7. ENVIRONMENTAL SCOPING STUDY – SOCIAL ASPECTS

As in the case of the bio-physical studies discussed in Chapter 6 of this ESR, the results of an Environmental Screening Investigation (ESI) and additional desk-top investigations for the proposed Steelpoort Pumped Storage Scheme, as well as certain specialist studies (desk-top level and field studies) undertaken by the environmental consultant are contained in this chapter. Assessments in this chapter relate to socio-economic aspects and assessments covered all three major alternative sites, together with a number of options for each site (for a description of the options studied, refer to Chapter 3 – Alternatives). The following socio-economic aspects were assessed (aspects not considered within the ambit of the ESI, but studied as part of the ESS, are indicated and *italicized*):

- **Social aspects**
  - *Air Quality (ESS)*
  - Displacement of persons
  - Heritage
  - Health and safety (including HIV/Aids)
  - Access route (accessibility to site)
  - Visual (deterrent in ecological scenic environment)
  - Infrastructural development (water, electricity, etc.)
  - *Traffic (ESS)*
  - *Tourism (ESS)*

- **Economic aspects**
  - Loss of local income due to project
  - Generation of employment by project

- **Enviro-Legal aspects**

7.1. Air Quality

More detail with regards to potential air quality-related impacts can be found in Appendix J, which contains the Air Quality Assessment that was conducted as part of the ESS.

7.1.1. Methodology

- Baseline Assessment

  During the baseline assessment hourly meteorological data sourced from the South African Weather Service was used to determine the atmospheric dispersion potential of the area. Sensitive receptors in close proximity to the site were also identified.

- Scoping Phase Impact Assessment

  During the scoping phase impact assessment, information gaps in the data provided were identified. This was followed by a qualitative assessment of the possible air quality impacts resulting due to the construction, operational and decommissioning phases of the project. The emissions generated and air quality impacts resulting due to these stages were evaluated where possible. As hydroelectric power generation (i.e. the operational phase of the project) is considered air quality friendly, the main air quality impacts to be considered will occur during the construction and decommissioning phases. The pollutant of concern in this investigation is particulate matter.

  The Calpuff View dispersion model was employed in order to demonstrate the three-dimensional wind field of the area. Meteorological input data for the model was sourced from the closest monitoring station(s) able to provide hourly average meteorological readings. Upper air data required to run the CALMET processor will be sourced from the Weather Services ETA model.

  The pollutant of concern during this investigation is particulate matter. Currently a detailed emissions inventory for the study area is not available. Based on 1:50 000 topographical maps, a number of current sources of air pollution have also been identified (Appendix J).

7.1.2. Baseline description of the area

The impact of anthropogenic emissions released to the atmosphere is controlled by prevailing metereological conditions and topographical features in the region. Air movement reduces air pollution by diluting or dispersing it. Air movement can also transport air pollutants over long distances, sometimes over hundreds of kilometers. Air movement and mixing is dependant on differences in low and high pressures and the presence of temperature inversions. The release of atmospheric pollutants into a large volume of air results in the dilution of those pollutants. This is best achieved during unstable atmospheric conditions when the mixing layer is deep. These conditions occur most frequently in summer during the daytime. The dilution effect can however be inhibited under stable atmospheric conditions when the mixing layer is shallow. These conditions occur frequently in the winter. For a detailed baseline description of the area, refer to Appendix J of this report.

7.1.4. Identified sensitive receptors

The following sensitive receptors were identified from 1:50 000 topographical maps:

- Sehlakwane – 2-3 km west of Site A and 3-4 km south and south-south-west of Site B

- Sovolo – 5-8km south and south-west of Site A
- Roossenekaal – 11 km south-east of Site A
- Mathula – 4-5 km south and south-east of Site B
- Thabaneng – ~1 km north of Site B
- Dindela - ~3 km west of Site B
- Eenzaam - ~1km south of Site C
- Maré - ~4-5 km west-south-west of Site C
- Patantswane - ~1km north of Site C
- Matlakatle - ~5km north-west of Site C
- Lehlakong – directly east of Site C
- Ngwaritsi - ~4-5 km west of Site C

7.1.6. The Impact of Particulate Matter

The pollutant of concern during the current investigation is particulate matter. Particulate matter is a collective name for fine solid or liquid particles added to the atmosphere by processes at the earth's surface. Particulate matter includes dust, smoke, soot, pollen and soil particles (Kemp, 1998). Particulate matter classified as criteria pollutant thus national air quality standards have developed in order to protect the public from exposure to the inhalable fractions. Similarly the South African Bureau of Standards has developed guidelines for assessment of nuisance dust impacts.

- Inhalable Particulates

  Particulate matter (PM) has been linked to a range of serious respiratory and cardiovascular health problems. The key effects associated with exposure to ambient particulate matter include: premature mortality, aggravation of respiratory and cardiovascular disease, aggravated asthma, acute respiratory symptoms, chronic bronchitis, decreased lung function, and increased risk of myocardial infarction (USEPA, 1996). PM represents a broad class of chemically and physically diverse substances. Particles can be described by size, formation mechanism, origin, chemical composition, atmospheric behaviour and method of measurement. The concentration of particles in the air varies across space and time, and is related to the source of the particles and the transformations that occur in the atmosphere (USEPA, 1996). PM can be principally characterised as discrete particles spanning several orders of magnitude in size, with inhalable particles falling into the following general size fractions (USEPA, 1996):

  - *PM10* – generally defined as all particles equal to and less than 10 microns in aerodynamic diameter; larger particles are not generally deposited in the lung;
  - *PM2.5* – also known as fine fraction particles (generally defined as those particles with an aerodynamic diameter of 2.5 microns or less)

- *PM10-2.5* – also known as coarse fraction particles (generally defined as those particles with an aerodynamic diameter greater than 2.5 microns, but equal to or less than a nominal 10 microns); and
- *Ultra fine particles* – generally defined as those less than 0.1 microns.

Fine and coarse particles are distinct in terms of the emission sources, formation processes, chemical composition, atmospheric residence times, transport distances and other parameters. Fine particles are directly emitted from combustion sources and are also formed secondarily from gaseous precursors such as sulphur dioxide, nitrogen oxides, or organic compounds. Fine particles are generally composed of sulphate, nitrate, chloride and ammonium compounds, organic and elemental carbon, and metals. Combustion of coal, oil, diesel, gasoline, and wood, as well as high temperature process sources such as smelters and steel mills, produce emissions that contribute to fine particle formation. Fine particles can remain in the atmosphere for days to weeks and travel through the atmosphere hundreds to thousands of kilometres, while most coarse particles typically deposit to the earth within minutes to hours and within tens of kilometres from the emission source.

Some scientists have postulated that ultra fine particles, by virtue of their small size and large surface area to mass ratio may be especially toxic. There are studies which suggest that these particles may leave the lung and travel through the blood to other organs, including the heart. Coarse particles are typically mechanically generated by crushing or grinding and are often dominated by re-suspended dusts and crustal material from paved or unpaved roads or from construction, farming, and mining activities (USEPA, 1996).

- Nuisance Dust

Nuisance dust is known to result in the soiling of materials and has the potential to reduce visibility. Atmospheric particulates change the spectral transmission, thus diminishing visibility by scattering light. The scattering efficiency of such particulates is dependent upon the mass concentration and size distribution of the particulates. Various costs are associated with the loss of visibility, including:

- the need for artificial illumination and heating.
- delays, disruption and accidents involving traffic.
- vegetation growth reduction associated with reduced photosynthesis.
- commercial losses associated with aesthetics.

The soiling of building and materials due to dust frequently gives rise to damages and costs related to the increased need for washing, cleaning and repainting. Dustfall may also impact negatively on sensitive industries, e.g. bakeries or textile industries. Certain elements in dust may damage materials. For instance it was

found that sulphur and chlorine if present in dust may cause damage to copper (Maeda *et al.*, 2001).

The physical smothering of the leaf surface of plants by dust particles causes reduced light transmission, affecting photosynthetic processes resulting in growth reduction (Thompson *et al*., 1984; Pyatt and Haywood, 1989; Farmer, 1993). A review of the effects of cement dust on trees showed that the dust caused physical damage to the leaves, reduced fruit setting and generally reduced growth (Farmer, 1993). Several studies in Europe and the United States have indicated that a decline in species diversity may be linked to declining air quality around urban and industrial areas (Gunnarsson, 1988; Hallingbäck, 1992; Váa, 1992; Van Zanten, 1992; Finizio *et al.*, 1998; Jones & Paine, 2006; Motiejūnaitė, in press; Otnyukova, in press).

Air pollution is a recognized health hazard for man and domestic animals (Newman *et al.*, 1979). Air pollutants have had a worldwide effect on both wild birds and wild mammals, often causing marked decreases in local animal populations (Newman *et al.*, 1979). The major effects of industrial air pollution on wildlife include direct mortality, debilitating industrial-related injury and disease, physiological stress, anaemia, and bioaccumulation. Some air pollutants have caused a change in the distribution of certain wildlife species.

7.1.7. Nature and Extent of the Impacts

- Construction Phase

Dust created during heavy construction is a source of air pollution that could impact substantially on the local air quality. Construction is temporary in nature and consists of a series of actions of known duration and extent (U.S Environmental Protection Agency, 1996). Thus dust emissions generated at a construction site have a definite beginning and end and will vary substantially over the period of construction. The quantity of dust emissions from construction activities is proportional to the area of land being worked, the level of construction activity and the prevailling metereological conditions (U.S Environmental Protection Agency, 1996).

The following possible sources of fugitive dust and particulate emissions were identified as activities which could potentially generate air pollution during construction operations (U.S Environmental Protection Agency, 1996):

- *Demolition and debris removal*
  - Demolition of obstacles such as boulders, trees, etc;
  - Loading of debris into trucks;
  - Truck transport of debris;
  - Truck unloading of debris;

- *Site preparation (earthworks)*
  - Bulldozing;
  - Scrapers unloading topsoil;
  - Scrapers in travel;
  - Scrapers removing topsoil;
  - Loading of excavated material into trucks;
  - Truck dumping of fill material, road base, or other materials;
  - Compacting;
  - Grading;
  - Excavating;
  - Embanking;
- *General Construction*
  - Vehicular traffic;
  - Portable plant – aggregate processing;
  - Concrete Mixing.

