**Robben Island Photovoltaic Facility Project**

**Alternative Site Selection January 2016.**

## Need and Desirability

The island has its own power supply system which provides the island with its electricity needs. This is achieved by five 275 kilowatt generators that are driven on diesel. Almost half of the power used is consumed by the desalination plant which is located within the village precinct to the south east of the island. The generation of electricity is critical to the development of Robben Island and therefore the Integrated Conservation Management Plan (2013-2018) for Robben Island has identified the need to reduce the islands efficiency. The desalination plant at Robben Island produces up to 500 000 litres of potable water per day.

## Alternative Sites Selection Process

On the 6th October 2015 the project team undertook a site visit of Robben Island to explore potential sites for the proposed development of a Photovoltaic (PV) facility on the island. Sites that were considered needed to be within reasonable distance of the main power plant and desalination plant on the island in order to supply alternative energy to reduce the consumption of diesel. There are proposals to convert the desalination plant on the island to only run on solar energy, therefore selecting a site within close proximity of the desalination plant is preferable. In addition to this any future proposed development for the island will be focused around the village precinct and therefore increased power supply on the island will be required.

In order to create a facility capable of generating approximately 300 to 500kW it has been determined that a surface area of approximately 1ha would be required. A suitable receptor site would need to have sufficient surface area with limited obstructions to provide 1ha of solar panels. Although roof top surfaces on the island were investigated, it was deemed unsuitable as much of the roof structures are made of asbestos and in a poor state of repair and would therefore require replacement prior to construction which would make the project economically unfeasible. The following receptor sites were therefore considered.

**Site Alternative 1: Landing Strip**

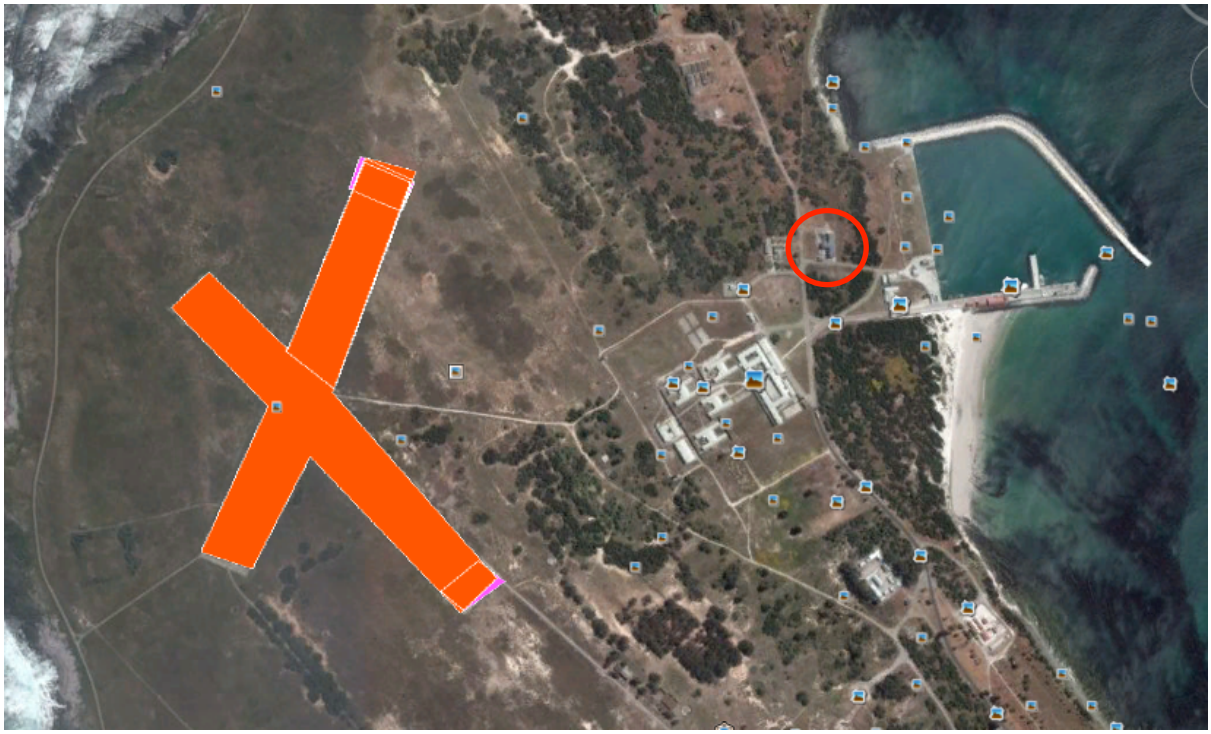

Figure 1: Approximate location of the proposed Landing Strip site and main power plant

A solar plant was tentatively proposed on the site of the old airstrip (currently unused) as this land has already been disturbed. The airstrip consists of two 700-metre long and 10-metre wide asphalt landing strips orientated in southeast and southwest directions. The airstrip was part of the infrastructure developed on Robben Island during the World War 2 period (circa. 1940 to 1942). The airstrip was used for supplies and for bombers and reconnaissance aircraft that had encountered problems. During the apartheid prison period the airstrip was used to bring prison officials to and from the island. There is a grave site located between the airstrip and the main power plant which would need to be circumnavigated. From discussions with Robben Island Museum (RIM) it was identified that there are proposals to possibly develop a hotel on the island in the future and this will likely require air travel access to the island by tourists and therefore it is anticipated that the currently disused airstrip will be required in the future. As such, the main reason for rejecting this site as a feasible site alternative is the potential future need for the landing strip. This site was therefore not considered further.

