	Medium	Medium	Medium	Medium
Reversibility	Low	Low	Low	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	Medium	High	High	Medium	High	High

**Mitigation objective:** To limit the negative effects and the disturbance on the sense of place that the project may have on the people.

*Mitigation measures:*

- Consult with affected communities in an effort to identify and address issues relating to the sense of place; and
- Follow the mitigation measures suggested in the visual, noise and traffic impact reports.

*Construction and Operational phase with mitigation:*

It is unlikely that mitigation would result in the significance of this impact changing to low.

### 3.15. Future Land Use (Planning)

#### ***Description of the impact***

The proposed nuclear power station will impact on future land use and planning in the area.

#### **Duynefontein**

The Duynefontein site to the north of the existing Koeberg nuclear power station, is currently not utilised for any activities. Eskom has in the past few years engaged in a process of removing alien vegetation from the site and placing wild game on the property.

The outer-lying rural settlements within the district (Atlantis, Mamre and Pella) are some distance from the urban core and district growth areas and have not been subject to the same growth pressures as the southern areas of the district (e.g. Parklands). These areas are in dire need of investment and job creation as unemployment figures are high and members of these communities are generally forced to travel long distances to the urban core to seek work opportunities. The nuclear power station project could make a positive contribution in this regard.

In order to begin to attract investment to the northern section of the district, development opportunities that would benefit Atlantis and the surrounding communities, need to be investigated. As a point of departure, the majority of vacant land within Atlantis is publicly owned. However, release of this land for development has been hampered by red tape, the lack of an integrated planning framework and the fact that the land is owned by different spheres of government. There is an urgent need to address this situation and facilitate development within the area; however, this development needs to be coordinated to ensure appropriate phasing, form and location. The need to accommodate staff and the development of the Staff Village in this area will contribute positively.

### New Development Areas

As a major growth axis of the City, a number of Greenfield development opportunities exist in the **district, which is** detailed in the following sections. The nuclear power station development as a whole will support the new development areas as outlined in the Draft SDF for Blaauwberg.

#### Mamre (1)

Three parcels of land are identified as growth areas for Mamre. These areas are suited to medium density residential development that is in keeping with the character of the town.

#### Atlantis

Atlantis was a settlement designed under the Apartheid Government's policy of industrial decentralisation and the Group Areas Act. Due to shifts in political ideology and planning policy since the original conceptualisation of the town, the full "master plan" for the area was never realised. The effects of this shift are evident in the large areas of serviced, publicly owned land that are undeveloped within the residential and industrial areas of the town.

In addition to areas of undeveloped residential and industrial land, the generous open space and facility standards applied in the layout of the town have led to large areas of underutilised and un-maintained open spaces that are not functioning optimally, thus contributing to a poor urban environment.

Due to these areas of undeveloped and underutilised land, opportunity for significant new development exists within Atlantis, including the following:

#### Residential Infill (2)

There are a number of parcels of vacant land within the residential areas of Atlantis that should be unlocked for housing development. These parcels are owned by various agencies including the City of Cape Town, the Housing Association of Blaauwberg and the Provincial Housing Board, and should be developed to cater towards a range of housing opportunities. In particular, the hospital site located in Avondale should include a mixed use edge along Reygersdal Drive due to the high traffic volumes on this road offering commercial opportunity.

In addition to vacant residential land, the rationalisation of the open space system within Atlantis provides further development opportunities. This, however, requires more detailed study, and in particular urban design guidelines to guide how parts of the open space system could be released for development. Although work in this regard has been completed for the neighbourhood of Avondale as part of the Atlantis Town Regeneration Study (1999), a comprehensive open space rationalisation study for the whole town is required to ensure

that sufficient, quality open space is provided, while still unlocking development opportunities.

### Industrial Infill (3)

Extensive areas within the industrial area of Atlantis remain vacant and are publicly owned. This is particularly evident in the southern portion which is reserved for noxious industries. Due to the high levels of unemployment in Atlantis, the release of vacant industrial land for economic development purposes is essential. This process has already been initiated by the City of Cape Town with the sale of a number of parcels of City-owned land for industrial development. As part of this process, opportunities for light industrial parks and incubator opportunities should be investigated.

### Buffer Strip (4)

The residential and industrial areas of Atlantis are separated by a 100 m wide buffer strip, which was originally intended to accommodate a district distributor road and a railway line connecting to the proposed towns 2, 3, 4 and 5 of Atlantis. These areas, however, were never developed and now form part of the proposed Cape West Coast Biosphere reserve. As a result, the proposed transport infrastructure is no longer required and it is therefore proposed that the buffer strip be developed into a mixed use precinct. As part of this precinct, it is proposed that the railway line is extended along the edge of the industrial area, terminating with a station in the vicinity of Witzand. Development within the buffer will assist to integrate the residential and industrial areas of Atlantis as well as the Witzand community. Structuring elements of this precinct are the proposed north-south routes that will link the residential areas to the industrial areas as well as an east-west route that will link Witzand to Dassenberg Road, assisting to integrate the neighbourhood with Atlantis. The key structuring element of this proposal is an east-west activity route linking from Bloembosch Road along the southern edge of the buffer to Dassenberg Road.

This route will link the site into the higher order movement network including the R304 and Klein Dassenberg Road. Intensive development around the proposed Witzand station will create a vibrant node that could include public facilities. Although a portion of this precinct is suited to residential development, opportunities exist for commercial and light industrial developments that reinforce the existing large scale industrial operations in the south.

It is recommended that a precinct plan for this area be drafted as a means of facilitating development of the site.

### Witzand (5)

The portion of land south of Witzand and north of Bloembosch Road is currently in the process of being designed for housing development. Plans should ensure opportunities to integrate with the proposed re-development of the buffer strip detailed above.

### Melkbosstrand (7)

Limited parcels of land are available in Melkbosstrand for development. These include privately owned and publicly owned land within the urban edge. Development on these parcels is largely either already taking place or is currently in the planning phase. Development opportunities include areas of residential development (market and subsidised opportunities) as well as mixed use and commercial opportunities on publicly owned land within the Melkbosstrand CBD. More intense, mixed use development should be located in relation to the accessibility network. Proposals should also take into consideration biodiversity corridor requirements as indicated on the plan.