The following components of the environment may be impacted upon during the construction phase:

- ambient air quality;
- local residents and neighbouring communities;
- the aesthetic environment; and
- possibly fauna and flora

Impacts in this regard will be more of a nuisance value than a potential health risk.

Construction traffic, excavation and earthmoving, and aggregate processing facilities will generate dust. Short-term increases in sulphur oxides, nitrogen oxides, and hydrocarbons from vehicle exhaust will occur, but air quality is not expected to deteriorate significantly over the long-term as a result of construction activities. It is expected that air quality will be poorer during the winter months as a result of temperature inversions common over the region in the colder months and the cumulative effects of pollution caused by the burning of coal and wood in households, and from veld fires common in winter. Sensitive receptors were identified in close proximity to all three sites (Section 7.1.4). Considering the prevailing wind direction, it is predicted that construction activities could potentially impact particularly on these residential areas (although all identified receptors could be impacted upon):

- *Site A:* - Sehlakwane
  - Sovolo

- *Site B:* - Sehlakwane
  - Mathula
  - Dindela

- Thabaneng

- *Site C:* - Eenzaam
  - Lehlakong
  - Maré
  - Ngwaritsi
  - Matlakatle

Site A and B were identified as being ecologically sensitive (Howard *et al.*, 2006). Due to the short duration of construction activities, the impacts on fauna and flora of particulate matter are expected to be of low significance. The potential haze resulting from suspended particulate matter during the construction period could potentially impact on the aesthetics of the area (visual impact – discussed in Section 7.4). Tourism depends on natural beauty and poor air quality could impact negatively on tourism in the area (tourism impacts will be investigated in detail during the EIA phase of the project). Impacts on aesthetics and tourism due to poor air quality is expected to be of short duration, of a localised nature and therefore of **low significance**.

Impacts will be of a temporary nature and weather conditions are mostly stable with low wind speeds; dust should not be dispersed very widely and should be scavenged from the air by rains during the summer months. Provided that mitigation methods such as dust suppression are employed, overall the negative air quality impacts from construction activities are **not** expected to be significant during the construction phase.

- Operational Phase

Hydroelectric power generation is generally regarded as being environmentally friendly. However, decaying vegetation in dams may emit greenhouse gases such as carbon dioxide (CO_2) and methane (CH_4) (Fearnside, 2002) (also refer to Section 6.3 – Riverine Ecology: Greenhouse Gases). In the case of the proposed PSS, dam levels will fluctuate regularly and it is *not* foreseen that significant areas of the dam will be left unvegetated long enough for vegetation to re-establish before the area is flooded again (which would have lead to another cycle of decomposition).

Based on the scoping-level investigations, it is **not** foreseen that greenhouse gas emissions would be a significant impact and it would pose **no** health or safety risk to surrounding communities. It is therefore **not** considered necessary to investigate this potential impact further during the EIA phase; however, potential levels of greenhouse gas production have not been quantified in the ESS. Furthermore, there is general uncertainty in the literature as to the amount of greenhouse gases emitted by dams.

It can be added that any greenhouse gas emissions that might be associated with the proposed project, would pose **no** health risk to surrounding communities.

Methane emissions could add **cumulatively** to those from the proposed De Hoop Dam near Site C.

- Decommissioning Phase

The decommissioning phase is associated with activities related to the demolition of infrastructure and the rehabilitation of disturbed areas. Possible sources of fugitive dust emission during the closure and post-closure phase include:

- Smoothing of stockpiles by bulldozer;
- Grading of sites;
- Transport and dumping of overburden for filling;
- Infrastructure demolition;
- Infrastructure rubble piles;
- Transport and dumping of building rubble;
- Transport and dumping of topsoil; and
- Preparation of soil for re-vegetation – ploughing and addition of fertiliser, compost etc.

Impacts for this phase will depend on the extent of rehabilitation efforts and are similar to those identified for the construction phase.

The construction and future decommissioning of the facility and associated structures could impact on the local air quality over the short-term. The implementation of best management practices during construction and decommissioning activities will ensure that any negative impacts will be mitigated so that their effects on the neighbouring residential areas and ecological components are minimised.

It is recommended that appropriate site-specific management and mitigation measures be developed during the EMP phase. Based on the provided definitions the significance of the air quality impacts related to the operational phase are outlined in Table 7.2.

Table 7.2: Rating Of Impacts on Air Quality

RATING OF IMPACT: AIR QUALITY			
Dimension	**Construction**	**Operation**	**Decommissioning**
Duration	Short term	Long term	Short term
Extent	Localised	International	Localised
Intensity	Low	Unknown	Low

Probability	Probable	May occur	Probable
Significance	Low	Unknown	Low
Significance*	Low – very low	Unknown	Low – very low
Status	Negative	Negative	Negative
Rating of sites (1 = not suitable, 5 = ideal): **All sites are considered equally suited** to the proposed project; there is no preferred site.			
*Significance with mitigation			
Recommended studies for EIA phase: Mitigation and management measures to be developed for inclusion in EMP.			

7.2 Traffic

The traffic assessment report for the ESS phase is contained in Appendix M.

7.2.1. Status Quo

The Steelpoort River Valley under consideration is located between the Stoffberg-to-Phokwane provincial road (**R579**) and the Roossenekal-to-Steelpoort provincial road (**R555**). The proposed De Hoop Dam is located further north along the Roosenekal to Steelpoort Road (**R55**) near Steelpoort. The proposed pumped storage scheme sites A, B, C are shown in Appendix L together with their proposed access roads from the main provincial roads to the sites.

Daily traffic counts will have to be obtained for the provincial roads (this will be done during the EIA phase) but it is estimated that the patterns will be of a more long distance nature between the provinces of Mpumalanga and Limpopo. The R579 is used by the rural village community of Sehlakwane for transport to Stoffberg.

In terms of other existing transport infrastructure, there is a railway line serving Stoffberg and Roosenekal from the south of Mpumalanga but this is only a trunk line.

7.2.2. Assumptions for Traffic / Transport Scoping

- The proposed PSS will require at least one access road for workers from the nearest provincial road to the site.
- The number of employees and vehicles generated/attracted to the proposed SPSS during the operational phase will be only approximately 40.
- Three alternative scheme sites, *viz.* Sites A, B and C, were evaluated.
- Each site was evaluated based on an access road to the upper escarpment reservoir dam as well as an access road to the lower reservoir and power generation site in the valley.
- The transport cost/road construction cost is proportional to the length of road used or constructed.

7.2.3. Nature and Extent of the Impacts

- Transport of Construction Employees

  The distance, time and cost of transporting workers from nearby settlements and/or from temporary construction accommodation to the site and back will need to be evaluated for each site alternative. This is significant as the construction period is expected to last 5 years. It is assumed that there will be construction accommodation at the upper reservoir site as well as accommodation at the lower reservoir site.

  This traffic impact is expected to be **significant** in nature but mainly **local** in extent.

  The site selection representative transport costs are shown in Table 6.38 for each of the alternative sites. All the various representative transport costs were then added for each site and the best site selected as the one with the lowest transport cost (shortest overall trip length). The transport cost is directly proportional to the distance travelled.

- Length of Road to be Constructed for Access

  The length of access road required to serve each site from the nearest provincial road should be evaluated for each site. An access road needs to be constructed from the provincial road to the upper reservoir site and from the nearest provincial road to the lower valley site.

  This traffic impact is expected to be **moderate** in nature and mainly **local** in extent.

- Travel distance between Control Room and Upper Reservoir

  The length of the passenger car/LDV trip from the control room in the valley to the upper reservoir on the escarpment is crucial to the effective operations of the PSS. In case of an emergency, each of the reservoirs needs to be accessible in a short space of time. This needs to be evaluated for each site.

  The best site selected was the one with the shortest control room to upper reservoir trip length. This traffic impact is expected to be **moderate** in nature and mainly **local** in extent.

- Construction Traffic

  It is estimated that the construction of the PSS will require some 5 years to complete. During all this time the nature and extent of this traffic impact needs to

be evaluated for its effect on the traffic operating conditions and pavement condition of the roads affected.

The origin of the construction traffic may be quite dispersed in extent but the two main provincial roads would need to be considered for evaluation. A detailed evaluation in this regard would need to be undertaken during the Environmental Impact Assessment phase, once a preferred site has been selected.

This traffic impact is expected to be **significant** in nature but could be **regional** in extent.

- Transportation of Components during Construction

  As only the road mode is available to each site for the transport of large components for the SPSS during construction and the sites are very close to each other considering the very long travel distances, this aspect should not influence the choice of site in any significant way. The implications of road-based "Abnormal loads" are significant, but these will be fully explored during the Environmental Impact Assessment phase of the study when a preferred site has been selected.

- Future Location of Employee Residences

  The workforce employed at the proposed pumped storage scheme will most likely be based mainly in the nearby town of Roossenekal; however, this is unlikely to exceed 40 employees.

- Nature and Extent of the Impacts

Table 7.3: Rating Of Impacts on Traffic

RATING OF IMPACT: TRAFFIC		
Dimension	**During construction**	**During operation**
Duration	Short term	Long term
Extent	Local – regional	Local
Intensity	Moderate (regional) – severe (local)	Slight
Probability	Highly probable	Highly probable
Significance	Moderate (regional) – High (local)	Very low
Significance*	Moderate	Negligible
Status	Negative	Negative
Rating of sites (1 = not suitable, 5 = ideal): **Site A** is preferred**.**		
Recommended studies for EIA phase: Detailed traffic impact assessment.		
*Significance with mitigation		

7.3. Socio-economic Assessment

The full scoping-phase socio-economic assessment report can be found in Appendix N.

7.3.1. Introduction

The ESI included analysis of a number of socio-economic issues; however, this was not part of any EIA and therefore additional information was needed for the Scoping Phase of the Social Impact Assessment (SIA) conducted by the SIA specialist forming part of the environmental team. Issues that were not fully addressed within the ESI and which were identified to be addressed in the Scoping Phase were the following:

- Delineating the study area by identifying the communities, settlements and institutions likely to be affected by the project;
- Analysing the social and economic characteristics of the study area, including the following variables:
- Population composition and density;
- Economic activities;
- Levels of income, unemployment and education;
- Household sizes and types of housing;
- Existing services and infrastructure;
- The capacity of local municipalities;

- Preliminary assessment of social impacts by superimposing the description of the planned project on the profile of the socio-economic environment to obtain an indication of the possible impacts of the project;
- Based on the preliminary assessment of social impacts, identify issues that should be subjected to closer scrutiny during the EIA Phase; and
- Safety.

