MOTIVATION REPORT

Application for a Change in Land Use for Renewable Energy Purposes
Kleinfontein Solar PV1 Facility, Free State Province

12/9/2022
Prepared for: Kleinfontein Solar PV1 (Pty) Ltd

Prepared by: INDEX Social Consulting Services

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1. PURPOSE OF THE REPORT

This Motivation report serves the following purpose:

- To motivate for a Change in Land Use on an agricultural farm portion located in the Moqhaka Local Municipality, for the construction and operation of the **Kleinfontein Solar PV1** facility and associated infrastructure with a generating capacity of up to 120 MW; and
- To provide supporting documentation and supplementary information necessary for the Department of Agriculture, Land Reform & Rural Development (DALRRD/The Department) to process the application.

2. THE AIM OF THE APPLICATION

The aim of this application is to:

- Obtain a "No Objection" letter from DALRRD issued to **Kleinfontein Solar PV1 (Pty) Ltd**, for the Change in Land Use for the purpose of Renewable energy infrastructure (Solar PV farm) and purposes incidental thereto, situated on approximately 283.74 ha of agricultural land located near Viljoenskroon in the Moqhaka Local Municipality,.

3. BACKGROUND OF THE APPLICATION

3.1 MERCURY CLUSTER

The proposed Kleinfontein Solar PV1 facility forms part of the greater **Mercury Cluster Project** ("The Mercury Cluster") near Viljoenskroon in the Free State Province. The Mercury Cluster has been divided into the Mercury North PV Farms ("Mercury North") and the Mercury South PV Farms ("Mercury South") as indicated below:

Table 1. Mercury Cluster Project maximum generating capacities

Mercury North PV Farms – Maximum Generating Capacity		Mercury South PV Farms – Maximum Generating Capacity	
• Vlakfontein PV1	75 MW	• Hormah PV1	120 MW
• Zaaiplaats PV1	120 MW	• Ratpan PV1	75 MW
• Kleinfontein PV1	120 MW		

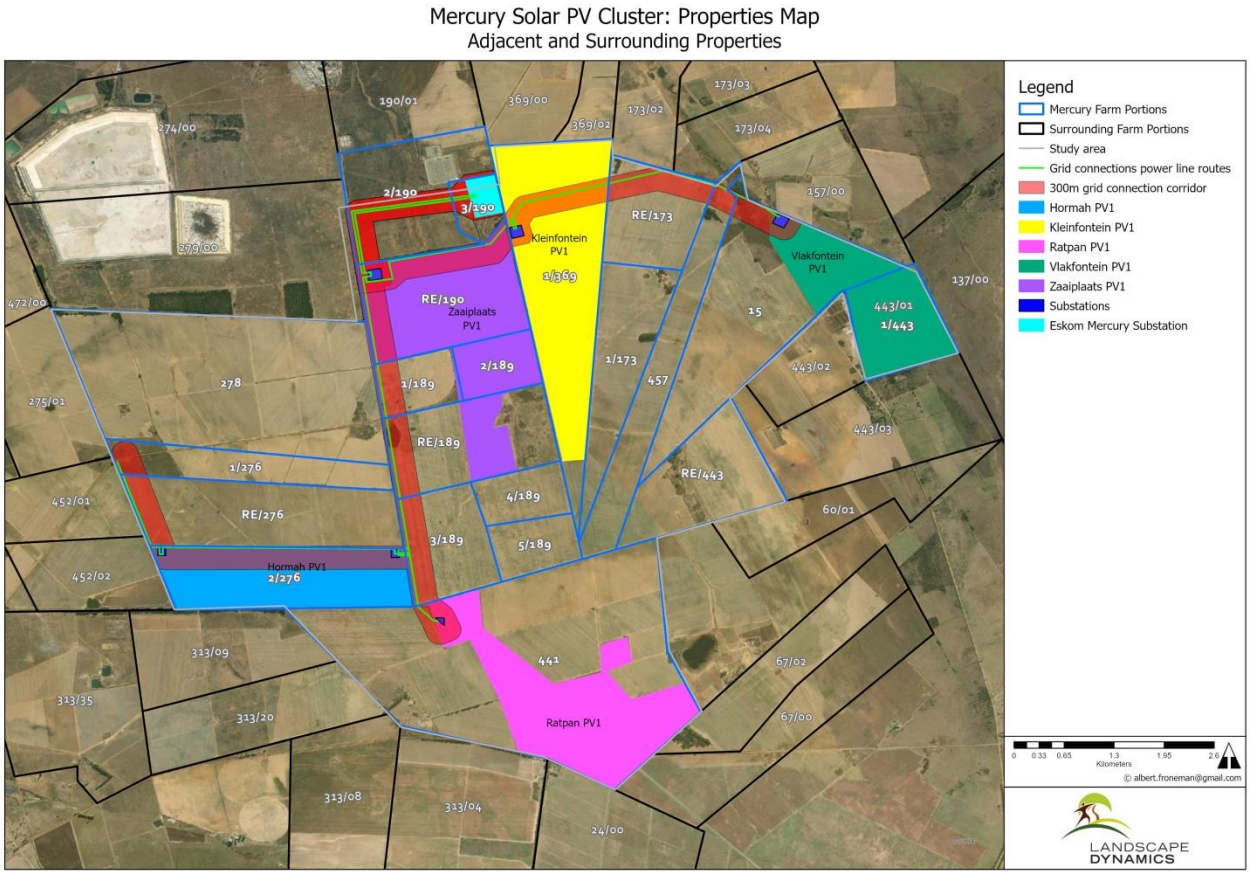

Figure 1. Mercury Solar PV Cluster

3.2 SITE IDENTIFICATION PROCESS

In order identify suitable sites for the Mercury Cluster, a detailed agricultural investigation and assessment has been undertaken. The level of agricultural assessment required in terms of the protocol (and hence in terms of NEMA)[1] is therefore an Agricultural Agro-Ecosystem Specialist Assessment, which is attached in Section 10.5, Annexure E (J. Lanz, 2022).

[1] The Protocol for the specialist assessment and minimum report content requirements of environmental impacts on agricultural resources by onshore wind and/or solar photovoltaic energy generation facilities where the electricity output is 20 megawatts or more, gazetted on 20 March 2020 in GN 320 (in terms of Sections 24(5)(A) and (H) and 44 of NEMA, 1998).

