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BIO THERM ENAMANDLA SOLAR FACILITY - SITE 2

SOCIO-ECONOMIC SCOPING REPORT

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BioTherm Energy (Pty) Ltd

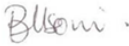





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WSP | Parsons Brinckerhoff

WSP House, Block A
1 on Langford, Langford Road, Westville

Tel: +27 31 2408860
Fax: +27 31 2408861
www.wspgroup.com
www.pbworld.com

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Signature				
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PRODUCTION TEAM

CLIENT

Biotherm Energy (Pty) Ltd

Irene Bezuidenhout

WSP | PARSONS BRINCKERHOFF

Director

Hilary Konigkramer

Senior Consultant

Danielle Sanderson

Assistant Consultant

Bathabile Msomi

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Acronyms and Abbreviations

Acronym	Description
Biotherm	Biotherm Energy (Pty) Ltd
BMM	Black Mountain Mine
CSP	Concentrated Solar Power
EA	Environmental Authorisation
EIA	Environmental Impact Assessment
IDP	IDP Integrated Development Plan
IRP	Integrated Resource Plan
LED	Local economic development
NCGPDS	Northern Cape Provincial Growth and Development Strategy
PV	Photovoltaic
SEIA	Social and Environmental Impact Assessment
SIA	Socio-economic Impact Assessment
SKA	Square Kilometre Array
WSP	WSP Environmental (Pty) Ltd

1 INTRODUCTION

Biotherm Energy (Pty) Ltd (BioTherm) propose to develop a renewable energy complex within the Northern Cape. As part of this complex, BioTherm, proposed to develop a Photovoltaic Solar power generation facility, namely Enamandla Site 2 (the proposed project). WSP Environmental (Pty) Ltd (WSP) has been appointed to undertake a Social and Environmental Impact Assessment (SEIA) and a Basic Assessment (BA) for the proposed project in order to apply for Environmental Authorisation (EA).

The SEIA is divided into two phases, firstly the Scoping Phase, and secondly and Environmental Impact Assessment (EIA) Phase, whereas the BA process is a single-phase assessment. In support of the EA processes, WSP will undertake a Socio-economic Impact Assessment (SIA). This report comprises the initial socio-economic screening in support of the Scoping Phase of the SEIA.

1.1 SCOPE AND LIMITATIONS

PROPOSED PROJECT AND ALTERNATIVES

The proposed project is located approximately 14 km south of the town of Aggeneys, between the towns of Upington and Springbok, in the Northern Cape Province.

The proposed project comprises the development of the Enamandla Site 2 PV power generation facility, as outlined in **Table 1**.

Table 1 Overview of the EA applications associated with the proposed project

Description	Technology	Extent
Enamandla Site 2 PV 75MW including internal power lines and access road	Fixed-tilt and Tracking	491 ha

SITE ALTERNATIVES

The proposed project site is on the Remaining Extent of the Farm Hartebeestvlei 86, located approximately 10 km south of the N14 Highway. The site is currently under extensive sheep grazing.

The proposed project site was selected based on the suitability for solar power generation. The placement of solar PV installation is dependent on several factors such as solar resource, climate, topography, grid connection, site access and water availability all of which are favourable at the proposed site location. No locational alternatives will be considered within this study.

LAYOUT ALTERNATIVES

The infrastructure related to the proposed project, namely water pipelines, transmission lines and access roads require further assessment in terms alternatives. The alternatives to be assessed in this study are described in **Table 2**. The site location, within the context of the full proposed solar complex is illustrated in **Figure 1**.

Table 2 Infrastructure alternatives

Aspect	Alternative	Description
Water Pipeline	Option 1	56.6 km pipeline from site in a north-easterly direction to the Orange River, near Pella
	Option 2	67.2 km pipeline from site in a north-westerly direction to the Orange River, opposite Houniams (Namibian settlement).
Substations	Location 3	Step-up infrastructure located near Enamandla Site 2 (Substation Location 3 in Figure 2).

AIM AND OBJECTIVES

The purpose of the SIA is to determine the potential positive and negative impacts of the proposed project, as well as the related infrastructure and alternatives, on the local and regional socio-economic landscape. In addition, the cumulative socio-economic impacts of the proposed project in relation to current and proposed activities within the local area have been considered.

The key objectives in the socio-economic screening process are:

- To contextualise the socio-economic landscape of the each of the proposed;
- To describe the socio-economic receiving environment; and
- To identify the potential socio-economic impacts of the proposed project, undertake a screening assessment of these impacts thereby identifying the key impacts to be taken forward into the EIA phase study.

The socio-economic screening was undertaken as a desktop assessment. The nature of the site of the proposed project, being set within a sparsely populated and arid area, means that there are unlikely to be significant socio-economic issues of concern. A desktop assessment is therefore considered a suitable methodology for the screening phase and impact assessment phase of the SIA.

The limitation of a desktop assessment is that the specialist does not have first-hand experience of the site, and related socio-economic activities. The investigation is thus limited to the understanding to be gained through the similar projects in the local area, feedback on stakeholder involvement in the Scoping Phase and other screening specialist studies related to the proposed project.



