

**FINAL ENVIRONMENTAL IMPACT ASSESSMENT REPORT
Boulders Wind Farm**

**Vol. 1
APPENDIX D1**

Developer's Pre-feasibility Assessment
of alternative sites

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ENVIRONMENTAL AND SOCIAL ADVISORY SERVICES

OUTLINE OF THE NEEDS & DESIREABILITY OF BOULDERS WIND FARM

The Boulders Wind Farm project is located in the Western Cape near the town of Vredenburg. The project is in accordance with South African Renewable Energy policies and the need to secure and renew the electricity generation capacity of the country.

At the time of release the Integrated Resource Plan of 2018, which is out for comment, presents a future energy mix of 34% of Wind Energy by the year 2050 in the IRP1 Scenario. This equates to a total installed capacity of 50.32GW of Wind Energy, where 8.1GW will be installed before the end of 2030, 25.92GW between the year 2030 and 2040, and 11.92GW between the years of 2040 and 2050.

The Boulders Wind Farm will deliver a meaningful amount of Renewable Energy to the South African electricity network and its citizens and it will contribute to changing the industry from being fossil fuel dominated to one which is based on clean renewable energy.

The electricity produced by the Boulders Wind Farm will correspond to the saving of approximately 7,000,000 tons of CO₂ gas emissions while supplying approximately 84,000 average South African households¹ with clean renewable energy over the next 20 years.

The Boulders Wind Farm epitomises the need and desire for sustainable ecological impact and justifiable social and economic development. With this in mind, the Boulders Wind Farm is ideally suited for the proposed location and will competitively contribute to the South Africa's future Renewable Energy market. The project is in the public interest and addresses fundamental societal needs in the short and in the long-term.

¹ As per data <http://sawea.org.za/index.php/media-room/press-releases/113-sa-to-have-400-wind-turbines-spinning-by-year-end>, "460 000 MWh/y, enough clean renewable electrical energy to power 100 000 average South African households. The project is expected to cut annual carbon emissions by 420 000 t".



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NEED AND DESIRABILITY IN CONTEXT

The Need and Desirability of a development is based on the principle of sustainability, set out in the Constitution and in NEMA, and provided for in various policies and plans, including the National Development Plan 2030 (NDP). Addressing the need and desirability of a development is a way of ensuring sustainable development where sustainable development can be described as development which is ecological sustainable and socially and economically justifiable, and as a result ensuring simultaneous achievement of the triple bottom-line.

Consistent with national priorities, environmental authorities aim to support increased economic growth and promote social inclusion, whilst ensuring that such growth is ecologically sustainable. The New Growth Path (NGP) highlights the need to focus on facilitating growth in sectors able to create employment at large scale and encouraging stronger investment by the private sector to grow these employment creating activities rapidly. In this regard the NGP aims to lay out a dynamic vision for how South Africa can collectively achieve a more developed, democratic, cohesive and equitable economy and society in the context of sustained growth. The NGP states: "In essence, the aim is to target our limited capital and capacity at activities that maximise the creation of decent work opportunities. To that end, we must use both macro and micro economic policies to create favourable overall environment and to support more labour-absorbing activities. The main indicators of success will be jobs (the number and quality of jobs created), growth (the rate, labour intensity and composition of economic growth), equity (reduction in lower income inequality and poverty) and environmental outcomes.

The design of the REI4P under which the selection of successful wind energy projects is evaluated (and this must be considered in this context), has specific development objectives that have been defined based on the Economic Development Policy. These objectives in the REI4P have been recognised by the Department as being inherently good for achieving positive socio-economic outcomes. Some of these outputs are: job creation (a heavy emphasis has been placed on this element as South Africa is facing an unemployment crisis); local content through, inter alia, increased local manufacturing; fostering rural development and involving communities; education and development of skills, enterprise development and socio-economic development and participation (both through employment and ownership) by historically disadvantaged citizens and marginalized regions.

It is well understood that a wind energy project will only be successful in the REI4P when it is very strong in achieving all of the objectives as outlined above, otherwise the project will fail. Wind energy projects are competitively encouraged and mandated to be strong contributors of economic development under the design of South Africa's REI4P. It is in their nature to have a very positive socio-economic contribution to address societal needs for the benefit of the broader community.



It is anticipated that the facility will have the following impact on the local economy, c.a. R2.0 billion investment (estimated CAPEX + OPEX) over the approximately 2 year construction period of the project with an estimated 5250 person-months during the wind turbine installation activities and a further 4500 person-months for balance of plant activities. Local communities and their needs will be identified by way of a comprehensive "needs-assessment" prior to REI4P bid submission. This will help shape our economic development commitments in order to maximise impact. The REI4P stipulates a threshold of 12% for "local" labour for onshore wind and a target of 20% (for the most recent bid). We are encouraged to target this 20% (or any future adjusted targets set out by the DoE) in order to maximise our competitiveness in the bid. The service and maintenance will constitute of estimated R 62 million investments over the 20 year operational phase of the project. Communities within 50 km radius of the wind farm will be prioritised in accordance with REI4P requirements to maximise economic development. The supported SED programmes will be developed following a comprehensive assessment prior to REI4P bid submission. Existing SED programmes, especially those that target host communities and our industry, may be supported where advantageous. New programmes could also be formulated. Where possible, SED revenues will be targeted at projects that support the wider wind energy industry in South Africa with an emphasis on up-skilling people to fill roles in our industry.

We, as the developers of the Boulders Wind Farm, believe that this is a great approach to enhancing a more socio-economically balanced, democratic, equitable and sustainable future for the society and the larger public interest.

As the consequence of the objectives under the REI4P as described above, wind farms bring large investment amounts into South Africa. Local content requirements lead to industrialization and the creation (and current survival) of highly qualified jobs in the industrial sector. The construction and operation leads to the creation of new job opportunities, employment and skills development. There are strong economic and social benefits for local communities through their participation in the project earnings, directly and indirectly. This relates to community trust funds participating directly in the project and the socio-economic development contribution that the project brings to the surrounding communities. Previously installed projects and associated numbers presented by the Department of Energy testify to this. Last but not least, the lease payments to the owners of the project land provides a second income and helps them to maintain their farming activities. This is an important alternative revenue stream during such difficult times for the agricultural sector due to all the accumulating effects of global warming and climate change, with less rainfall expected in the Western Cape in the future.

The National Development Plan (NDP) further stresses that the threat to the environment and the challenge of poverty alleviation are closely intertwined and as such, environmental policies should not be framed as a choice between the environment and economic growth. The NDP states: The 20th century was a period of unparalleled growth for humanity's population and socio-economic



development. During this period, environmental constraints to human activity were often not fully recognised. The world is now experiencing a growing number of undesirable consequences as continued economic expansion and resource exploitation threatens the stability of natural systems. Market and policy failures have resulted in the global economy entering a period of "ecological deficit" as natural capital is being degraded, destroyed, or depleted faster than it can be replenished. Waste and carbon-equivalent emissions per capita are climbing faster every year in an ecosystem with finite limits. South Africa faces urgent developmental challenges in terms of poverty, unemployment and inequality, and will need to find ways to "decouple" the economy from the environment, to break the links between economic activity, environmental degradation and carbon-intensive energy consumption." The NDP then formulated the principles to guide the transition to an environmentally sustainable low-carbon economy, moving from policy, to process, to action. To only cite a few of its principles; it is about being just, ethical and sustainable, solidarity on the global scale, protection of ecosystems acknowledging that human wellbeing is dependent on the health of the planet and also transition orientated, opportunity focused and effective participation of social partners by being aware of mutual responsibilities.

To add and underline the importance of these issues it must be stated that in recent times the effects of global warming and climate change are becoming more and more evident with all its severe and various consequences. To cite only some of the consequences of global warming, there is glacial meltdown and sea level rise leading to the loss of entire island nations and threatening densely populated coastal areas; heavier storms with devastating effects leaving people homeless and without any infrastructure required to sustain their lives; droughts (as also recently experienced in the Western Cape) further leading to desertification, the loss of biodiversity on the global scale, destruction of natural vegetation cover and loss of agricultural lands. On the other side there are heavier rainfalls, flash floods and inundations. All these events testify that global warming and climate change has and will continue to have severe impacts on mankind and all species around the globe. All of these severe negative impacts are affecting ever larger groups of populations one could even say mankind as a whole, but especially those that are poorest and the most vulnerable. Any form of environmental degradation specifically hits the lower income members of society because they do not have the means to react to a changing environment as do the wealthier parts of societies that can just simply establish their livelihoods somewhere else. This can be seen in many parts around the world in form of climate fugitives. Another example is the rural exodus and the associated ever-increasing pressure on the urban centres. People go to these urban centres once they have lost their basis for living in rural areas, almost always directly dependent on the local environment, in desperate need to find a basis for survival. However most of the times this is creating ever bigger problems in the urban centres.

The combat against global warming is therefore in the global public interest and concerns all societies around the world in the short and long-term. The ever-



increasing amount of CO₂ by human contribution has been identified as one of the key drivers for global warming and one of the main sectors responsible for the increase in CO₂ emissions around the globe is the electricity sector (Figure 1).

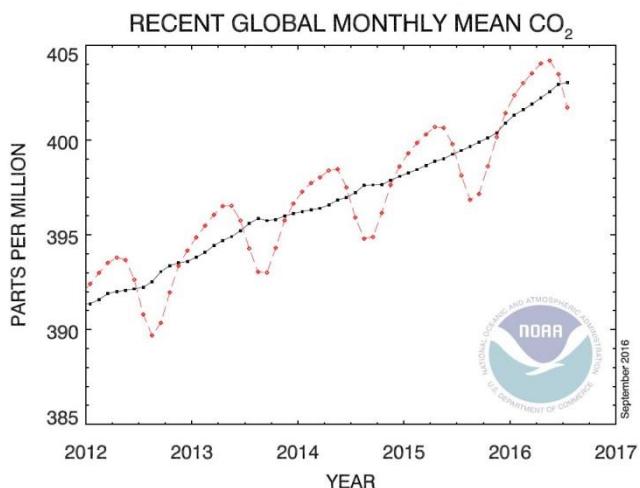


Figure 1: Increase of CO₂ emissions over the last five years (NOAA).

South Africa is currently the largest emitter of greenhouse gases in Africa, accounting for more than 40% of the continent's total emissions. It is also estimated to rank above the 20 largest emitters of greenhouse gases in the world. The emissions are largely the result of the energy intensive economy and the high dependence on coal-based electricity generation. So, the status quo is not acceptable. The status quo was exactly the situation that the NDP focuses on to change where economic development on the one side was happening on the burden of the protection of ecosystems worldwide and the wellbeing of humanity as a whole on the other side. This is now finally being addressed under the IRP and through the REI4P.

To meet its fundamental international obligations in the combat against global warming and climate change, and to reduce its overall environmental footprint, the South African government has signed and ratified several international agreements, amongst them the Kyoto Protocol and the Paris Agreement on Climate Change. The Paris Agreement is a legally binding instrument that will further guide the process for universal action on climate change. It brings all nations into a common cause of acting collectively to address the threat of climate change within the context of sustainable development and efforts to eradicate poverty. It sets the goal of holding the increase in global average temperature to well below 2 degrees Celsius and pursuing efforts to limit global temperature increase to 1.5 degrees Celsius.

While there is an urgent need for additional new generation capacity in South Africa to ensure economic growth and stability (including the avoidance of power shortcuts as happened in the recent past), at the same time a need of safeguarding and promoting the principles of social justice, ethics, sustainability, solidarity on the global scale. In addition, the protection of ecosystems must acknowledge that



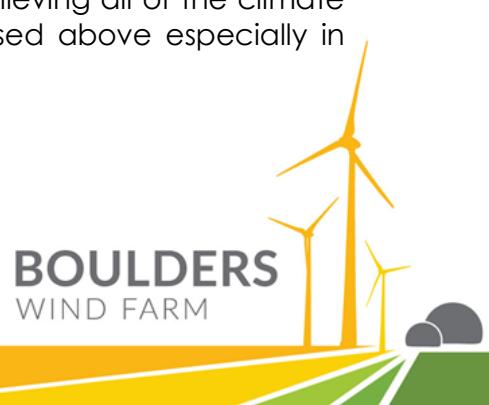
human wellbeing is dependent on the health of the planet and that a transition should be focused on the effective participation of social partners by being aware of mutual responsibilities, positive socio-economic development and social aspects associated with a stable and growing economy.

The only way to resolve and align these overarching interests, in both the local and international context in the short-term and for the long-term is by rapidly increasing the deployment of renewable green energy sources such as wind power and the Boulders Wind Farm. Renewable energy is critical to South Africa as this source of energy is recognised as a major contributor to climate protection, has a much lower environmental impact (including no harmful effects on local air quality), as well as advancing economic and social development. It is the only practicable environmental option for a sustainable future. Only in this way will it be possible to integrate all of the above mentioned principles and to achieve a low carbon electricity sector for the protection of ecosystems in South Africa and around the world. Under the aspect of global action and solidarity, this will ensure that especially the poorer and more vulnerable members of society are not over and over again the ones that will suffer the most in case such opportunities are lost.