The terms of reference for such an assessment, as stipulated in the protocol, are listed in the Agricultural Agro-Ecosystem Specialist Assessment Report attached. The protocol requires, amongst others, that a Site Sensitivity Verification be submitted that:

(i) Confirms or disputes the current use of the land and the environmental sensitivity as identified by the screening tool, such as new developments or infrastructure, the change in vegetation cover or status etc.;
(ii) Contains a motivation and evidence (e.g. photographs) of either the verified or different use of the land and environmental sensitivity;
(iii) Confirms that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities; and
(iv) Confirms that the proposed siting minimizes agricultural impact and disturbance.

Section 7 of this Motivation Report elaborates on the baseline data of the Agro-ecosystem, identifies potential impacts and mitigations and provides the conclusion and professional opinion of the Agricultural Specialist whether the Mercury Cluster Project should proceed.

The proposed sites were chosen from a **much larger investigated area of approximately 4170 ha** that underwent a detailed assessment. Based on the findings, opinion and recommendations of Johann Lanz, a qualified and registered Agricultural Specialist and Soil Scientist (Pr.Sci.Nat), specific areas that were assessed as having sufficient land capability to support viable and sustainable crop production were deliberately excluded from the project. Such land is considered to be above the threshold for being prioritised for conservation as agricultural production land and has not therefore been proposed for solar development.

The proposed site includes only land within the larger assessed area that was identified as having soil limitations and does not have sufficient land capability to support viable and sustainable crop production.

Figure 2 below indicates the greater assessment area. After initial input the development proposal was downscaled to seven (7) PV facilities and after more in-depth agricultural studies the proposal was further downscaled to five (5) PV facilities, which now comprise the Mercury Cluster (Figure 1). The proposed Mercury Cluster site is therefore the part of the assessed larger area that has the lowest agricultural sensitivity.

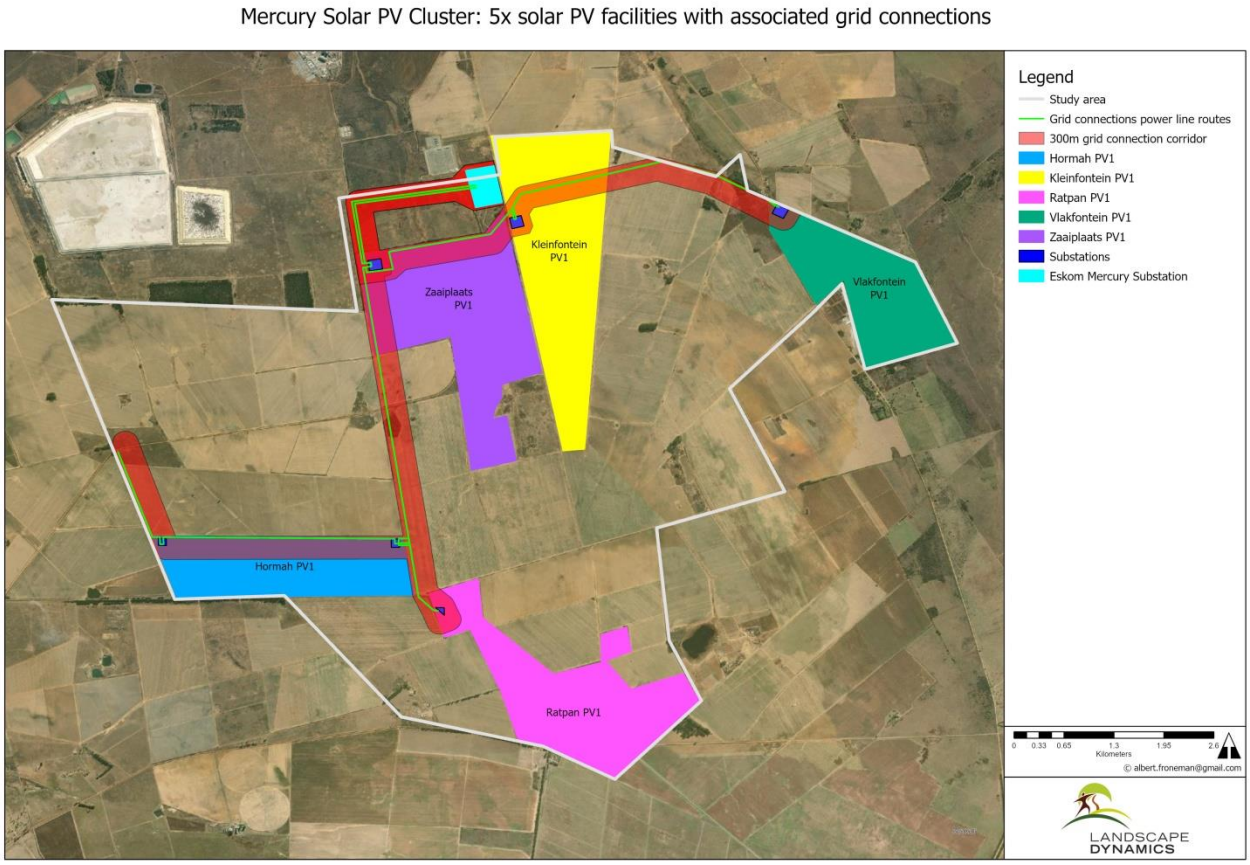

Figure 2. Proposed sites for the Mercury Cluster Project that were identified within the larger assessed area (Study area) as being those parts of the study area that had insufficient land capability to support viable and sustainable crop production.

3.3 REDZ

Eleven (11) Renewable Energy Development Zones ("REDZ") have been identified that are suitable for renewable energy development. The designation of the REDZ has taken into account the country's need to balance renewable energy development against the need to ensure the conservation of land required for agricultural production and national food security.

The Mercury Cluster is located in the Klerksdorp REDZ 10 and within the Central Electricity Grid Infrastructure Corridor, suggesting that this area, when taking environmental considerations on a strategic level into consideration, is suitable for renewable energy development and should be prioritised. See Figure 3 below.