7.3.2. Demographic

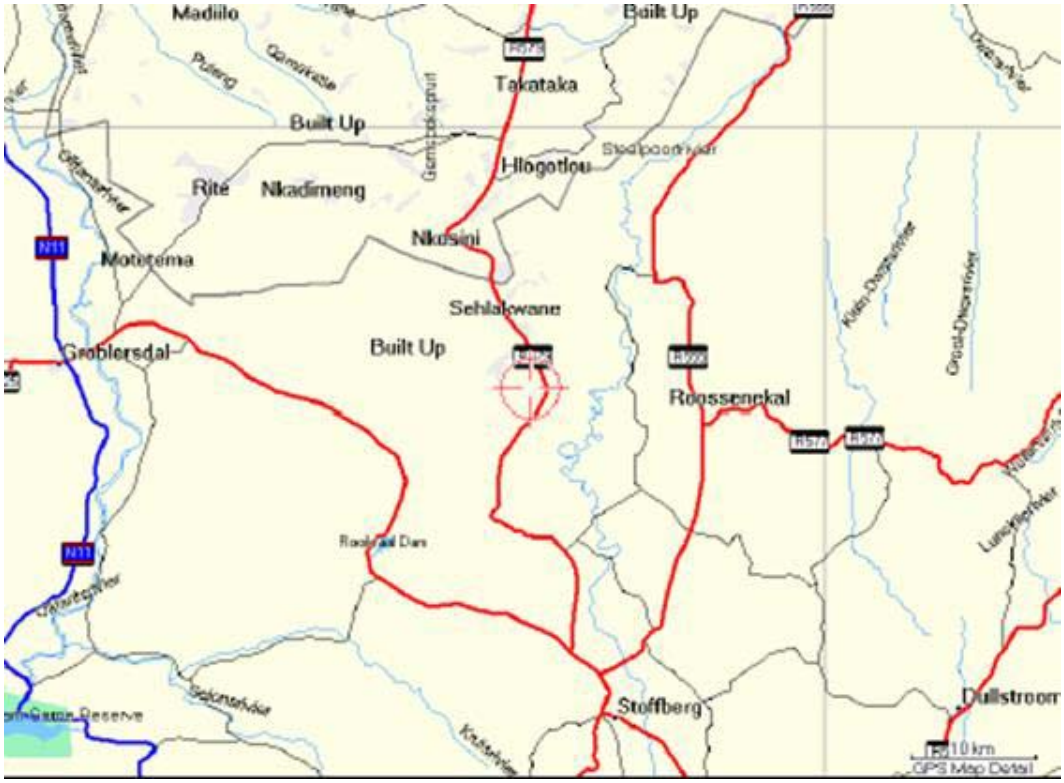
- Introduction

Due to recent changes to the Limpopo/Mpumalanga provincial boundary, there is uncertainty at provincial government level as to which province the alternative study sites are situated in. A description is provided herewith of the Greater Sekhukhune District Municipality which forms part of the Limpopo Province. As all the proposed sites for the PSS fall within the boundaries of the Sekhukhune District, only this District Municipality, together with its affected Local Municipalities, *viz.* the Elias Motswaledi Local Municipality (EMLM) (Groblersdal), Greater Tubatse Local Municipality (GTLM) (Steelpoort) and Makhuduthamaga Local Municipality (MLM) (Jane Furse), will be discussed in more detail in the following sub-sections. Several settlements within the GGLM would potentially be affected by the proposed Steelpoort Pumped Storage Scheme (SPSS) – these are listed in Table 7.4, and illustrated in Figure 7.1.

Table 7.4: Potentially Affected Communities

Settlement	Ward	Site
Greater Groblersdal Local Municipality		
Roossenekal	Ward 16	Site A
Sehlakwane	Ward 16	Site A
Mathula	Ward 17 and 19	Site A
Nkosini, Hlogotlou	Ward 19	Site B
Makhuduthamaga Local Municipality		
Eenzaam, Lehlakong	Ward 6	Site C

Figure 7.1: Potentially affected Communities



- Mpumalanga Province

  The Mpumalanga Province is located in the north-eastern part of South Africa, and links South Africa with Mozambique to the east and the Kingdom of Swaziland to the south and east. Mpumalanga Province is centrally located, with the province of Gauteng on its western border, the Free State to the south west and KwaZulu-Natal to the south-east.

  The predominant population group is Black African (92.4%) followed by White (6.5%), Coloured (0.7%) and Indian/Asian (0.4%). The most commonly used languages in the province are SiSwati (29.4%) and IsiZulu (24.15).

- Limpopo Province

  The Limpopo Province can be seen as at the centre of regional, national and international developing markets. Despite its location in terms of international trade, the Limpopo Province can still be regarded as one of the poorest provinces in South Africa.

  Black Africans are the predominant population group (97.3%) in this province. This is followed by Whites (2.4%), Coloureds (0.2%) and Indians/Asians (0.1%). Tsonga speakers account for a quarter (23.0%) of the province's population, followed by Venda (12.0%). Afrikaans is spoken by 2.6% of the province's population, while English-speaking people account for less than half a percent. Several ethnic groups

are found amongst the population groups. With close to 57%, the Sepedi ethnic group makes up the bulk of the population.

- Greater Sekhukhune District Municipality

The Greater Sekhukhune District Municipality (GSDM) is a category C Municipality, meaning that it has a municipal executive and a legislative authority in an area that includes more than one municipality. The headquarters of the GSDM is currently situated in Groblersdal. The GSDM was established in 2002 and consists of five local municipalities:

- Elias Motswaledi (Groblersdal)
- Marble Hall
- Tubatse (Steelpoort)
- Fetakgomo
- Makhuduthamaga (Jane Furse)

The district was known as a cross-provincial district municipality since it is located to the north west of the Mpumalanga Province and to the south of the Limpopo Province. According to the Demarcation Board, the GSDM has officially been incorporated into the Limpopo Province in accordance with proclamation No 422, dated 27 December 2005. However, to be prudent information on the Mpumalanga Province has also been included as it could not be determined with complete certainty whether part of the GSDM, notably the Greater Tubatse Local Municipality does not indeed fall within Mpumalanga.

The areas of traditional authorities were part of the former homelands of KwaNdebele and Lebowa. Areas in KwaNdebele were developed as resettlement areas for people forcibly removed from farms. The GSDM is still for the most part a rural district, with 94.7% of its total population residing in rural areas, and only 5.3% of the total population residing in urban areas.

According to the current year projections, the total population of the GSDM is estimated at approximately 1 024 748 in 217 000 separate households, an average of 4.7 people per household. Census 2001 puts the total population at approximately 967 144 people living in 204 699 separate households. According to the Bureau for Market Research at UNISA, the population growth rate is expected to drop by approximately 1% per annum until the year 2008, due to the effects of HIV/AIDS.

The Integrated Development Plan (IDP) revealed the following socio-economic issues:

- More than half (56.0%) of the Sekhukhune population is under the age of 20, thus economically inactive resulting in high and unsustainable dependency ratios.

- A total of 6.0% of the population is pensioners who play a major role in the economy of the area.
- Sekhukhune is 94.7% rural, meaning that the very small economic base of the area is dependant on the urban towns. It also means that Sekhukhune has to address the disparities between the urban and rural capacities to support the economy.
- The unemployment rate is very high requiring the creation of jobs, which should be a priority issue to ensure a sustainable society.
- About three quarters (77.4%) of households live below the minimum sustainable level of R1 100 per month - a fact that extends the poverty cycle.
- The majority of households (58.6%) are headed by females and yet jobs are still male focused.
- The majority of the population is concentrated in 529 separate villages with scant facilities and services.
- The education levels are very low as a third (31.0%) of the population does not have any formal education.
- The provision of health services is not satisfactory due to functional inadequacies.
- The crime rate is high.

Amongst the issues identified by the GSDM as priority issues to be addressed, are:

- Poverty alleviation;
- Gender inequality;
- Bulk water supply / reticulation;
- Roads;
- Refuse removal;
- Sanitation;
- Emergency Services and Municipal Policing;
- Cemeteries;
- Health delivery, and more so focused on HIV prevention;
- Community facilities : Sport and Recreation;
- Economic;
- Tourism; and
- Land Tenure Upgrading / Land Reform.

There is no spatial development plan available for this area, and use zones are not clearly identified. The recommendation in the IDP is that development to the east and west of the district should link up with the neighbouring provinces. The major roads of concern are the R33, R555 and the R579.

- Elias Motsoaledi Local Municipality

The Elias Motsoaledi Local Municipality (EMLM), previously known as the Greater Groblersdal Local Municipality, lies in the southern to south-western portion of the

GSDM, on the western banks of the Olifants River. The town of Groblersdal, where the municipality is based, lies north east of Pretoria and is situated approximately 32km from Loskop Dam. Alternative site B falls within the boundaries of the EMLM.

According to the Municipal Demarcation Board the total population of the EMLM is estimated at approximately 221 638 people living in 48 925 separate households, an average of 4.5 people per household. The projected growth rate for the period 2001 to 2010 is 1% per annum.

The settlements within the EMLM that could potentially be affected by the proposed project are Roossenekal and Sehlakwane in Ward 16, Matula in wards 17 and 19, and Nkosini and Hlogotlou in ward 19. These wards are discussed in more detail in the following sub-sections.

- Ward 16 of the EMLM

Although the settlement Roossenekal is not indicated on the Municipal Demarcation Board, it would be safe to assume that it does form part of Ward 16 of the EMLM due to its close proximity to Sehlakwane, which does form part of Ward 16 of the EMLM.

The ward consists mostly of young people, i.e. people under the age of 19 (60.8%). The total population of this ward is estimated at approximately 8 835 people living in 1 867 separate households, an average of 4.7 people per household. The predominant population group is Black African (99.9%) with the remainder 0.1% being Coloured. Just over half (54.9%) of the population consists of females.

Development plans: The EMLM IDP has identified the following priority developments for Roossenekal: A council office, primary school, pension payment facility, purification plant, bridges to link the area with main roads, road construction and repair, water pipes, tourism centre (Ekgoleni Magopo Caves). Agricultural and poverty alleviation projects need to be initiated. Poverty alleviation and agricultural projects are planned for Sehlakwane.