The National Framework for Sustainable Development (2008) states that sustainable development is an on-going process that requires a particular set of values and attitudes in which economic, social and environmental assets that society has at its disposal, are managed in a manner that sustains human well-being without compromising the ability of future generations to meet their own need. In that way a sustainable development is a process to achieve the goal of sustainability. A sustainable development therefore implies the selection and implementation of a development option, which allows for appropriate and justifiable social and economic goals to be achieved, based on the meeting of basic needs and equity, without compromising the natural system on which it is based.

As it has been elaborated, due to the legislative environment in South Africa, there is no doubt that a renewable energy facility such as the Boulders Wind Farm allows for justifiable social and economic goals to be achieved, just by the design of how the selection of the successful projects is being processed under the REI4P. Even if there was no need to achieve such high levels of socio-economic development contribution in the tender process, wind farms contribute strongly to socio-economic growth at national and at local level by generating job opportunities and the enhancement of the large investments into South Africa's economy. Again, all the more under the REI4P which is specifically designed to promote socio-economic development and green industrialization to address the most urgent key issues such as unemployment, better education and to achieve a more equitable and balanced society for the benefit of all and in the public interest.

In terms of ecological sustainability, on the global and national scale there is no doubt that renewable energies are the only solution for achieving all of the climate and environmental targets based on the principles discussed above especially in



the interest of future generations because of the valuable contribution to the reduction of the global carbon footprint. In terms of the local natural system, the local environment, this has been thoroughly analysed by conducting a thorough EIA process including dedicated independent specialist analysis. These specialists in their respective fields where applied to specifically identify local environmental sensitivities of the site and its surroundings. Initially the developer had considered many project alternatives, having various layouts designed to occupy the project site. Once these initially identified local sensitivities during the Scoping process had been identified, a very thorough and detailed project planning process was initiated to analyse the various alternatives with the clear and dedicated aim to mitigate and absolutely minimize the project's impact on the local environment to the extent that the local ecological limits would never be exceeded looking at the preferred alternative (more on that in the specific chapter below).

The Boulders Wind Farm will have large benefits on the global and national scale in the combat against global warming and climate change while at the same time the Boulders Wind Farm is ecologically sustainable on the local scale from the environmental impact perspective considering the receiving environment. Therefore, it can be stated clearly that the Boulders Wind Farm will have a significant positive ecological contribution under the concept of sustainability.

Also, it must be noted, that the project is located on agricultural land whereas all environmental features are almost entirely avoided with the preferred alternative for this site. The actual area consumed by the project is very little, less than 2% of the project land available. Therefore, all agricultural activities can continue and the effect on the agricultural activities has been considered negligible by the respective specialist. Therefore, it can be stated that the Boulders Wind Farm project is a very wise use of land and it is the best practicable environmental option at this specific site for reaching the most benefit in terms of socio-economic development and societal needs as a whole, having the least environmental damage.

The project is in line with all local economic development strategies and plans. To cite two examples: The West Coast District Municipality Integrated Development Plan (IDP) (2017 – 2022) includes a Climate Change Strategy and it notes in this regard that the West Coast area will become a very dry area with less rainfall and less water. The plan is of great relevance to the Boulders Wind Farm because the IDP notes that the approach to addressing the challenges includes the reduction of greenhouse gas emissions from electricity generation by switching to renewable energy. The Saldanha Bay Integrated Development Plan (IDP) (2017 – 2022) notes that the Saldanha Bay area plays an important role in the broader strategic framework of the South African Government as driven by the National Development Plan and National Growth Plan, which brings us back to the discussion held above. Furthermore, the Saldanha Bay Local Municipality Medium Term Economic Development Strategy (2013) considers the renewable energy sector and green technology sectors in its focus.



The contributions of the Boulders Wind Farm are of international significance as it contributes to South Africa being able to meet its international obligations by aligning its domestic policy with the goals and overarching principles of the internationally agreed strategies and standards. Whilst at the same time, providing its valuable socio-economic development input to the local communities and the needs of the broader South African society. The project's input is needed in the short-term for its immediate contribution to job creation, socio-economic development input amongst others and in the long-term to contribute to a more just, ethical and sustainable society being in solidarity on the global scale, protecting ecosystems acknowledging that human wellbeing is dependent on the health of the planet for all future generations to come. The Boulders Wind Farm is desirable because it is ecologically sustainable. It is desirable because it is socially and economically justifiable. Being ecological sustainable and socially and economically justifiable, the Boulders Wind Farm is ensuring the simultaneous achievement of the triple bottom-line. It would be of vital importance for South Africa that the Boulders Wind Farm is fully considered as a sustainable development opportunity and be given the chance to provide all those valuable contributions to South Africa as a whole.



NEEDS AND DESIREABILITY ACCORDING TO THE GUIDELINE

In the Environmental Impact Assessment process, it is important to understand the Needs and Desirability of a development. The Guidelines on Needs and Desirability were published in the Government Gazette on 20th of October 2014. Within the Guidelines, a checklist is presented which is a useful tool in addressing specific questions relating to the need and desirability of a project and assists in explaining that need and desirability at the provincial and local context. Table 1 and Table 2 includes a list of questions based on the DEA's Guideline to determine the need and desirability of the proposed project.

Table 1: The Guideline on the Needs and Desirability's "QUESTIONS TO BE ENGAGED WITH WHEN CONSIDERING NEED AND DESIRABILITY" – Ecological Sustainability

"securing ecological sustainable development and use of natural resources"	
1. 1. How will this development (and its separate elements/aspects) impact on the ecological integrity of the area?	The impact of the development on the ecological integrity has been assessed in the Fauna & Flora Impact Assessment included in the EIA report (Appendix X).
1.1.1.Threatened Ecosystems,	According to the Fauna and Flora Impact Assessment, there is no impact of Endangered Ecosystems affected by this development.
1.1.2.Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, wetlands, and similar systems require specific attention in management and planning estuaries, procedures, especially where they are subject to significant human resource usage and development pressure,	The Fauna and Flora Impact Assessment states that 85% of the development is transformed and a further 5% degraded, and only 5% of the area being considered natural and near natural, with some invasion of alien plants disturbance to the soil. Of this 5% Natural area, any Remnant Saldanha Granite Strandveld has be considered a no-go area and buffered accordingly.
1.1.3.Critical Biodiversity Areas ("CBAs") and Ecological Support Areas ("ESAs"),	While other Wind Energy developments are currently being considered entirely within ecological CBA1 and CBA2 areas, where offsets are being proposed, the Boulders Wind Farm is not being developed within an ecological CBA area. They are remnants of natural vegetation, but have been buffered accordingly. The Impact Assessment concludes that there will be no additional habitat loss from the development and as such minimal impact on the Biosphere Reserve. The Freshwater Impact Assessment identified that only River and Terrestrial CBAs exist within the site. These areas have been considered a no-go area for turbine placement. Wind Farm infrastructure crossings of these CBAs with will be done over existing degraded crossings currently being used for current agricultural purposes. Upgrades to these crossings with culverts have been proposed to improve the hydrological functioning of the systems within the larger project area.



1.1.4.Conservation targets,	The Fauna and Flora Impact Assessment has identified that the site does not lie within a National Protected Area Expansion Strategy (NPAES) focus area and has therefore not been identified as an important area for future conservation area expansion.
1.1.5.Ecological drivers of the ecosystem,	-
1.1.6.Environmental Management Framework,	The Flora and Fauna Impact Assessment identified that the site does not lie within a National Protected Area Expansion Strategy (NPAES) focus area and has therefore not been identified as an important area for future conservation area expansion. An Environmental Management Plan has been proposed for the Boulders Wind Farm
1.1.7.Spatial Framework, and Development	According to the latest Saldanha Bay Municipality Spatial Development Framework (SDF 2011), the development area is not considered a Protected Area. Considering the Urban Growth in the area, the establishment of the Wind Farm could further protect the landscape from encroaching Urban development which can be seen in the Municipality SDF.
1.1.8.Global and international responsibilities relating to the environment (e.g. RAMSAR sites, Climate Change, etc.)	See section on "Need and desirability in context".
1.2. How will this development disturb or enhance ecosystems and/or result in the loss or protection of biological diversity? What measures were explored to firstly avoid these negative impacts, and where these negative impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The Fauna and Flora Impact Assessment concluded that Cumulative impacts as well as impacts on CBAs as a result of the development are likely to be low as the footprint of the development would be largely restricted to already transformed areas and operational impacts on terrestrial ecology within such areas would be very low. The Freshwater Impact Assessment concluded that the development will have an overall 'low' impact on the freshwater habitat and ecology, ecological and socio-cultural service provision and on hydrological function and sediment balance. Generally ecological sensitivities were avoided to cause the least impact. The various Impact Reports explore the mitigations required to avoid negative impacts (no-go) areas as well as minimise negative impacts through the provision of respective buffers where required. The EMPr shall include measures to avoid, remedy, mitigate and manage impacts associated with the development.
1.3. How will this development pollute and/or degrade the biophysical environment? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	Generally the approach is to avoid all sensitive areas to minimize the impact adding further mitigation were required. The EMPr further includes measures to avoid, remedy, mitigate and manage biophysical impacts associated with the development. The Freshwater Impact Assessment identified that only River and Terrestrial CBAs exist within the site. These areas have been considered a no-go area for turbine placement. Wind Farm infrastructure crossings of these CBAs will be done over existing degraded crossings currently being used for current agricultural purposes. Upgrades to these crossings with culverts have been proposed to improve the hydrological functioning of the systems within the larger

	project area.
1.4. What waste will be generated by this development? What measures were explored to firstly avoid waste, and where waste could not be avoided altogether, what measures were explored to minimise, reuse and/or recycle the waste? What measures have been explored to safely treat and/or dispose of unavoidable waste?	Waste will mostly be generated during the construction and decommissioning phases of the project. Measures to avoid, remedy, mitigate or manage waste are to be included within the EMPr. The developer will ensure that such strict waste management plans as required by the EMPr will be ensured by the manufacturer at all stages of the project.
1.5. How will this development disturb or enhance landscapes and/or sites that constitute the nation's cultural heritage? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The landscape of the Vredenburg Peninsula consists of agricultural land, coastal towns, an already existing Wind Farm and some light and heavy industry. To protect the coastal landscape, in close proximity to the project, roughly 40% of the site was considered no go to protect the landscape from a Heritage and Visual perspective. The Heritage Impact Assessment has confirmed that there are no declared national heritage sites in proximity to the project. The only significant heritage feature is the Kasteelberg koppie, which was proposed as a Heritage site quite some time ago but was unsuccessful and postponed back in 2011. No further progress has been made on the declaration of this site. However, buffers associated with this feature were respected, such as 1.5km buffer on the Eastern side of the feature, and 250m buffers on either side of the Vredenburg-Stompneus Bay Road.
1.6. How will this development use and/or impact on non-renewable natural resources? What measures were explored to ensure responsible and equitable use of the resources? How have the consequences of the depletion of the non-renewable natural resources been considered? What measures were explored to firstly avoid these impacts, and where impacts could not be avoided altogether, what measures were explored to minimise and remedy (including offsetting) the impacts? What measures were explored to enhance positive impacts?	The Flora and Fauna Assessment includes a detailed profile of the natural environment and anticipated impacts. Measures to avoid, remedy, mitigate and manage impacts are to be included in the EMPr. During the Scoping Phase of the project, it was made aware to the applicant that there exists Mining Rights over Portion 1 of Farm Skuitjesklip 22, which is one of the properties considered for the Wind Energy Facility. While this farm has been considered a "not preferred area" for the wind farm due to the visual impacts associated with the facility, and vegetation over this property portion is the Saldanha Limestone Strandveld, and the Saldanha Flats Strandveld, where the latter is considered to be an Endangered vegetation type. Avoiding the placement of turbines in this area, due to the Mining Rights and the high sensitive environmental and social impacts, is considered to be a method to avoid the high impacts for the Wind Farm.