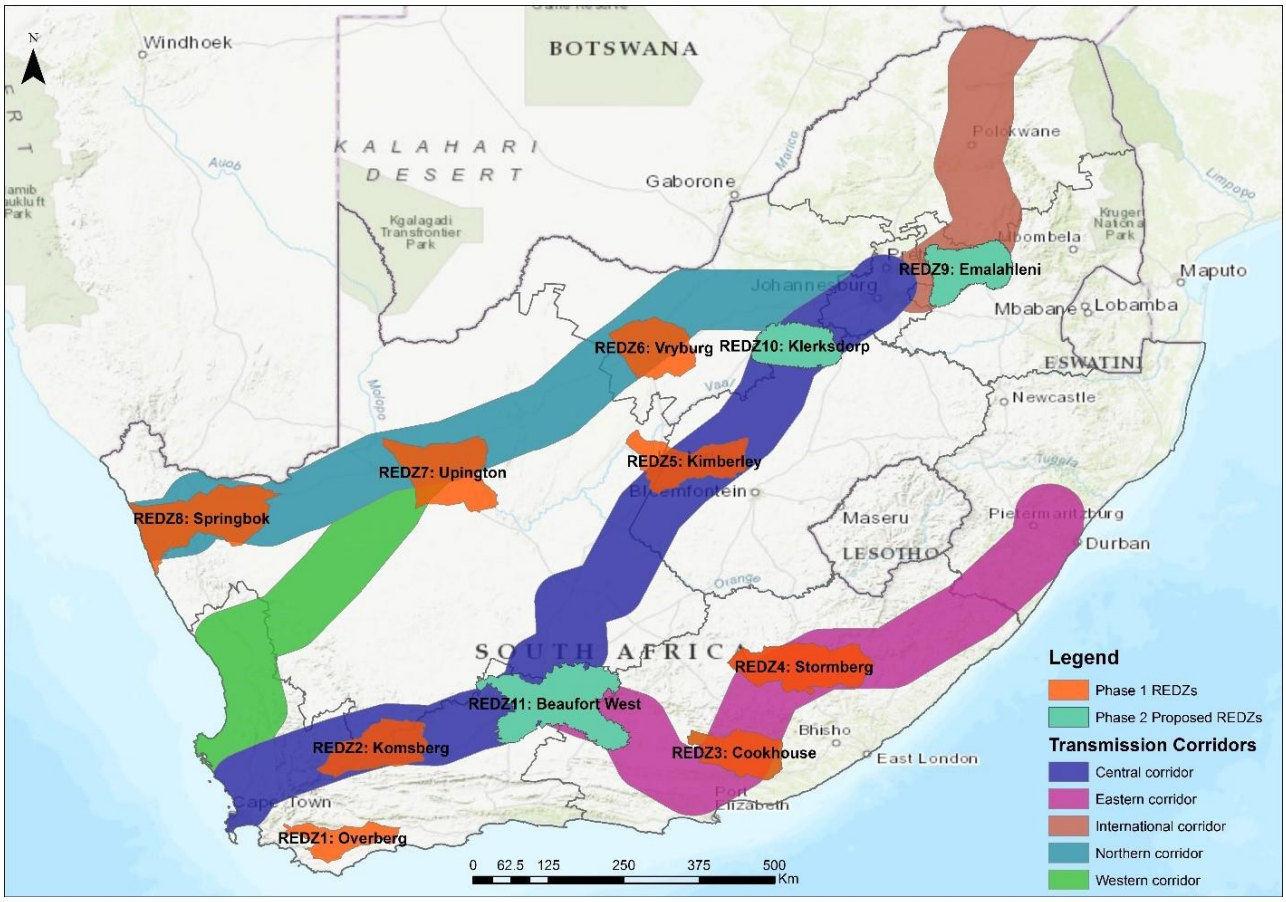

Figure 3. Location of the REDZ's overlaid onto the electricity grid infrastructure corridors where investment in transmission infrastructure is planned

(Source: www.csir.co.za/renewable-energy-development-zones)

4. EXISTING SITUATION

4.1 LOCALITY

The proposed Kleinfontein Solar PV1 site is situated near Viljoenskroon, south of the Vaal River, in the Free State Province.

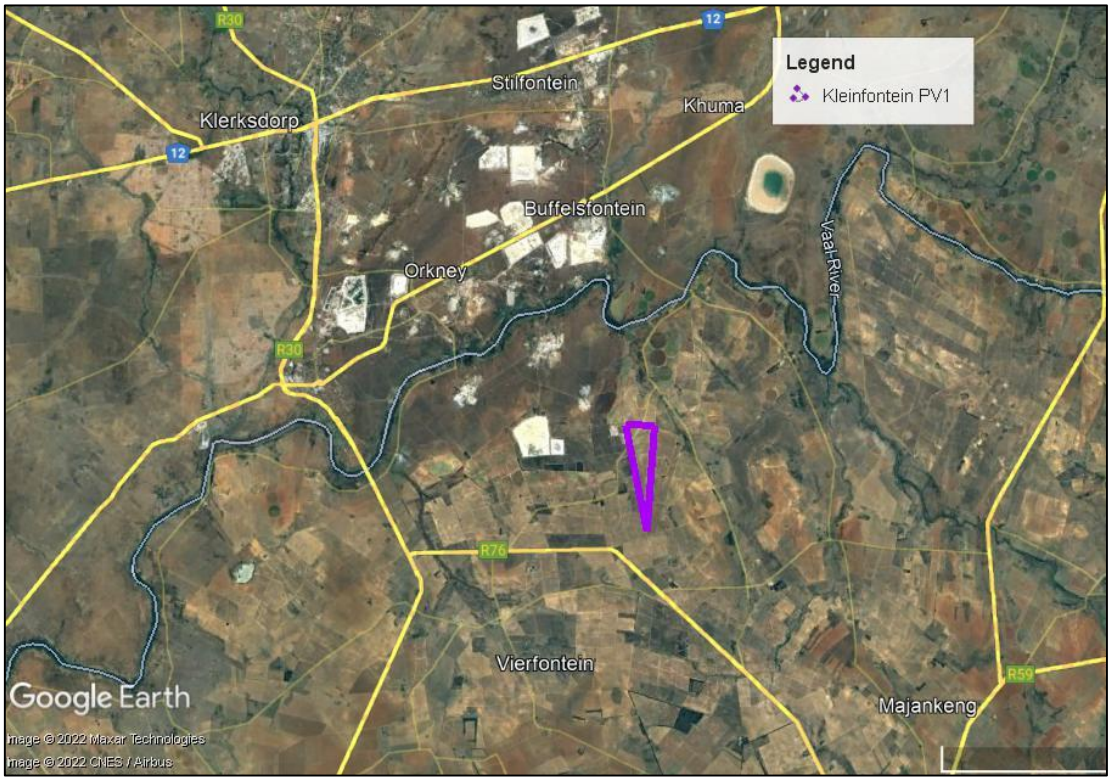

Figure 4. Locality of the proposed Kleinfontein Solar PV facility

4.2 EXTENT OF THE PROPERTY

The Kleinfontein Solar PV1 facility is located on:

Table 2. Extent of property

Farm name	District	Extent (ha)
Portion 1 of Farm Kleinfontein No. 369	Viljoenskroon	369,706

4.3 EXISTING LAND USE

The whole of the Kleinfontein site has continued to be cropped but is becoming increasingly marginal and high risk. An investigation of the soils across the site shows them to be limited by poor drainage and shallower depths.

4.4 LAND USES AND DEVELOPMENT SURROUNDING THE SITE

The site is located directly adjacent to Portion 3 of the Farm No.190, whereby the Mercury Substation is situated (proposed connection), elevating the sites potential for efficient energy production. The site is located in a grain farming agricultural region, but the soils vary in their suitability for crop production. Crops in the area include maize, sunflowers and soya beans. Farmers generally utilise all suitable soil as cropland. Only soil that is not suitable for crop production is used for cattle grazing. Limitations that render the soil unsuitable for crop production are discussed in Section 7.1.1. The footprint of the solar facilities has been deliberately laid out so that it utilises only areas that are unsuitable or marginal for crop production, as informed by the findings of Johan Lanz, May 2022 (Appendix E, Section 10.5).

In addition to the historical, agricultural use of the region, there are other developments present, such as the Mercury Substation, located directly adjacent to the proposed site on Portion 3 of the Farm No. 190.

5. SUPPLEMENTARY INFORMATION

5.1 SPECIAL POWER OF ATTORNEY

Power of Attorney giving Marchelle Terblanche the authority to bring this application to the Department on behalf of the registered landowner is attached (Annexure B, Section 10.2).

5.2 LAND OWNERSHIP

Title Deed is attached, Annexure D, Section 10.4 and details provided below:

Table 3. Land ownership

Farm	Owner	Number	Title Deed	Extent (ha)
Portion 1 of Farm Kleinfontein No. 369	Gossayns Beleggings (Pty) Ltd	64/7837	T16297/1980	369,706

5.3 RESTRICTIVE CONDITIONS

No restrictive conditions are contained in Title that could prohibit the establishment of renewable energy infrastructure on the property.

5.4 GOVERNMENTAL COMMENTS AND APPROVALS

5.4.1 NEMA: Environmental Authorization

The Environmental Impact Assessment process in accordance with the National Environmental Management Act, 1998 (Act No. 107 of 1998) ("NEMA") is currently underway.

5.4.2 Municipal Rezoning

An application for Rezoning to the Moqhaka Local Municipality will be done and finalised once the DALRRD has issued the "No Objection" letter.

6. DEVELOPMENT PROPOSAL

The proposed Kleinfontein Solar PV1 facility will have a generating capacity of up to a maximum of 120MW. Project components will comprise the following:

- Solar PV Farm
- Battery Storage System ("BESS")
- Diesel storage facility of less than 500m^3
- 132kV Grid Connections with switching station/substation
- Laydown area for the construction period
- Operations and Maintenance ("O&M") Buildings
- Additional infrastructure (Access roads (new and/or upgraded); stormwater; water pipelines; etc.)

The facility will connect to the existing Eskom Mercury Substation via a 132kV Overhead Powerline (OHL). The OHL will be transferred to Eskom once the operational phase commences.

Table 4. Land use table: Kleinfontein Solar PV1

Farm portion	Extent of farm (ha)	Total impact area (Solar PV & associated infrastructure)
Portion 1 of Farm Kleinfontein No. 369	369,706 ha	283.74 ha

NOTE: Please refer to Section 8.2 (*Motivation: The 10% Rule*) for an argument against using the so-called 10% rule for this application. Section 8.2 provides a thorough motivation why this "rule" is no longer conducive for renewable, and specifically solar developments, and should therefore not be applicable to the proposed application.

Sketch Plan of the facility is included in **Annexure C, Section 10.3.**

7. AGRICULTURAL ASSESSMENT

Johann Lanz (Soil Scientist (Pri.Sci.Nat.)) compiled a *Site Sensitivity Verification and Agricultural Agro-Ecosystem Specialist Assessment for the proposed Mercury Cluster Project (Northern PV Farms) near Viljoenskroon in the Free State Province* in May 2022 (attached Annexure E, Section 11.5). This section of the Motivation Report provides extracts of his findings.

7.1 BASELINE ASSESSMENT OF THE AGRO-ECOSYSTEM

Baseline information that controls the agricultural production potential of the Mercury Northern site are very similar for the three Solar PV facilities that comprise the site (i.e. Zaaiplaats, Vlakfontein and Kleinfontein). Where data differs, specific reference is made to the Kleinfontein Solar PV1 site.

7.1.1 **Soils**

The land type soil data as well as the soil data from investigated auger samples across the site is given in Appendix 4. Almost the entire site falls within one land type, Bd13 and only a small part in the extreme east falls into Bc25. The geology is mainly Ecca sandstone. Ecca shale and mudstone may occur in places. There are sporadic occurrences of dolerite and diabase. The geology of Bc25 is mainly diabase and Hekpoort lava.

The land type includes a fairly high proportion of deep, red and yellow, reasonably-drained, sandy soils of the Avalon, Clovelly and Hutton soil forms that are good for crop production. It also includes other soils that have various limitations for crop production, which include poor drainage, limited depth, and limited water and nutrient holding capacity. These are soils of the Longlands, Westleigh, Kroonstad and Katspruit soil forms.