2 APPROACH AND METHODOLOGY

The approach to the socio-economic screening assessment for the Scoping Phase included the following:

- Desktop Review
- Description of the socio-economic context of the project
- Identification of potential issues and impacts associated with all components and alternatives associated with the proposed project
- Plan of Study for EIA phase SIA study

2.1 DESKTOP REVIEW

The following key sources were reviewed to determining the socio-economic context of the proposed project:

- 2011 National Census Data (Statistics South Africa, 2012)
- Namakwa District Municipality Integrated Development Plan (IDP) (Namakwa District Municipality, 2012)
- Khâi-Ma Local Municipality IDP 2012-2017 (Khâi-Ma Local Municipality, 2011)
- Northern Cape Provincial Growth and Development Strategy (Northern Cape Province, 2004)
- Environmental and Social Impact Assessment for Proposed Construction of the Gamsberg Zinc Mine (ERM, 2013)
- Social and Environmental Impact Assessment for the proposed Concentrated Solar Facility, Upington, Northern Cape (WSP, 2014)
- Social Impact Assessment EIA Report: Proposed Paulputs 200MW Concentrated Solar Power Tower Facility and Associated Infrastructure near Pofadder, Northern Cape Province (Savannah Environmental, 2016)

2.2 DESCRIPTION OF THE SOCIO-ECONOMIC CONTEXT OF THE PROJECT

The description of the socio-economic receiving environment of the proposed project comprises the regional, local and site-specific information, including population statistics, landuses and economic activities. This provides context to the potential socio-economic impacts and allows the screening of these impacts in line with the impact screening approach.

2.3 PRELIMINARY IDENTIFICATION OF POTENTIAL IMPACTS

The screening phase provides insight into the nature of the local social and economic environment, and the potential socio-economic issues that may arise from the proposed project. This step provides a preliminary description of these issues and the potential anticipated socio-economic impacts within the appropriate context.

2.4 IMPACT SCREENING TOOL

The screening phase includes an impact screening process developed by the environmental assessment practitioner (WSP) to assess the significance of identified impacts. The screening tool

will allow any impacts of very low significance to be excluded from the detailed study in the impact assessment phase (i.e. the SIA). The screening tool is based on two criteria, namely probability and severity, as described in **Table 3**,

Table 4, and

Table 5.

Table 3 Screening Assessment Matrix

		Severity / Beneficial Scale			
		1	2	3	4
Probability Scale	1	Very Low	Very Low	Low	Medium
	2	Very Low	Low	Medium	Medium
	3	Low	Medium	Medium	High
	4	Medium	Medium	High	High

Table 4 Probability Scale

4	Definite Where the impact will occur regardless of any prevention measures
3	Highly Probable Where it is most likely that the impact will occur
2	Probable Where there is a good possibility that the impact will occur
1	Improbable Where the possibility of the impact occurring is very low

Table 5 Severity / Beneficial Scale

4	Very severe An irreversible and permanent change to the affected system(s) or party (ies) which cannot be mitigated.	Very beneficial A permanent and very substantial benefit to the affected system(s) or party(ies), with no real alternative to achieving this benefit.
3	Severe A long term impacts on the affected system(s) or party(ies) that could be mitigated. However, this mitigation would be difficult, expensive or time consuming or some combination of these.	Beneficial A long term impact and substantial benefit to the affected system(s) or party(ies). Alternative ways of achieving this benefit would be difficult, expensive or time consuming, or some combination of these.
2	Moderately severe A medium to long term impacts on the affected system(s) or party (ies) that could be mitigated.	Moderately beneficial A medium to long term impact of real benefit to the affected system(s) or party(ies).

		Other ways of optimising the beneficial effects are equally difficult, expensive and time consuming (or some combination of these), as achieving them in this way.
1	<p>Negligible</p> <p>A short to medium term impacts on the affected system(s) or party(ies). Mitigation is very easy, cheap, less time consuming or not necessary.</p>	<p>Negligible</p> <p>A short to medium term impact and negligible benefit to the affected system(s) or party(ies). Other ways of optimising the beneficial effects are easier, cheaper and quicker, or some combination of these.</p>

2.5 PLAN OF STUDY FOR EIA

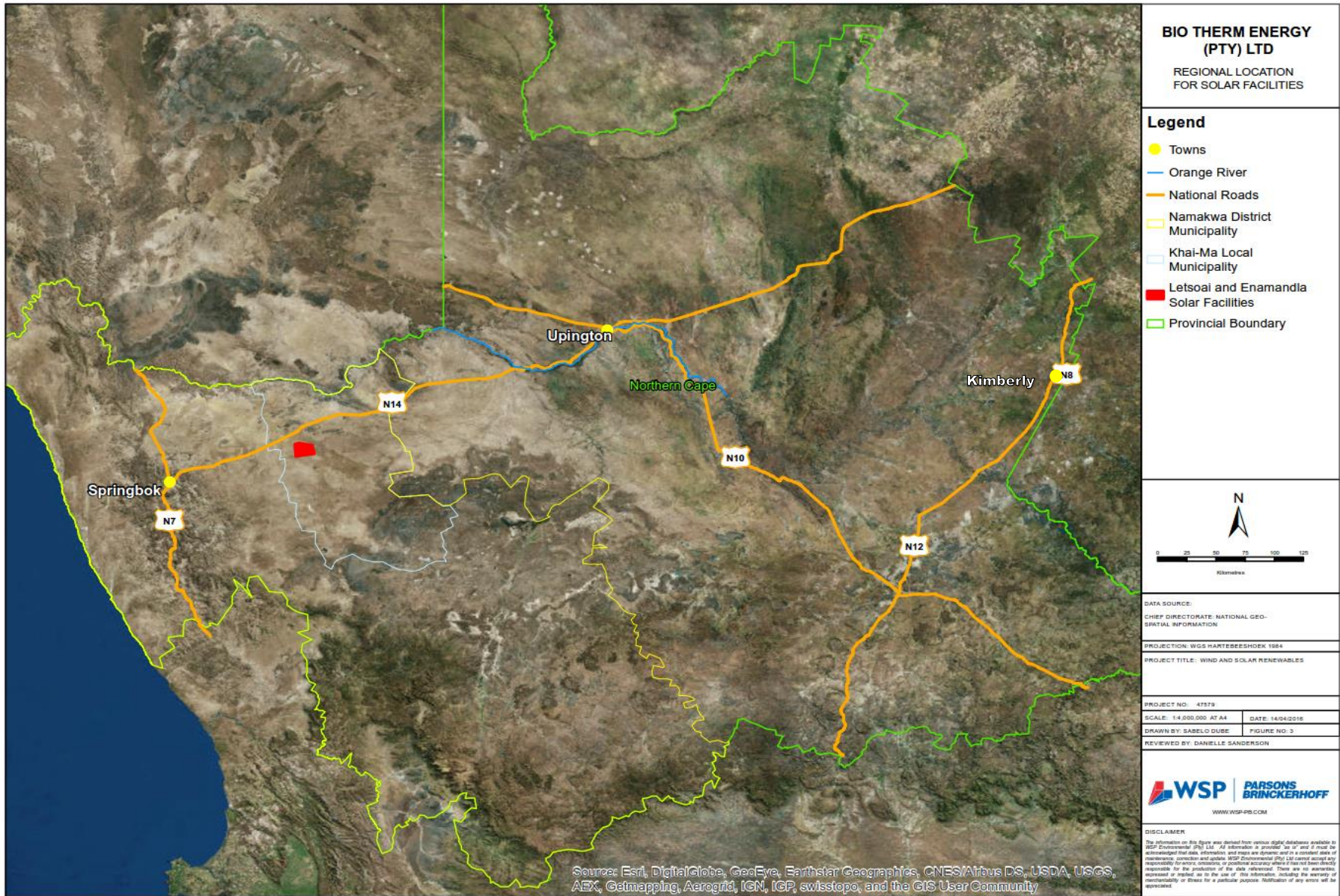
Following the screening phase, the potential impacts identified as low to high significance will require further investigation during the EIA phase. The plan of study outlines the next steps that are required during the EIA phase to ensure effective assessment during the SIA.

