

**VISSERSPAN PV FACILITY
PROJECT 2
FARM 40, DEALESVILLE, FREE STATE**

VISUAL ASSESSMENT

For consideration in the Basic Assessment

For
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Final Report
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ANNEXURES

- A View profiles of Potential visual receptors**
- B Photo sheet**

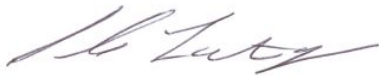
Relevant Qualifications & Experience of the Author

Ms Sarien Lategan holds an Honours Degree in Geography as well as a Masters Degree in Town and Regional Planning from the University of Stellenbosch. She has 7 years experience as Town planner at a local government, 3 years with South African National Parks as planner and project manager of various GEF and World Bank managed, tourist facilities in the Table Mountain National Park and since 2004 as private practitioner involved in inter alia Site Analysis and Visual Impact assessments for various types of developments ranging from housing, tourism to infrastructure developments.

Ms Lategan is registered as a professional Town and Regional Planner as well as Environmental Assessment Practitioner.

Declaration of Independence

I, Sarah C. Lategan, declare that I am an independent consultant to EnviroAfrica and, has no business, financial, personal or other interest in the proposed project or application in respect of which I was appointed, other than fair remuneration for work performed in connection with the application. There are furthermore no circumstances which compromise my objectivity in executing the task appointed for.



SC Lategan

EXECUTIVE SUMMARY

Sarien Lategan was appointed to undertake the visual impact assessment for the Visserspan PV Facility, Project 2, near Dealesville, Free State.

At the time of assessment, detail regarding the exact technology and site layout was not yet available. The most probable technology would be Single axis tracking PV arrays, with an assumed maximum vertical height of 3m. Should a different technology thus been decided on which involve smaller units, the visual impacts will certainly be less than what is assessed in this report.

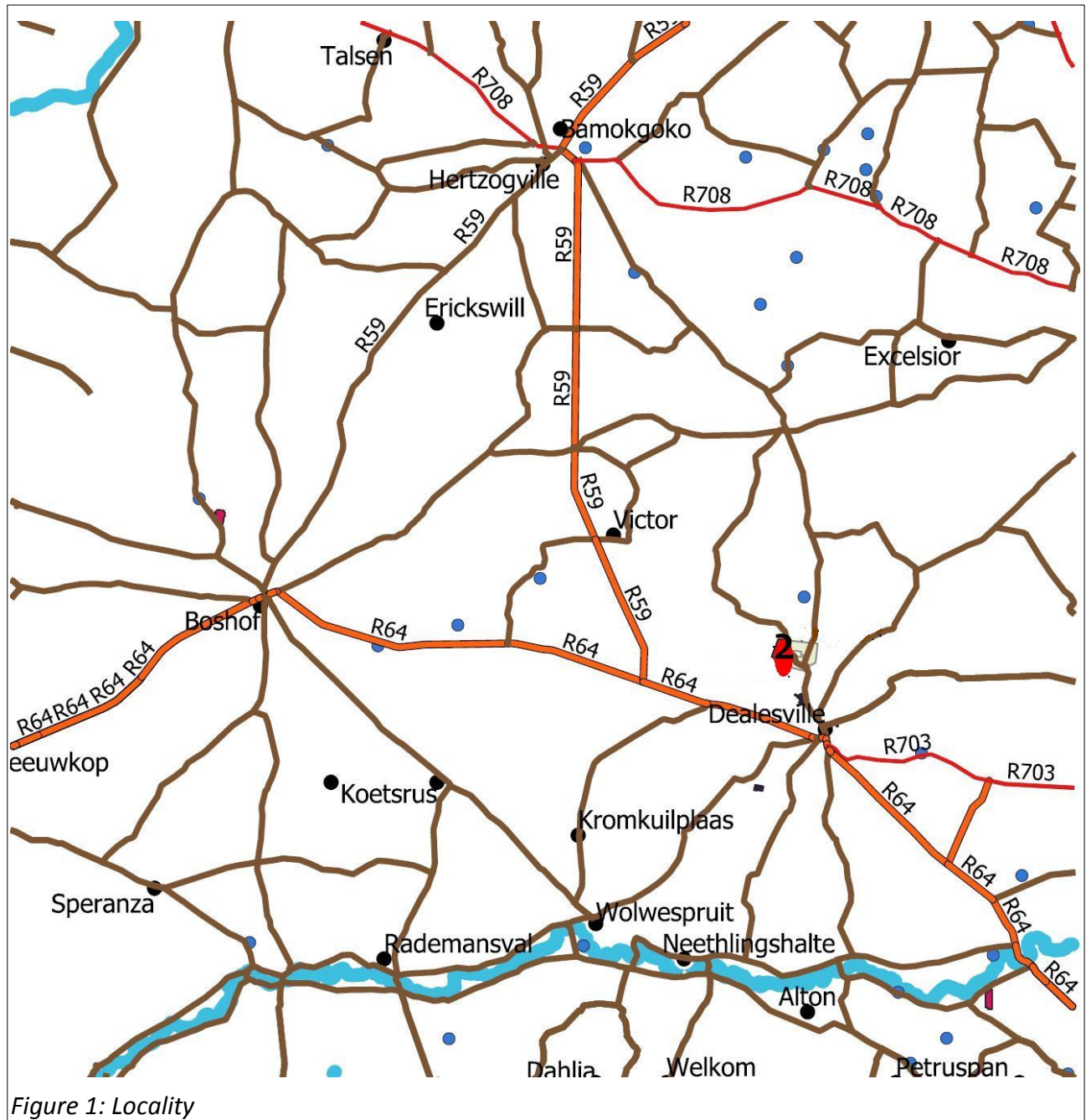
The viewshed of the site is limited by the topography which is characterized by low undulating rises and valleys which created a medium level of visual absorption. Due to the low vertical extent of the proposed development, this absorption rate is sufficient to reduce the viewshed for the particular project proposal.