- Ward 17 of the EMLM

The Mathula settlement partially falls within Ward 17 of the EMLM and therefore this ward is discussed in more detail. The ward consists mostly of people under the age of 19 (60.8%). Three quarters (74.5%) of the population is not economically active. The predominant population group is Black African (99.8%). The total population consists of approximately 10 746 people living in 2 113 separate households, an average of 5.1 persons per household. Females dominate at 56.5%.

Most households (43.1%) have no income, although a fairly large proportion (27.3%) reported having an average household income of between R4 801 and R9

600 per month, followed by 13.3% who have a household income of between R9 601 and R19 200 per month. Again, most of these households are headed by females (64.9%). Households consist mostly of six or more people (37.6%).

Development plans: A primary school is planned for Mathula, together with housing developments and the upgrading of roads and sanitation.

- Ward 19 of the EMLM

The settlements of Nkosini, Hlogotlou and a part of Mathula form part of Ward 19 of the EMLM. According to Census 2001 there are approximately 6 091 people residing in this ward in 1 266 separate households, at an average of 4.8 people per household. Most of the residents (57%) are 19 years or younger. Slightly more than half (55.8%) of the total population is female. The predominant population group is Black African (99.9%). Two thirds (62.0%) have no schooling.

The employment rate is low at 4.9% of which the majority (20.5%) are employed in the private household sector. A third (37.2%) of all households has no income, and a third (30.5%) of all households has an average monthly income of between R4 801 and R9 600. Again, most of these households are headed by females (64.8%). Most of the households consist of at least 4 people (17.2%) followed by households consisting of five (15.7%) and two people (12.0%).

Development plans: A pre-school and electricity provision is planned for Hlogotlou.

- Makhuduthamaga Local Municipality (MLM)

The Makhuduthamaga Local Municipality (MLM) is one of the potentially affected local municipalities situated in the Sekhukhune District of the Limpopo Province – alternative site C falls within the boundaries of the EMLM. The MLM was established in the year 2000 in terms of the Local Government Municipal Structures Act.

According to Census 2001 data, there are approximately 261 996 people living in the MLM in 54 017 separate households, an average of 4.9 persons per household. Most of these residents (55.9%) are aged 19 or younger. The predominant population group is Black Africans (99.9%). Females dominate at 56.3%. Close on a half (44.3%) has no schooling. A quarter (24.1%) has completed some secondary education.

The area has a fairly low employment rate of 7.9% (68.4% are not economically active), of which 2.3% is employed in the community services sector. The MLM does not contribute significantly towards agriculture, largely as a result of acute water shortages that only allows for a small percentage of the arable land to be irrigated.

Large areas are cultivated for semi-commercial and subsistence dry land farming in the areas of Nebo and Jane Furse.

The settlements within the MLM that could potentially be affected by the proposed project are Eenzaam and Lehlakong. Both these settlements form part of Ward 6 of the MLM and therefore this ward is discussed in more detail in the following sub-section.

- Ward 6 of the MLM

There are approximately 9 163 people residing in 1 697 separate households within this ward, with an average of 5.4 persons per household. The majority (58.7%) is aged 19 years or younger. There are more females (56.0%) than males in the area. The predominant population group is Black Africans at 99.9%. The majority (43.1%) has no schooling. Only a quarter (25.0%) completed some secondary education.

By far the majority of residents (84.2%) are not economically active. Of the 2.2% who is employed, almost a half (42.0%) is employed by the community services sector. Most of the households (62.3%) are female-headed and have no household income (54.4%). More than a quarter (28.7%) of all households have a monthly income of between R4 801 and R9 600.

Development plans: The identification and implementation of housing projects were identified as a priority by the local municipality.

- Greater Tubatse Local Municipality

The Greater Tubatse Local Municipality (GTLM) forms part of the Greater Sekhukhune District Municipality. The total population of the GTLM is estimated at 270 116 people, residing in 56 231 separate households (with an average of 4.8 persons per household). Almost all of the residents are Black African (99.0%), followed by White (0.8%). The predominant languages spoken are Sepedi (90.2%) and SiSwati (4.1%).

Close on half of the total population (55.8%) are aged 19 years or younger and there are more females (55.0%) than males (45.0%) in the area. Four in ten of the adult population (40.0%) reported having had no schooling. Of those who have had some form of education, three quarters (74.9%) reported that they attended school. Only 13.3% of the total adult population are employed, mostly in the Community Services Sector (2.3%). Four in ten of all the households (42.8%) have no household income, followed by households with an average monthly income of between R4 801 and R9 600 (22.3%).

The majority of households appear not have access to proper municipal services. Two thirds of the households make use of wood for cooking (67.0%) and heating (69.5%). There is an almost 50-50 split between energy sources for lighting purposes: 47% make use of electricity, whilst 46.7% still make use of candles. Two thirds (65.4%) make use of their own refuse site for refuse removal, whilst a quarter (26.4%) has no access to refuse removal facilities. Half of the households (53.8%) only have access to a pit latrine without ventilation. Two in ten households (18.5%) have no access to water, followed by 14.6% of the population whose only access to water is through a communal stand some 200m or more away from their place of residence.

- Nature and Extent of the Impacts

The influx of a large number of outsiders is likely to result in a number of social ills such as prostitution/stock theft, other security problems and an increase in sexually transmitted diseases, particularly HIV/AIDS.

Table 7.5: Rating Of Impacts in Terms of Influx of Workers

RATING OF IMPACT: INFLUX OF WORKERS		
Dimension	**During construction**	**During operation**
Duration	Short term could become long term	Long term
Extent	Localised	Localised
Intensity	Could be severe	Could be severe
Probability	Will definitely occur	Highly probable
Significance	High	Medium
Significance*	Medium	Low-medium
Status	Negative	Negative
Rating of sites (1 = not suitable, 5 = ideal): At **Site A** the most favourable option is Option 3. The proximity of Sehlakwane makes this a less favourable option. **Site B** is most favourable since the location is remote. **Site C** is located in close proximity to existing communities and thus presents the less favourable option.		
Site A: 3	**Site B:** 4	**Site C:** 2
*Significance with mitigation		

7.3.3. Displacement of Persons

It is not foreseen that displacement of persons would be a significant impact in terms of the proposed PSS, as very few people would need to be displaced. Table 7.6 below

indicates the potential displacement levels that may be associated with each of the alternative sites.

Table 7.6: Potential displacement of persons at each of the alternative sites

Site	Potential displacement
Site A	A small number of people may be displaced. One weekend farm house and one worker dwelling would be affected by Option A3 and the occupants thereof may need to be relocated.
Site B	No persons would be displaced at the upper reservoir. There are a small number of dwellings at the lower reservoir option 5 and these occupants will be displaced.
Site C	No people are expected to be displaced at the upper site at site C.

- Nature and Extent of the Impacts

  The impact of relocation depends on the level of attachment to a place, and this will have to be assessed to get an indication of the possible effect. Level of attachment is linked to variables such as age and number of years spent in that particular area. Displacement should be avoided as far as possible.

Table 7.7: Site selection and impacts summary – displacement of persons – ESI

RATING OF IMPACT: DISPLACEMENT OP PERSONS		
Dimension	**During construction**	**During operation**
Duration	Long term	Long term
Extent	Household	Household
Intensity	Very severe	Very severe
Probability	May occur	May occur
Significance	Very high	Very high
Status	Negative	Negative
Rating of sites (1 = not suitable, 5 = ideal): **Site A2**: A number of people may be displaced. **Site A3**: A weekend farmhouse and worker dwelling will be affected. **Site B**: There are a number of dwellings at the lower reservoir option 5 and these occupants will be displaced. **Site C**: Relocation at the lower site might be necessary.		
Site A: 3	**Site B:** 3	**Site C:** 4
Recommended studies for EIA phase: More detailed information required on numbers of people who will have to be displaced, and level of place attachment.		

- Site Selection Summary – Displacement of Persons

Table 7.8: Site selection summary – displacement of persons – ESI

Location	Site A Option 1	Site A Option 2	Site A Option 3	Site B Option 1	Site B Option 5	Site B Option 7	Site C Option 1
Rating	2	2	4	4	2	3	4

7.3.4. Health and Safety

Health and Safety is focussed primarily on the potential for people to be negatively influenced by the proximity to the dam. Typical health and safety issues include:

- The influx of a large number of outsiders is likely to result in number of social ills such as prostitution/ stock theft, other security problems and an increase in sexually transmitted diseases, particularly HIV and Aids
- Due to rapid movement of water and fluctuation in water levels the dam will be a safety hazard for local populace. However, the dams will be heavily fenced and there will be other safety notification in order to prevent people and/or animals straying into the dams and thereby placing themselves at risk
- An increase in the number of vehicles using the road during the construction may results in a higher incidence of road injuries and/or deaths, particularly in Sehlakwane.

Sub-Saharan Africa (SSA) remains the region most severely affected by HIV/AIDS in Africa (source: AIDS Epidemic Update: UNAIDS/WHO, December, 2004) The HIV epidemic in SSA is likely to continue to spread for the foreseeable future. About one-third of those currently living with HIV/AIDS are aged 15-24 years.

Demographic data provides some of the clearest sources of knowledge about HIV/AIDS and the workplace. At a symposium on HIV/Aids in the workplace in 2004, it was identified that:

- The HIV prevalence among contract workers and the unemployed is higher than among permanent employees
- There is a higher HIV prevalence in lower paid than higher paid occupations
- The HIV prevalence rate peaks between the ages of 30 and 39 years in men, and among women it peaks at a lower age
- The epidemic disproportionately affects women (as opposed to men) in Southern Africa.

An analysis of this information points clearly to the fact that development projects could have a significant impact on local and regional prevalence of HIV / Aids. In development projects, the bulk of the workforce is contract workers, typically coming for areas outside

of the region, the wages are generally low, the composition of the workforce is predominantly young male and women in the surrounding community could be at risk.

Socio-cultural and economic as well as demographic changes associated with population mobility in and out of a project area will determine the risk environment related to HIV/AIDS in the communities associated by the project. Within this context, attitudes, values, knowledge and practices affecting safer sex will determine the extent of risk in terms susceptibility and vulnerability.