<p>1.7. How will this development use and/or impact on renewable natural resources and the ecosystem of which they are part? Will the use of the resources and/or impact on the ecosystem jeopardise the integrity of the resource and/or system taking into account carrying capacity restrictions, limits of acceptable change, and thresholds? What measures were explored to firstly avoid the use of resources, or if avoidance is not possible, to minimise the use of resources? What measures were taken to ensure responsible and equitable use of the resources? What measures were explored to enhance positive impacts?</p>	<p>South Africa has heavily relied on coal as a source of electricity for decades. Due to the nature of coal as a non-renewable resource that causes major environmental degradation, there is therefore a need to identify alternative resources that could promote sustainable energy sources as well as cleaner energy production ways. The proposed project aims to harness the high wind resource available in the area for the generation of electricity. This project is seen as a source of 'clean energy' and reduces the dependence on non-renewable sources. The proposed project is considered ecologically sustainable and the footprint has excluded a significant portion of the site, and the remaining footprint will as far as possible avoid areas of very high environmental sensitivity. Where impacts cannot be avoided, the footprint will be placed to minimise, mitigate or manage potential impacts to the receiving environment.</p>
<p>1.7.1. Does the proposed development exacerbate the increased dependency on increased use of resources to maintain economic growth or does it reduce resource dependency (i.e. dematerialised growth)? (note: sustainability requires that settlements reduce their ecological footprint by using less material and energy demands and reduce the amount of waste they generate, without compromising their quest to improve their quality of life)</p>	<p>The proposed development significantly reduces the national dependence on fossil fuel energy generation, moving the country towards a decentralised renewable independent energy market.</p>
<p>1.7.2. Does the proposed use of natural resources constitute the best use thereof? Is the use justifiable when considering intra- and intergenerational equity, and are there more important priorities for which the resources should be used (i.e. what are the opportunity costs of using these resources this the proposed development alternative?)</p>	<p>Using the country's highest wind resource areas for the cheapest electricity prices, at a sustainable ecological impact and minimal social and economic impacts is considered as sustainable development. The Agricultural Impact Assessment confirmed that the land is considered to be of low agricultural potential and that the implication of this extremely low percentage of the farmland to be taken up by the development is that the negative impact on total agricultural production value should be virtually zero. The Tourism Impact Assessment concluded that because the location of the proposed Boulders Wind Farm is inland and is not expected to obstruct the beach view for tourists visiting the coastal towns (i.e. Paternoster and St Helena Bay), no potential negative impact on leisure tourists is expected.</p>
<p>1.7.3. Do the proposed location, type and scale of development promote a reduced dependency on resources?</p>	<p>The harnessing of Wind Energy in the windiest areas of the country to generate clean renewable energy will reduce the dependency of the country on Fossil Fuel energy generation.</p>
<p>1.8. How were a risk-averse and cautious approach applied in terms of ecological impacts?</p>	<p>In each Ecological Impact Assessment the respective risk mitigation approaches have been discussed. See Appendices attached to the EIAr.</p>



1.8.1.What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	Current gaps in knowledge include confirmation on the preferred turbine generating capacity and turbine technology to be used at this site. Ways in which these gaps are addressed are to consider the worst-case scenarios thresholds in terms of turbine size and generation capacity. Mitigation measures to manage these impacts have been identified.
1.8.2.What is the level of risk associated with the limits of current knowledge?	The level of risk associated with the limits of current knowledge can be mitigated by the threshold limits mentioned above, by assuming a worst-case scenario for development.
1.8.3.Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	In each Ecological Impact Assessment the respective risk mitigation approaches have been discussed. See Appendices attached to the EIAr.
1.9. How will the ecological impacts resulting from this development impact on people's environmental right in terms following:	According to the regulations, "everyone has the right to an environment that is not harmful to his or her health or well-being;" The regulations state that "sustainable development requires the integration of social, economic and environmental factors in the planning, implementation and evaluation of decisions to ensure that development serves present and future generations;" In addition, it states that everyone has the right to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that-- > prevent pollution and ecological degradation; > promote conservation; and > secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development:
1.9.1. Negative impacts: e.g. access to resources, opportunity costs, loss of amenity (e.g. open space), air and water quality impacts, nuisance (noise, odour, etc.), health impacts, visual impacts, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	While the project will provide great socio-economic development opportunity on a national and local scale and provide cheaper clean energy to South Africa (better access to resources), it will also help reduce opportunity costs. It is clear that air and water quality impacts are not to be expected, but rather contrary this type of clean renewable energy helps to conserve quality of these environmental assets. Noise impacts are minimized by applying sufficient buffers to and avoiding close turbine location to receptors. There are no health impacts related to wind energy. Visual impacts were largely reduced through the avoidance of turbine placement within the preferred development area only. These impacts are explored in the Impact Assessments, and more specifically the Noise Impact Assessment, the Visual Impact Assessment, Freshwater Assessment, Social Assessment and Socio-Economic Impact Assessment. Measures to avoid, remedy, mitigate or manage these impacts are to be included within the EMPr.
1.9.2.Positive impacts: e.g. improved access to resources, improved amenity, improved air or water quality, etc. What measures were taken to enhance positive impacts?	As per the negative impacts in Section 1.9.1, the project will contribute to better access to resources, i.e. cheaper clean renewable energy, improve air and water quality especially compared to conventional energy sources. Furthermore respective the impact reports of the respective biological



	impacts contain the suggested actions taken to enhance any positive impacts.
1.10. Describe the linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area in question and how the development's ecological impacts will result in socio-economic impacts (e.g. on livelihoods, loss of heritage site, opportunity costs, etc.)?	<p>Human well-being is dependent on the availability of basic resources such as electricity for all members of society at affordable cost while at the same decoupling energy generation from massively impacting of the ecosystems. Also job opportunities need to be created in times of permanent and increasing unemployment. The only way to resolve and align these overarching interests, in both the local and international context in the short-term and for the long-term is by rapidly increasing the deployment of renewable green energy sources such as wind power and the Boulders Wind Farm. Renewable energy is critical to South Africa as this source of energy is recognised as a major contributor to climate protection, has a much lower environmental impact, as well as advancing economic and social development. It is the only practicable environmental option for a sustainable future. Only in this way it will be possible to integrate a low carbon electricity sector with cheaper clean energy and for the protection of ecosystems in South Africa and all around the world under the aspect of global solidarity while at the same time enhancing socio-economic development for the wellbeing and livelihoods of people on the local as well as the national South African scale. There no declared heritage sites surrounding the project area. The heritage report elaborates further on cultural landscape features.</p> <p>These linkages and dependencies between human wellbeing, livelihoods and ecosystem services applicable to the area were further considered in the Social and Socio-Economic Impact Assessments, included as Appendices in the EIAr.</p>
1.11. Based on all of the above, how will this development positively or negatively impact on ecological integrity objectives/targets/considerations of the area?	<p>Based on all of the above, it can be seen that the Boulders Wind Farm ensures a sustainable ecological impact. In all the ecological specialist reports, the impacts were identified and avoided, mitigated where required and do not present fatal flaws in the project. The proposed activity does not compromise any of the objectives set within the Saldanha Bay Municipality's Integrated Development Plan (IDP) (2011) and the West Coast District Municipality's IDP (2017 – 2022). In both regional plans, provisional is made to support national clean energy development. The proposed project will also be supportive of the National IDP's objective of creating more job opportunities. The proposed WEF will assist in local job creation during the construction and operation phases of the project (if an EA is granted by the DEA). However, as noted above, employment opportunities will be temporary during the construction phase and long- term during the operational phase as the plant is expected to be operational for 20 years.</p>



1.12. Considering the need to secure ecological integrity and a healthy biophysical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the "best practicable environmental option" in terms of ecological considerations?	See Section on Alternatives.
1.13. Describe the positive and negative cumulative ecological/biophysical impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and existing and other planned developments in the area?	Refer to the Chapter on Cumulative Impacts in the EIAr.

Table 2: The Guideline on the Needs and Desirability's "QUESTIONS TO BE ENGAGED WITH WHEN CONSIDERING NEED AND DESIRABILITY" – Justifiable Social and Economic Development

"Promoting justifiable economic and social development"	
<p>2.1. What is the socio-economic context of the area, based on, amongst other considerations, the following considerations?:</p> <p>2.1.1. The IDP (and its sector plans' vision, objectives, strategies, indicators and targets) and any other strategic plans, frameworks or policies applicable to the area,</p>	<p>The West Coast District Municipality (WCDM) IDP lists a number of Strategic Objectives that are relevant to the proposed development. More specifically, the Strategic Objective 3 is related to promoting Social Wellbeing of the community and this section lists the key economic and social challenges and opportunities facing the area. The opportunity highlighted by the municipality is "The promotion of the West Coast as a renewable energy destination".</p> <p>The WCDM IDP includes a Climate Change Strategy. In this regard the IDP notes that the West Coast area will become a very dry area with less rainfall and less water. Of relevance to the proposed development, the IDP Notes that the approach to addressing the challenges includes reducing greenhouse gas emissions from energy by switching to renewable energy.</p> <p>The IDP of the Saldanha Bay Municipality notes that the area forms part of Strategic Integrated Project (SIP) 8 which forms part of the government's National Infrastructure Plan of 2012. SIP 8 involves supporting green energy initiatives on a national scale through a diverse range of clean energy option.</p>



2.1.2. Spatial priorities and desired spatial patterns (e.g. need for integrated or segregated communities, need to upgrade informal settlements, need for densification, etc.).	<p>As presented in the Social Impact Assessment, the West Coast District Municipality SDF contains the following policies which are relevant:</p> <ul style="list-style-type: none"> > HR1 Promote infrastructure development in locations with medium, high and very high economic growth potential; > HR2 Invest in key economic sectors to facilitate development and employment opportunities. <p>A sectoral analysis and assessment of the West Coast District Economy identified the key sectors for future growth. Of relevance to the study, renewable energy is identified as a key sector. The SDF notes that "wind and solar projects can become a key sector in the study area" and that the manufacture and distribution of renewable energy components, such as wind turbines, can further promote this sector.</p> <p>The WCDM SDF also highlights the potential risks posed by climate change. In this regard the Western Cape and South Africa as a whole, has been identified as potentially relatively sensitive to the impacts of climate change. The risks include increased mean annual temperatures and extended dry periods between rainfall events. Of specific relevance to the proposed development eight mitigation focus areas, including Renewable Energy, are identified to address the challenges associated with climate change. The establishment of renewable energy in the WCDM in suitable locations is therefore supported.</p>
2.1.3. Spatial characteristics (e.g. existing land uses, planned land uses, cultural landscapes, etc.), and	The SBLM SDF (2011) notes that the existing landscape of the Saldanha Bay Municipal Area reflects the dynamic nature of the interaction between human and natural elements that have over time combined to create the unique landscape of the area. The combination of these elements and their spatial context creates a number of 'districts' or areas with specific attributes and a distinct character.
2.1.4. Municipal Economic Development Strategy ("LED Strategy").	The SBM LED document explicitly discusses the development of renewable energy resources as a viable environmentally sustainable economic sector within the Saldanha Bay LM area (Chapter 7: Economic Development Framework). The following extract is of particular relevance to the study: "Renewable energy is of high priority in South Africa. In the Saldanha Bay Municipal area, most winds occur during May to September, and November to February. Strong winds of over 20km/h are common in this area (...). This illustrates that the Saldanha Bay Municipal area could be the ideal place to implement wind energy (renewable energy), due to the constant occurrence of wind through the year. A feasibility study should be done in order to take this concept further. The Saldanha Bay Municipality is already involved in various activities, regarding renewable energy, and is also part of the Provincial Task Team that is looking into this issue".



2.2. Considering the socio-economic context, what will the socio-economic impacts be of the development (and its separate elements/aspects), and specifically also on the socio-economic objectives of the area?	The Social-Economic impacts of Renewable Energy implementation is facilitated through the Department of Energy's Independent Power Producer Programme (REI4P). Through this program, the DoE ensured job creation, social economic development (SED) and Enterprise Development (ED). SED and ED are implemented through dedicated revenue spend of the Renewable Energy Projects. As part of the Renewable Energy programme, the higher this percentage of revenue spend towards SED and ED, the higher the Economic Development score in the REI4P tender, and the higher likelihood of a project reaching success. This further encourages contributions to SED and ED in renewable energy projects. Furthermore, the REI4P insists on the establishment of a community trust to have local ownership of the project. The dividends of this community trust are used towards SED and ED contributions in the community.
2.2.1. Will the development complement the local socio-economic initiatives (such as local economic development (LED) initiatives), or skills development programs?	The development of Renewable Energy will definitely complement the socio-economic initiatives of the local community. The Social Impact Assessment for the project highlights that the LED is an important tool for the alleviation of poverty and the development of sustainable local economies in that it can: <ul style="list-style-type: none"> > Create jobs and new employment opportunities; > Increase income levels and enable people to pay for services; > Enable the Local Authority to concentrate on human resource potential; > Enable the Local Authority to concentrate on opportunities for development; > Enable the Local Authority to promote linkages between developed and under-developed areas; > Enable the Local Authority to build new institutions for sustainable economic development". The development of Wind Energy facilities have proven to assist in the development of all of these above objectives through the REI4Ps requirements for job creation, social economic development and enterprise development.
2.3. How will this development address the specific physical, psychological, developmental, cultural and social needs and interests of the relevant communities?	The details assessment of this is discussed in the Social Impact Assessment. Further a comment received during the Scoping PPP helps to understand the situation within the local communities: "We are taking a very social view of this project, and any other project coming into the area. Our area is about 95% dependent on the fishing industry. Earlier this year 245 employees were retrenched from one of the fishing companies. The economics of the area is not looking good and the economics of the area has a direct impact on poverty and the increase in crime, which is considered as a ripple effect. Any kind of project where limited permanent employment opportunities are available for the local residents of the area it is considered to be a future positive change. Any project would get our blessing with the employment opportunities it will bring to the area."