3 REGIONAL OVERVIEW

3.1 SOCIO-ECONOMIC CONTEXT

The proposed project is located within Northern Cape Province (**Figure 2**). This is one of the largest provinces within South Africa's, taking up nearly a third of the country's land area, but has the country's smallest population. The population density of the province is therefore very low (approximately 1 person per square kilometre) (Statistics South Africa, 2016). On a geographical basis, the province shares borders with Namibia in the north and stretches as far as the Atlantic Ocean in the west. The Northern Cape also shares borders with the Western Cape to the south, the Eastern Cape to the southeast, and the Free State and the North West Province to the east. The largest centres in the Northern Cape are Kimberley and Upington. Kimberley was founded on the mining industry, but most mineshafts in Kimberley have been closed, thus the traditional economic base of the city has been eroded, and there is a need to look for alternative activities to sustain its local economy. Upington's (population ~47000) local economy is based on services, agriculture and agro-industry, and long-term sustainability is not a particular issue. It is, however, an issue in the northern areas of the province where mining has taken over from extensive agriculture.

The sparse, arid landscape is dominated by extensive sheep, goat, and cattle rearing, as well as mining (including diamonds, iron, titanium, zinc, lead, and copper). The Northern Cape mining industry makes up nearly 7% of South Africa's total mining value and contributes 23.4% to the provinces total economy. Farmers in the province contribute to 6.1% to South African agriculture and 6.6% of the province's economy (Statistics South Africa, 2012). The Orange River provides a source of fertile land and water within the northern region of the province. The areas immediately adjacent to Orange River are therefore characterised by a concentration of vineyards and other intensive agricultural activities, producing products such as export-quality table grapes, wine, dried and preserved fruit. The Northern Cape is also home to the world's largest telescope, the Square Kilometre Array (SKA). The province has numerous parks and conservation areas. The Kgalagadi Transfronteir Park is Africa's first cross-border game park and one of the largest conservation areas in southern Africa.



The Namakwa District Municipality, in which the site is located, is one of five districts of the Northern Cape Province and comprises six local municipalities. Namibia forms the northern border and the Atlantic Ocean the western border. This municipality has the lowest population within the province, with just over 100 000 people spread over the municipality, and concentrated within small to medium-sized settlements and towns.

The local economy is natural resource-based, primarily dependant on extensive livestock farming. The mining sector, however, is the dominant economic sector (52% to Gross Domestic Product). Recent trends in the mining sector, however, show the sector to be in decline. Increasing levels of unemployment have resulted in increased pressure on the employed population and a high dependency on the State for support. A decline in employment opportunities in the mining sector emphasises the need to prioritise alternative sectors (Namakwa IDP, 2012).

3.2 LOCAL CONTEXT

The local context refers to the area surrounding the site contextualised within local municipality. The proposed project site is located within Ward 4 of the Khâi-Ma Local Municipality, which lies in the northern region of the Namakwa District Municipality, bordering on Namibia. The seat of local government is located in the town of Pofadder, and the four main economic sectors are livestock grazing, agriculture, mining and tourism (Khâi-Ma IDP, 2012).

The Khâi-Ma Local Municipality covers an area of approximately 16 600 km², and has a population of approximately 12 500 people, Resulting in a very low population density of less than 1 person per square kilometre (Statistics South Africa, 2012). The municipality is characterised by vast tracts of flat, undeveloped and arid Karoo landscape, with scattered mountainous areas, and ephemeral rivers. The majority of the population live within urban areas (82.8%), with only 17.2% living in rural areas (Statistics South Africa, 2012). As a result, the local service levels are reasonable, with 89.6% of the households having access to electricity for lighting 84.3% for cooking and 50.8% for heating. Almost 70% of potable water is provided by the municipality and other water service providers, and 8.4% is sourced from boreholes.

Education levels are characteristically low, with 7.1% having completed their primary and 9.8% having completed secondary education (Statistics South Africa, 2012). This is likely to be due to the lack of access to secondary and tertiary education within the municipality. Resultantly the majority of the local population is likely to be unskilled, or have basic (elementary) skills in terms of the employment market. The income levels in the region reflect this trend, with 73.5% earning less than R1 600 per month. The unemployment levels are high with 31.8% of the potential labour force being unemployed, compared to the current national unemployment rate of 25.4% (Statistics South Africa, 2016). The main economic sectors within the Khâi-Ma Local Municipality are mining, agriculture, tourism, and community and social services. The majority (77%) of employed persons fall within the formal sector, and 15% within the informal sector (Statistics South Africa, 2012).