The risk environment, in which the chances of disease transmission are increased as a result of social, economic and cultural factors, includes the following factors:

- Project employees interacting on a regular basis with sex workers (SWs)
- Wage earners with disposable income for alcohol, drug use and SWs
- Opportunities for SWs to establish activities at project site
- Lack of awareness and knowledge regarding sexually transmitted infections (STIs) and unsafe sex
- Sexual relationships of people from different areas with unknown sexual histories (casual sex, multiple sex partners, etc.).
- Poverty among SWs.

Table 7.9 below indicates potential health risks and suitability of each of the site alternatives. It is important to note that the construction workforce could change the local HIV/Aids profile and thus a comprehensive and holistic management plan is required.

Table 7.9: Potential health risks and suitability of alternative sites

Site	Potential health risk and suitability
Site A	Most favourable option is for more remote sites, in this case Site A3.
Site B	Site B is considered most favourable since the location is remote.
Site C	Site C is located in close proximity to existing communities and thus presents the least favourable option.

- Site Selection Summary – Health and Safety

Table 7.10: Site selection summary – Health and Safety – ESI

Location	Site A Option 1	Site A Option 2	Site A Option 3	Site B Option 1	Site B Option 5	Site B Option 7	Site C Option 1
Rating	2	2	4	4	4	4	2

- Nature and Extent of the Impacts

HIV/Aids

Development projects could have a significant impact on local and regional prevalence of HIV / Aids, as the bulk of the workforce is generally employed on a contract basis, typically coming for areas outside of the region, the wages are generally low, the composition of the workforce is predominantly young male and women in the surrounding community could be at risk.

Socio-cultural and economic as well as demographic changes associated with population mobility in and out of a project area will determine the risk environment related to HIV/AIDS in the communities associated by the project. Within this context, attitudes, values, knowledge and practices affecting safer sex will determine the extent of risk in terms susceptibility and vulnerability. Factors influencing the risk environment and risk behaviour are described in the sections above.

Table 7.11: Impacts summary – Health and Safety (HIV/Aids) – ESS

RATING OF IMPACT: HIV/AIDS (DUE TO INFLUX OF WORKERS)		
Dimension	**During construction**	**During operation**
Duration	Short term could become long term	Long term
Extent	Regional	Regional
Intensity	Could be severe	Could be severe
Probability	Will definitely occur	Highly probable
Significance	High	Medium
Significance*	Medium	Low-medium
Status	Negative	Negative
Rating of sites (1 = not suitable, 5 = ideal): At **Site A** the most favourable option is Option 3. The proximity of Sehlakwane makes this a less favourable option. **Site B** is most favourable since the location is remote. **Site C** is located in close proximity to existing communities and thus presents the less favourable option.		
Site A: 3	**Site B:** 4	**Site C:** 2
*Significance with mitigation		

Safety hazard of dams

Due to rapid movement of water and fluctuation in water levels the dam will be a safety hazard for local populace.

Table 7.12: Impacts summary – Health and Safety (Safety Hazard of Dams) – ESS

RATING OF IMPACT: SAFETY HAZARD OF DAMS		
Dimension	**During construction**	**During operation**
Duration	Short term	Long term
Extent	Localised	Localised
Intensity	Severe	Severe
Probability	Possible	Unlikely
Significance	High	High
Status	Negative	Negative
Rating of sites (1 = not suitable, 5 = ideal): At **Site A** the most favourable option is Option 3. The proximity of Sehlakwane makes this a less favourable option. **Site B** is most favourable since the location is remote. **Site C** is located in close proximity to existing communities and thus presents the less favourable option.		
Site A: 3	**Site B:** 4	**Site C:** 2
Recommended studies for EIA phase: Feedback from relevant specialists is necessary to better assess this impact.		

Health impact of vehicle emissions

Vehicle emissions can impact negatively on health. Especially primary pollutants can be of concern where people are concerned.

Table 7.13: Impacts summary – Health and Safety (Vehicle Emissions) – ESS

RATING OF IMPACT: HEALTH IMPACT OF VEHICLE EMISSIONS		
Dimension	**During construction**	**During operation**
Duration	Short term	Long term
Extent	Localised	Localised
Intensity	Low to medium	Low
Probability	Highly probable	Probable
Significance	Low	Negligible
Status	Negative	Negative
Rating of sites (1 = not suitable, 5 = ideal): At **Site A** the most favourable option is Option 3. The proximity of Sehlakwane makes this a less favourable option. **Site B** is most favourable since the location is remote. **Site C** is located in close proximity to existing communities and thus presents the less favourable option.		
Site A: 3	**Site B:** 4	**Site C:** 2
Recommended studies for EIA phase: More detailed information is required on numbers and size of vehicles.		

7.3.5. Access Route to Site

Access to the various sites will require, in some instances, the construction of a new road and in others, the upgrading of the existing road.

Required access during construction and operation of the scheme can be classified in four categories:

- Temporary access roads to the site during construction
- Permanent access roads to the site
- Temporary site roads required during construction

Table 7.14 below indicates potential issues with regards to access routes.

Table 7.14: Access routes

Site	Access route
Site A	Access to site A for all options is relatively easy and no significant impact is expected. At the upper site, a new road will have to be constructed with its associated impact on grazing land.
Site B	Site B lower (B1 & B5) is relatively easy and no significant impact is expected. Site B lower (B7) will require the construction of a new road and this is anticipated to impact negatively upon the environment. The upper reservoir is remote and a new road will need to be constructed over a long distance, potentially resulting in an increase in impacts along the route.
Site C	Access to site C is relatively easy and no significant impact is expected.

- Nature and Extent of the Impacts

  An increase in the number of vehicles using the road during the construction may result in a higher incidence of road injuries and/or deaths, particularly where roads run through or in close proximity to villages / settlements.

Table 7.15: Impacts summary – Health and Safety (Traffic Hazard) – ESS

RATING OF IMPACT: SAFETY HAZARD OF TRAFFIC		
Dimension	**During construction**	**During operation**
Duration	Short term	Short term
Extent	Localised	Localised
Intensity	High	High
Probability	Probable	May occur
Significance	Severe	Severe
Status	Negative	Negative
Rating of sites (1 = not suitable, 5 = ideal): At **Site A** the most favourable option is Option 3. The proximity of Sehlakwane		

makes this a less favourable option. **Site B** is most favourable since the location is remote. **Site C** is located in close proximity to existing communities and thus presents the less favourable option.		
Site A: 3	**Site B:** 4	**Site C:** 2
Recommended studies for EIA phase: More detailed information required on numbers and size of vehicles.		

The disruption of recreational and daily activities could potentially be a problem where heavy duty traffic occurs and roads are being built.

Table 7.16: Impacts summary – Health and Safety (Disruption of Community Activities) – ESS

RATING OF IMPACT: DISRUPTION OF COMMUNITY ACTIVITIES – TRAFFIC		
Dimension	**During construction**	**During operation**
Duration	Short term	Long term
Extent	Localised	Localised
Intensity	Moderately severe	Slight
Probability	Will definitely occur	Unlikely
Significance	Moderate	Low
Status	Negative	Negative
Rating of sites (1 = not suitable, 5 = ideal): Access roads to **Site C** bypass settlements. Access roads to **Sites A and B** pass through settlements.		
Site A: 3	**Site B:** 4	**Site C:** 2
Recommended studies for EIA phase: More detailed information is required on the movement patterns of the affected communities.		

- Site Selection Summary – Access Routes

Table 7.17: Site Selection – access routes – ESI

Location	**Site A Option 1**	**Site A Option 2**	**Site A Option 3**	**Site B Option 1**	**Site B Option 5**	**Site B Option 7**	**Site C Option 1**
Rating	4	4	4	2	2	2	4

7.3.6. Loss of Income

Loss of income can have two main causes:

- Loss of land or access to land for agricultural activities
- Farm workers in the area leaving farms to join the construction workforce, which may cause problems with local farmers, due to the likelihood that wages will be higher for construction work (albeit for a limited period of employment)

Table 7.18 indicates potential issues with regards to loss of income.

Table 7.18: Potential loss of income

Site	Potential loss of income
Site A	At Option A1, the dam would inundate existing farm land resulting in a loss of income to the farmer. At the other options, the impact is not considered significant. At Option 3, some 25% of the farm portions would be lost for winter grazing purposes, potentially dropping below the break-even point for sustainable economic cattle farming.
Site B	The potential loss of income at all options within Site B is not considered significant.
Site C	Potential loss of income is significant as the current land use is agricultural crops that provide both food and cash for the farmers. A sensitive consultation process would be required to address each of the comments from current farmers and to ensure that the net benefit to the community as a whole is maximised. There is an opportunity to re-train the community into fishing but this will need to be explored in more detail.

- Nature and Extent of the Impacts

  Although farming is not the main sector of income in the area, land with agricultural potential should be preserved. Subsistence farming does have an important role to play in providing for families. Agricultural land therefore needs to be protected and developed, and the disruption of farming activities should be avoided as far as possible. Longer access roads also imply more loss of land.

Table 7.19: Site selection and impacts summary – loss of income – ESS

RATING OF IMPACT: AGRICULTURAL POTENTIAL/LOSS OF INCOME		
Dimension	**During construction**	**During operation**
Duration	Short term	Long term
Extent	Localised	Localised
Intensity	Severe (if agricultural activities are impacted upon)	Severe (if agricultural activities are impacted upon)
Probability	Probable	Probable
Significance	High	High
Status	Negative	Negative
Rating of sites (1 = not suitable, 5 = ideal): **Site A and B**: From the ESI it is not clear whether Site A and B will impact on agricultural activities. According to the agricultural potential assessment, the impact of the upper dam of Site A is of low significant impact for agricultural activities as no agricultural activities are currently taking place there. According to the assessment on potential loss of income, at Option A1 the dam will inundate existing farm land resulting in a loss of income to the farmer. At Option A3, some 25% of the farm portions would be lost for winter grazing purposes, potentially dropping below the break-even point for sustainable economic cattle farming. **Site C**: The construction of a dam will have a medium significant impact as portions of the area are currently being cultivated. Some portions that have been cultivated in the past are not under cultivation any more probably because these portions do not yield a good crop. According to the ESI the potential loss of income is significant, as the current land use is agricultural crops that provide both food and cash to the farmers.		
Site A: 4	**Site B:** 4	**Site C:** 2
Recommended studies for EIA phase: More detailed information about land use and planned land use. A detailed agricultural potential assessment will also be conducted in the EIA phase.		