2.4. Will the development result in equitable (intra- and inter-generational) impact distribution, in the short- and long-term? Will the impact be socially and economically sustainable in the short- and long-term?	The impact of the development is considered to be sustainable in the short and long term, both socially and economically. The Social Economic Impact Assessment indicated that the effects on Tourism, Property values is negligible, and that the economic development through the REI4P is considered to be high.
2.5. In terms of location, describe how the placement of the proposed development will:	-
2.5.1. result in the creation of residential and employment opportunities in close proximity to or integrated with each other,	It is anticipated that the development will have the following impact on the local economy, c.a. R2.0 billion investment (estimated CAPEX + OPEX) over the construction period of the project with an estimated 5250 person-months during the installation activities and 4500 person-months for balance of plant activities. Local communities and their needs will be identified by way of a comprehensive "needs-assessment" prior to REI4P bid submission. This will help to shape the economic development commitments in order to maximise impact. The REI4P stipulates a threshold of 12% for "local" labour for onshore wind and a target of 20% (for the most recent bid). The applicant aims to target this 20% (or any future adjusted targets set out by the DoE) in order to maximise the competitiveness in the bid. The service and maintenance will constitute an estimated R 62 million investment over the operational phase of the project. Communities within 50 km radius of the wind farm will be prioritised in accordance with REI4P requirements to maximise economic development. The SED programmes will be developed following a comprehensive assessment prior to REI4P bid submission. Existing SED programmes, especially those that target host communities and our industry, may be supported where advantageous. New programmes could also be formulated. Where possible, SED revenues will be targeted at projects that support the wider wind energy industry in South Africa with an emphasis on up-skilling people to fill roles in our industry.
2.5.2. reduce the need for transport of people and goods,	N/A - the project is a renewable energy project
2.5.3. result in access to public transport or enable non-motorised and pedestrian transport (e.g. will the development result in densification and the achievement of thresholds in terms public transport),	N/A - the project is a renewable energy project
2.5.4. compliment other uses in the area,	The planning for this area by the municipality is designated as agricultural use. The Agricultural Impact Assessment confirms that the land is in fact has a low agricultural potential. Of the preferred development area, the project will only take 1.6% of the available land. The remaining 98.4% will still be available for current agricultural usage.



2.5.5. be in line with the planning for the area,	Furthermore, as confirmed in the Draft of the Municipality Conceptual Framework Report, the neighbouring property which has an already existing wind farm, is zoned as agriculture and special use due to the wind farm. Further expansion of this special has been noted in the Conceptual Framework report in the section relating to St. Helena Bay.
2.5.6. for urban related development, make use of underutilised land available with the urban edge,	N/A - the preferred development area of the project is planned for agricultural use
2.5.7. optimise the use of existing resources and infrastructure,	The need and desirability for this development completely aligns with the optimisation of existing resources and infrastructure. As discussed in the Needs and Desirability document, the existing Wind Resource is one of the best in the country. The existing infrastructure in the area includes an Eskom Powerline and Substation which was built for the purpose of the neighbouring wind farm and further Eskom load forecasts for the area. The capacity available for energy generation at this substation is so large that it could in fact accommodate two additional wind farms. The existing infrastructure in the area also includes the already established road network, over the simple terrain, as well as the Saldanha deep sea harbour which has been used to import wind turbine components in the past.
2.5.8. opportunity costs in terms of bulk infrastructure expansions in non-priority areas (e.g. not aligned with the bulk infrastructure planning for the settlement that reflects the spatial reconstruction priorities of the settlement),	No reconstruction of the settlement would be required due to this development, and thus no opportunity costs would be lost.
2.5.9. discourage "urban sprawl" and contribute to compaction/densification,	The presence of the wind farm would conserve the current agricultural activities of the land, preserving its visible and cultural sense of place, preventing further urban development in the close proximity (<5km) from the wind farm. This would reduce "urban sprawl" in the area.
2.5.10. contribute to the correction of the historically distorted spatial patterns of settlements and to the optimum use of existing infrastructure in excess of current needs,	N/A - the project is would not assist in the correction of historically distorted spatial patters of settlements
2.5.11. encourage environmentally sustainable land development practices and processes,	The EIAR has confirmed that there are no ecological red flags for the development and can considered to be sustainable with implementation of appropriate mitigation, and can be considered socially and economically justifiable. As confirmed in the Agricultural Impact Assessment, the development would have a negligible impact on the low potential agriculture currently in operation on the land.



2.5.12. take into account special locational factors that might favour the specific location (e.g. the location of a strategic mineral resource, access to the port, access to rail, etc.).	Discussed in 2.5.7 and as well as the Needs and Desirability discussion, this location is ideal for the development. There exists a phosphate prospecting mining right on the Schuitjes Klip 1/22 property, held by Montero Mining and Exploration Limited, which lies north of the proposed development. Montero intends to establish a phosphate mine and fertilizer operation on the Property and several other properties to which the Prospecting Right relates. Due to the high visual impact considered by residents of Paternoster and Britannica for the current development, this northern section of the proposed site where the mining right exists has been excluded, not been considered as a preferred area.
2.5.13. the investment in the settlement or area in question will generate the highest socio-economic returns (i.e. an area with high economic potential).	The REI4P programme set out by the Department of Energy ensures that the highest Job Creation, Social Economic Development and Enterprise Development is reached through the implementation of Renewable Energy. This is a great socio-economic opportunity for any receiving community and ensures the highest socio-economic returns due to the utility size of such a project.
2.5.14. impact on the sense of history, sense of place and heritage of the area and the socio-cultural and cultural-historic characteristics and sensitivities of the area, and	The landscape of the Vredenburg Peninsula consists of agricultural land, coastal towns, an already existing Wind Farm and some light and heavy industry. To protect the coastal landscape, in close proximity to the project, roughly 40% of the site was considered no go to protect the landscape from a Heritage and Visual perspective. The Heritage Impact Assessment has confirmed that there are no declared national heritage sites in proximity to the project. The only significant heritage feature is the Kasteelberg koppie, which was proposed as a Heritage site quite some time ago but was unsuccessful and postponed back in 2011. No further progress has been made on the declaration of this site. However, buffers associated with this feature were respected, such as 1.5km buffer on the Eastern side of the feature, and 250m buffers on either side of the Vredenburg - Stompneus Bay Road. Furthermore, the Heritage Impact Assessment also confirmed that there is no registered cultural landscape in the facility. The Heritage Impact Report concludes that the effect on the facility cannot be mitigated due to the physical presence of the facility in the landscape. However, the HIA concludes that the elimination of the facility as a no-go alternative would be a loss to the social-economic development of the development in the area.
2.5.15. in terms of the nature, scale and location of the development promote or act as a catalyst to create a more integrated settlement?	A more integrated settlement, defined by Western Cape in the document "Breaking New Ground": A Comprehensive Plan for the Development of Sustainable Human Settlements, considers that Integration and co-operation must underpin all efforts to develop sustainable human settlements. The presence of a wind farm in the regional promotes the development of sustainable human settlements in the local municipality, district municipality and as well as a level of provincial and national governance.
2.6. How were a risk-averse and cautious approach applied in terms	As discussed below in following questions.



of socio-economic impacts?	
2.6.1. What are the limits of current knowledge (note: the gaps, uncertainties and assumptions must be clearly stated)?	The Social Impact Assessment states that the information contained in some key policy and land use planning documents, such as Integrated Development Plans etc., may not contain data from the 2011 Census. However, where required this data has been updated with the relevant 2011 Census data.
2.6.2. What is the level of risk (note: related to inequality, social fabric, livelihoods, vulnerable communities, critical resources, economic vulnerability and sustainability) associated with the limits of current knowledge?	Addressed in the Social Impact Assessment.
2.6.3. Based on the limits of knowledge and the level of risk, how and to what extent was a risk-averse and cautious approach applied to the development?	Addressed in the Social Impact Assessment.
2.7. How will the socio-economic impacts resulting from this development impact on people's environmental right in terms following:	
2.7.1. Negative impacts: e.g. health (e.g. HIV-Aids), safety, social ills, etc. What measures were taken to firstly avoid negative impacts, but if avoidance is not possible, to minimise, manage and remedy negative impacts?	Referenced from the Social Impact Assessment, "The potential health impacts typically associated with WFs include, noise, shadow flicker and electromagnetic radiation. As indicated above, the findings of a literature review undertaken by the Australian Health and Medical Research Council published in July 2010 indicate that there is no evidence of wind farms posing a threat to human health. The research also found that wind energy is associated with fewer health effects than other forms of traditional energy generation and in fact will have positive health benefits (WHO, 2004). Based on these findings it is assumed that the significance of the potential health risks posed by the proposed WF is of Low Negative significance."
2.7.2. Positive impacts. What measures were taken to enhance positive impacts?	Through the Renewable Energy Independent Power Producer Programme, the Socio Economic Development and Enterprise Development contributions enhance the positive impact of the facility in the area by ensure contributions targeted at 1.5% and 0.6% respectively. The Job Creation of the REI4P aims to create jobs for SA citizens, SA citizens who are black, skilled black SA citizens and SA citizens from local communities. The REI4P also encourages local content, which encourages the manufacturing of local renewable energy products. Furthermore, the REI4P targets ownership of the development to 40% by black people and/or black enterprises and 10% of ownership by local communities.
2.8. Considering the linkages and dependencies between human wellbeing, livelihoods and ecosystem services, describe the linkages and dependencies applicable to the area in question and how the development's socio-economic	The Socio-Economic development opportunities that exist for a Wind Energy facility will not be a detriment to the ecological environment of the area.



impacts will result in ecological impacts (e.g. over utilisation of natural resources, etc.)?	
2.9. What measures were taken to pursue the selection of the "best practicable environmental option" in terms of socio-economic considerations?	<p>When looking to suitable wind energy locations, supply of skilled workers is a significant advantage to support local economic development in line with Local Economic Development plans by local government. Considering the close proximity to Saldanha Port, with skilled labour can be sourced for the construction and operations activities of the development.</p> <p>In addition, in finding the best possible site, it is preferential to place the facility in an area where previous wind energy facilities have been developed. This will continue the economic stimulus from local small companies to continue to offer services for wind energy development. This would include smaller civil contractors in the area.</p>
2.10. What measures were taken to pursue environmental justice so that adverse environmental impacts shall not be distributed in such a manner as to unfairly discriminate against any person, particularly vulnerable and disadvantaged persons (who are the beneficiaries and is the development located appropriately)? Considering the need for social equity and justice, do the alternatives identified, allow the "best practicable environmental option" to be selected, or is there a need for other alternatives to be considered?	The Public Participation Process was run according to the regulations. These regulations ensure that the project does not discriminate against any particular I&AP, especially vulnerable and disadvantaged people. The development will implemented according to the requirements of the Department of Energy's Independent Power Producer Programme, which ensures that the Socio-Economic Development activities are directed towards the Social Environmental needs of the community. Currently, the existing Wind farm neighbouring the proposed facility provide support to Early Childhood Development for children in need, and provides support to Primary and High School leadership and educators, as well as parents and children. Wind Energy developments have set a benchmark for effective Socio-economic Development activities in the surrounding areas.
2.11. What measures were taken to pursue equitable access to environmental resources, benefits and services to meet basic human needs and ensure human wellbeing, and what special measures were taken to ensure access thereto by categories of persons disadvantaged by unfair discrimination?	The REI4P ensures that the job creation of renewable energy facilities consist of RSA based citizens, black SA citizens, local community members. The programmes sets threshold values and preference is given towards bidders with higher Economic Development scores in the tendering process.
2.12. What measures were taken to ensure that the responsibility for the environmental health and safety consequences of the development has been addressed throughout the development's life cycle?	The first way the environment is protected is through the implementation of the environmental management plan, which discusses way to measure and manage impacts of the development during the operation period. Furthermore, the Department of Energy, through the signed Implementation Agreement as part of the REI4P, ensure commitment of all the Socio Economic Development commitments and enterprise developments and job creation by the operations contractor and shareholders.
2.13. What measures were taken to:	-
2.13.1. ensure the participation of all interested and affected parties,	A regulated Public Participation Campaign was completed by Savannah Environmental to ensure participation of all interested and affected persons.