## **Bantamsklip**

The Bantamsklip site is located approximately 5 km east of Pearly Beach and approximately 50 km northwest of Cape Agulhas. The site is situated on the Southern Cape coast and falls within the jurisdiction of the Overberg District Municipality.

Fishing and holiday towns are scattered along the southern coast in the vicinity of Bantamsklip. The surrounding main towns are Bredasdorp, Stanford and Hermanus. The Bantamsklip site is situated within a nature reserve. No developments fall within a 5 km PAZ radius from Bantamsklip. Pearly Beach is the only town that falls within a 16 km radius.

More recently, the area developed into the most recent wine region of the Cape, viz. the Agulhas wine region. In a half circle of about 25 km around the proposed site several wine estates have been established: Agulhas Wines, Zoetendal, Quoin Rock and the Oystercatcher, with potential for more to develop in the future. The area is considered good for wine with respect to soil types and climate, and is seen as a refuge from the traditional wine areas in the Western Cape if temperatures keep rising in these areas. Generally, it is expected that the Agulhas Wine Region will be of major importance to the wine industry of the Western Cape.

An interesting feature is that, roughly, the area from Hermanus (in a straight line down to Cape Agulhas) and then bordered by the sea in the south, is gradually becoming a conservation area. It has been suggested that, through public-private agreements, the whole area will eventually become a large open nature reserve. There will still be private farm owners, but their fences will be removed, allowing animals to move freely. There are long-term plans to build a fence along the perimeter, and then around any towns such as Gansbaai.

It has been suggested that in the next 7 to 8 years, there is potential for the industry to grow to as much as R 750 million per annum, provided that critical infrastructure is in place.

## **Thyspunt**

The following is captured in the Kouga Spatial Development Framework, 2009:

*“The Thyspunt site, west of Cape St. Francis has been acquired by ESKOM for possible future power generation purposes. As a result, the Kouga Coast Sub-Regional Structure Plan was prepared based on the need to maintain the viability of the Thyspunt site for possible future nuclear power generation. Subsequently, with the preparation of the St. Francis Bay Spatial Development Framework and approval of same by the Kouga Council, the Kouga Coast Sub-Regional Structure Plan was replaced by the recommendations of the Greater St. Francis Bay Spatial Development Plan.*

*With respect to the Thyspunt site, the following land use principles apply:*

- *To ensure the viability if the Thyspunt site for future possible power generation, development of the surrounding areas must be carefully managed;*
- *Any proposed changes to current land uses, in terms of standard rezoning procedures within the 16 km monitoring and emergency zone, must be brought to the attention of Eskom Nuclear Sites Department at Koeberg Nuclear Power Station, for their consideration and comment;*
- *Urban expansion of Oyster Bay and Umzamuwethu, which falls within the 0 - 5km zone should not be permitted;*

- *The provision of a small school (without a hostel) to cater for local children may be supported in Oyster Bay;*
- *Institutional land uses such as prisons, old age homes and hospitals that may result in the concentration of a resident population should not be developed within 16 km of the Thyspunt site, because of potential evacuation difficulties;*
- *No new food processing plants to be allowed to be developed within the 16 km; and*
- *Agricultural activities to be monitored within the 16 km.*

*With respect to the future development of the Thyspunt site for power generating purposes, all National, Provincial and Local Legislative processes should be followed, with specific reference to relevant permits, environmental approval, implementation, design and development parameters. The management of this site should be subject to all required approvals and international protocol associated with the land use type. Future development of the Thyspunt site should take cognisance of bulk infrastructure and development of supporting land uses, with specific reference to housing, social facilities, etc.”*

#### *Humansdorp*

*The industrial node towards the north of the CBD is also well defined with available land to expand.*

*Humansdorp does have the ability to expand and play a more dominant role in the greater Kouga area. Opportunities for future development are mainly based on its strong administrative, commercial, industrial and residential function.*

#### *Spatial Development Principles*

- *Promote and encourage administrative, commercial and industrial development;*
- *Promote integration of previously segregated areas and residential densification. Upgrade informal residential areas;*
- *Promote utilisation of vacant, derelict, degraded and underutilised land to accommodate new development; and*
- *Provision of infrastructure that will meet the internal and external need of Humansdorp. The existing built environment is ideally suited for a policy of infill and densification.”*

#### *Francis Bay / Cape St. Francis*

*“Encourage environmentally sensitive developments that are in line with the existing character and urban fabric of the St. Francis Bay / Cape St. Francis area. Development along the Kromme River should be based on the guidelines as per this SDF, with specific reference to the setback line.*

#### *Spatial Development Principles*

- *Make land available for the current and future demand for the expansion of Sea Vista, in a holistic and integrated manner;*
- *Residential developments strictly adhere to architectural and aesthetics control Low density residential developments;*
- *Environmentally sensitive developments;*
- *Transport corridors to receive special attention;*
- *New developments in line with existing character and urban fabric of St. Francis Bay. Commercial activities to be concentrated in existing two central nodes;*

- *No commercial development East of St. Francis Drive except existing bottle store and hotel;*
- *Prevent intrusion of business into residential fabric;*
- *Present industrial node not to be expanded in near future;*
- *Pedestrian and cycle routes to business nodes;*
- *Ensure effective vehicular movement and parking provision; and*
- *Provision for church sites.*

*As indicated, with respect to low income / high density residential demand, the expansion of Sea Vista is inevitable. The Municipality is currently negotiating with the Department of Environmental Affairs to obtain the land south of the Sea Vista residential area. Housing demand in this area can grow up to 1 000 units and this should be accommodated east of the Cape St. Francis access road. Detailed planning should dictate the provision of non-residential uses and integration with higher income areas to the east.*

*Lower density residential developments are restricted and should only be permitted within the urban edge, with specific reference to areas that have already been impacted.*

*The expansion of the existing industrial area north of Sea Vista is proposed in the eastern direction. This will compliment the labour force of Sea Vista and the proposed expansion of Sea Vista to the south.*

#### *Oyster Bay*

*The small settlement of Oyster Bay is situated west of Thyspunt and includes the small residential area of Umzamuwethu. The town has limited commercial and non-residential activity and a number of residential erven are still undeveloped.” (Source: Draft Kouga Spatial Development Plan, 2009).”*

#### **Assessment of the impact**

*Operational phase without optimisation:*

##### *Duynefontein*

Without optimisation measures, it is anticipated that the scale of this impact will be local, the nature positive, and the intensity medium. This impact is probable, of long-term duration, medium reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.24 below.