3.3 LOCAL ECONOMIC ACTIVITIES

The main activity within the local area is mining. Approximately 14 km north of the site lies the town of Aggeneys, which is a mining town that was developed in support of the Black Mountain Mine (BMM), located in the same vicinity. This mine primarily produces zinc and lead, as well as copper and silver, and is the main source of employment within the local area. BMM employs approximately 1 300 people, 700 permanently and the remainder on a contract basis (ERM, 2013). BMM provides basic services (including free potable water) to the staff housed at Aggeneys, as well as water to surrounding the towns of Pofadder and Pella, and surrounding farmers (a total of 11 200 people) (ERM, 2013). In 2015, BMM commenced excavation on the Gamsberg Mine, located approximately 10 km northeast of the proposed project site. This mine is proposed to employ up to 3 200 people during the construction phase (highly skilled to low-skilled) over 30 months of construction, and approximately 100 people during the operational phase (ERM, 2013).

After mining, there are two other key local economic activities namely agriculture and tourism. Agricultural activities include intensive crop and fruit farming along the Orange River, and extensive sheep and goat farming. Tourism related activities are centred around the Orange River, the Namaqualand region (wildflowers, cultural and nature conservation tourism), and national wildlife reserves within the Northern Cape such as the Richtersveld and Kgalagadi National Parks.

Development in the area appears to be centred on renewable energy generation and associated infrastructure. Currently there are several proposed projects within a 100 km radius of the site, and one existing facility, as described in **Table 6**.

Table 6 Renewable energy projects in proximity to the proposed project site

Name	Distance and direction from site	Technology (output)	
Zuurwater Aggeneys Solar Project	15 km northwest	PV (3 x 75 MW)	Proposed
Zuurwater Sato Energy Holdings Photovoltaic Project	13 km northwest	PV (3 x 50 MW, 1 x 75 MW)	Proposed
Aroams Orlight Sa Solar Photovoltaic Power Plant	17 km north	PV (70MW)	Proposed for 2017 (Preferred bidder Round 4)
Namies Suid Mainstream Wind Energy Facility On A Site Near Pofadder	25 km east	Wind (unknown)	Proposed
Kangnas Wind Energy Facility On Kangnas Farm, Near Springbok	38 km west southwest	Wind (4 x 75 MW)	Proposed
Scuit-Klip Proposed Solar Energy Project On Portion 4 Of The Farm Scuitklip 92, Northern Cape Province	72 km northeast	PV (1 x 10 MW)	Constructed
		PV (6 x unknown)	Proposed
Melkboschkuil Corolusberg PV Solar Energy Facility	82 km west southwest	PV (2 x 20 MW)	Proposed

3.4 LOCAL COMMUNITIES

The key centres within the Khâi-Ma Local Municipality are Pofadder, Aggeneys, Pella, Witbank and Onseepkans (**Figure 3**). The remote nature of the site from public services (i.e. local towns) means that there are few rural or farming settlements on or within the vicinity of the site. Scattered farming settlements are present north of the site along the Orange River near Pella, Witbank and Onseepkans, as well as to the northeast around Pofadder. **Table 7** provides a summary of these communities, and their relative distance from the proposed project site.

Table 7 Description of local communities

Town	Description	Distance & direction from site
Aggeneys	The small town of Aggeneys is located adjacent to the BMM. The town was developed in the 1970s to accommodate mine staff, and comprises residential housing, a police station, basic retail and a private airstrip. The population is estimated at 2 053 with approx. 666 households (Khâi-Ma IDP, 2011).	14 km northeast
Pella	Pella is a small town, located at the base of the Pella Mountains on the Orange River, with a population of approximately 2 500 people (Statistics South Africa, 2012). The town supports the local farming and the Aggeneys mining communities.	40 km northeast
Pofadder	The town is situated along the N14, and is an agricultural centre for the surrounding farming community. The town has approximately 808 households and estimated population of 2919 people (Khâi-Ma IDP, 2011)	50 km northeast
Witbank	Witbank is a hamlet of approximately 80 households. Although little information is available about the settlement, it is likely to support the local agricultural sector.	60 km north, northwest
Onseepkans	Onseepkans is a small, scattered settlement located on the Orange River. The community comprises farming settlements (farm houses and staff accommodation) and is a border post between South Africa and Namibia.	80 km northeast