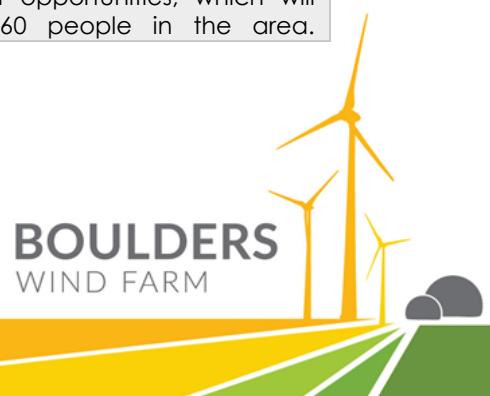
2.13.2. provide all people with an opportunity to develop the understanding, skills and capacity necessary for achieving equitable and effective participation,	
2.13.3. ensure participation by vulnerable and disadvantaged persons,	
2.13.4. promote community wellbeing and empowerment through environmental education, the raising of environmental awareness, the sharing of knowledge and experience and other appropriate means,	
2.13.5. ensure openness and transparency, and access to information in terms of the process,	
2.13.6. ensure that the interests, needs and values of all interested and affected parties were taken into account, and that adequate recognition were given to all forms of knowledge, including traditional and ordinary knowledge, and	
2.13.7. ensure that the vital role of women and youth in environmental management and development were recognised and their full participation therein were be promoted?	
2.14. Considering the interests, needs and values of all the interested and affected parties, describe how the development will allow for opportunities for all the segments of the community (e.g.. a mixture of low-, middle-, and high-income housing opportunities) that is consistent with the priority needs of the local area (or that is proportional to the needs of an area)?	In line with the Department of Energy's REI4P, the programme encourages commitments for job creation of RSA based citizens, Black persons and local community members through a competitive bidding process. In the same programme, Socio Economic Development and Enterprise development is ensured by dedicated project revenues. These revenues are used to uplift the needs identified in the local community.
2.15. What measures have been taken to ensure that current and/or future workers will be informed of work that potentially might be harmful to human health or the environment or of dangers associated with the work, and what measures have been taken to ensure that the right of workers to refuse such work will be respected and protected?	In the EMPr, the Environmental Control Office will be appointed to monitor compliance.
2.16. Describe how the development will impact on job creation in terms of, amongst other aspects:	-



2.16.1. the number of temporary versus permanent jobs that will be created,	It is anticipated that the development will have the following impact on the local economy, c.a. R2.0 billion investment (estimated CAPEX + OPEX) over the construction period of the project with an estimated 5250 person-months during the installation activities and 4500 person-months for balance of plant activities.
2.16.2. whether the labour available in the area will be able to take up the job opportunities (i.e. do the required skills match the skills available in the area),	Local communities and their needs will be identified by way of a comprehensive "needs-assessment" prior to REI4P bid submission. This will help to shape the economic development commitments in order to maximise impact. The REI4P stipulates a threshold of 12% for "local" labour for onshore wind and a target of 20% (for the most recent bid). The applicant aims to target this 20% (or any future adjusted targets set out by the DoE)
2.16.3. the distance from where labourers will have to travel,	Communities within 50 km radius of the development will be prioritised in accordance with REI4P requirements to maximise economic development.
2.16.4. the location of jobs opportunities versus the location of impacts (i.e. equitable distribution of costs and benefits), and	The Social Impact Assessment elaborates on this topic but the location of the jobs will be site specific and the environmental impact of the facility will be site specific.
2.16.5. the opportunity costs in terms of job creation (e.g. a mine might create 100 jobs, but impact on 1000 agricultural jobs, etc.).	The Social Impact Assessment makes mention to the jobs that are created compared to the no-go alternative.
2.17. What measures were taken to ensure:	-
2.17.1. that there were intergovernmental coordination and harmonisation of policies, legislation and actions relating to the environment, and	The different government departments have been listed as I&APs and were given the opportunity to comment during the 30 day public participation periods. Legislation, policies and guidelines, which could apply to impacts of the proposed development on the environment, have been considered in each specialist report.
2.17.2. that actual or potential conflicts of interest between organs of state were resolved through conflict resolution procedures?	No conflict of interest has been raised during the Public Participation which has been undertaken to date.
2.18. What measures were taken to ensure that the environment will be held in public trust for the people, that the beneficial use of environmental resources will serve the public interest, and that the environment will be protected as the people's common heritage?	The development will adhere to the principle of environmental management and that of Duty of Care. The Public Participation has been run to ensure public interest has been considered.
2.19. Are the mitigation measures proposed realistic and what long-term environmental legacy and managed burden will be left?	The mitigation measures will be proposed in the EMPr which will be informed by the specialist studies undergone as part of the EIA process. The advantage of a Wind Energy facility is that it can be dismantled and decommissioned ensuring that the environment be restored.
2.20. What measures were taken to ensure that the costs of remedying pollution, environmental degradation and consequent adverse health effects and of preventing, controlling or minimising further pollution,	The EMPr of the facility will be a contractual agreement whereby the mitigations and recommendations adhered to during the proposed activities.



environmental damage or adverse health effects will be paid for by those responsible for harming the environment?	
2.21. Considering the need to secure ecological integrity and a healthy bio-physical environment, describe how the alternatives identified (in terms of all the different elements of the development and all the different impacts being proposed), resulted in the selection of the best practicable environmental option in terms of socio-economic considerations?	Due to the low agricultural potential of the site, as presented in the Agriculture Impact Assessment, the site can be better utilised for other land uses. Renewable Energy is a suitable land use option for this site, and will be more robust in economic viability and will remain unaffected by climate change variables. The needs as identified in the Social Impact Assessment show that the community could do with additional jobs in the area, as well as social-economic contributions which could be implemented according to the Department of Energy's REI4P programme.
2.22. Describe the positive and negative cumulative socio-economic impacts bearing in mind the size, scale, scope and nature of the project in relation to its location and other planned developments in the area?	<p>In general terms, the REI4P has been recognised by the Department as being inherently excellent for achieving positive socio-economic outcomes. The REI4P is the only route to market for wind farms of this scale in South Africa today. Some of these outputs are: job creation (a heavy emphasis has been placed on this element as South Africa is facing an unemployment crisis); local content through, inter alia, increased local manufacturing; fostering rural development and involving communities (community trust funds); education and development of skills, enterprise development and socio-economic development and participation by historically disadvantaged citizens and marginalized regions.</p> <p>Additionally to the social impact assessment a socio-Economic Impact Assessment was completed to understand the impact of the development on Tourism, Property Prices and Economic Issues. With regards to Tourism, the report concludes that "Considering that the location of the proposed Boulders Wind Farm is inland and is not expected to obstruct the beach view for tourists visiting the coastal towns (i.e. Paternoster and St Helena Bay), the above-mentioned concern is likely to be unrealised and no potential negative impact on leisure tourists is expected. Moreover, considering the noted effects of the West Coast One Wind Farm, the proposed development of the Boulders Wind Farm is more likely to have a positive impact on tourism in the area than a negative effect."</p> <p>As for Property Prices, the report states "Having said that, some property owners may often have unsubstantiated perceptions concerning the negative impact of renewable energy projects on property prices in general, which is why it is a common concern raised by the I&APs. However, as indicated above, such perceptions cannot be corroborated with any empirical evidence, therefore, it is important to dispel these as early as possible through awareness campaigns and regular engagements with the local property owners prior to the construction phase." Finally, the report concludes that "The proposed project will create permanent employment opportunities, which will improve the lives of up to 60 people in the area.</p>



In conclusion it can be stated that no red flags could be identified from an economic impact perspective associated with the proposed development activities and operation of the Boulders Wind Farm. Therefore, the project is recommended for approval from an economic standpoint."



ASSESSMENT OF ALTERNATIVES

The Regulations, as amended (GN R326), define "alternatives", in relation to a proposed activity, "as different means of meeting the general purpose and requirements of the activity, which may include alternatives to the:

- a) property on which or location where the activity is proposed to be undertaken;
- b) type of activity to be undertaken;
- c) design or layout of the activity;
- d) technology to be used in the activity; or
- e) operational aspects of the activity; "

Sections 24(4) (b) (i) and 24(4A) of the NEMA requires that an EIA must include investigation and assessment of impacts associated with alternatives to the proposed project. In addition, Section 24 (O) (1)(b)(iv) also requires that the Competent Authority (CA), when considering an application for EA, takes into account "where appropriate, any feasible and reasonable alternatives to the activity which is the subject of the application and any feasible and reasonable modifications or changes to the activity that may minimise harm to the environment".

Therefore, the assessment of alternatives should consider the scenario of a no-go alternative, a comparison of the reasonable and feasible alternatives, as well as provide a methodology for the elimination of an alternative.

This section discusses the no-go alternative, land-use alternatives, technology alternatives and Site Alternative considered by the Applicant when choosing the location of the Boulders Wind Farm.

Consideration of no-go alternatives

The no-go alternative is one where it is assumed that the project will not go ahead. This alternative would ensure than no ecological risks are created on or near the development site, and that no environmental impacts would take place. However, the no-go alternative would also mean that the following would not be realized:

- Land-use – The farming activities will remain under financial pressure and the opportunity to generate capital for possible farming developments and enhancements by leasing a portion of land for the proposed wind energy development facility will not be realized.
- Renewable energy in sustainable ecological areas – considering that no ecological fatal flaws are present, it is considered the wind farm presents an ecologically sustainable project
- Not assist government with reaching Renewable Energy targets
- Local economy will be less diversified
- Local communities will continue dependence on small scale periodic tourism, small scale fishing and low production agriculture



- No opportunities for additional employment in Civil and Ground Engineering, Electrical Engineering and Wind Turbine Installation, Operation & Maintenance.
- Lost opportunity for skills transfer and development.
- No significant Social Economic Development or Enterprise Development contributions will be realized in line with REI4P
- Upgrading of CBA water course crossings will not take place.

While a no-go alternative will result in no negative environmental impact, it will also not result in any positive community development or socio-economic benefits. It will additionally not assist government in responding to climate change, reaching targets for renewable energy as set out in the Integrated Resource Plan, or assisting in supplying the long-term ever-increasing electricity demand. Hence, it is considered that the no-go alternative is not a reasonable alternative in the EIA process.

Land-use alternatives

All three land owners over which the wind farm is proposed, use their land for agriculture including small-grain and livestock farming. The Soil and Agriculture Impact Assessment has confirmed that it is very/extremely sandy in the topsoil and upper subsoil. The inherent nutrient status and potential to retain nutrients will therefore be low. As such, the associated specialist concluded that the soils of the planned installation area have a medium-low to low suitability for crop production. In this impact assessment, it is also concluded that the proposed development should have a significant positive effect on the economic sustainability of the relevant farms as farming businesses, which in turn will provide the opportunity for the landowner to enhance the farming activities being undertaken. Furthermore, the contribution of the project to the national energy network should obviously decrease the pressure on energy development from non-renewable sources and therefore contribute to a cleaner environment. Hence, it can be concluded that the agricultural land use is not the preferred alternative, or a reasonable and feasible alternative to be considered for the site.

Technology alternatives

When considering the best alternative for the site based on renewable energy technologies, possible alternatives could consist of Biomass, Hydro Energy and Solar Energy.

Biomass Energy

Together with Eskom and the Department of Minerals and Energy, the CSIR completed a study² which determined the Biomass potential across South Africa. It

² DME, Eskom & CSIR (Department of Minerals and Energy, Eskom & Council for Scientific and Industrial Research) 2001. South African renewable energy resource database. Pretoria



can be seen in the Figure below, that the development is considered to have a very low potential for the implementation of a Biomass Facility.

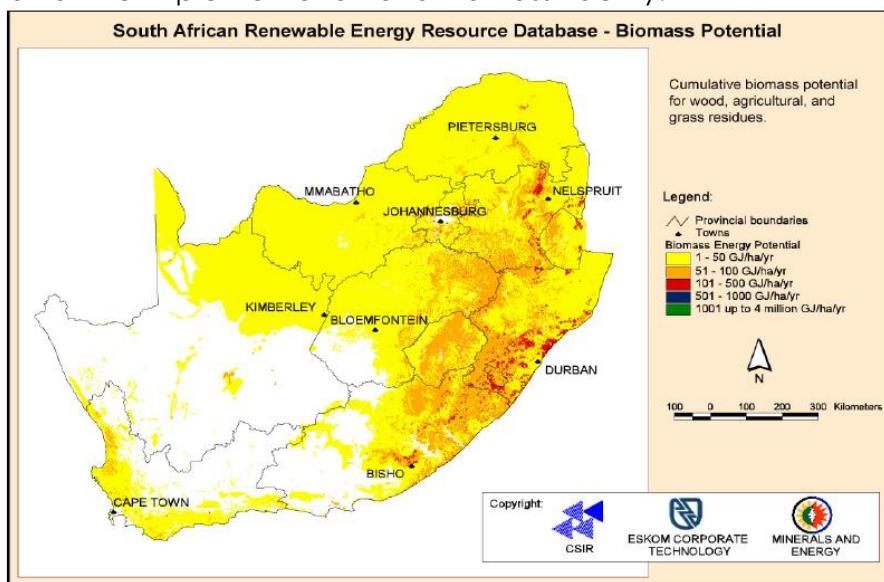


Figure 2: Biomass Potential (DME, Eskom, CSIR)

Hydro Energy

Due to the significant droughts in the area over the last two years, and the lack of any large water bodies in the area, the site is not suitable for hydro energy. It can be seen in Table 2 that the micro hydro power potential is also not suitable, according to the CSIR study completed in 2001, mentioned above.



Micro hydro power potential is modelled for local (i.e. 1 km²) flow along a river

Micro power potential

- Not suitable
- Poor
- Acceptable
- Good
- Excellent

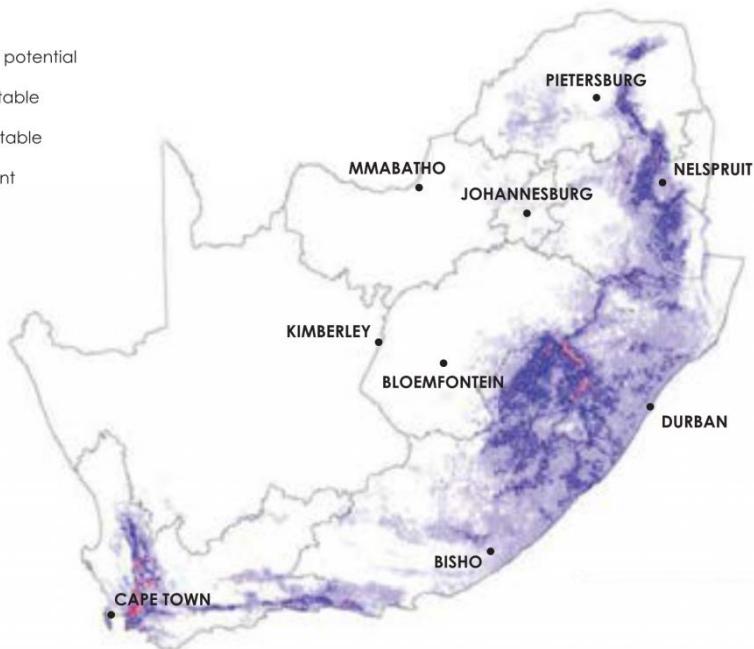


Figure 3: Micro Hydro Potential (DME, CSIR)

Solar Energy

The Northern Cape, specifically the North West part of the country has the highest Global Horizontal Irradiation (GHI) relevant to Photovoltaic installations. Compared to the regions of the Northern Cape, where solar irradiation is measured at 2300 kWh/m², the site only has a solar irradiation of 2000 kWh/m² which is considered less favorable for solar energy generation. Therefore, a more economically feasible solar energy facility would have to be considered further north towards the boundary of Namibia, or in the vicinity of Upington.