##### *Bantamsklip and Thyspunt*

Without optimisation measures, it is anticipated that the scale of this impact will be local, the nature positive, and the intensity medium. This impact is highly probable, of long-term duration, medium reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.24 below.

*Construction phase without optimisation:*

Duynefontein

Without optimisation measures, it is anticipated that the scale of this impact will be local, the nature positive, and the intensity medium. This impact is probable, of medium-term duration, medium reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.24 below.

Bantamsklip and Thyspunt

Without optimisation measures, it is anticipated that the scale of this impact will be local, the nature positive, and the intensity medium. This impact is highly probable, of medium-term duration, medium reversibility and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.24 below.

**Table 3.24: Future land use without optimisation**

Phase	Construction Phase <u>without</u> Optimisation Measures			Operational phase <u>without</u> Optimisation Measures		
	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Site	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	Low	Medium	Medium	Low	Medium	Medium
Nature	Positive	Positive	Positive	Positive	Positive	Positive
Extent	Local	Local	Local	Local	Local	Local
Duration	Medium-term	Medium-term	Medium-term	Long-term	Long-term	Long-term
Intensity	Medium	Medium	Medium	Medium	Medium	Medium
Consequence	Medium	Medium	Medium	Medium	Medium	Medium
Probability	Probable	Highly probable	Highly probable	Probable	Highly probable	Highly probable
Significance	Medium	Medium	Medium	Medium	Medium	Medium
Reversibility	Low	Low	Low	Low	Low	Low
Irreplaceable	No	No	No	No	No	No
Confidence	Medium	Medium	Medium	Medium	Medium	Medium

**Optimisation objective:** To minimise the impact of the proposed nuclear power station on future land use and planning.

*Optimisation measures:*

- Follow a transparent public participation process with role-players and interested and affected parties regarding future planning and land use needs;
- After the location of the nuclear power station has been finalised, an intensive planning process should be engaged in order to:
  - Ensure adherence to applicable legislation, e.g. environmental, water, roads, sustainability, etc.;
  - Ensure revision of existing planning policy and guidelines at National, Provincial and Local level (e.g. IDPs, SDFs, WSDPs, ITPs, etc.);
  - Ensure comprehensive and transparent public participation in all planning processes; and
  - Optimise the creation of economic opportunities at all levels; and\

- More detailed Spatial Development Plans should be developed as soon as the location has been finalised. These plans will also enable more detailed impact assessments to be done.

*Construction and Operational phase with optimisation:*

It is unlikely that mitigation would result in the significance of this impact changing to low.

### **3.16. Perceived Risks Associated with Nuclear Incidents**

The use of nuclear energy to generate electricity carries with it both a perceived and real risk.

#### ***Description of the impact***

Through public consultation, it was stated clearly by various participants that they fear the impact of possible health and safety risks. These risks are related to;

- design safety;
- nuclear accidents;
- potential terrorist acts;
- capacity and capability of people operating the nuclear power station
- strikes and labour unrest affecting daily management; and
- communication flow, especially with reference to perception on potential risks and negative impacts on public health.

Typically, the term “risk” is referred to as the product of a harmful consequence of an activity or event and the probability of its occurrence. At the social level risk needs to be viewed as a subjective perception experienced differently amongst the affected population.

In this respect, the following comments from residents were printed in the Herald newspaper on 2 June 2009 in an article entitled “*residents wary of nuclear plant so close to home*”:

*“During a snap survey conducted by The Herald, residents cited health fears and concern for plant and animal life among their greatest worries if the government gives Eskom the go-ahead.*

*Zukiswa Matodlana of Wells Estate said she thought the health of the people in the area would definitely be affected in the long run.*

*CW van der Merwe, a farmer from Rocklands, said he thought the power plant would be built to ensure extra power for the Coega development.*

*‘They should build it in the Karoo somewhere far off and more remote. I would not be comfortable knowing that there was a nuclear power plant that close to where I lived. We are too close,’ he said.*

*Noluthando Nyondo of Kwazakhele said the increased power would be a good thing, but also said it should be built somewhere more remote. 'There is a need for it, but they should build it where people are not that close by.'*

*Anele July, a welder from Motherwell, said there was a need to increase the area's power capabilities, but agreed that a different site should be chosen. "This is a good thing and it will create jobs, but I do not think they should build it so close to us,' he said.*

*Vanessa de Monk of Schauderville said a nuclear plant that close could be dangerous and hazardous to health. 'All the wind blows from that direction, so it means all kinds of particles will be in the air.'*

*'There are children here and we should protect the environment for them and their future,' she said.*

*Siyasanda Vellem of Motherwell said: 'I am definitely against anything like that. It would be dangerous for everyone and everything, especially plants and animals. They really cannot be allowed to do this.'*

*Leonardo Maarman, a student from Uitenhage, said he did not think Eskom would have proposed the development if people's lives and the environment would be in danger.*

*'They would not do something like this if they thought they would be harming people. This development could be a good thing and it will increase power, and that is something we really need,' he said.*

*Jolene Pompies of Plettenberg Bay said, 'I don't think it will be a problem. We need electricity.'*

*Elizabeth Thompson of Plettenberg Bay said, 'They have one in Cape Town and it doesn't seem to harm the environment. All I know about nuclear energy is, it is cleaner and better for the environment than coal but I don't know how it would impact on the environment.'*

*Wickus Geel of Knysna said, 'I think it is a good idea but I don't know enough about the topic to comment on the impact.'*

*Mark Allan of Knysna said, 'I don't know, I don't like seeing pieces of the coastline disappear.'*

*Thoko Jini of George said, 'Why do they want to put a nuclear plant there? It would affect everyone.' "*

*In an article by The Herald, St. Francis residents want answers from nuclear environmental authorities on 16 November 2009, Oberon wrote the following: In an article appearing in The Herald, on 16 November, 2009 Oberon (2009, p.1) wrote the following.*

*or*

*On 16 November, 2009, it was claimed in the Herald, (Oberon 2009, p.1) that, "[i]n order to determine.....*