In a well-developed agricultural area with a long history of cropping, like the area where the proposed land use change is being assessed, the suitable versus the unsuitable soils have been identified over time through trial and error. All the suitable soils are generally cropped, and uncropped soils can therefore fairly reliably be considered to be unsuitable for crop production (such as those find on the proposed study area). It should be noted that the suitability changes with a changing agricultural economy over time. Slightly poorer soils that may have been cropped with economic viability in the past, are abandoned as cropland because they become too marginal for viable crop production in a more challenging agricultural economy.

As informed by the study completed by Johan Lanz (May 2022), the entire development area has been deliberately laid out on the poorer soils that are limited in their suitability for crop production. Soils, especially in the Zaaiplaats and surrounding areas are predominantly limited in depth by poor drainage that causes saturation in underlying horizons and thereby limits root development and depth. Many of these soils are also depth-limited by a distinct transition to a dense, underlying clay horizon in the subsoil. Furthermore, the leached E horizons, that are present as a result of the drainage limitations, have low water and nutrient holding capacity and can also have low pH. Crops on these soils are at risk of water logging in wet seasons and suffering from drought in dry seasons because the poorly developed, shallow roots and the soil's low water holding capacity provide an insufficient moisture reservoir to carry the plants through the season.

Soils with depth limitations due to cemented, hard plinthic horizons (Glencoe soil form) or underlying rock (Mispah and Glenrosa soil forms) also occur within the investigated area. Details of the soil limitations specific to Kleinfontein is given below.

Kleinfontein:

Attempted agricultural activities (crops) over the whole of the Kleinfontein site has continued, but is becoming increasingly marginal and high risk. An investigation of the soils across the site shows them to be limited by poor drainage and shallower depths.

Figure 5. The whole Kleinfontein site is cropped but is on soils with poor drainage and depth limitations that makes the land marginal for viable crop production.

7.1.2 Terrain and slope

The site is situated on flat terrain with a very low slope gradient at an altitude of between 1,320 and 1,380 metres.

7.1.3 Available water sources

There is no irrigation available anywhere across the site.

7.1.4 Vegetation

Natural vegetation of the site is Vaal-Vet Sandy Grassland, which has been disturbed by agricultural activities.

7.1.5 Agro-climatic information

The site has a summer rainfall with a mean annual rainfall of between 503 and 535 mm and a mean annual evaporation of approximately 1,485 mm.

7.1.6 Agricultural potential and productivity

The cropping potential of the proposed site is limited by the combination of a somewhat marginal climate (annual rainfall of 503 to 535 mm per annum) and soils with poor drainage, limited depth, and limited water and nutrient holding capacity (see Section 8.1). Crop production on these soils is therefore high risk and no longer considered economically viable.

The long-term grazing capacity of the farm is high at 7 hectares per large stock unit.

7.1.7 Agricultural employment

The agricultural enterprises employ a low number of farm workers (approximately 7) across their entire enterprise. Because of the large size of the total farm operations, the loss of marginal parts of these operations is unlikely to have any impact on agricultural employment. The impact on agricultural employment will be offset by the employment opportunities created by the construction and operation of the Kleinfontein PV Solar Facility.

7.1.8 Existing impacts on the site

There are no impacts on the site that are relevant to agricultural potential.

7.2 IMPACTS ON AGRICULTURE

7.2.1 What constitutes an agricultural impact?

An agricultural impact is a temporary or permanent change to the future production potential of land. If a development will not change the future production potential of the land, then there is no agricultural impact. A decrease in future production potential is a negative impact and an increase is a positive impact. The significance of the agricultural impact is directly proportional to the extent of the change in production potential.

7.2.2 Assessing the significance of agricultural impact

The purpose of the agricultural component in Environmental Authorisation is to ensure that South Africa balances the need for development against the need to ensure the conservation of the natural agricultural resources, including land, required for agricultural production and national food security.

When the agricultural impact of a development involves the permanent or long term non-agricultural use of potential agricultural land, as it does in this case, the focus and defining question of the agricultural impact assessment is to determine the importance, from an agricultural production point of view, of that land not being utilized for the development and kept solely for agriculture.

In other words, the significance of an agricultural impact should be evaluated by asking the question: Does the extent of the loss of future agricultural production potential that will result from this development, justify keeping the land solely for agricultural production and therefore not approving the development? If the loss is small, then it is unlikely to justify non approval. If the loss is big, then it is likely to justify it.

The extent of the loss is a direct function of two things:

(i) The amount of land that will be lost; and

(ii) The production potential of the land that will be lost.

The land's production potential must be evaluated on a scale of land capability (which equates to production potential) that is applicable across the country, because the need is to conserve the higher potential land in the country, not the lower potential land. **If the land capability is below a certain threshold then its loss as agricultural production land may be justified, depending on the importance and value of the proposed**

non-agricultural land use that will replace it. That threshold is determined by the scarcity of arable crop production land in South Africa and the relative abundance of land that is only good enough to be used for grazing. If land is of sufficient land capability to support viable and sustainable crop production then it is considered to be above the threshold for being conserved as agricultural production land**. If land is not of sufficient land capability to support viable and sustainable crop production, then it is considered to be below the threshold and its loss as agricultural production land may be justified. When the replacing land use is something that has high national importance and benefit, such as renewable energy development, the use of agricultural land that is below the threshold is considered to be justified.**

It is also important to note that renewable energy facilities have both positive and negative effects on the production potential of land and so it is the net sum of these positive and negative effects that determines the extent of the change in future production potential.

Another aspect to consider is the scale at which the significance of the agricultural impact is assessed. The change in production potential of a farm or significant part of a farm is likely to be highly significant at the scale of that farm, but may be much less so at larger scales. This assessment considers a regional and national scale to be the most appropriate one for assessing the significance of the loss of agricultural production potential because, as has been discussed above, the purpose is to ensure the conservation of agricultural land required for national food security.

It should be noted that, in assessing agricultural impact, the exact nature and layout of the different infrastructure within a solar energy facility has absolutely no bearing on the significance of agricultural impacts. All that is of relevance is simply the total footprint of the facility that excludes agricultural land use or impacts agricultural land, referred to as the agricultural footprint.

7.2.3 Micro-siting to minimise fragmentation and disturbance of agricultural activities

The agricultural protocol requires confirmation that all reasonable measures have been taken through micro-siting to minimize fragmentation and disturbance of agricultural activities. The proposed siting minimizes agricultural impact and disturbance. The exact position of all infrastructure within the proposed site will not make any material difference to agricultural impacts.