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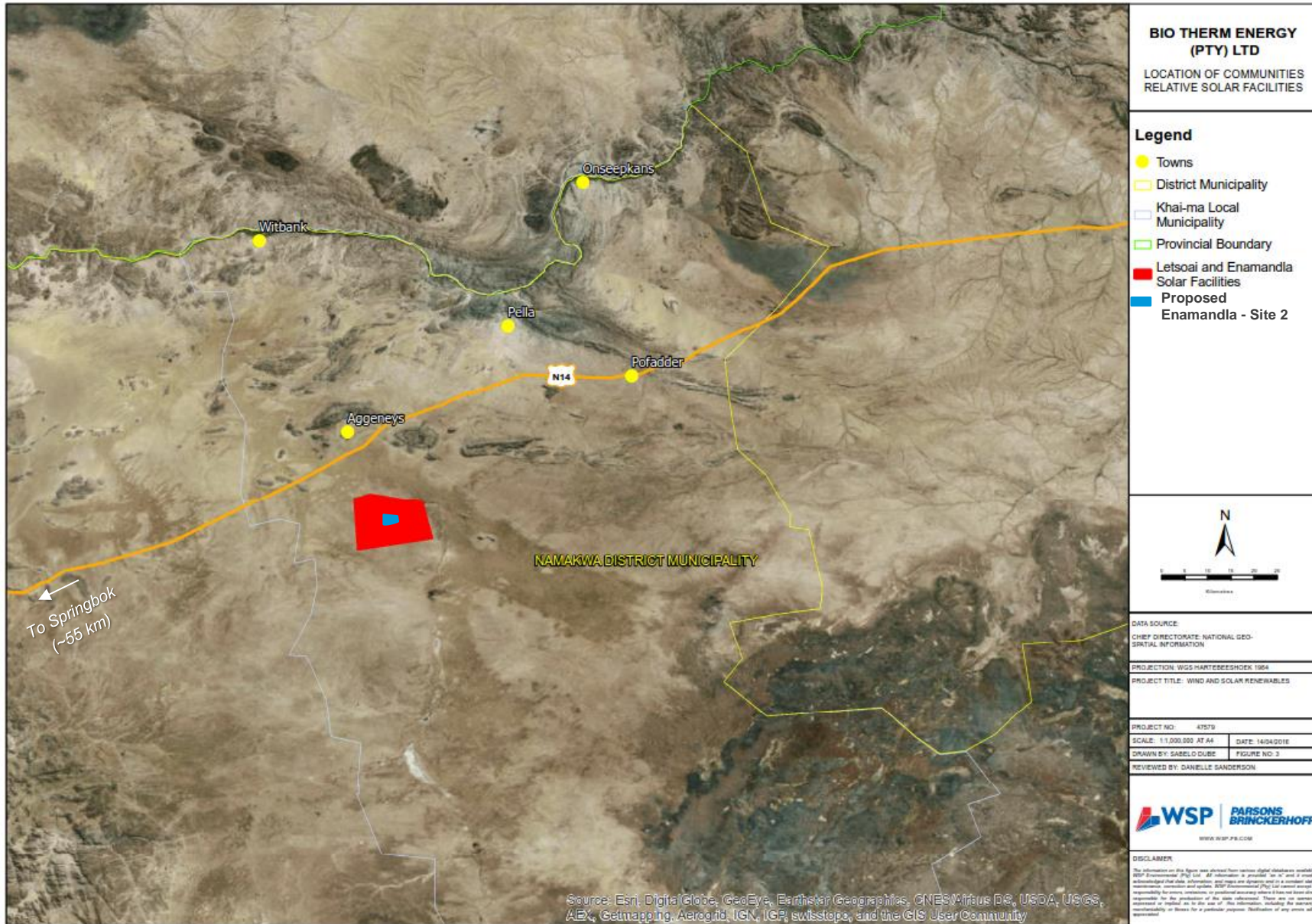
SOCIO-ECONOMIC POLICY AND PLANNING CONTEXT

NATIONAL POLICIES

The current energy policy in South Africa is guided by the Integrated Resource Plan (IRP) for Electricity 2010-2030, under the Electricity Regulation Act of 2006. The IRP aims to diversify energy supply in South Africa and in addition to all existing and committed power plants. The implementation of renewable energy in South Africa has been driven by the following policy and legislation:

- The 1998 White Paper on Energy Policy,
- The 2003 White Paper on Renewable Energy,
- National Energy Act (34 of 2008),
- The 2011 National Climate Change Response White Paper Policy.

These policies indicates government's goal to diversify the energy supply and move away from the tradition of fossil-fired power generation. Government also seeks to take advantage of the possibilities relating to the Green Economy in creating new industries and much needed jobs.



PROVINCIAL POLICIES

The Northern Cape Provincial Growth and Development Strategy (2004 – 2024) (NCPGDS) provide a framework for development in the Province. The main objectives for development planning in the Province are planning

- Promoting growth, diversification and transformation of the provincial economy; and
- Poverty eradication through social development.
- Enhancing Infrastructure for economic growth and social development

The key sectors, identified for the promotion of growth and development, are:

- Agriculture and agro-processing;
- Finishing and mariculture;
- Mining and mineral processing;
- Manufacturing
- Tourism;
- Knowledge economy (tertiary market); and
- Energy

The proposed project will improve infrastructure for economic growth and social development and also result in the employment generation.

DISTRICT AND LOCAL MUNICIPALITY POLICIES

The IDPs developed by the Namakwa District Municipality and Khâi-Ma Local Municipality provide socio-economic context to the proposed project, and highlight the potential social and economic requirements and opportunities within the region.

NAMAKWA DISTRICT MUNICIPALITY INTEGRATED DEVELOPMENT PLAN

The key strategic objectives of the Namakwa District Municipality contained within the Draft IDP 2015-2016 (based on Vision 2014) (Namakwa District Municipality, 2015) relevant to this study are as follows:

- Ensuring the delivery of basic services which include water, sanitation, electricity and waste management;
- Creation of a thousand job opportunities by 2014 through the community public works programme, as part of 4.5 million Expanded Public Works Programme jobs to be reached by 2014;
- Ensure sustainable economic and social transformation in the District; and
- A society with a renewed sense of identity and confident in their skills and knowledge.

Economic development within the municipality's IDP aims to promote the living conditions and economic development of local communities. A key focus area is the optimal utilisation of natural resources in various sectors and this includes renewable energy.

KHÂI-MA LOCAL MUNICIPALITY INTEGRATED DEVELOPMENT PLAN (2011)

The role of the local municipality is to implement national and regional policies in order to achieve development goals. The key priorities for the Khâi-Ma Local Municipality within the 2012 to 2017 IDP include the following (Khâi-Ma Local Municipality, 2012):

- Provide sustainable services to the inhabitants and to maintain existing resources;
- Develop the Local Municipality as an institution through transformation and capacity building;
- Promote local economic development (LED) through poverty alleviation, job creation, empowerment of the previous disadvantage people with capacity building in business skills and establish a climate for investment.