*“In order to determine if there are indeed emissions from Koeberg with negative environmental impacts, then SURELY one need not look further than the reserve in the immediate vicinity of the power station. To date there has been no record of the wildlife in the area showing signs of exposure to dangerous levels of radiation. Right now you are probably exposed to more radiation from the computer that you used to type this letter than the wildlife is exposed to around Koeberg. Think on this: a passenger flying on an airline flight at cruising altitude is exposed to levels of radiation comparable with the supposed emission risks posed by a nuclear reactor... I am not aware of an outcry by the public about such risks while on a flight. @Surfer Dave: Give us a few examples of cleaner and more efficient means of producing the amount of power required to support our industries. Sorry to inform you, but solar, wind, hydro, geothermal and wave action power generation are not as efficient, clean or feasible as you might believe. It would be refreshing for people to first gain sufficient knowledge on a topic before attempting to influence others' opinions...”*

The Constitution of South Africa that states that “everyone has the right to an environment that is not harmful to their health or well-being”.

South Africa became a nuclear electricity generating country with the acquisition of the Koeberg Nuclear Power Station. After years of exhaustive investigation and study, Eskom decided to build Koeberg at Duynefontein near Cape Town (African Wildlife 2006). Construction of Koeberg began in June 1976 and electricity was generated for the first time, by Unit 1 on 4 April 1984, and by Unit 2 on 25 July 1985.

South Africa therefore has nearly a quarter of a century of experience in operating a major nuclear power plant. Koeberg is considered by the international community to be one of the best-run nuclear plants in the world (African Wildlife, 2006).

The operation of Koeberg has provided vast experience in all aspects of nuclear power including the ‘Front End’ of the fuel cycle (fuel manufacture and supply) and the ‘Back End’ of the fuel cycle the handling of nuclear waste. (Kemmm, 2007 and African Wildlife (2006) Vol 60 no 2, Special Edition: Energy, Koeberg Nuclear Power Generation pg 27.)

#### Design safety:

Since the commercial production of nuclear energy to generate electricity commenced, strong arguments were put forward to prove that it is one of the worlds’ safest energy technologies. This may in part be contributed to the fact that safety forms a major component of the design, construction and operation of a nuclear power station. There are a number of systems that monitor, control and support the safe operation of the reactor at its power plant. These systems provide maximum safety and reliability and reduce the chance of an accidental release of radioactivity into the environment.

#### Nuclear accidents:

This concern relates to the possibility that the perceived risks associated with nuclear incidents, e.g. fuel storage and transportation, radioactive waste storage and transportation will change the behaviour of some community members in a negative way, the extent of which is illustrated through the following statements made in response to the proposed project.

There is a misconception amongst the public that a nuclear reactor can explode like an atomic bomb. This cannot happen, as a nuclear explosion requires a very high concentration of fissionable uranium, which is not the type of uranium that is used within the nuclear power station.

Some stakeholders have major concerns about potential safety impacts, despite information from a diversity of sources that supports the notion that nuclear technology can be safe if handled correctly. The following statements were made by members of the public:

*"Hermanus sits within the 50 km "no go" zone which means that if a meltdown a la Chernobyl should happen (and you know it is bound to happen sooner or later!!) the whole area is to be evacuated, not to be populated again for at least 200 years."*

*"The distance from Thyspunt to the township of Sea Vista is about 11 km, so in the event of an accident, when a 60km south-western is blowing, as is not uncommon, the people of Sea Vista would have 11 minutes in which to evacuate their homes and shacks. There is also only one escape route, the Humansdorp, to serve the five communities of Rebelsrus, Mostert's Hoek, Cape St. Francis, Sea Vista and St. Francis Bay." ( The St. Francis Bay Ratepayers Association Chairperson, the Herald, 6 March 2008).*

Furthermore, there is an ongoing lingering fear of such technology, even though we are exposed to radiation on an ongoing basis whether standing in the sun, flying in an airplane or having X-rays taken. Numerous safety systems have been engineered to assist in preventing an accident with the reactor or to lessen the effects in the event that an accident should occur. All critical safety systems have backup systems that duplicate the jobs that the system is supposed to perform.

An extension of the psychological impact that nuclear technology may have on susceptible individuals is the phenomenon referred to as the "nocebo effect" whereby, for some people, the belief that they are at risk is sufficient for them to incur the risk. This phenomenon has vast implications in that any person who speaks with "authority" on the health and safety impacts of nuclear activity, has a moral duty to ensure that the information he or she is providing is "the whole truth and nothing but the truth".

Eskom is obliged to implement measures that ensure compliance with the nuclear licensing and safety criteria in terms of the Occupational Health and Safety Act and as prescribed by the National Nuclear Regulator. No effective or latent effects would manifest from normal operation related activities.

Radiation exposure to humans can be either harmful or beneficial, with numerous applications in the medical and industrial fields. The effect of the radiation exposure depends on the type of radiation (alpha, beta or gamma), the amount received, the rate at which it is received, the body part exposed to radiation, and whether the exposure is chronic (regular, low doses) or acute (short term, high dose). The ability of the body to repair radiation damage should also be considered. The exposure of individuals to radiation may lead to health effects that are generally classified as either "deterministic" or "stochastic".

Blerk (June 2008) concludes that a comparison of the KNPS radiological protection licensing requirements against the IAEA guidelines for a Radiation Protection Programme for a nuclear power station, suggests that the KNPS requirements are comprehensive and in full compliance with the IAEA guidelines. The purpose of such a Radiation Protection Programme is to protect humans (i.e. workers and the public) from harmful effects of radiation. The KNPS system of radiation protection, which has been refined according to international standards over a period of more than 20 years, is sufficient as a guideline for a Radiation Protection Programme for the nuclear power station. From this perspective, it can be concluded that there are no additional worker health and safety measures necessary to be incorporated in the nuclear power station RMS and own radiation protection programme, other than what is already implemented at the KNPS.

***The NNR will issue a license only if full compliance with the radiological dose limits and dose constraints are demonstrated, taking into account the principles of ALARA and all other matters relating to the overall safety case. Accident conditions are accounted for in design and included in the licensing process.***

The cumulative impact on the emergency response planning for an off-site emergency is that the number of people, in this case plant personnel, in close proximity of either one of the two sites will increase. The cumulative impact under these conditions are still considered to be localized and of low significance.