7.2.4 Allowable development limits

The agricultural protocol requires confirmation of whether the development footprint is in line with the allowable development limits or not, and requires motivation to support any deviation from the limits.

The proposed development site on Kleinfontein include cropland which means that any solar facility will not be within the allowable development limits. However, as has been discussed above, the sites are marginal for viable crop production and their use for solar energy can therefore be justified. The motivation for this is detailed in Section 8.1.

The proposed development site offers the win-win situation of renewable energy development that is integrated with agricultural production in a way that provides benefits to agriculture – reliable, additional income and security - and leads to little loss of future agricultural production potential because they utilise only lower potential land that is not suitable or marginal for crop production.

7.2.5 Impacts associated with the construction phase

Impacts associated with the construction phase are reflected in the following tables.

Table 5. Construction phase: Impact 1

Impact Description: Loss of agricultural potential by occupation of land - Agricultural land directly occupied by the development infrastructure will become restricted for agricultural use, with consequent potential loss of agricultural productivity for the duration of the project lifetime. This impact is relevant only in the construction phase. No further loss of agricultural land use occurs in subsequent phases.

Cumulative impact description: Loss of agricultural potential by occupation of land

Mitigation: None possible

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Loss of land	Site	Long term	Definite	High	Low	Low

Impact on Irreplaceable Resources (after mitigation): No

Cumulative impact rating (after mitigation): Low

Table 6. Construction phase: Impact 2

Impact Description: Loss of agricultural potential by soil degradation – This impact only occurs during the construction and decommissioning phases, but only becomes relevant once the land is returned to agricultural land use after decommissioning. Soil can be degraded by impacts in three different ways: erosion; topsoil loss; and contamination. Erosion can occur as a result of the alteration of the land surface run-off characteristics, which can be caused by construction related land surface disturbance, vegetation removal, and the establishment of hard surface areas including roads. Loss of topsoil can result from poor topsoil management during construction related excavations. Hydrocarbon spillages from construction activities can contaminate soil. Soil degradation will reduce the ability of the soil to support vegetation growth.

Cumulative impact description: Loss of agricultural potential by soil degradation

Mitigation: storm water run-off control; maintain vegetation cover; strip, stockpile and re-spread topsoil.

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Soil degradation	Site	Long term	Possible	Medium	Low	None

Impact on Irreplaceable Resources (after mitigation): No

Cumulative impact rating (after mitigation): Low

7.2.6 Impacts associated with the operational phase

Impacts associated with the operational phase are reflected in the following tables.

Table 7. Operational phase: Impact 1

Impact Description: Enhanced agricultural potential through increased financial security for farming operations - Reliable income will be generated by the farming enterprises through the lease of the land to the energy facilities. This is likely to increase their cash flow and financial security and could improve farming operations and productivity through increased investment into farming.

Cumulative impact description: Enhanced agricultural potential through increased financial security for farming operations

Mitigation: None possible

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Increased financial security	Site	Long term	Possible	High	Low	Low

Impact on Irreplaceable Resources (after mitigation): No

Cumulative impact rating (after mitigation): Low

Table 8. Operational phase: Impact 2

Impact Description: Improved security against stock theft and other crime due to the presence of security infrastructure and personal at the facilities.

Cumulative impact description: Improved security against stock theft and other crime

Mitigation: None possible

Impact Assessment

Name of Impact	Extent	Duration	Probability	Reversibility of impact	Significance without mitigation	Significance after mitigation
Improved security	Site	Long term	Possible	High	Low	Low

Impact on Irreplaceable Resources (after mitigation): No

Cumulative impact rating (after mitigation): Low

7.2.7 Impacts on agricultural employment

No impact on agricultural employment will occur. However, employment opportunities will be created by the construction and operation of the Kleinfontein Solar PV1 facility.

7.2.8 Impact Statement

The impact of the proposed development on the agricultural production capability of the site is assessed as being acceptable. This is substantiated by the following points:

1. The only land that will be used by the developments has limited agricultural production potential, as informed by the Agricultural Assessment (J. Lanz). The layout of the facility has deliberately avoided all higher potential land within the wider assessed area. It will only utilize land that was identified as having insufficient land capability for viable and sustainable crop production and is therefore only good enough for grazing. There is not a scarcity of such agricultural land in South Africa and it is therefore considered to be below the threshold for being prioritized for conservation as agricultural production land.
2. The cropping potential of the proposed site is further limited by the combination of a somewhat marginal climate and soils with poor drainage, limited depth, and limited water and nutrient holding capacity, as well as **no available water sources for irrigation.**
3. The proposed development offers **positive impact on agriculture by way of improved financial security for farming operations, as well as security benefits against stock theft and other crime.**
4. The PV panels will **not totally exclude agricultural production. The area can still be used to graze sheep** that will, in addition, be protected against stock theft within the security area of the facility.
5. The loss of agricultural potential by occupation of land is **not permanent**. The land will become fully available again for agricultural production once the proposed activity ceases.
6. The proposed development poses a **low risk in terms of causing soil degradation**, which can be adequately and fairly easily managed by standard, best practice mitigation management actions.
7. The **proposed development is within a REDZ**, which is an area that has specifically been designated within South Africa for the prioritization of renewable energy development. The designation of the REDZ has taken into account the country's need to balance renewable energy development against the need to ensure the conservation of land required for agricultural production and national food security.
8. The proposed development will also have the **wider societal benefits of generating additional income and employment in the local economy.** In addition, it will contribute to the country's need for energy generation, particularly renewable energy that has lower environmental and agricultural impact, on a national scale, than existing, coal powered energy generation.
9. The proposed site is located directly adjacent to Portion 3 of the Farm No.190, whereby the Mercury substation and proposed grid connection is situated. Being located as close as possible to a grid connection highly improves the economic viability of a Solar Energy Facility. The locality of the proposed site and available solar resource makes the potential for the development of a Solar Energy Facility on the proposed site very high.