The Khâi-Ma Local Municipality has identified the following threats to growth and development within the municipality:

- Social Issues in communities, including unemployment, drug and alcohol abuse, crime, and HIV/AIDS¹.
- Constraints that directly impact the growth of the economic sector, including poor infrastructure.
- Reluctance of investors to develop outside of the main economic centres of Springbok and Upington.
- Low levels of skills development.

Khâi-Ma Municipality has rich mineral deposits and unexploited tourism potential, which can contribute to the expansion of the local economy. The IDP also identifies spatial strategies for the development of renewable energy. The renewable energy sector has the potential to provide socio-economic benefits by increasing investments and job opportunities to the local area. The proposed project will contribute positively to the LED of the Khâi-Ma Local Municipality.

4 IMPACTS AND ISSUES IDENTIFICATION

The nature of the local and regional landscape is a sparsely populated with little infrastructure and limited development opportunities. The potential socio-economic impacts and issues identified at the scoping phase, therefore, are likely to be experienced at a broader level, rather than at a site-specific level.

4.1 ALTERNATIVES ASSESSMENT

WSP has considered the project alternatives specific to the infrastructure proposed to service the proposed project. Due to the nature of the socio-economic environment there are no notable socio-economic aspects that distinguish the various alternatives from one another.

The socio-economic screening assessment has, therefore, been assessed in terms of the overall, broad potential socio-economic impacts, which are applicable to all components and alternatives of the proposed project.

¹ Human Immunodeficiency Virus Infection and Acquired Immune Deficiency Syndrome

4.2 BROAD SOCIO-ECONOMIC IMPACTS AND ISSUES

CONSTRUCTION PHASE

INCREASE IN EMPLOYMENT OPPORTUNITIES

A labour force will be required for the proposed project. Some of the labour will be sourced from outside the Khâi-Ma Local Municipality due to the very limited local population and the lack of skills required for the construction (due to the specialised nature of some of the construction activities). The potential benefits in terms of short-term employment and skills development are therefore likely to be recognised on many levels, from local to national level.

INCREASED ECONOMIC DEVELOPMENT OPPORTUNITIES

The proposed project has the potential generate LED opportunities. The nearest town of Aggeneys could provide services such as accommodation and cleaning services, stimulating economic development within the local area. Other local towns that could also be positively impacted include Pofadder and Springbok. Larger-scale manufacturing and specialised services for the proposed project are likely to be sourced from a regional and national level. The proposed project is, therefore, likely to impact all levels of the economy from local to national to differing degrees and scales.

DISTURBANCES TO LOCAL COMMUNITIES

The construction phase may lead to the influx of skilled and unskilled employment seekers from outside the immediate area. This could lead to social conflict over the resources and employment opportunities. The potential for this is, however, likely to be limited, due to the isolated nature of the site, and the lack of supporting services and infrastructure within the local area. Labour will be sourced from surrounding areas and towns as far as practically possible. Should labour be sourced for outside the local municipality, this could result in a number of local short-and long-term localised social issues, such as increased prostitution, and drug and alcohol abuse. Details on the number of construction phase employees, as well as temporary housing and services provision, will need to be investigated further during the SIA.

INCREASE IN COMMUNICABLE DISEASES AND REDUCED PUBLIC HEALTH

A presence of an outside labour force within a small community could potentially negatively affect local public health, due to a higher likelihood of a spread of communicable diseases such as Tuberculosis, as well as HIV/AIDS and other sexually transmitted diseases. HIV/AIDS is known to be a significant issue within the Northern Cape (Department of Health, 2012). Further details on the proposed sourcing and management of construction phase employees will need to be interrogated during the SIA.

CHANGE IN SENSE OF PLACE

The sense of place is a social construct of individuals and communities and their interaction within the landscape in which they live and work, creating a unique identity for a geographical area. The site of the proposed project is located within a predominantly flat, desert landscape, with a sparse, scattered population and limited agricultural and mining activities. The change in the nature of the site as a result of the construction activities of the proposed project, as well as presence of construction staff, is likely to change the local sense of place. This local change is likely to have a direct impact on the closest town of Aggeneys through economic development and an increase in population. The other settlements within the local area (namely, Pofadder) may be affected indirectly.

NUISANCE FROM NOISE, DUST AND TRAFFIC DISTURBANCES

The construction of the proposed project is likely to result in a number of localised disturbances that may indirectly affect local activities, such as farming (on neighbouring sites) and tourism (passing through the area). These may include the generation of dust, noise and traffic associated with the construction activities. The closest community is located 9 km north of the N14 Highway, and therefore between 4 km and 14 km from the proposed project and infrastructure. The impacts of the construction activities may, therefore, affect this community where activities through increased traffic and activities in the local area. There are no other known sensitive receptors, such as tourism establishments or farming communities within close proximity to the proposed project site.

LOSS OF FARMLAND

The activities associated with the construction phase have the potential to reduce the available land for grazing in the local area. This may have a long term economic impact on the land owner. The offset of leasing or selling the proposed project site against this loss of agricultural land will be assessed further during the SIA phase.

LOSS OF ACCESS TO NATURAL RESOURCES

Communities within the local area are known to collect wood and medicinal plants from the open farming and accessible mine land surrounding Aggeneys for personal use and selling to the local communities (ERM, 2013). Certain areas of the proposed project may fall within the areas regularly accessed by the community. The use of this site by local communities, however, is to be assessed further within the SIA.

OPERATIONAL PHASE

INCREASED EMPLOYMENT AND BUSINESS OPPORTUNITIES

The proposed project is anticipated to provide a number of employment opportunities, from professional and management level through to skilled and unskilled levels. Professional and management level employment is likely to be sourced from outside the Northern Cape, due to the specialised nature of this development, while there is the potential for skilled and unskilled employees (e.g. service providers, security and cleaners) to be sourced locally or from within the region. The impact of employment opportunities will be determined by the total number and breakdown (level) of operational phase opportunities that will be created by the proposed project.