A very important question raised by communities, relate to a nuclear accident and the potential impacts thereof. The Chernobyl Forum 2003 - 2005 published a study named: "Chernobyl's legacy: Health, Environmental and socio-economic impacts", Second Revised Version. This study contains valuable information on the impacts experienced after the accident at the Chernobyl nuclear power plant in 1986. Although the realities are different around the proposed nuclear power station and Chernobyl, the mere possibilities of these impacts influence individual, family and community living and people's behaviour related to fear for these impacts. Impacts experienced include:

- Childhood thyroid cancer caused by radioactive iodine fallout as one of the main health impacts of the accident;
- Many people being traumatized by the rapid relocation, the breakdown in social contacts, fear and anxiety about what health effects might result;
- Imposed huge costs;
- Indirect losses relating to the opportunity cost of removing agricultural land and forests from use and the closure of agricultural and industrial facilities, and opportunity costs, including the additional costs of energy resulting from the loss of power from the Chernobyl nuclear plant;
- Communities in the affected areas suffer from a highly distorted demographic structure; and
- Mental health impact due to psychological distress arising from the accident and its aftermath has had a profound impact on individual and community behaviour.

From the above it is clear that a nuclear accident will definitely impact negatively on health and safety, and the way people live their lives. The degree of an accident may not be the same as Chernobyl, but the consequences may be similar. Due to the fact that Chernobyl did happen, individuals, families and communities are influenced by the possibility that it can happen again.

The emergency response specialist study (Mogwere Khoathane, Nov 2007, PBMR DPP) focuses on emergency preparedness that could be defined as the measures that enable individuals and organizations to stage a rapid and effective emergency response. In the context of nuclear emergencies, protective actions include measures to limit the exposure of the public to radioactive contamination through external exposure, inhalation and ingestion. The objectives of these actions are to prevent deterministic effects (early mortality) and to reduce stochastic effects (principally cancer) as much as is reasonably practicable.

The following key findings derive from this Emergency Response study:

- The current KNPS emergency response infrastructure and systems associated with the affected communities is adequate to cope with the demands that the proposed nuclear power station will place on the infrastructure and systems within the 5km radius of the site;

- The evaluation of the KNPS emergency plan requirements suggest that the KNPS requirements are comprehensive and in compliance with international guidelines; and
- 
- For Nuclear Emergencies two sets of requirements have to be fulfilled. For the KNPS the infrastructure requirements are in place, however, there is still room for improvement for functional response requirements that refer to the “capability” to perform an activity.

### Terrorist attacks

Security concerns focus on protection of the nuclear power station on the one hand, but safety of the citizen and how any attempt to break into the nuclear power station or attack the nuclear power station will affect the ordinary person living in the area, on the other hand. From the information available in other specialist studies, it is clear that proper precautions are taken to ensure the safety and security of the proposed nuclear power station at all times.

This concern is reflected in the following statement:

*“ A factor we did not spot in the report was in building a Nuclear Generating and distribution facility at Bantamsklip, could create a target for future Piracy/Terrorist hold to ransom attacks! Eugene and Louise Hendry, Pearly Beach, Fax, 2009/04/30”.*

In an article: “*Nuclear reactor hazards: ongoing dangers of operating nuclear technology in the 21st Century*”, by Hirsch et al, regarding the risk from terrorist attacks, the following was noted:

“Even before the attacks in New York and Washington in 2001, concerns had been raised over the risk of nuclear facilities from terrorist attacks. Nuclear facilities have been targeted in the past leading to their destruction, such as the attack by Israel on the Osirak reactor in Iraq. The threats to nuclear power plants from terrorist attacks and acts of war can be summarized as follow:

- Because of the importance to the electricity supply system, the severe consequences of radioactive releases as well as the symbolic character, nuclear power plants are “attractive” targets for terrorist as well as for military attacks;
- An attack on a nuclear power plant can lead to radioactive releases equivalent to several times the release at Chernobyl. Relocation of the population can become necessary for large areas (up to 100 000 km<sup>2</sup>). The number of cancer deaths could exceed 1 million;
- Nuclear power plants could be targets in times of war if a military use is suspected;
- The spectrum of possible modes of attack is very diverse. Attacks could be performed by air, on the ground and from the water. Different means/weapons can be used; and
- Protective measures against terror attacks are of very limited use. Furthermore, a number of conceivable measures cannot be implemented in a democratic society.”

From the abovementioned, it is clear that the constant fear of possible terrorist attacks will affect negatively on day-to-day living.

## Capacity and capability

Another key aspect to consider when looking into the safety of a nuclear power station is the training and preparedness to which the people who operate these stations are exposed. For example, reactor operators are trained and tested on the procedures of power plant operation, and in order to train such staff, utilities around the world use sophisticated power plant simulators, which are replicas of the control room of the real power plant in which they will be working.

The simulators are computer controlled, allowing the operators to gain practical experience in managing all types of normal and unusual occurrences without posing any danger to the public or the environment.

The Economic Study (September 2009) concluded that there are two serious concerns with regard to skills. The first relates to the ability of the South African educational system to produce the skills, not only with regard to trainees, but also trainers. Eskom is recruiting widely to find instructors and trainers in order to produce the number of operators required. Such recruits need mathematics and science qualifications, but these are in short supply in the educational system.

Eskom commenced recruiting and training for Nuclear-1 in 2007. Nuclear skills are a scare resource worldwide, and Eskom therefore cannot expect to find it easy to recruit such skills outside the country. Instead, it will have to rely very largely on its own training, and the focus at present is on engineering and operational staff. According to information provided by Eskom, it has thus far been able to recruit on the open market but, with growing competition in this market as more countries opt for nuclear power, it has developed a significant programme for skills training over the next ten years in order to produce the numbers required.

Investment in this programme includes a bursary scheme and funding the establishment of university courses in nuclear engineering:

At the University of Cape Town elective courses in nuclear engineering for final-year engineering students commenced in 2008.

Before Nuclear-1 commences operating, 1 000 technical persons need to be trained as nuclear professionals. Already 60 operators are in training. In total, between 150 and 200 professionals are in training, but this will increase to over 200 at any given time once the decision on a site is finalised. Some individuals will be trained overseas. KNPS has been done locally, but the technology for Nuclear-1 will be different to that at Koeberg, and thus a large part of the training will be overseas depending on which system is chosen. However, local training will be increased over time.