Because of the above factors, **the impact of the proposed development on the agricultural production capability of the site is assessed as being acceptable. Therefore, from an agricultural impact point of view, it is recommended that the development be approved.**

7.2.9 Long term project benefits versus agricultural benefits

The development will generate a greater per hectare income for the farming enterprise than the existing agricultural production will earn. It will also generate additional income and employment in the local economy. In addition, it will contribute to the country's urgent need for energy generation, particularly renewable energy that has lower environmental and agricultural impact, on a national scale, than existing, coal powered energy generation.

7.3 MITIGATION MEASURES

The following standard, best practice mitigation measures are recommended for controlling soil degradation.

- Implement an effective system of storm water run-off control, where it is required - that is at any points where run-off water might accumulate. The system must effectively collect and safely disseminate any run-off water from all accumulation points and it must prevent any potential down slope erosion.
- Any occurrences of erosion must be attended to immediately and the integrity of the erosion control system at that point must be amended to prevent further erosion from occurring there.
- Maintain where possible all vegetation cover and facilitate re-vegetation of denuded areas throughout the site, to stabilize disturbed soil against erosion, and to reduce dust formation.
- If an activity will mechanically disturb the soil below surface in any way, then any available topsoil should first be stripped from the entire surface to be disturbed and stockpiled for re-spreading during rehabilitation. During rehabilitation, the stockpiled topsoil must be evenly spread over the entire disturbed surface, and then stabilized by facilitating vegetation cover.

7.4 AGRICULTURAL ASSESSMENT: CONCLUSION

The purpose of the agricultural component in Environmental Authorisation is to ensure that South Africa balances the need for development against the need to ensure the conservation of the natural agricultural resources, including land, required for agricultural production and national food security.

An agricultural impact is a change to the future production potential of land. Whether a development should receive agricultural approval or not should be evaluated by asking the question: Does the extent of the loss of future agricultural production potential that will result from this development, justify keeping the land solely for agricultural production and therefore not approving the development?

South Africa needs agricultural production for food security. It also urgently needs renewable energy development. In order to achieve its renewable energy generation goals, agriculturally zoned land will inevitably need to be used for renewable energy generation. The ideal, win-win scenario for both agricultural production and for electricity generation in South Africa, is for renewable energy facilities to be integrated with agricultural production in a way that provides benefits to agriculture and leads to very little loss of future agricultural production potential.

The conclusion of this Agricultural assessment is that the proposed development offers such a win-win scenario. This is substantiated by the following points:

1. The only land that will be used by the development has limited agricultural production potential.

The layout of the facility has deliberately avoided all higher potential land within the wider assessed area. It will only utilise land that was identified as having insufficient land capability for viable and sustainable crop production and is therefore only good enough for grazing. There is not a scarcity of such agricultural land in South Africa and it is therefore considered to be below the threshold for being prioritised for conservation as agricultural production land.

2. The proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, as well as security benefits against stock theft and other crime.
3. The PV panels will not totally exclude agricultural production. The area can still be used to graze sheep that will, in addition, be protected against stock theft within the security area of the facility.
4. The loss of agricultural potential by occupation of land is not permanent. The land will become fully available again for agricultural production once the proposed activity ceases.
5. The proposed development is within a REDZ, which is an area that has specifically been designated within South Africa for the prioritisation of renewable energy development. The designation of the REDZ has taken into account the country's need to balance renewable energy development against the need to ensure the conservation of land required for agricultural production and national food security.
6. The proposed development will also have the wider societal benefits of generating additional income and employment in the local economy. In addition, it will contribute to the country's need for energy generation, particularly renewable energy that has lower environmental and agricultural impact, on a national scale, than existing, coal powered energy generation.
7. The proposed site is located directly adjacent to Portion 3 of the Farm No.190, where the Mercury substation and proposed grid connection is situated. Being located as close as possible to a grid connection highly improves the economic viability of a Solar Energy Facility. The locality of the proposed site and available solar resource makes the potential for the development of a Solar Energy Facility on the proposed site very high.

Because of the above factors, the impact of the proposed development on the agricultural production capability of the site is assessed as being acceptable. Therefore, from an agricultural impact point of view, it is recommended that the development be approved.

8. MOTIVATION

A motivation in favour of the development of the proposed Kleinfontein Solar PV1 facility is provided herewith:

8.1 SITE-SPECIFIC MOTIVATION

- The only land that will be used by the developments have limited agricultural production potential. The layout of the facility has deliberately avoided all higher potential land within the wider assessed area. It will only utilise land that was identified as having insufficient land capability for viable and sustainable crop production and is therefore only good enough for grazing. There is not a scarcity of such agricultural land in South Africa and it is therefore considered to be below the threshold for being prioritised for conservation as agricultural production land.
- The proposed solar energy facility is on land that belongs to an established agricultural family in the area, whom has large, diverse agricultural enterprises that cover multiple land holdings over and above

those considered for this development. The proposed sites are on those parts of their land that have the least agricultural production potential and are marginal for crop production. There is therefore no danger that the proposed developments will replace their farming activities or lead to any significant decrease in the future agricultural production potential of their farming enterprises.

- The proposed development offers some positive impact on agriculture by way of improved financial security for farming operations, as well as security benefits against stock theft and other crime.
- The proposed development will also have the wider societal benefits of generating additional income and employment in the local economy through the Enterprise Development and Socio-economic Development components of the project, which are ensured through minimum thresholds prescribed by the Department of Energy for Independent Power Producers.
- The PV panels will not totally exclude agricultural production. The area can still be used to graze sheep that will, in addition, be protected against stock theft within the security area of the facility.
- The loss of agricultural potential by occupation of land is not permanent. The land will become fully available again for agricultural production once the proposed activity ceases.
- The proposed development poses a low risk in terms of causing soil degradation, which can be adequately and fairly easily managed by standard, best practice mitigation management actions.
- The proposed development site offer the win-win situation of renewable energy development that is integrated with agricultural production in a way that provides benefits to agriculture - reliable additional income and security - and leads to very little loss of future agricultural production potential because it utilises only lower potential land that is marginal for crop production.
- The proposed development is located within the Klerksdorp REDZ 10 and in the Central Electricity Grid Infrastructure Corridor, suggesting that this area, when taking environmental considerations on a strategic level into consideration, is suitable for renewable energy development. The designation of the REDZ has taken into account the country's need to balance renewable energy development against the need to ensure the conservation of land required for agricultural production and national food security.
- The proposed developments will also have the wider societal benefits of generating additional income and employment in the local economy. In addition, it will contribute to the country's need for energy generation, particularly renewable energy that has lower environmental and agricultural impact, on a national scale, than existing, coal powered energy generation.