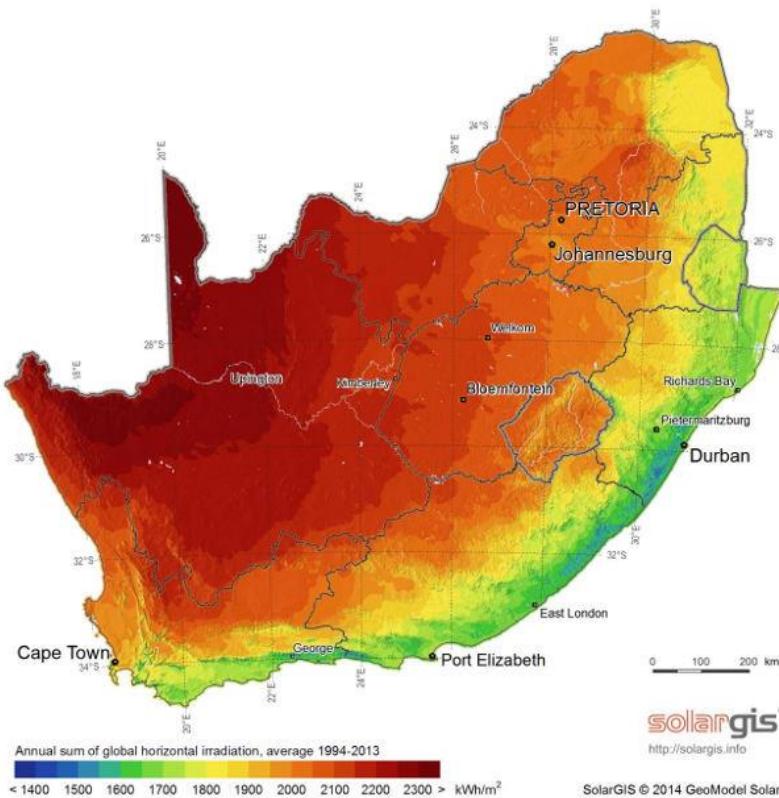


Figure 4: Solar Resource Availability in SA (SolarGIS map 2013 GeoModel Solar))

Wind Energy

The Wind Energy potential, or wind resource available, is predominantly defined in terms of the average annual wind speed. In addition to wind speed, additional wind considerations include direction of the wind, turbulence of the wind available, frequency and strength of extreme winds and also the wind shear which gives an idea of the wind speed difference experienced at different heights. All these wind characteristics are used to determine the suitability of a wind site.

The Wind Atlas of South Africa (WASA), which was created using measurements from Measurement Masts/Towers located across South Africa, indicates that the South West part of the country has high wind speeds and a strong wind resource. In fact, the closest WASA wind measurement mast (WASA4) is located roughly 8km east of the site boundaries. This mast confirmed that this area has wind speeds which are very high, which can be seen in the Figure below.

To confirm these wind speeds, more than 1 year of on-site measurement of wind data has been completed to confirm this very high wind speed. Two met masts were installed to confirm the wind resources.

Therefore, from the evidence of resources available at this development site, Wind Energy is considered to be the preferred alternative at the site, as it would be able



to generate sufficient energy to support an economically viable wind energy project.

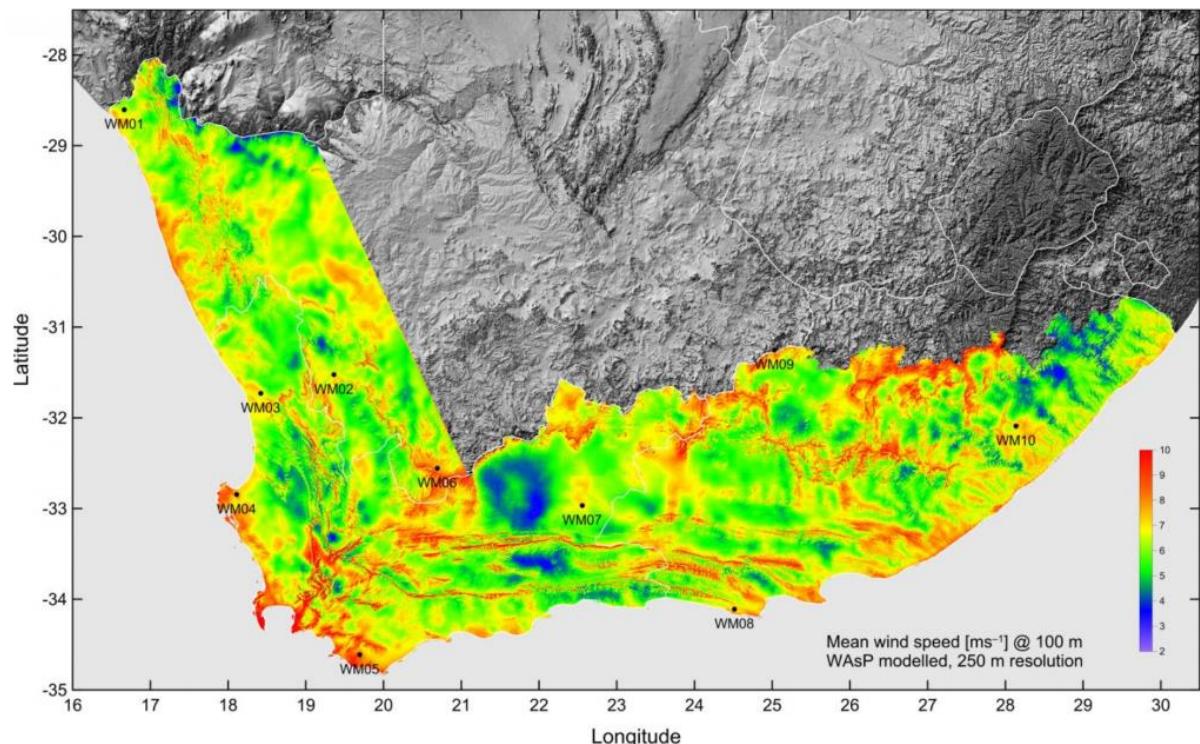


Figure 5: Representation of Mean Wind Speed (ms^{-1} at 100 m) (Source: WASA, 2014).

Site Alternatives

According to NEMA Regulations 2014, in Appendix 2 (2) (h) (xi), it states that when deciding on a site, the outcomes of a selection matrix should be described to show how the preferred site (Boulders Wind Farm) was selected through a site selection process.

When considering a site, the factors that are important to consider suitability are land availability, environmental sensitivities, distance to the national grid, site accessibility, Civil Aviation Authority acceptance, topography, current land use and land owner willingness. At a very first stage, the previous developer identified three potential sites for consideration. Considering these sites, a preferred alternative approach was taken.



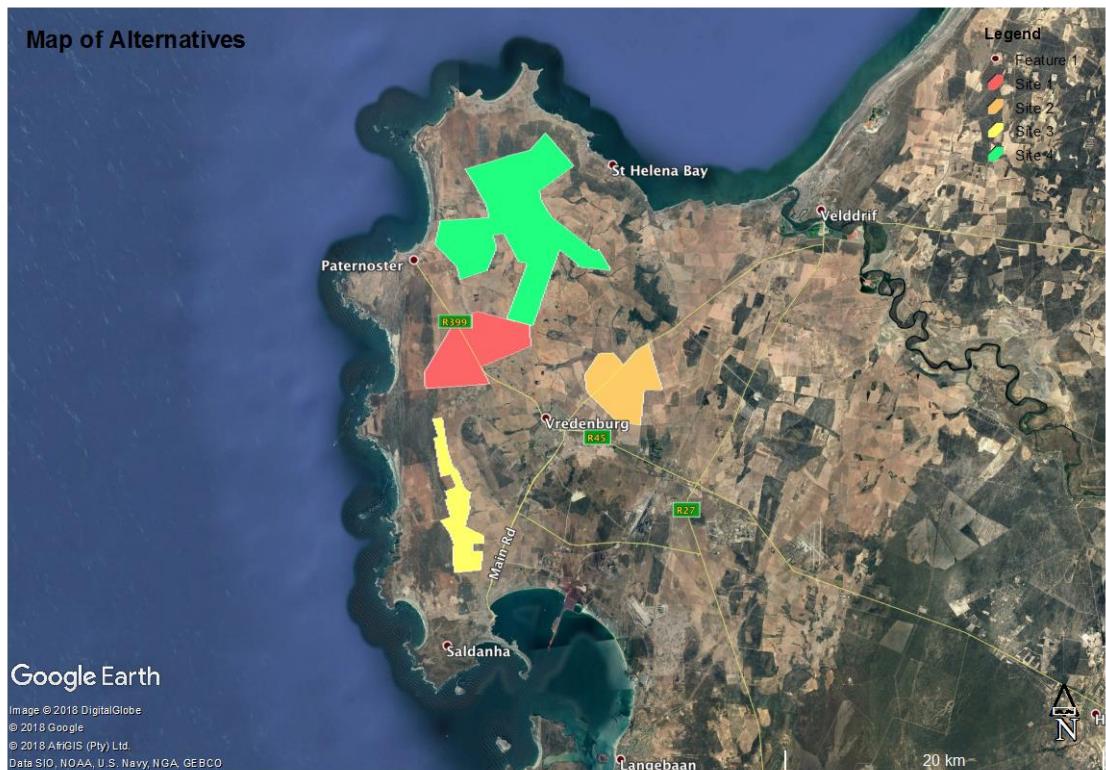


Figure 6: Assessment of alternatives

Table 3: Screening analysis of the Site Alternatives

FACTOR	SITE 1	SITE 2	SITE 3	SITE 4
Land Availability	✓	✓	✗	✓
No unacceptable environmental sensitivities on site	✗	✓	✗	✓
Suitable Wind speed levels	✓	✓	✓	✓
Acceptable maximum distance to and availability of the Grid	✓	✓	✓	✓
CAA Acceptable	✓	✗	✓	✓
Topography	✓	✓	✓	✓
Current Land Use	✓	✓	✓	✓
Landowner Willingness	✓	✓	✓	✓



Taking the above into account, the outcomes of the fatal flaw analysis can be summarized as:

- **Site 1:** This site is deemed unacceptable due to its location along the R399, which due to its large traffic volume and link between Paternoster and Vredenburg, is being considered as a scenic route.
- **Site 2:** Due to the 18.5km setback created by the Langebaan Airforce base, this site is unacceptable. In addition, this site falls in close proximity to the Lower Berg River Wetlands Important Bird Area.
- **Site 3:** Due to the 1km proximity to the close town of Hoogland, and the 3km proximity to the SAS Saldanha Nature Reserve, this site is considered unacceptable due to the environment.
- **Site 4:** Due to this site being furthest away from the Important Bird Areas, outside the Airforce 18.5km buffer, and furthest from the Vredenburg Town, it is considered as the preferred alternative.

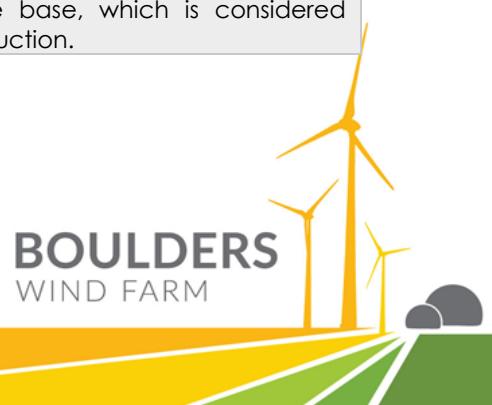
Site Specific Considerations

The Boulders Wind Farm, considered as Site 4 in the previous section, consists of the following properties:

- Boebezaks Kraal 2/40
- Boebezaks Kraal 3/40
- Boebezaks Kraal 5/40
- Frans Vlei 2/46
- Schuitjes Klip 3/22
- Schuitjes Klip 1/22
- Davids Fontyn 9/18
- Davids Fontyn 7/18
- Het Schuytje 1/21
- Uitkomst RE/6/23

These portions were considered the most feasible for the site. A detailed outline of the site is discussed in the table below.

FACTOR	SUITABILITY OF THE PREFERRED SITE
Land Availability	The total extent of the site is 5084ha, which is considered to be enough space to accommodate a facility of 140MW. The preliminary layout will cover roughly 0.8% of this land.
No unacceptable environmental sensitivities on site	No fatal flaws have been identified for the site.
Suitable Wind speed levels	As per Figure 5 above, the wind conditions are one of the highest in the country.
Acceptable maximum distance to and availability of the Grid	The site has grid connection available on the neighboring property, with grid connection less than 10km. This has been confirmed by the Eskom Grid Access Unit in a Cost Estimate Letter received.
CAA Acceptable	The site falls outside of the 18.5km buffer from the Langebaan Air Force base, which is considered acceptable for construction.