- Site Selection Summary – Loss of Income

Table 7.20: Site selection summary – loss of income – ESI

Location	**Site A Option 1**	**Site A Option 2**	**Site A Option 3**	**Site B Option 1**	**Site B Option 5**	**Site B Option 7**	**Site C Option 1**
Rating	2	4	4	4	4	4	2

7.3.7. Employment Creation

A positive impact of the proposed dam will be the employment of an average of 2000 construction workers over a 5-7 year period (approximately 300 for upper reservoir and 1700 for the powerhouse and lower reservoir), with 1000 to be sourced from local communities. Peak employment during construction is set to reach 400 and 3100 for the upper and lower reservoirs respectively. At all sites there will be a potential for

employment, which is a positive impact, except at Site B where the potential benefits are uncertain due to the remoteness of the upper reservoir.

- Nature and Extent of the Impacts

  The use of local labour could boost the local economy, and empower people. A project such as this gives opportunity for training and development. The presence of contract workers could also boost local businesses.

Table 7.21: Site selection and impacts summary – employment creation – ESS

RATING OF IMPACT: CREATION OF EMPLOYMENT OPPORTUNITIES		
Dimension	**During construction**	**During operation**
Duration	Short term	Long term
Extent	Localised to sub-regional (people from surrounding villages may also be used)	Localised
Intensity	Very beneficial	Very beneficial
Probability	Definite	Probable
Significance	Very high	High
Status	Positive	Positive
Rating of sites (1 = not suitable, 5 = ideal):		
Site A: 5	**Site B:** 4 (distance from settlements)	**Site C:** 5
Recommended studies for EIA phase: More detailed information required on numbers and skills levels of possible employment opportunities.		

- Site Selection Summary – Employment Creation

Table 7.22: Site selection summary – employment creation – ESI

Location	**Site A Option 1**	**Site A Option 2**	**Site A Option 3**	**Site B Option 1**	**Site B Option 5**	**Site B Option 7**	**Site C Option 1**
Rating	5	5	5	3	3	3	5

7.3.8. Infrastructural Development

Local and regional infrastructural development at all sites will have a positive impact for the local communities in the area. This positive impact will, however, need to be committed to the project to ensure that the positive impact does not become a negative impact due to no service delivery and thus resistance to the project.

- Nature and Extent of the Impacts

Infrastructural development will be necessary to a certain extent as part of the proposed SPSS, e.g. upgrading of roads to gain access to the construction sites. This is foreseen to have positive spin-off impacts, particularly in rural villages – for instance the building of a tarred road through a local village would. These will be of long-term use to the local inhabitants.

Pumping of water from De Hoop Dam up the escarpment (through the tunnel system that will form part of the proposed PSS) to the villages on the plateau has been approved in theory and discussions are currently on-going between the relevant parties. This will have a significantly positive impact on the rural inhabitants on the plateau, as there is currently a scarcity of potable water.

Table 7.23: Site selection and impacts summary – infrastructural development – ESS

RATING OF IMPACT: INFRASTRUCTURAL DEVELOPMENT		
Dimension	**During construction**	**During operation**
Duration	Short term	Long term
Extent	Localised	Sub-regional
Intensity	Beneficial	Very beneficial
Probability	Highly probable	Highly probable
Significance	Moderate	High (if water pumping project comes to pass)
Status	Positive	Positive
Site A upper New gravel: 0.5 km. Gravel reinstate/upgrade: 4.2 km. Upgrade to tar: 9.0 km. **Site B** upper New gravel: 1.0 km. Gravel reinstate/upgrade: 4.0 km. Upgrade to tar: 9.0 km. **Site C** upper: New gravel: 3.0 km. Gravel reinstate/upgrade: 12.5 km. Upgrade to tar: 15.5 km.		
Site A: 5	**Site B:** 4	**Site C:** 5
Recommended studies for EIA phase: More detailed information about the planned infrastructural developments and how it might benefit the affected communities. The extent and possibility of social investment initiatives should be assessed.		

- Site Selection Summary – Infrastructural Development

Table 7.24: Site selection summary – employment creation – ESI

Location	Site A Option 1	Site A Option 2	Site A Option 3	Site B Option 1	Site B Option 5	Site B Option 7	Site C Option 1
Rating	5	5	5	5	5	5	5

7.3.9. Noise

Noise levels experienced during construction could have an effect on the sense of place.

No detailed study was conducted during the Scoping phase pertaining to noise. However, a detailed specialist study will be conducted in this regard during the EIA phase of the project.

Table 7.25: Rating of Impacts – Noise – ESS

RATING OF IMPACT: NOISE		
Dimension	**During construction**	**During operation**
Duration	Short term	Long term
Extent	Localised	Localised
Intensity	Slight	Slight
Probability	Will definitely occur	Will definitely occur
Significance	Low	Low
Confidence	Probable	Probable
Rating of sites (1 = not suitable, 5 = ideal): At **Site A** the most favourable option is Option 3. The proximity of Sehlakwane makes this a less favourable option. **Site B** is most favourable since the location is remote. **Site C** is located in close proximity to existing communities and thus presents the least favourable option.		
Site A: 3	**Site B:** 4	**Site C:** 2
Recommended studies for EIA phase: A specialist noise assessment will be conducted within the EIA phase of the project and detailed, site-specific mitigation and management measures will be recommended for inclusion in the EMP.		

7.3.10. Summary Description and Assessment of Potential Impacts – Social Impact Assessment

This section summarises the planned construction activities and the potential impacts that can be expected as a result thereof. Table 6.61 describes the activities that can be expected, and Tables 6.62 discuss and assess the potential impacts.

Table 7.26: Construction and Operations activities

Construction period: 2009-2014	
Traffic	Heavy duty trucks will be used. The details of the number and size of construction vehicles need to be determined for the EIA phase.
Access roads	Temporary access and site roads will be required. Access roads to Site C will bypass settlements. Access roads to Site A and B will pass through settlements. This is expected to have both positive and negative impacts.
Employment creation	An estimated 300-400 jobs at the upper dam. An estimated 1 700-3 000 jobs at the lower dam. It is estimated that 1 000 jobs will be created for local people. The level of skills required for these is not known at this stage, and needs to be identified. Skilled labour will be needed for excavation and mechanics.
Construction villages	Accommodation will need to be provided at the upper dam site as well as at the lower dam site. These will not be on site, although housing might be constructed on site for security purposes. Details of construction villages need to be assessed for the EIA phase.
Construction method	Cut to fill will be used and excavated material will be used for construction of the dams. Drilling will have to be done. Details will have to be assessed to assess potential impacts.
Land loss	Approximately 50-80ha will be occupied by the dams (each). The exact portion of land which will be used for construction purposes is not known at this stage, and will have to be provided for the EIA phase.
Operation	
Traffic	The traffic numbers will be dependent on tourism numbers, employees' mode of transport, and maintenance activities. The heavy duty vehicles of the construction phase will not be present during operation.
Land loss	The size of land occupied by the dams will be 50-80ha each, excluding an administrative building of 1000m^2 for 40 odd people, and probably a visitor centre to view the power station and visit archaeological sites (this may, however, be combined with the administration building). Confirmation of this information will be available for the EIA phase.
Access roads	Access roads to Site C will bypass settlements.

	Access roads to Site A and B will pass through settlements.
Employment creation	A total of approximately 40 people will be employed during operation. The level of skills required for these need to be determined for the EIA phase.
Housing	No permanent houses will be left behind, apart from 1 or 2 houses close to the administration building. Permanent staff will probably be housed at Roossenekal where undeveloped serviced stands are available.

7.3.11. Conclusions and Recommendations

The ESI concluded that overall Site A3 and C1 were the preferred sites. Based on the **social** impacts discussed in the ESI, Site A, then B, followed by Site C was the order of preference. In this Scoping Assessment as part of the SIA, **Site B** is preferred, followed by Site A. This is mainly because of the proximity of the sites to settlements, and the potential impact of construction activities on these settlements. Should Site B not be taken to EIA Phase, the proximity of the other alternatives to settlements should be considered, and the Environmental Management Plan should set out strict guidelines for conduct with inhabitants. For operation, safety aspects should be considered, and the potential economic gain for inhabitants (e.g. tourism activities) should the SPSS be located in close proximity of settlements. Land with relatively high agricultural potential should be avoided as far as possible in order not to impact upon the means of livelihood of subsistence farmers in the area.

Table 7.27: Summarised Ranking of Alternative Sites (ESS) (Social Aspects)

Impact variable	**Ranking of sites** (1 = not suitable, 5 = ideal)		
	Site A	**Site B**	**Site C**
Agricultural potential/loss of income	4	4	2
Displacement of persons	3	3	4
Disruption of activities	3	4	2
Influx of job seekers	3	4	2
Safety hazard of water levels	3	4	2
Safety hazard of traffic	3	4	2
Dust	3	4	2
Vehicle emissions	3	4	2
Noise	3	4	2
Infrastructural development	5	5	5
Employment opportunities	5	4	5
Total:	38	54	30

The table below contains the site preference ratings for the three proposed sites. These ratings were obtained by averaging the totals presented in the table above.

Table 7.28: Site Preference Ratings for the Proposed Sites

Site	**Score** (1 = not suitable, 5 = ideal)	**Site preference rating**
Site A	3.5	Second choice
Site B	4.9	First choice
Site C	1.7	Third choice

Table 7.29 below summarises the identified social impacts discussed in the previous section, as well as the ratings assigned to them in terms of duration, extent, severity, etc. The symbols employed in the table to indicate the ratings are explained in Table 7.28.