The ability to retain skills is the second concern. A considerable investment is made in training an individual to the point where he is authorised to work in the plant. For example, it takes five years to train a nuclear reactor operator who has to be licensed to operate by the NNR. According to information provided by Eskom, its salaries were recently substantially increased in an effort to retain core skills. The loss of staff to overseas has not been significant but some staff is lost to South African firms. Eskom thus needs to train more individuals than it actually requires. The training period cannot be reduced but the tendency in recent years has been for operators not to stay for their entire careers.

## Communication flow

Risk perception and negative psycho-social squeal of nuclear related “dread risk perception” are frequently attenuated and tempered by the provision of neutral, reliable, responsible, unbiased information dissemination and risk communication. While there is limited public perception that neither Nuclear Energy Corporation of South Africa (Necsa) nor Eskom will, necessarily, provide neutral information and risk communication, it is also perceived that anti-nuclear lobbies will not necessarily engage in the provision of neutral information and risk communication either.

For this reason it is seen as imperative that an organisation such as the African Commission on Nuclear Energy (AFCON), formed to oversee compliance in respect of the Organisation of African Unity’s Treaty of Pelindaba, be formally requested to extend its activities under Article 12 of the Treaty to educate and inform the public of the real risks and issues related to “the peaceful use of nuclear energy for the betterment of society”.

The perceived risk of something going wrong with all the activities around the nuclear power station site, may result in some residents moving away. The effects of exposure to risk (whether real or perceived), is a reality that must be dealt with. If this is not properly managed, it may lead to interest group activity and social mobilization against the proposed nuclear power station.

The perceived possibility of increased risks that the operational phase of the nuclear power station may bring about, could discourage people from moving into the area. A number of housing projects are currently in process or close to the start of construction. After consultation with the developers, no evidence could be found that they will stop the developments. However, some potential buyers may decide to invest elsewhere.

The South African Cabinet approved a National Radioactive Management Policy and Strategy in 2005, and the National Radioactive Waste Management Agency Bill was presented to parliament in late 2008. In terms of this legislation, a National Radioactive Waste Management Agency will be established, and will exert tight control over the disposal of radioactive waste. For the proposed Nuclear-1 nuclear power station, Eskom will be compelled to follow the practices for the management of radioactive waste laid down in the legislation, under the regulatory control of the NNR.

Approximately 25-30 tonnes of used nuclear fuel is produced each year from the operation of a typical large (about 1000 MW) nuclear reactor which if no reprocessing takes place, would be disposed of as high-level radioactive waste, this amount could be reduced to approximately three cubic metres of vitrified high-level radioactive waste per year. At present, South Africa does not have an authorised facility for the disposal of spent fuel or high-level radioactive wastes. Thus, the producers of used nuclear fuel (Koeberg and Safari) are required to store the waste at the plant until the processes outlined in the National Radioactive Waste Management Policy have been finalised. Intermediate-level radioactive waste is typically combined with concrete to solidify it prior to disposal at Vaalputs. Koeberg currently produces approximately 120 – 160 of these five-ton metal lined concrete containers on an annual basis. The capacity of the proposed nuclear power station is higher than that of the KNPS and hence it is expected that the volume of intermediate-level radioactive waste produced by the proposed nuclear power station would exceed the quantities produced by the KNPS. The quantities of intermediate-level radioactive waste produced by the proposed nuclear power station will be discussed in the Draft EIR. Low Level radioactive waste must be disposed of more sensitively than normal domestic and industrial waste. In most instances around the world such waste is placed in sealed containers (steel drums) and is normally buried in shallow landfill sites, such as Vaalputs in South Africa. Koeberg currently produces 550 of these sealed containers (steel drums) on an annual basis. Again, since the

capacity of the proposed nuclear power station is higher than that of Koeberg, it is expected that the volume of lowlevel radioactive waste produced by the proposed nuclear power station would exceed the quantities produced by the KNPS.

#### Low to Medium Radioactive Waste Transport (Transport study)

The transportation of radioactive waste is performed under the regulatory control of the National Nuclear Regulator and in accordance with international standards. Two to four shipments of low to medium-level radio active waste will be made each week. Maud, Drennan and Partners conducted a preliminary investigation between 1984 and 1987/14 with regard to the transport of nuclear waste from the Thyspunt site to Vaalputs.

The results of this study indicates that road transport is the most viable option. Radioactive waste will be required to be transported cross-country from the Eastern Cape to the Northern Cape.

#### **Assessment of the impact**

*Operational phase without mitigation:*

#### Duynefontein, Bantamsklip and Thyspunt

Without mitigation measures, it is anticipated that the scale of this impact will be local, the nature negative, and the intensity medium. This impact is highly probable, of long-term duration, irreversible and of medium consequence and significance. The degree of confidence in the assessment is medium. A summary of the impact is provided in Table 3.25 below.

Failure to supply enough electricity to meet the demand, could enhance the negative effects that power disruptions may have on both economic and personal effects, with disruptions to industry, medical facilities and traffic control mechanisms etc.

**Table 3.25: Perceived risks associated with nuclear incidents without mitigation**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	N/A	N/A	N/A	Medium	Medium	Medium
Nature	N/A	N/A	N/A	Negative	Negative	Negative
Extent	N/A	N/A	N/A	Local	Local	Local
Duration	N/A	N/A	N/A	Long-term	Long-term	Long-term
Intensity	N/A	N/A	N/A	Medium	Medium	Medium
Consequence	N/A	N/A	N/A	Medium	Medium	Medium
Probability	N/A	N/A	N/A	Probable	Highly probable	Highly probable
Significance	N/A	N/A	N/A	Medium	Medium	Medium
Reversibility	N/A	N/A	N/A	Low	Low	Low
Irreplaceable	N/A	N/A	N/A	No	No	No
Confidence	N/A	N/A	N/A	Medium	High	High

**Mitigation objective:** To ensure that communities receive correct and reliable information regarding the real and perceived risks of nuclear power.