Topography	The topography consists of slopes less than 15% gradient, which is considered suitable for wind farm construction.
Current Land Use	The current land use is agriculture, where it is considered as low agricultural potential land.
Landowner Willingness	The three landowners have signed agreements to allow the wind farm over their property portions.

Site Suitability discussion

The fundamental factors determining the consideration for wind farm development at any site is a suitable wind resource and grid connection capacity availability. The wind resource is the ability of the wind in the area to produce a high amount of energy annually. The grid connection availability is considered to be the ability of a substation or line to accommodate a certain amount of additional generated power. Without these two fundamental factors, there would be no reason for development at any particular site.

During the initial site selection of this project, dating back to 2010, the developers considered the Wind Resource in the area to be very high. At the time, the Wind Atlas of South Africa was in its infancy and did not accurately map the wind resources available due to a high degree of uncertainty and a low resolution. This meant that wind resource could be significantly higher or lower in reality compared to the wind atlas. Nevertheless, even with this high degree of uncertainty, the Saldanha Bay area was considered as one of the windiest areas in the country for wind energy development.

With this in mind, the developer then considered the grid connection in the surrounding area. No wind energy development had occurred in the area, and the only Eskom Grid connection that existed was the Aurora Substation, which is an Eskom Transmission substation (Figure 7). No Eskom Distribution connections existed at the time. However, it was confirmed during this site selection period that there existed available generation capacity at the Eskom Transmission substation, which would require Distribution upgrades and extensions.



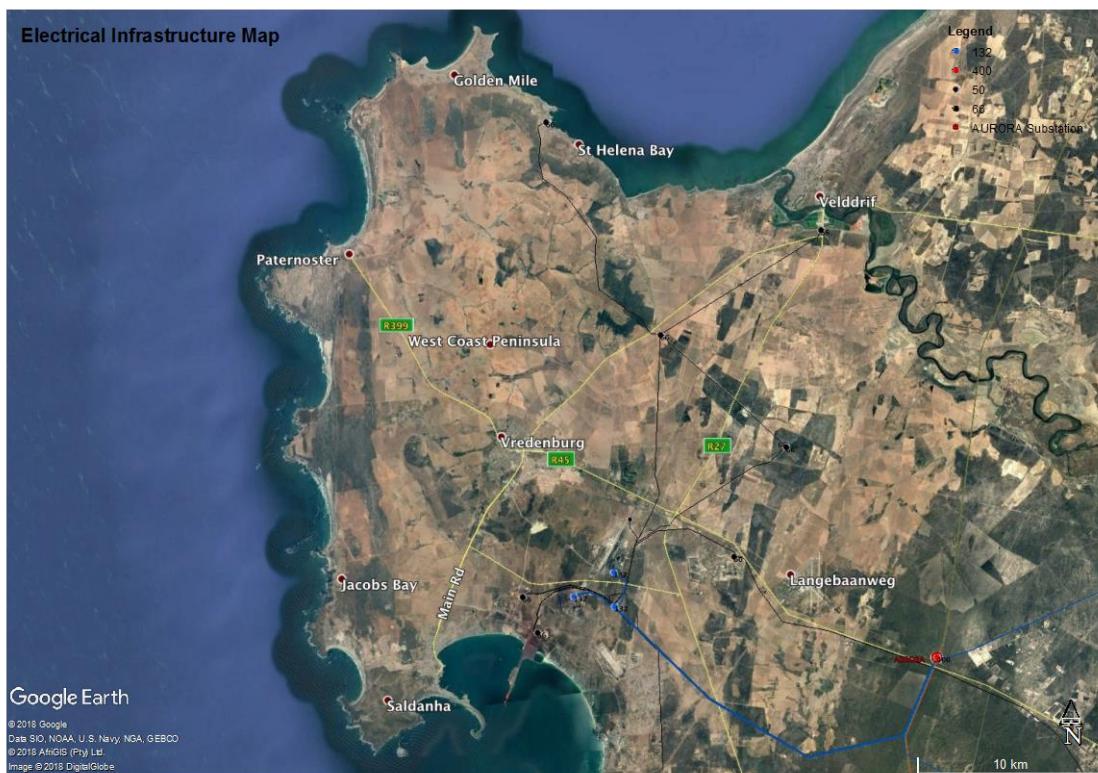


Figure 7: Electrical Infrastructure Map

With the Grid Connection and Wind resource available, this attracted many developers to the greater Saldanha Bay area, all with the hope of Wind Farm development in the area. The developer then had to go through a thorough site selection process to choose the right land for the prospective wind farm. The site selection of this development which now dates back to 2011, underwent a screening assessment with various specialists to understand the environmental sensitivities of the whole area. Upon consideration of many potential land areas, and considering that developers were competitively securing land, the least environmentally sensitive farms were chosen and secured.

After many developers began securing land in the area, where some had already started environmental permitting processes, it was found that the Langebaan Air Force Base Radar and radar operators could not accommodate wind turbine radar interference within a 18.5km distance from the radar (Figure 8). This was catastrophic to developers in the area, which meant that nearly 280km² of developable land was excluded from development in this high wind resource area. The location of the nearby Aurora substation, and most other Eskom infrastructure lay within this exclusion area, which meant that wind energy development would have to be done some distance away from their respective connections. This, in turn, meant that connections would ultimately be costly, increasing the capital of the project and resulting in uncompetitive high electricity prices. Additionally and aside from the cost factor, short grid connection distances minimise the need for additional



electrical lines thus resulting in a largely reduced impact on the environment and stakeholders.



Figure 8: Langebaan Airforce Base Buffer

Managing to permit a facility outside of environmental and technical exclusion areas, in the second round of the Renewable Energy Independent Power Producer Programme the first project in the Saldanha Bay area was successful, called West Coast 1 Wind Farm. This project took advantage of the strong wind resource and was situated outside of the radar exclusion zone. However, in order to connect the project to the national grid, a long powerline had to be constructed to connect the facility to the Aurora substation. Eskom, predicting a large industrial electrical load in the future and further potential generation in the area, decided to build a double circuit power line to the facility which would accommodate the additional load and generation. Eskom made an agreement at the time, that the wind farm would cover the costs associated with their capacity usage of the power line (Fransvlei-Aurora 132kV) which was roughly 25% and Eskom would then cover the rest. The remaining 75% capacity available on the line has however never been utilised to date due to the radar exclusion zone preventing further wind development and in addition, there has been slow industrial development in the area. As a result, 75% of the costs of this power line can be considered a stranded asset on Eskom's behalf because they have invested the capital and not received the returns for this investment.

The Boulders Wind Farm is located in the ideal location because of the strong wind energy potential available in the area. This has been confirmed during an onsite



wind measurement programme which began in 2015. Due to the Boulders Wind Farm position outside of the Radar Exclusion Area, the Wind Farm also has the potential to assist in covering the costs of the Transvlei- Aurora line built by Eskom for the West Coast 1 Wind Farm and industrial loads which were never realised. Due to the Boulders Wind Farm being located adjacent to the West Coast 1 facility, the connection costs required to connect to the existing Transvlei-Aurora 132kV line, are estimated to be quite low. With high wind resource and a resulting greater energy production, and low grid connection costs, this means that the costs of electricity for the facility would be cost competitive in a Renewable Energy auction programme in the future, resulting in lower costs of energy for South Africans.

Traditionally, strong winds occur in areas of complex terrain and rugged landscapes. These typically rural mountainous landscapes can make wind farm component transport and wind farm construction very complex and expensive. This is because the road infrastructure used to transport components to the site has not been developed to accommodate industry transports and loads. In addition, the complexity of these types of sites, results in challenging civil and electrical designs and works. The Boulder Wind Farm, having comparable wind conditions as these types of sites, is situated in the great Saldanha Bay area and has the luxury of a well-developed road network which can accommodate industrial activities and transport. In addition, the Boulders Wind Farm consists of rolling hills and quite simple terrain. Both of these benefits ensure a lower impact on the environmental compared to other sites and reduce the resulting electricity price required to make the facility feasible.

The nearby Saldanha Bay deep sea harbour is in close vicinity to the site. This harbour has been used in the past to import wind turbine components and as such, can be considered for the import of components for the Boulders Wind Farm. With the harbour in close vicinity, this results in very short transport routes and an overall lower impact on roads, traffic and environment.

The conclusion of what has been described above is that Boulders Wind Farm is located at the ideal and preferred site. Marrying all the above-mentioned aspects in the best form possible, as it is the case at this location will be reflected in the price offered in the competitive tender program, the REI4P. In other words, the best project will be able to provide the lowest cost of electricity, being best for South Africa's economy and society as a whole.

[Alternative locations of the development footprint](#)

While the previous developer had considered various project alternatives, the first wind project alternative for this site that had been considered under the management of the current shareholders of the Vredenburg Windfarm is the wind farm layout presented in Figure 9. This project layout alternative had been established making use of all the available space for the proposed project site with the intent of maximising the energy produced at the site.





Figure 9: Project Alternative 1 - Layout making use of available project area

When starting the EIA process, it was then the clear intention of the developer to firstly understand all the detailed environmental sensitivities of the site, before refining the project layout and designing alternatives under the mitigation hierarchy. For this reason, the initial layout, i.e. the first alternative for the project had not been shared with the public under this specific process. This was done to ensure that the public would not be confronted with a status of planning that would potentially be revised based on further ecological assessments. So it is and has always been the clear approach taken by the developer to aim for the best result under the aspect of sustainability minimizing the environmental impact to the lowest degree possible. Whilst at the same time, ensuring the biggest socio-economic benefit to the public in the short and long-term by offering a project capable of making the best use of the strong wind resource on site to optimize production whilst also being ecologically sustainable in terms of the receiving environment.

As a result of the Scoping phase of the EIA for the Boulders Wind farm, the following map as presented in Figure 10 was suggested by the EAP.



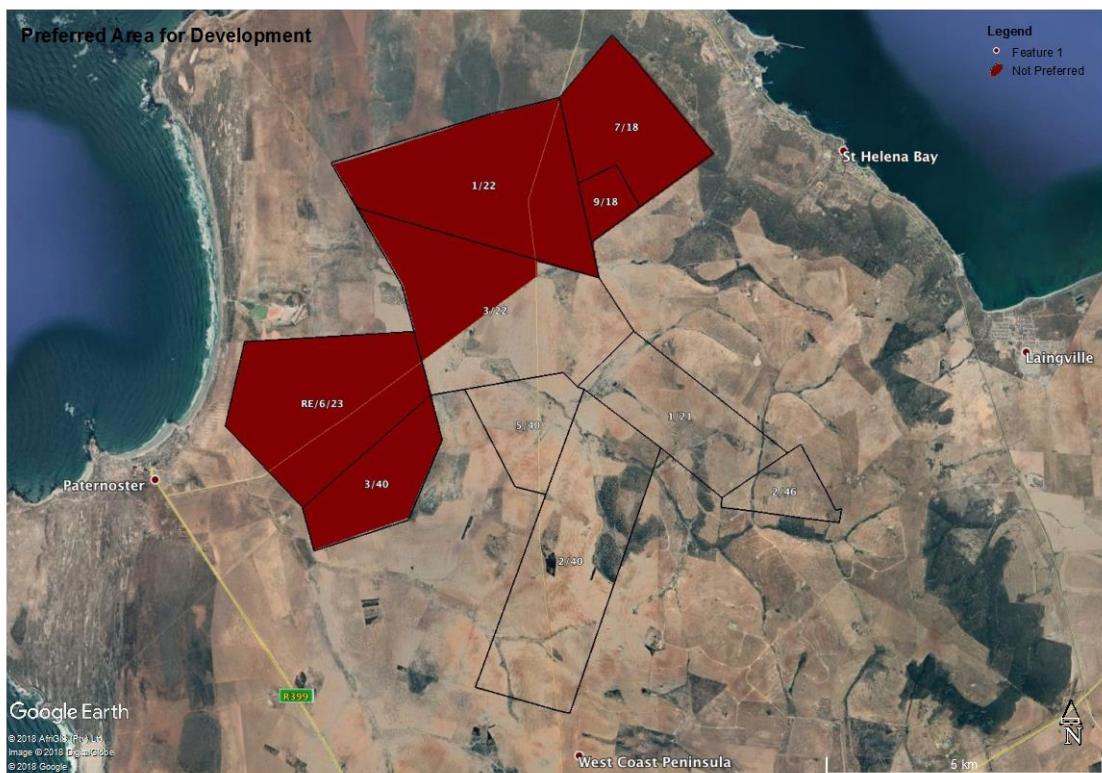
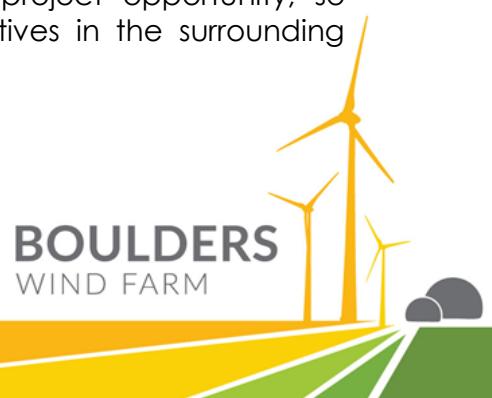


Figure 10: Preferred area for development after Scoping Studies

After conducting thorough analysis of all the features of the project area, the specialist had identified all the specific sensitivities, which are not shown in detail on this map. It must be clearly highlighted in the context of the identification of the preferred development area shown in Figure 10, that the main and almost only reason for the identification of this preferred development area have been concerns expressed by some individuals on the perceived visual impact and associated issues that the project may have on the landscape. It could be discussed at great length here of whether sacrificing all that available project land mainly for subjective visual considerations is socially and economically justifiable since this might have led to a higher energy production of clean renewable energy, which is in the interest of the public needs in South Africa. Also, as stated it was not necessarily for ecological reasons that this large area was not further considered as preferred development area but because of individual concerns. This has to be stated because if a project can be ecologically sustained and socially and economically justified and fits into the strategic context and is in the public interest (all of which has been elaborated above), then individual concerns might not necessarily rank above that.