Table 7.29: Symbols of Rating Impacts

Dimension	**Ratings**
Duration	Short term: - Medium term: 0 Long term: + Permanent: ++
Extent	Individual: -- Household: - Localised: 0 Regional: + National: ++ International: +++
Intensity	Very severe: H- Severe: M- Mod. severe: L- Slight: 0- Very beneficial: H+ Benefit.: M+ Mod. benef.: L+ Slightly benef.: 0+ Undetermined: 0
Probability	Very unlikely: - Unlikely: 0 May occur: + Definitely occur: ++
Significance	None: -- Low: - Moderate: 0 High: + Very high: ++
Confidence	Unsure: - Possible: 0 Probable: + Definite: ++

Table 7.30: Summary of Impact Ratings – Social Aspects

	Duration	**Extent**	**Intensity**	**Probability**	**Significance**	**Confidence**
CONSTRUCTION IMPACTS						
Agricultural potential/loss of income	-	0	M-	++	+	+
Displacement of persons	+	-	H-	+	++	++
Disruption of activities	-	0	L-	++	0	++
Influx of job seekers	-	0	M-	++	+	++
Safety hazard of water levels	-	0	M-	+	+	0
Safety hazard of traffic	-	0	H-	+	H-	+
Safety hazard of HIV/Aids	-	+	L-	++	0	+

	Duration	Extent	Intensity	Probability	Significance	Confidence
Dust	-	0	0-	++	-	++
Vehicle emissions	-	0	0-	++	-	++
Noise	-	0	0-	++	-	+
Infrastructural development	-	0	M+	++	0	++
Employment opportunities	-	0	H+	++	++	+
OPERATIONS IMPACTS						
Agricultural potential/loss of income	-	0	M-	++	+	+
Displacement of persons	+	-	H-	+	++	++
Disruption of activities	+	0	0-	0	-	++
Influx of job seekers	-	0	M-	++	+	++
Safety hazard of water levels	-	0	M-	+	+	**0**
Safety hazard of traffic	-	0	H-	+	H-	+
Safety hazard of HIV/Aids	+	+	L-	+	0	+
Dust	-	0	0-	++	-	++
Vehicle emissions	-	0	0-	++	-	++
Noise	-	0	0-	++	-	+
Infrastructural development	-	0	M+	++	0	++
Employment opportunities	+	**0**	**H+**	++	++	+

7.4 Visual Impact

The construction and inundation of the reservoirs would alter the aesthetic character of the lower dam and upper reservoir areas considerably. Temporary visual impacts (landscape scarring) related to the construction phase of the scheme are expected to be significant, due to clearing of construction servitudes, exposure of soils in previously vegetated areas, construction of access roads and haul roads, etc. The presence of machinery and construction workers at the construction site over the 5-7 year construction period will also represent a relatively significant visual impact for people living in the vicinity.

Although the bulk of the infrastructure is to be situated underground, dams will be visible to the Sehlakwane community (Upper reservoir) and to farmers living downstream of the lower reservoir. These walls will, however, not be visible from the closest tarred provincial road. Due to periodic fluctuation in water table of the dam due to pumping in between basins, a muddy bank area is likely to be exposed often. This is expected to particularly affect the lower dam.

Table 7.31 below indicates the potential visual impacts that can be expected with regards to the alternative sites.

Table 7.31: Potential visual impacts associated with the alternative sites

Site	Potential visual impacts
Site A	The visual impact would be minor for Options A1, A2 and A3, but the upper reservoir for Options A2 and A3 would be visible from the Steelpoort Valley, thus increasing the impact.
Site B	The lower reservoirs are not foreseen to have a significant impact. The upper reservoir may have an impact, however, though the extent of the impact is at this stage uncertain. This will be investigated in greater detail during the EIA phase of the project. The construction of the access road for the lower dam (Option B7) is likely to have a negative visual impact.
Site C	The upper reservoir for Site C will have an impact on visual quality but should not significantly change the overall visual effect.

7.4.1. Site Selection Summary – Visual Impacts

Table 7.32: Site Selection – Visual Impacts – ESI

Location	Site A Option 1	Site A Option 2	Site A Option 3	Site B Option 1	Site B Option 5	Site B Option 7	Site C Option 1
Rating	4	4	2	3	3	2	4

7.5. Heritage

A short overview of past human occupation in the region is presented below. This should provide insight into the complexity of the identified cultural resources.

7.5.1. Stone Age (2 000 000 years ago to ad 200)

The larger geographical area has been inhabited since Stone Age times. One of the more important sites, known as Bushman Rock Shelter, is located at Echo Caves north of Ohrigstad. Early humans lived here, discontinuously, for thousands of years, from the Early Stone Age (2 million to 150 000 years ago), through what is known as the Middle Stone Age (150 000 to 30 000 years ago), and well into the Late Stone Age (30 000 to 1 800 years ago).

That Stone Age people occupied the Steelpoort valley is confirmed by the occurrence of stone tools dating to the Early, Middle and Late Stone Age. The majority of finds are classified as isolated surface occurrences, and mostly date to the Middle Stone Age. Consequently, such finds are judged to have a low significance and they require no mitigation measures.

Very few sites containing rock art are known from the larger geographical region and none were identified in the survey area.

7.5.2. Iron Age (AD 200 – AD 1830)

Iron Age people moved into southern Africa by c. AD 200, entering the area either by moving down the coastal plains, or by using a more central route. It seems more likely that the first option was what brought people into the study area. From the coast they followed the various rivers inland. Being cultivators, they preferred the rich alluvial soils to settle on. One of the earliest dated sites is located near Tzaneen (Silver Leaves).

Iron Age occupation of the study area seems to have taken place on a significant scale and at least three different phases of occupation have been identified.

Sites dating to the Early Iron Age (AD 200 to AD 1000) were identified. Preliminary identification of the pottery indicates that it belong to the Doornkop phase of the Early Iron Age, and should have a date of between AD 600 – 900. This is the same group of people that produced the remarkable clay masks found near Lydenburg in the 1960s.

These settlements seem to have been followed at a slightly later date by settlements linked to the Eiland Phase of the Early Iron Age (c. AD 1000).

Early Iron Age sites are our only source of evidence for the occupation of the area by early farming communities. As such these sites are important and they are viewed to have medium significance, which implies that they would require mitigation measures.

The last period of pre-colonial occupation consisted of Pedi-related and Swazi-speaking and Ndebele-speaking people that settled on stone-walled terraced sites at the foot on the mountains. At present it is not clear, but, judging by the pottery found here, these sites might even date to early historic times.

As this was a period of population movement, conflict and change, it in large part set the scene for the current population situation in the country. Considering the time period that they were occupied, they also feature in the early historic period. These sites are therefore viewed to have medium significance and would require mitigation.

7.5.3. Historic period (post ad 1840)

The historic period started c. 1840s, with the arrival of the first white settlers. Negotiations between the *trekkers* and the Pedi resulted in the Steelpoort River becoming the border between the two groups. Later, tension developed between the two groups, giving rise to armed conflict. One of the better known incidents is the so-called Sekhukhune Wars (1876, 1879). Remains of this event can still be found in the larger

geographical region. Other events that took place in the area included the so-called Mapoch Wars (1863, 1883)

As time went by, the area was divided into farms. At first people were slow to undertake any development, preferring to use the farms for winter grazing as to summers were to hot. In such cases, they established extensive camps and existed by hunting. It was only later that they started with crop farming. This was followed by a period when farmsteads developed, as well as infrastructure (e.g. roads).

7.5.4. Site A

Up on the plateau, in the upper dam basin, there are chances of finding sites dating to the historic period. It is possible that some rock shelters may be found on the steep slopes of the upper rock face. The bottom dams, close to the Steelpoort River, could present a problem as research in the proposed De Hoop Dam area has shown that there is a high likelihood of Iron Age sites occurring here. Potential, but as yet unconfirmed, ruins have been found above option A3 on the 1100 m contour, but are unlikely to be disturbed by the proposed reservoir.

7.5.5. Site B

No data is available for the lower dams and a field assessment is required. At the upper reservoir however, a small ruin has been found. The layout of the buildings and the siting of the buildings overlooking a gorge down to the plateau below indicate that this ruin could be of significance. The whole region was affected in the late 1800s by the Great Sekhukhune Wars both between the Boers and the British. Many Forts and outposts were built at that time and this could be one such structure. In light of the location of this heritage resource, the dam has been moved slightly to reduce the potential impact.

7.5.6. Site C

The site consists of only one dam up on the plateau. It is quite likely that sites dating to historic times would be located in the upper basin area. Such sites however may well have been disturbed by farming activities in the area.

7.5.7. Site Selection Summary – Heritage Aspects

Table 7.33: Site Selection – Heritage Aspects – ESI

Location	Site A Option 1	Site A Option 2	Site A Option 3	Site B Option 1	Site B Option 5	Site B Option 7	Site C Option 1
Rating	2	3	3	2	2	2	4

Apart from the comments received during the public meeting, several comments supporting Site C were received on the comment forms during the ESI conducted by BKS (see Appendix K). No other completed forms were received from I&APs potentially affected by Sites A and B.

- Conclusions

  From the inputs received during the ESI-stage public participation process, the following conclusions were drawn:

  - *Upper Reservoirs:*
    - Limited concerns were raised with regards to the bio-physical environment. Some social concerns related to safety and security issues, the potential for upgrading the quality of life of the residents, and the economic spin-offs that may arise out of the project.
    - At this stage there is no evidence of attitude formation against the proposed project, although there are differences in opinion amongst the communities regarding the proposed location of the upper reservoir.

  - *Lower Reservoirs:*
    - A number of farmers and potentially affected property owners were contacted, and except for one objection, no completed comment forms were received.
    - One telephonic objection was received with regards to the location of the public meetings, as these seemed to favour the local communities, by whom the property owners feel intimidated.
    - Farmers on Site A indicated that they had no immediate objections.
    - Due to time constraints, a meeting could not be arranged with the I&APs who felt unsafe to attend the scheduled public meetings at the chosen venues.

  From a communication and information perspective, the following general recommendations are made:

  - Should any negotiations with individual property owners be necessary, it should be undertaken in a considerate and constructive manner. Sensitive issues such as the possible economic impact on the properties, as well as safety and security should be taken into account.
  - Communication with the communities and affected property owners should continue to ensure informed decision-making and a transparent process throughout.

7.6. Tourism

A tourism assessment was conducted by Dave Blair of SiVEST. In the light of the land uses surrounding the proposed site, it was considered important that the impact on the existing and future tourism industry be assessed. This assessment is not an exhaustive tourism analysis of the area, but purely a basis from which to reasonably assess the significance of the likely impacts of the proposed development on the tourism industry.

7.6.1. Methodology

Information was gathered about the tourism industry in the area of the development area using the following methods:

- Site visit
- Ad hoc interviews with various tourism facility operators in the area
- Telephonic conversations with key stakeholders such as the Greater Groblersdal Local Municipality, Mpumalanga Tourism Authority, tourism facility operators in the immediate area of the alternative sites
- Internet research
- Personal knowledge and application
- Reference to other specialist reports as part of the EIA team.