*Mitigation measures:*

- Due to the identified complexity of the community and the highlighted impact of public perceptions and image, the first mitigation measure is an aggressive community-oriented and comprehensive public information campaign. The lack of information and the overwhelming amount of misinformation regarding nuclear power as a whole, and specifically Eskom's Nuclear-1 plans, has generated all manner of popular myth and worst-case scenarios, scepticism and particularly doubt regarding the intentions and trustworthiness of Eskom;
- The proposed public information campaign would address popular misconceptions regarding the Nuclear-1 programme, and specifically the impacts of nuclear power generation on the sea, the immediate environment and the sense of place. It is quite simply a case of the better the communications are with the local communities, the more measured and balanced their reaction to a nuclear power station will be;
- A community-focused exercise in the provision of such public information in all three nuclear power station areas would offset the majority of concerns, especially environmental and biological issues. Most important, though, it would provide sufficient knowledge and time to the stakeholders and authorities to start adjusting their marketing strategies and brand focus, assisting to minimise the negative tourism impacts and optimise the benefits; and
- Eskom's policy is to maintain and expand the existing nature reserves at each of the three sites. It should utilise these parks as catalysts to increase tourism and overcome negative public perceptions. It could do this by, for example, establishing visitor information centres with lectures and films, promoting hiking trails, funding eco-tourism and conservation education, and working in unison with the Agulhas National Park and Grootbos Private Nature Reserve in the Bantamsklip area to further develop nature tourism.

*Operational phase with mitigation:*

If mitigation measures are successfully implemented, the likelihood of the impact occurring should revert to that of probable.

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### **3.17. Assessment of no Development Option**

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***Description of the impact:***

The property will remain in its current vacant and non-utilised state. In the context of this project, the "no-go" alternative implies that the nuclear power station will not be developed.

***Assessment of the impact:***

In general, the "no-development" alternative will imply that virtually none of the identified impacts of proceeding with the project will be incurred for any of the three proposed sites. Conversely, selection of the "no-development" alternative will also result in the benefits of the project not being realized. In addition, should the "no-development" alternative be selected, the positive impact of the nuclear power station on macro-economic performance indicators will be lost. The "no-development" development option would result in a significant loss in opportunity costs. The opportunity costs would include the loss of employment and business opportunities with both the construction and operation phases of the project.

The selection of the “no-development” alternative will also result in the negative impacts of the project not being realised. Aspects like the inflow of unemployed job seekers, negative impact of perceived risks, additional pressure on service delivery, negative impacts on individual, family and community living and crime issues would not be realized if the “no-development” alternative is selected.

The SIA did not consider any possible future non-nuclear development taking place at any of the sites. Therefore no comparative analysis is available.

**Table 3.26: No Development Option**

Phase	Construction Phase <u>without</u> Mitigation Measures			Operational phase <u>without</u> Mitigation Measures		
	Duynefontein	Bantamsklip	Thyspunt	Duynefontein	Bantamsklip	Thyspunt
Cumulative	N/A	N/A	N/A	Medium	Medium	Medium
Nature	N/A	N/A	N/A	Negative	Negative	Negative
Extent	N/A	N/A	N/A	Local	Local	Local
Duration	N/A	N/A	N/A	Long-term	Long-term	Long-term
Intensity	N/A	N/A	N/A	Medium	Medium	Medium
Consequence	N/A	N/A	N/A	Medium	Medium	Medium
Probability	N/A	N/A	N/A	Probable	Highly probable	Highly probable
Significance	N/A	N/A	N/A	Medium	Medium	Medium
Reversibility	N/A	N/A	N/A	Low	Low	Low
Irreplaceable	N/A	N/A	N/A	No	No	No
Confidence	N/A	N/A	N/A	Medium	High	High

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## 4. CONCLUSIONS AND RECOMMENDATIONS

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This report has examined the social impact of the proposed nuclear power station on the three sites, viz. Duynfontein, Bantamsklip and Thyspunt. The focus fell upon the broader local impact as opposed to the specific sites of the nuclear power station, as the sites themselves will have very little social significance.

The project cites a number of important issues which have resulted in, and no doubt will continue to result in, many discussions regarding the viability of the proposed development. Taking cognisance of this throughout the assessment, every effort was made to consider the proposed development from as neutral a position as possible. To what degree this can be achieved will, however, always be a matter of debate. All the identified impacts are relevant to all three proposed sites. However, the rating of the impacts may differ between the sites due to the nature of each site.

An overview of the social environment around the three proposed sites of Duynfontein, Bantamsklip and Thyspunt, was provided. This was followed by an assessment of potential impacts of the proposed nuclear power station development on the surrounding communities.

At a social level, a number of important issues associated with the responsibility of generating and supplying a secure source of electricity, is applicable. The first of these issues concerns the scarcity of suitable sites on which to place new infrastructure as, due to rapid development, the requirement to upgrade existing infrastructure and the availability of suitable sites are in contradiction. This paradox begs for a need to attempt to balance the interests and welfare of neighbouring communities with the national interests of a secure electricity network. To this end, it would be important to carefully select a suitable site and to find compromises that ensure the sense of place of the area remaining intact. As one resident put it in response to the EIA process:

*“ As so aptly stated at the beginning of the Visual Impact Assessment, ‘The project needs to be assessed in the context of the regional landscape character and “sense of place” which is defined as the unique quality or character of a place, whether natural, rural or urban, relating to its uniqueness, distinctiveness or strong identity, the “spirit of the place”.’ The varied uniqueness, distinctness, strong identity and sense of place throughout our region cannot be disputed, and as such requires our commitment to protect its integrity for the future - there is simply nothing else like it anywhere else.” TAG – Tesselaarsdal Action Group, Courier, 2009/04/30, 1 June 2009 Draft EIR Issues Report.*

Ensuring a sense of place is worth considering in the light of people's perceptions of their area being used as a 'dumping ground' for industrial developments, especially as expressed in the case of the Duynfontein site.

The most significant positive social impact that may be associated with the proposed nuclear power station development is the provision of electricity and its related linkages to the broader national economy.

Additional potential positive impacts that can be optimised through appropriate mitigation include provision of temporary employment, local business opportunities (SMMEs) and possible skills development during construction. Limited employment opportunities for locals exist during the operational phase. The significance and consequence is high in the context of high levels of poverty and unemployment characterising the social environment around the three proposed sites. Possible Social Investment from Eskom could depict another potential positive impact with significance, depending on the extent and appropriateness of such an investment to address social needs. The extent to which local employment creation during construction can truly be considered positive, depends on the extent to which local labour is utilised and capacitated during the construction process, as well as on ensuring optimal working conditions for labourers.