It should be stated here that the indigenous population expressed a certain concern that this opportunity might suffer due to such individual concerns expressed by more recent newcomers. What is meant by this, is that this project opportunity, so desperately needed for the creation of new job alternatives in the surrounding



communities, might suffer because of the visual perception and a certain dislike by a minority of individuals. This is then further elaborated in the following chapter.

Nonetheless to harmonize all concerns, the further development was then concentrated within this preferred development area. And so, the developer has engaged in very detailed layout planning revisions to accommodate all these concerns to achieve the best compromise possible. The result of this thorough planning revision is the layout that can be seen in Figure 11 below.

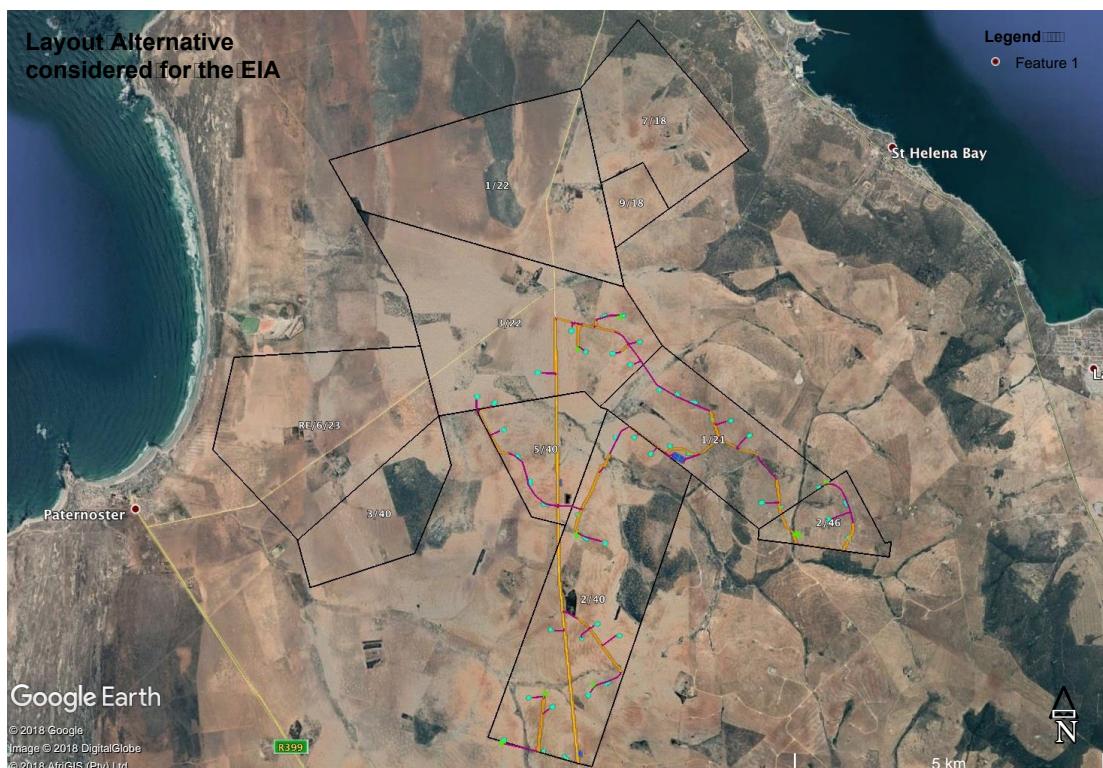


Figure 11: Layout Alternative

The developer now proposes this alternative as the preferred alternative for the project. This preferred alternative has now taken into account all environmental sensitivities avoiding any conflicts with sensitive areas by creating large buffers around all such sensitivities indicated by the specialist. Additionally, and as discussed above, it aims to accommodate all the concerns on visual impact, cultural landscape and sense of place perceptions expressed by certain individuals as much as the project allows for remaining intact.



DISCUSSION ON POTENTIAL CONFLICTS OF INTEREST.

Like any other type of development activity, wind energy projects face certain conflicts of interest originating mostly from residents in the surrounding areas of where these projects are planned and deployed. In mature markets there are even anti-wind groups that will try to halt any wind development activity, but this seems not to yet be the case in South Africa. Here it is rather what is often called as the Nimby (Not in my backyard) syndrome: Stakeholders will say that they are generally in favour of wind, but they try to find reasons of why such development should not happen where they live.

One potential conflict of interest to wind energy projects that is often raised is the conflict with the tourism sector. In terms of the Boulders Wind Farm project this was raised during the Scoping PPP where I&APs stated these concerns. The perception is often that the visual impact that the wind farm may have, also on what is often referred to as the sense of place or in this case the cultural landscape (which has not exactly been defined) within the heritage context, would lead to the loss of tourism potential. Of course, it is clear and this is also stated by the visual specialist, that ultimately the visual impact is a subjective concept. If the observer considers the positive aspects of wind energy with regards to climate change and technological advancement, their acceptability would be different to that of an observer who displeased by the intrusive aesthetics. It is in the eye of the individual beholder. Another aspect is the perception that property values might be affected due to similar reasons, mainly the visual impact. These are concerns that we, the developer of the Boulders Wind farm have taken very seriously. Whilst we are convinced that the overall socio-economic benefit under the South African REI4P will generally always be positive in terms of the local and national socio-economic benefits that are quantifiable by hard facts and in the public interest for South Africa as a whole, specific additional studies have been conducted explicitly to assess these specific impacts. Whilst the property evaluation study concludes that no negative impact is to be expected from the Boulders Wind Farm project, the property price study indicates that if a low negative impact would need to be considered, it would be improbable for this impact to actually occur. Furthermore this impact would be reversible and does not lead to an irreplaceable loss of resource. Also, this would concern a tiny group of the local population and not the broader public within the surrounding communities. On the potential conflict of interest with tourism, the specialist even concludes in the specific assessment that the construction of the wind farm will have a low positive effect on the tourism businesses and even medium positive if adequately enhanced. So, while I&APs might continuously express their perceived concerns on these issues, no negative short or long-term impacts affecting the local community and being unfavourable for the public interest are to be expected. All the socio-economic benefits, job creation, socio-economic development contributions, black ownership & participation, green industrialisation, local content amongst many other benefits (that can be presented as hard facts and numbers) attributed to the Boulders Wind Farm project stand in glaring contrast to these perceptions.



It must also be explained that the perceptions and concerns discussed above were mainly raised by wealthier members of the local society, many of whom only recently having moved to the area, living permanently or who are only part time residents of Paternoster or the area that is called Britannica Heights.

When looking at the social environment and context of where the project fits in, the depletion of fishing grounds and what that does to large groups of the local society has to be mentioned. It has been discussed above how mainly the poorer members of society, i.e. often those from the indigenous populations, who become vulnerable to changes in their environment, which are regularly associated with global warming and climate change. The depletion of fishing is yet another example of the importance of certain environmental assets that an area has in terms of the socio-economic impact and stability. This aspect has such great relevance to this specific project, the Boulders Wind Farm, due to the projects specific location and where the socio-economic benefits would contribute in the event that the project was implemented because jobs are being lost in fishing industry with no alternatives available in the near surroundings. This is one reason why it is therefore so vitally important that projects such as the Boulders Wind farm are available to provide solutions to these fundamental issues.

So, the much larger groups of the local communities surrounding the project area are in desperate need of the socio-economic contributions, i.e. job opportunities that the wind farm would bring if implemented. They have not expressed concerns related to visual impact, sense of place, and cultural landscape issues. If anyone had a proper and true right to comment on natural and cultural heritage, it should be these members of society, being descendants of those that would have been "responsible" for giving the area its certain potential heritage interest. These are the people that have been living in this area for many generations.

The following comments received during the meeting with Ward 11 by participants, representing the broader general needs of the local community, give an indication of what is meant by the above and what is needed to be considered here:

"We are taking a very social view of this project, and any other project coming into the area. Our area is about 95% dependent on the fishing industry. Earlier this year 245 employees were retrenched from one of the fishing companies. The economics of the area is not looking good and the economics of the area has a direct impact on poverty and the increase in crime, which is considered as a ripple effect. Any kind of project where limited permanent employment opportunities are available for the local residents of the area is considered to be a future positive change. Any project would get our blessing with the employment opportunities it will bring to the area."

"I am concerned that the comments received from the Britannica Heights residents carry more weight than our comments. I also feel that our community needs to be



provided with the opportunity to also provide comment on the project and that the comments will carry the same weight as other comments."

"In the past five years new houses are being developed at a rapid pace in St Helena Bay due to the fact that Langebaan has reached its capacity. All the new residents coming to the area are now complaining about the fish stench coming from the fishing factories. However, the new comers coming into the area do not consider that the fish factories are part of the economic sector and that there are locals living from the fish factories and struggling within the area. The residents coming into the area from other parts of the world need to understand that we as the indigenous locals do not have any other properties within the country and that we are dependent on the fish factories which are now being considered as a nuisance for the new incoming residents."

"The new residents who have been establishing themselves within the area are so mobilising in order to prevent development from taking place because they want to keep the area as it is for themselves as a holiday destination or retirement homes. However, these residents do not consider the local sectors and poverty being experienced by the indigenous community who have been living in this area for most of their lives. This must also be considered as part of the process. Therefore, the comments from the indigenous community must also be considered as important as the comments from the Britannica Heights residents."

"The sense of place for me and the indigenous community includes the industries that are associated within the area including the fish factories, the noises of the activities currently being undertaken. People are buying into our community but not necessarily benefiting the community. The voices of the impoverished and less educated also needs to be heard and considered as part of development within the area. We are concerned that the people within the area with the loudest voices and who are organised will be heard and not the indigenous communities of the area."

The guideline for involving social assessment specialists in EIA process it states the following

"Given South Africa's needs, the improvement of social well-being (with particular focus on developmental objectives, such as poverty reduction and job creation) should be assessed as an issue in all SIAs. Within the South African and developing world context the SIA process should therefore include a commitment to:

- The principles of sustainable Development and social sustainability;
- Vulnerable groups
- Meeting basic needs and services
- Livelihood strategies
- Fairness and equity
- Social justice



- Openness and participation
- And accountability”

This is important because it puts emphasis on those issues that are to be considered as the real social issues in the South African context and that are so rightfully in line with the overarching principles to achieve a society based on; social justice, ethics, sustainability, solidarity on the global scale, protection of ecosystems acknowledging that human wellbeing is dependent on the health of the planet and also transition orientated, opportunity focused and effective participation of social partners by being aware of mutual responsibilities.

A good balance needs to be found in light of the comments and concerns from the larger indigenous community, being much more vulnerable to activities in local economic development, when considering the principles of justice, ethics, solidarity, sustainability and the commitments referred to for social assessments. In the end it must be ensured that the perceptions of single individuals be measured against the short-term and long-term community benefits and the public interest. The question that would have to be answered is what is socially and economically justifiable, the creation of jobs and supporting survival for the more vulnerable local indigenous members of society in an area where they have always lived in without any alternatives or to allow perceptions by certain individuals to make this opportunity a lost opportunity. If this was the case it could be considered to be very unfitting with all the principles that aim at safeguarding sustainable development in the public interest and the overarching principles and commitments that a modern South Africa stands for. It could also be considered quite dramatic because what this would indicate is that anyone at any time has the ultimate chance that his or her individual perceptions and concerns would be valued above the public interest as a whole.

To finalize, when considering the discussion above and after having clearly elaborated on the sustainability aspect of the Boulders Wind Farm, “why it is socially and economically justified?” and “why it is ecologically sustainable?” and “why it is in the public interest in the short-term and in the long-term?”, a final consideration on the Needs & Desirability seems appropriate. To be consistent with national priorities where environmental authorities must support increased economic growth and promote social inclusion, whilst ensuring that such growth is ecologically sustainable, EIA decision making should take place considering why it is so important that the right balance for such decision making is found for the Boulders Wind Farm:

“The consideration of “need and desirability” in EIA decision-making therefore requires the consideration of the strategic context of the development proposal along with the broader societal needs and the public interest. The government decision-makers, together with the environmental assessment practitioners and planners, are therefore accountable to the public and must serve their social, economic and ecological needs equitably. Ultimately development must not



exceed ecological limits in order to secure ecological integrity, while the proposed actions of individuals must be measured against the short-term and long-term public interest in order to promote justifiable social and economic development – i.e. ensuring the simultaneous achievement of the triple bottom-line.”