INCREASED ECONOMIC DEVELOPMENT OPPORTUNITIES

The proposed project has the potential to result in economic development opportunities during the operational phase. As local resources are limited, the majority of specialised services are likely to be sourced from regional or national service providers, resulting in economic development opportunities in the relevant sectors, including solar power generation equipment and associated infrastructure suppliers.

There are, however, a number of potential local economic development opportunities. Despite the constraints placed on local communities by restricted access to natural and economic resources, local residents could potentially provide services (e.g. catering, transport and accommodation) and manufacturing amenities to the proposed project during the operational phase. The extent of local, regional and national economic development resulting from the proposed project will be considered further during the SIA.

CHANGE IN SENSE OF PLACE

The operation of the proposed project is likely to change in the overall nature of the area, specifically related to the development of infrastructure such as PV panels and buildings. A change in the sense of place has the potential to affect the surrounding communities; however this is limited to Aggeneys. Other potential sensitive receptors (such as tourism operators and tourist travelling through the area) will need to be investigated further during the SIA phase.

ACCESS TO WATER RESOURCES

Currently BMM owns and operates the Pelladri Water Board which provides households, in Pella, Pofadder and Aggeneys, with water drawn from the Orange River (ERM, 2013). The operational phase of the proposed project could result in additional pressure on available water resources. There is, however, currently restricted water for the existing users; therefore the additional pressure on available water resources could result in a negative impact on existing users.

DECOMMISSIONING PHASE

LOSS OF PERMANENT EMPLOYMENT

There is the potential for the loss of permanent employment opportunities following the decommissioning of the proposed project. The significance of this impact will be investigated further during the SIA.

GAIN OF SHORT TERM EMPLOYMENT

The decommissioning phase may require a limited number of short-term unskilled or semi-skilled labour. This could potentially increase short term employment opportunities for local communities, as labour will be sourced locally as far as practically possible.

NUISANCE FROM DUST, NOISE AND TRAFFIC

The decommissioning phase of the proposed project will generate dust nuisance from the demolishing and dismantling of the facility. Noise and traffic impacts are likely to increase with the movement of trucks transporting rubble away from the site. The closest sensitive receptor is Aggeneys.

CUMULATIVE IMPACTS

The cumulative impacts are related to the proposed project in context with the number of solar projects (including CSP and concentrated photovoltaic projects) and wind power generation projects that are proposed within a 100km radius of the proposed site (as described in **Table 6**). A 100km radius is considered acceptable area for cumulative impacts, as the nature of the area (sparsely populated with scattered towns and settlements), means that any development may impact on the socio-economic environment.

INCREASED LOCAL ECONOMIC DEVELOPMENT OPPORTUNITIES

Currently BMM is the principle employer within the local municipality, pinning mining as the key local economic driver. One PV facility and two CSP (trough) facilities have been constructed in the study area, and one additional PV facility has been awarded preferred bidder status. There are no other significant economic activities within the local area, with agricultural, tourism and social services sectors currently providing the main source of (limited) employment in the local economy.

The construction and operation of a number of solar and wind projects within the area between Springbok and Pofadder (as per **Table 6**) will contribute collectively towards a significant increase in local employment and business development opportunities within the local municipality. The

provision of services by existing local communities, and the development of new opportunities through the presence of new residents (temporary and permanent) during construction and operational phases could present numerous economic development opportunities through services such as accommodation, transport provision, catering, and cleaning services.

INCREASED PRESSURE ON LOCAL SERVICE PROVISION

The lack of access to water within this arid area has meant that communities are widely spread and resident populations are small. Infrastructure is also limited to the National Highway (N14), and basic municipal services with the towns. The development of numerous renewable energy projects within the 100 km radius is likely to put significant pressure on the local municipalities and communities. The proposed project is one of eight proposed solar facilities within the local area, and could potentially contribute towards this pressure.

There is, however, also an opportunity for these developments to assist the local municipalities by supplying services and infrastructure to local communities in addition to the proposed projects. Further assessment of the nature of these opportunities and constraints and the potential impacts will be undertaken in the SIA.

CHANGES IN TOURISM ACTIVITIES

The tourism industry within the local area may be affected by this change in landscape and sense of place as a result of the construction and operation of several large solar and mining operations within the local area. Tourism in this region relies in part on the aesthetic value of the Karoo landscape, as well as the “picturesque” nature of the small Karoo towns. There is, however, an opportunity in terms of promoting solar facilities as technology tourism within the region. The SIA will further consider the potential cumulative impact on tourism.

CHANGE TO EMPLOYMENT PATTERNS

With the development of a number of solar facilities within the local area, there is potential for the broad change in nature of businesses and employment patterns within the local area. The potential economic investment, business development in the area, and an overall awareness of different types of employment opportunities could result in people changing employment sectors.

Currently local employment is predominantly in mining and agriculture-based sectors. There is a potential for this to shift towards construction and services sector employment as new opportunities could be perceived as more favourable to existing opportunities. The new opportunities are likely to be short to medium term opportunities (e.g. construction phase only). The impact could, however, be long-term in that loss of staff for existing employers could result in loss of revenue, closure, or the need to source new staff. This could result in a higher unemployment rate following the completion of construction projects, as current staff would not be able to return to their original employer, and increased competition for employment.

ACCESS TO WATER RESOURCES

There are numerous proposed renewable energy projects, as well as a new mining operation within the local area (Gamsberg Mine). There is currently a shortage of water for existing residents and activities in the area. Should all of the proposed renewable energy project be authorised and constructed, there is unlikely to be sufficient water available to support all of these projects, and to sustain the existing agricultural activities established along, and highly dependent on, the Orange River. The cumulative impact on water resources is therefore a key concern in relation to the local socio-economic environment.

4.3 SCREENING ASSESSMENT

The screening phase of the SIA is required to support the SIA and EIA phase of the SEIA process. To this end, the Screening tool (as described in **Section 2.3**) has been used to undertake a preliminary assessment of the identified potential socio-economic impacts.