The most controversial impact relates to the perceived risks associated with nuclear incidents. From a social point of view, risk is a “subjective experience” which is felt by, and is different, for everyone. Perceived risks could lead to a change in attitude which, in turn, could change behavior. It is therefore important to ensure a reliable flow of relevant and correct information in order for communities to differentiate between perceived and real risks.

A potential negative impact that may result from the proposed development relates to accommodation for temporary workers, particularly during the construction period. The possibility of an influx of job seekers is also a reality. Temporary workers, combined with influx of unsuccessful job seekers, can have a number of social impacts. This includes, inter alia, conflict with local communities, apparent competition for employment and the possibility of single men engaging in relations with local women (possibly increasing the risk of STDs, HIV and AIDS and unwanted pregnancies resulting in fatherless children). A potential increase in criminal and other illegal activities cannot be excluded.

Furthermore, additional strain on municipal and social infrastructure is a logic consequence when large numbers of people flow into an area.

The following specific aspects need to be emphasized for the three proposed sites:

#### **4.1. *Duynefontein***

With regard to the Duynefontein Site, the following applies:

The area around the Duynefontein site may find it easier to accommodate large numbers of staff and construction workers than the other two sites, due to the development level of the area. A construction village will contribute positively to provide required accommodation for construction workers who do not have the option of alternative accommodation. Other developments in the area have the potential to absorb some of the influx of job seekers into the area. Municipal services and social infrastructure and facilities will experience additional strain. Implementation of mitigation measures is of high importance to cope with large numbers of people flowing into the area.

#### **4.2. Bantamsklip**

The following applies to the Bantamsklip Site:

Accommodation for large numbers of staff and construction workers pose a serious problem, but can be mitigated. The erection of a construction village seems to be the **preferred** way to provide accommodation for construction workers, and should be done to enhance and support the building of sustainable human settlements. The exact location of the construction village, however, needs to be determined. The future of the construction village, after the construction phase has been completed, requires a proactive negotiated decision between Eskom and the local municipality. Large numbers of job seekers into the area will impact negatively on the rural character of the area, especially if an increase in the number of informal illegal dwellings is experienced. Municipal services and social infrastructure is inadequate to cope with a growth in the number of people working and living in the area. The implementation of mitigation measures are a pre-requisite to ensure proper provision of services and infrastructure.

#### **4.3. Thyspunt**

Regarding Thyspunt, the following applies:

The situation in Thyspunt is very similar to that of Bantamsklip. However, the relative proximity of Humansdorp and Jeffreys Bay, do offer some alternative options to address some of the impacts. Accommodation for large numbers of staff and construction workers pose a serious problem but can be mitigated. The erection of a construction village seems to be the **preferred** way to provide accommodation for construction workers, and should be done to enhance and support the building of sustainable human settlements. As in the case of Bantamsklip, the actual site for the village needs to be determined. The future of the construction village after the construction phase has been completed, requires a proactive negotiated decision between Eskom and the local municipality. Large numbers of job seekers into the area will impact negatively on the rural character of the area, especially if there is an increase in the number of informal illegal dwellings around the site and towards St. Francis Bay. Municipal services and social infrastructure is inadequate to cope with growth in the number of people working and living in the area. Implementing mitigation measures is a pre-requisite to ensure proper provision of services and infrastructure.

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- The following is a list of additional role-players and organisations who were consulted as part of the SIA consultation process in order to gain better understanding of the social variables. Valuable inputs were made by various role-players and organisations during the general EIA public participation process and no need exist to duplicate the long list of role-players who have taken part in the meetings thus far.
- A large number of community members, and people in organisations were willing to participate in discussions but with the request that their names do not appear in any documentation. They were willing to provide valuable information in order to understand the social variables and how they impact on the way people live their lives.

The following list is therefore not a complete list of all role-players consulted with.

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- Oyster Bay, Councillor, Ward 1, Ben Rheeder.
- Oyster Bay, Mr. Augustus, School Principal.
- Sea Vista, Alwin Malgas.
- South African Police Gansbaai / Hermanus.
- South African Police St. Francis Bay.
- St. Francis Bay Ratepayers Association.
- St .Francis Bay Tourist Association.
- St .Francis Bay, Chris Barret.
- Western Cape Department of Education
- Western Cape Department of Health

### ***Businesses***

Wide variety of Businesses in towns close to the three sites including but not limited to hospitality industry, building, fishing, tourism and retail.

### ***Churches/Community Leaders***

Church leaders / community leaders

### ***Different Officials (IDP/LED/ Civil Services etc) at the following Municipalities:***

- Cacadu
- Caledon
- Cape Metro
- Kouga
- Nelson Mandela Metro
- Overstrand
- Saldanha Bay
- Swartland

### ***Schools***

Principles / teachers of various schools close to the three sites - Interviews

### ***Informal Interviews***

- Ben Rheeder – Ward 1, Kouga Municipality - Interview
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- Boat owners and fisherman- Interview
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- Charles Jordaan – Dept Social Development Western Cape - Interview
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- Dr. A Siyego, Dr. A., Interview
- Elmarie Holtzkamp – APD Western Cape – Interview
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- Fryer, Bob, Overstrand Conservation Federation - Interview
- Gumede, Duke, Head: Project Co-ordination (Northern Region), Housing Directorate, City of Cape Town - Interview
- Harry Wiestra, St. Francis Bay Residents Association - Interview
- Hennie Augustus, Oyster Bay, Kouga - Interview
- Hilton Thorpe – Waterways – Interview, Hilton Thorpe, Kouga Anti-Nuclear Group, Interview
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- L Roux – Oyster Bay, Kouga, Ratepayers Association - Interview
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- Malgas, Alwijn - Independent Democrat Councilor, Interview
- Members of the communities around the three proposed sites - Interviews
- Mr. W Jantjies – Human Capital Development Provincial Government Western Cape - Interview
- Mrs. N Mahanjane – Department of Education Eastern Cape - Interview
- Nicoleen Erasmus – Department of Education Eastern Cape - Interview
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