8.2 THE 10% RULE

The so-called 10% rule that has been used by DALRRD is not considered to be useful or constructive for assessing the agricultural approval of this project. The rule is likely to simply hinder solar energy development without serving any benefit to agriculture. The argument against using the rule is detailed below.

In order to limit the potential threat that solar energy development in rural areas could pose to agricultural production and to the agricultural economy of those rural areas, DALRRD created the so-called 10% rule to inform the decision of whether a solar energy development on agricultural land should be approved or not. This rule states that a solar energy facility may not utilize more than 10% of the surface area of a farm. Its aim was to ensure that each farm unit remained predominantly agricultural rather than certain farms abandoning agricultural production in favour of renewable energy generation.

The rule was established when solar energy development was new and unknown. However, it is now evident that solar energy development is less of a threat to agricultural production and the agricultural economy than it was initially feared that it might be. Solar energy development has demonstrated benefits for agriculture and has potential to be integrated into the rural agricultural economy. It is a source of much needed income injections into rural areas. The 10% rule is now considered unnecessary and impractical. It is likely to simply hinder solar energy development without serving any benefit to agriculture. It is far more constructive and effective to **focus on integrating renewable energy with agricultural production in a way that provides benefits to agriculture and focuses on minimizing loss of future agricultural production potential. This can be done by using only the production potential of land as the deciding factor for solar energy approval.**

The problem with the 10% rule and only utilizing up to 10% of each farm, is that it forces solar facilities to be spread across the landscape in a way that is impractical and financially non-viable and creates a much larger environmental footprint in the landscape, and increases fragmentation of the landscape. Furthermore it does not actually make any difference to the loss of agricultural production potential or to the impact on the agricultural economy of the area.

It is important to recognize that there is no real need to limit the amount of land occupied by solar energy facilities. Solar energy will never occupy more than a tiny proportion of the land, anyway. The total extent of South Africa's intended solar development for the foreseeable future was calculated to only occupy 0.4% of the surface area of the 8 original renewable energy development zones (REDZ) (DEA, 2015). This was if all the country's solar development was located only in those 8 REDZ, which it is not. An additional three (3) REDZ have been proclaimed since then and much of the country's solar development is occurring outside the REDZ. This means that for the foreseeable future, solar energy will only ever occupy much less than 0.4% of land in an area. If it will only ever occupy such a small proportion of the land, anyway, it cannot replace agriculture in the rural economy and it serves no purpose to limit solar facilities to 10% of each farm. From an agricultural production and food security point of view there is only a need to preserve scarce arable land for crop production and therefore to limit solar development to land that is of insufficient land capability to support viable crop production.

Early solar development in the country was located predominantly in arid, low potential agricultural environments with large farm sizes, such as the Northern Cape. In such environments the 10% rule is achievable, even if not desirable. However, because solar development has now used up the available grid capacity in the Northern Cape, it needs to move to more intensively farmed areas in the North West, Free State and Mpumulanga provinces. Farms are much smaller in these areas and 10% of a farm is often an unfeasibly small area for solar development. In such agricultural environments, some soils are suitable for crop production and others are not. The important thing in these environments is that land that has potential for viable crop production is not sacrificed for solar development. The focus in terms of locating solar facilities should be to avoid land that has potential for viable crop production, and thereby minimize the loss of agricultural production potential. As long as that is done, it does not matter what percentage of an individual farm is used.

The 10% rule is therefore unnecessary. Solar energy development is integrated with agricultural production, it will not replace agriculture from the land and therefore does not pose a threat to agricultural production or to the agricultural economy of rural areas.

8.3 REGIONAL AND NATIONAL PERSPECTIVE

- South Africa needs agricultural production for food security. It also urgently needs renewable energy development. In order to achieve its renewable energy generation goals, agriculturally zoned land will inevitably need to be used for renewable energy generation. The ideal, win-win scenario for both agricultural production and for electricity generation in South Africa, is for renewable energy facilities to be integrated with agricultural production in a way that provides benefits to agriculture and leads to very little loss of future agricultural production potential.
- The development will contribute to the country's urgent need for energy generation, particularly renewable energy that has lower environmental and agricultural impact, on a national scale, than existing, coal powered energy generation.
- The cumulative impact of loss of future agricultural production potential will not have an unacceptable negative impact on the agricultural environment in the area. The proposed development is therefore acceptable in terms of cumulative impact, and it is therefore recommended that it be approved.

9. CONCLUSION

The Agricultural Assessment determined that the site identified for the proposed Kleinfontein Solar PV1 facility have limited crop potential and insufficient land capability for viable and sustainable crop production and is therefore only good enough for grazing. There is not a scarcity of such agricultural land in South Africa and it is therefore considered to be below the threshold for being prioritized for conservation as agricultural production land.

The assessment and this motivation prove that the proposed development site offers the win-win situation of renewable energy development that is integrated with agricultural production in a way that provides benefits to agriculture - reliable additional income and security - and leads to very little loss of future agricultural production potential because it utilizes only lower potential land that is not suitable or marginal for crop production.

Because of the factors used as motivation to illustrate that the impact of the proposed development on the agricultural production capability of the site is assessed as being low, it is recommended that the DALRRD approves the application for the Change in Land Use on approximately 283.74 ha to establish the Kleinfontein Solar PV1 facility

10. ANNEXURES

10.1 ANNEXURE A – LOCALITY MAP

10.2 ANNEXURE B – POWER OF ATTORNEY ISSUED TO M. TERBLANCHE

10.3 ANNEXURE C – KLEINFONTEIN SOLAR PV1 - SKETCH PLAN, 2022/07/13

10.4 ANNEXURE D - TITLE DEED T16297/1980

10.5 ANNEXURE E – SITE SENSITIVITY VERIFICATION AND AGRICULTURAL AGRO-ECOSYSTEM SPECIALIST ASSESSMENT FOR THE PROPOSED MERCURY CLUSTER PROJECT (NORTHERN PV FARMS) NEAR VILJOENSKROON IN THE FREE STATE PROVINCE: J. LANZ, MAY 2022