The rating and overall preliminary assessment of significance for the broad socio-economic impacts is provided in **Table 8**.

Table 8 Screening assessment of broad socio-economic impacts

Phase	Potential Impact	Nature	Probability	Severity/Benefit	Significance
Construction	Increase in employment opportunities	Positive	3	2	Medium
	Increased economic development opportunities	Positive	3	2	Medium
	Disturbances to local communities	Negative	2	2	Low
	Increase in communicable diseases and reduced public health	Negative	2	1	Very Low
	Change in sense of place	Negative	1	1	Very Low
	Nuisance from noise, dust and traffic disturbances	Negative	1	2	Very Low
	Loss of access to natural resources	Negative	1	2	Low
	Loss of farmland	Negative	1	2	Low
Operational	Increased employment and business opportunities	Positive	3	2	Medium
	Increased economic development opportunities	Positive	3	2	Medium
	Change in sense of place	Negative	3	2	Medium
	Access to Water Resources	Negative	3	3	Medium
Decommissioning	Loss of permanent employment	Negative	3	3	Medium
	Gain of short term employment	Negative	2	2	Low
	Nuisance from dust, noise and traffic	Negative	1	1	Very Low
Cumulative	Increased local economic development opportunities	Positive	3	3	Medium
	Increased pressure on local service provision	Positive	3	3	Medium
	Changes in tourism activities	Negative	2	2	Low

Phase	Potential Impact	Nature	Probability	Severity/Benefit	Significance
	Change to employment patterns	Negative	2	3	Medium
	Access to Water Resources	Negative	2	4	Medium

4.4 SOCIAL SENSITIVITY MAPPING

A social sensitivity map for the proposed project should present those communities (or settlements) that may be significantly adversely affected by the proposed project. There are currently no inhabitants of the site, or the immediately surrounding area, that would experience direct, adverse socio-economic impacts. The nearest community that may be affected by the project is Aggeneys, a distance of 14 km from the site. The potential socio-economic impact of the proposed project will need to be assessed further during the SIA, following a review of other specialist studies. It was, therefore, not possible to develop a meaningful social sensitivity map during the screening phase.

5 TERMS OF REFERENCE FOR THE IMPACT ASSESSMENT PHASE

There were no significant socio-economic impacts identified during the socio-economic screening study, and there is sufficient information available for the proposed project site and study area. It is therefore proposed that a desktop SIA is undertaken during the EIA phase for the proposed project.

The desktop assessment will include a review of the information contained within other specialist studies, as well as insights from the scoping phase stakeholder engagement process. This process will allow for the assessment of key socio-economic issues relating to the proposed project. An outline of the proposed approach is provided below.

5.1 DESKTOP REVIEW

SPECIALIST REPORTS

The relevant specialist reports, and related data, will be reviewed including the Visual, Hydrological, Land Capability, Traffic, and Fauna and Flora assessment. It is anticipated that these reports will provide a thorough understanding of the broader impacts associated with the project that may have a bearing on the social landscape. The biophysical impacts will provide confirmation of the anticipated socio-economic impacts beyond the site boundary.

STAKEHOLDER ENGAGEMENT REVIEW

There will be no direct stakeholder engagement undertaken during the SIA. A review of the scoping phase stakeholder engagement and comments and response report will, however, be undertaken to obtain insight into the local social and socio-economic issues and inform the assessment of the potential socio-economic impacts

5.2 IMPACT ASSESSMENT AND RECOMMENDATIONS

Potential socio-economic impacts associated with the proposed project will be evaluated using a recognised risk assessment methodology in line with the National Environmental Management Act (107 of 1998). In addition the *Western Cape Guideline for Involving Social Assessment Specialists in EIA Processes* (Barbour, 2007), will be used to inform the socio-economic assessment. Recommendations resulting from the impact assessment will be developed, in line within international base practice, to contribute towards socio-economic sustainability during all phases of the proposed project.

5.3 REPORTING

The Draft SIA Report will be compiled, including the socio-economic context, potential impacts, assessment, and mitigation recommendations. Following stakeholder comment on the report, the final report will be updated and submitted with the final EIA Report.

6 CONCLUSIONS AND RECOMMENDATIONS

The nature of the local and regional landscape in which the proposed project is located is a sparsely populated and arid, with little infrastructure and limited development opportunities. In addition, there are no communities located on, or within the immediate vicinity of the proposed project site. The closest community is located 14 km north of the proposed project, and up to 4 km from the proposed linear infrastructure. As a result, the potential socio-economic impacts of the proposed project have been identified on a broad, local level, rather than on a site-specific scale. The potential socio-economic impacts and issues identified during the socio-economic screening are therefore applicable to all the proposed project sites and alternatives.

The screening assessment has not identified any fatal flaws in terms of the socio-economic environment for any of the proposed sites or alternatives. A number of socio-economic benefits and opportunities are recognised as being key impacts of the proposed project. The following key potential socio-economic impacts should, therefore, be taken through to the SIA phase:

Construction Phase	<ul style="list-style-type: none"> → Increase in employment opportunities → Increased economic development opportunities → Disturbances to local communities → Loss of farmland → Loss of access to natural resources
Operational Phase	<ul style="list-style-type: none"> → Increased employment and business opportunities → Increased economic development opportunities → Change in sense of place → Access to Water Resources
Decommissioning Phase	<ul style="list-style-type: none"> → Loss of permanent employment → Gain of short term employment
Cumulative	<ul style="list-style-type: none"> → Increased local economic development opportunities → Increased pressure on local service provision → Changes in tourism activities

- Change to employment patterns
- Access to Water Resources

The SIA will also provide mitigation and recommendations to minimise the potential negative impacts, and maximise the potential socio-economic benefits. This will require an improved understanding of the proposed project impacts and social objectives of the proposed project, but will contribute towards the sustainability of this project within the context of the local socio-economic environment.

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