7.6.2. Current tourism in and around Steelpoort

- The Highlands Meander

The Mpumalanga Tourism Authority has divided the province into several tourism regions based on the tourism attractions in an area. The site in question is located within the "Highlands Meander" area. This area is characterised by scenic landscapes and attractive river valleys. The region extends from the northern boundary of Mpumalanga, and extends southwards through the Steelpoort River Valley towards Dullstroom and Waterval-Boven. The fly fishing in this area of the country is well known and has resulted in the rapid growth of the tourism industry in this area. The area is also home to a variety of hiking trails, rock climbing routes and historic towns. The tourism possibilities of this province are as diverse as the landscape itself. It is a scenically magnificent province and boasts a rich cultural heartland. Forests, pristine waters and trout fishing opportunities abound and there is no shortage of adventure activities, such as rock-climbing and abseiling.

Apart from Verloren Vallei Nature Reserve, there are very few formally conserved areas around which tourism development is located. The natural value of the area has given rise to a variety of guest lodges (9), bed and breakfasts (4), country houses (2), hotels

(4), lodges (15) and self catering facilities (23) (MTA, 2005)[1]. However, these areas are generally located in the south of the Highlands Meander area, with a scarcity of accommodation in the northern areas in the vicinity of the proposed development.

- The Kamoka Open Africa Route

The Kamoka open Africa route has been established from Moloto via Marble Hall to Groblersdal and then on to Roossenekal. The proposed Cultural/Information centre proposed for Marble Hall will link to the route giving the opportunity for arts/craft and cultural groups to present their wares.[2]

The Kamoka Open Africa Route will cover areas such as:-

- KwaMhlanga,
- Kwaggafontein,
- Siyabuswa,
- Greater Marble Hall,
- Greater Groblersdal,
- Stoffberg,
- Roossenekal and many other small villages and townships.

It will also pass through two District Municipalities, the Nkangala District Municipality and the Greater Sekhukhune District Municipality.

The Route will be in what was once called the "KwaNdebele Homeland", the area s given to the Ndebele people by the apartheid government in its failed Bantustan policy. There are other tribes such as the Pedi, and Bantwana (an offshoot of the Tswana tribe) living in the area, and this Route highlights their cultures preserved through the ages.

- Tourism Trends and Land Use

The Steelpoort area is very well located as it is a cross boundary municipality located partly in Mpumalanga Province and partly in Limpopo Province.

The land use in the area surrounding the potential sites for development is generally agriculture and mining. The areas to the west of the Steelpoort Valley have generally been degraded by unsustainable farming practices. The Steelpoort Valley itself is scenically beautiful, with a diversity of habitats from typical bushveld riverine in the valley to highveld grassland on the plateau. Areas to the north of the development sites are presently being mined.

[1] Mpumalanga Tourism Authority Annual Report, 2005
[2] Greater Marble Hall IDP review 2005/2006

While the tourism potential in the area is high, especially for activities such as hiking, mountain biking, abseiling, birding, general ecotourism etc, very little of this potential has been recognised and developed. Most tourism establishments have developed to serve the business tourism needs of the mines.

- Tourism Supply

Based on a field trip to the study area, and contact details obtained from facilities within the area, a number of telephonic interviews were conducted with accommodation facility owners. There were only six facilities identified most of them being located on the R555 to the south of the development area.

Lodges and chalets supply the passing through and leisure markets, while the guesthouses, team building and conference facilities supply the business tourism markets. The results from the interviews with local accommodation facility owners showed that people using these facilities are attending business related meetings as well leisure based activities over the weekends. Visitors to the Steelpoort area have limited accommodation facilities to use depending on their needs for such services.

Average occupancy rates range from 80 to 50 percent throughout the year with little seasonal variation. These percentages are based on the observations of accommodation establishment owners who were interviewed. It is important to note that the occupancy rate mentioned differs per facility[3].

The number of beds available per establishment range from as little as eight, to as much as 90. These accommodation facilities are mainly used during the week as the main visitors to this area are business people visiting the mines. Very few of the accommodation facilities attract purely ecotourism clients, although some facility owners did mention that occupancy rates are sustained over holiday periods with family groups.

- Tourism Demand

These accommodation facilities have shown that their occupancies appear to reflect the high numbers of business tourists staying in these facilities. Thus the primary demand for tourism facilities in the area is from the mines themselves.

- Business Tourism

Generally this type of tourism shows trends for high occupancy during the week and lower occupancies during the weekend. The stays are normally longer than leisure based tourism. Unfortunately no information was available on average stay length. One of the

[3] Based on interviews with accommodation owners

facilities provides team building activities within an attractive surrounding. A number of facilities also advertised game viewing as activities on offer. However, it is likely that these are not the core business of the facilities, but rather additional attractions to the business tourist.

- Leisure Tourism

Leisure tourism is important to the future of the tourism market in the Steelpoort area. This form of tourism is made up of a number of sub-groupings, which include site-seeing, game viewing, family holidays on the game farms, etc. These tourists generally spend their time in game reserves and lodges. Most of the owners of the tourism facilities in the area seem to rely on the business tourists for the success of their businesses. This may be the result of less development of adequate tourism infrastructure such as good road access which can be regarded as a key input required for unlocking the tourism potential of the area. The potential for leisure tourism in the area has not yet been recognised, some facilities did state that they did not rely solely on business tourism, but also catered for family holidays, which could indicate a change to the status quo.

- Educational Tourism

The geological academic fraternity regard this area surrounding the study area as particularly interesting. This area is used by a number of tertiary (and possibly other) educational institutions for studying the geological formations which are so prominent in the area. Very little information was available of the extent of this as contributor to the tourism industry.

- Passing Through

The R579 which runs just to the west of the proposed development area, provides an important link between towns in Mpumalanga (Belfast etc) and Polokwane. This route passes through the Sehlakwane settlement and is well-frequented by taxis. The R555, which passes to the east of the proposed development area, provides an important link to Steelpoort and Burgersfort, which is undergoing significant development presently.

Various sectors of the tourism industry (for example accommodation facilities and restaurants) will certainly benefit from this strategic location. However, this form of tourism is considered small and is therefore not considered further in this scoping study.

7.6.3. Future tourism in and around Steelpoort

The tourism potential in the area has not been fully recognised. The dominance of the business tourism sector is likely to grow with the proliferation of mining ventures in the area. However, it is likely that the scenic and ecological value of the area will also be recognised and developed. This is likely to result in a diversification of the tourism

industry to include ecotourism as a new growth area. A number of facilities already promote ecotourism attractions.

The proposed development of the De Hoop Dam nearby could also provide a tourism attraction by allowing water sports, and other water-related activities to be developed in proximity to this dam.

7.6.4. Preferred site selection

From a tourism perspective, the proposed development is **not** likely to be a significantly negative or positive impact on the preferred site selection process. The natural beauty of the Steelpoort Valley should be seen as the greatest tourism asset. This defers the impact assessment to the visual, biodiversity and noise aspects, which will then relate to the tourism development potential of the area.

7.6.5. Nature and extent of the impacts

Four main impacts have been identified that are likely be associated with the proposed project:

- Visual Impact
- Noise Impact
- Land Use change
- Corporate Demand (increased business tourism)
- Biodiversity

The environmental impacts described above have been investigated (and will be investigated in more detail during the EIA phase) within other sections of this ESS; this tourism assessment has, however, related these aspects to the tourism industry.

The tourism industry in the areas immediately adjacent to the proposed alternative development sites is largely undeveloped. The potential does exist for further development of the tourism industry, particularly related to the scenic beauty of the Steelpoort Valley. However, the mainstay of the existing tourism industry in the immediate vicinity is related to business tourism of the mines in the area, and this is likely to grow in the foreseeable future. The scoping phase of this study concludes that the natural capital of the areas of the Steelpoort Valley should be preserved where ever possible and the site selection process should bear this in mind.

Tourism is not likely to be a determining factor in the final site selection, but rather other aspects (noise, visual, biodiversity) which are related to tourism, should assist is preferred site determination.

- Visual Impact Relative to Tourism

The Site Selection Report (2006)[4] states that very little visual impact is likely to result from the proposed development. However, Site C is stated as having the least visual impact, with Site A and B upper dams having a potential visual impact if viewed from the Steelpoort Valley.

The visual impact relative to existing tourism facilities is expected to be **negligible**. The close proximity of Sehlakane settlement will act as a mitigating impact for Site A and Site B. However, views from the Steelpoort Valley should be protected where possible as this valley holds great tourism development potential.

- Noise Impact Relative to Tourism

The proposed pump storage scheme is not expected to generate noise during the operational phase, but noise will be a factor during the construction phase. This phase will be temporary and is not likely to be a significant factor impacting the tourism facilities in the area. There is no apparent difference in potential noise impact between the alternative development sites.

- Land Use Relative to Tourism

There is no dedicated tourism land use that has been identified at the scope study level. However, during a site visit, it was noted that a game fence was being erected close the location of Site A. This may indicate the potential introduction of game to the area for breeding, hunting or ecotourism purposes. This issue will need to be explored further in the EIA phase through more detailed public participation, but is unlikely to indicate a fatal flaw. Land use for tourism purposes is unlikely to be an issue for Site B and Site C.

- Corporate Demand

The existing corporate demand for the few tourism facilities in the area is likely to increase as a result of the proposed development. The construction phase will see increased numbers of business people visiting the area, and this is likely to be the case to a lesser degree during the operational phase. There is unlikely to be any difference in this corporate demand for business tourism accommodation between the three alternative development sites.

- Educational Tourism

The proposed development may generate some interest in the secondary and tertiary educational institutions in terms of engineering. However, safety and security concerns may make this unfeasible. There is the potential for development of a controlled visitors centre to increase public awareness of the pump storage scheme, and this could be

developed into a tourism attraction in the area. This issue will be discussed in more detail in the EIA phase of the project. Education tourism is unlikely to be a determining factor of alternative site selection.

Table 7.34: Rating of impacts – tourism – ESS

RATING OF IMPACT: TOURISM		
Dimension	**During construction**	**During operation**
Duration	Short term	Long term
Extent	Localised	Localised
Intensity	Neutral	Neutral
Probability	Unlikely	Unlikely
Significance	Low	Low
Status	Positive / negative	Positive / negative
No preference in sites.		
Recommended studies for EIA phase: More detailed studies to be conducted in the EIA phase and management and mitigation measures (to optimise potential positive impacts and ameliorate potential negative impacts) to be developed in the EMP phase.		