Photograph 1: Photograph showing a view of the landings strip from a helicopter landing pad

**Site Alternative 2: Helicopter Landing Strip**


Figure 2: Approximate location of the proposed Helicopter landing strip site and main power plant

A solar plant was proposed on one or two of the helicopter landing sites which are located at the end of the landing strips. This land has already been disturbed with concrete surfacing. However, as with the landing strip site, from discussions with Robben Island Museum it was identified that there are proposals to develop a hotel on the island, this will likely require air travel access to the island by tourists and therefore it is anticipated that more use will be made of the helicopter landing pads in the future. As such, the main reason for rejecting this site as a feasible site alternative is the potential future need for the helicopter landing pads. This site was therefore not considered further.

Photograph 2:Photograph of one of the landing pads

**Site Alternative 3: Shooting Range**


Figure 3: Approximate location of the potential Shooting Range site and main power plant

A solar plant was proposed at the site of the old shooting range which is located just outside the village precinct. The site is a significant distance away from the main power plant but is in very close proximity to the desalination plant located within the village precinct. The site was not deemed suitable due to the physical obstructions in the form of the shooting range walls and the site being signifcantly too small with the walls in place.. These walls would need to be removed to allow for the solar plant as there is not enough surface area within the range to accommodate the size of facility required. Furthermore these walls would cast shadows onto the panels which is undesirable. The shooting range is also likely to hold cultural heritage value. As part of Robben Islands rich and varied history the shooting range was identified as the possible site of burials (Le Grange, Baumann and Hart 2000). In addition, the shooting range is currently utilised by the Cape Gull as a breeding ground, any development in this location would require suitable assessment and mitigation of this aspect. This site was therefore not considered further as the site size constraints make it not feasible.

Photograph 3: Photograph of the Shooting Range, showing walls

**Site Alternative 4: The Cricket Pitch**


Figure 4: Approximate location of the Cricket Pitch site and main power plant

A solar plant has been proposed at the site of the cricket ground which is located within the village precinct on the southeastern boundary of the island. The site is an achievable distance away from the main power plant and is in very close proximity to the desalination plant located within the village precinct. The vegetation on the site has been predominantly grassland as it has been managed as a cricket ground for more than 50 years. Although not documented with the Robben Island Integrated Conservation Management Plan, it is understood that the cricket ground was used by the prison wardens and not the prisoners. In addition, it has been said the military used this ground for awards ceremonies.

The site is within 100m of the high water mark and therefore the area appears to support a number of sea birds. The cricket ground is adjacent to an important moulting beach for the penguins and right next to the site where the swift tern and crowned cormorants were seen breeding in 2015 and 2014. There is also a Heronry and a Swift Tern colony nearby. The site is located on the coastline of Robben Island that is visible from Cape Town and therefore any development of this site may be visible from the mainland. Furthermore the site is located within the historical village precinct which has heritage value for the island. Any development on this site will need to consider avifauna, visual and cultural heritage impacts. This site was considered technically feasible and therefore has been progressed to assessment phase.

View of Boundary Road showing the cricket ground and the village in the background

**Photograph 4: A photograph showing the cricket pitch prior to much of the current village development, source ICMA 2013-2018**

**Photograph 5: Photograph of the Cricket Pitch currently**

**Site Alternative 5: Agricultural Holding Site**


Figure 5: Approximate location of Agricultural Holding Site and main power plant

A solar plant has been proposed at the site of the old agricultural buildings located within the middle of the island. The site is equi-distant from the main power plant and the desalination plant located within the village precinct. The proposed site appears to be a vegetated dune feature that is border to the north by a forest of alien species, which is ear-marked for removal as part of the island invasive species clearance programme. To the east is the Hydroponics Building, this building started as a dairy in the 1960s and was later transformed into a greenhouse with a translucent roof creating an environment for rapid plant growth. Smaller buildings in the area housed engines that were used to pump water to supply the agricultural activities. In the 1960s prisoners worked at the site, initially as a form of punishment but later it was seen more as 'social rehabilitation'. To the west of the site is Boundary Road and to the southwest is the remains of the piggery buildings. To the south is natural vegetation beyond which is the limestone quarry. The site has cultural heritage significance in relation to the old limestone quarry and the surrounding agricultural buildings. Any development on this site will need to consider flora and fauna, visual and cultural heritage impacts. This site was considered technically feasible and therefore has been progressed to assessment phase.

Hydroponics in the 1960s

**Photograph 6: Photograph showing the Hydroponics Building in the 1960s**

**Photograph 7: Photograph of the Agricultural Holding site, looking at the vegetated dune feature**

Both Alternative Sites 4 and 5 will need to be assessed and authorisation sought in order to ensure there is a back-up site available should one of the sites be technically not feasible.