An assessment of the potential visual receptors through the use of landscape profiles coupled with on-site verification was undertaken. The visual receptors in the area are of medium to low sensitivity. The assessment finds that the overall visual impact of the proposed Project2 of the Visserspan PV facility holds a low overall visual impact. For this reason no mitigation measures are required.

Due to the fact that a number of PV facilities have been approved to the south of Project 2, the project does contribute to the cumulative impact specifically to spatial crowding. The pro rate contribution to the overall number of approved projects is however low although Project 1 and Project 2 combined increase the pro rata contribution. Since no thresholds has been determined on a regional level it is not appropriate to assess the impact on landscape change.

1 BACKGROUND

This report assess the visual impact of a 223ha site known as Project 2 Visserspan PV Facility, as input to the Environmental Assessment in terms of the National Environmental Management Act, 1998 (Act no. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2017, undertaken by EnviroAfrica. Project 2 is part of the larger Visserspan PV project which will in total cover approximately 900ha. The site is situated approximately 4km north of the Preseus Substation near Dealesville in the Free State, west of the gravel road to Hertzogville.



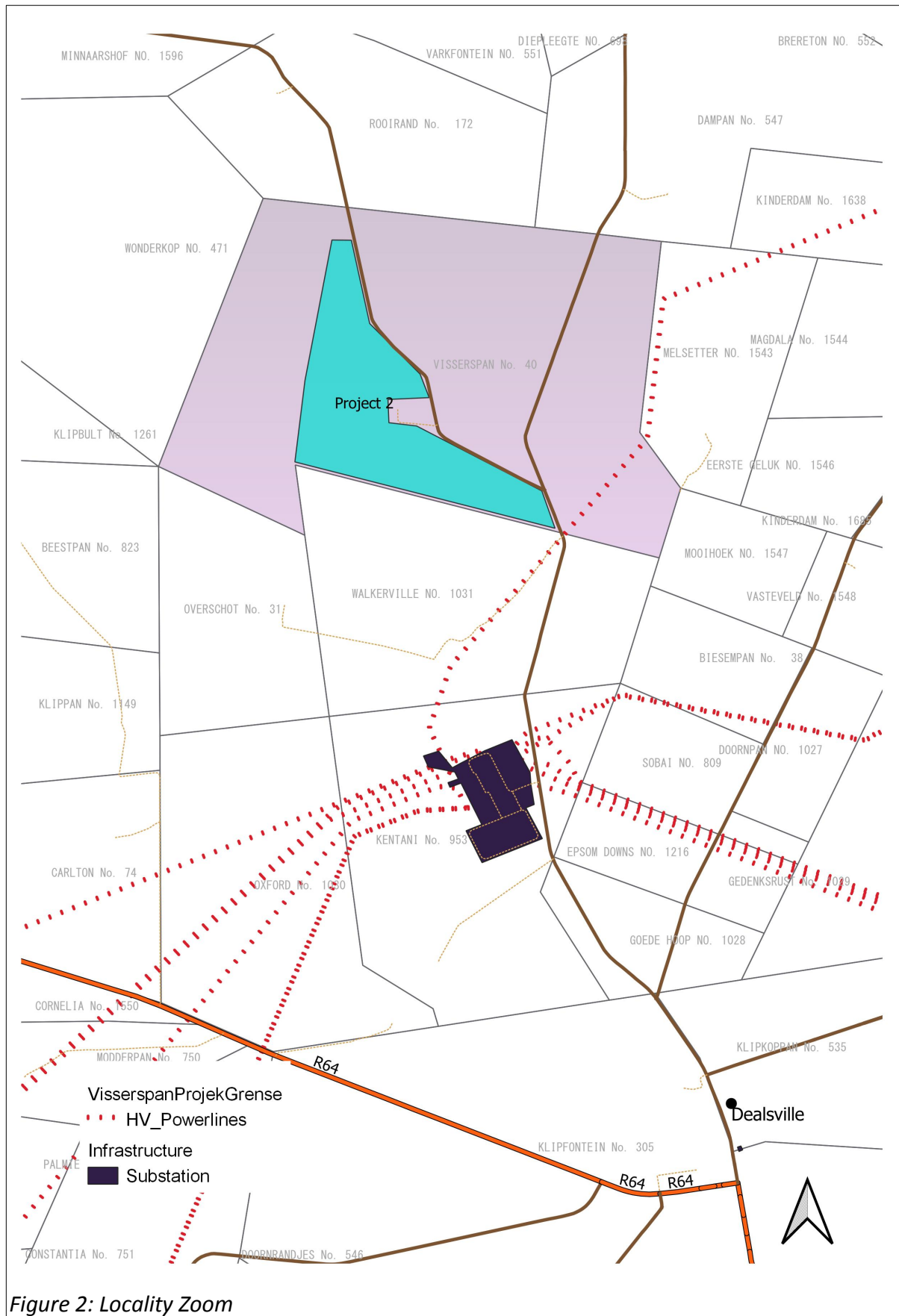


Figure 2: Locality Zoom

2 TERMS OF REFERENCE

The objective of the Visual Impact assessment is to determine the significance of any visual impact which may result from the construction of the proposed PV facility. This assessment will indicate whether from a visual perspective the development constitute an acceptable level of change and if so, what potential mitigation measures can reduce any visual impact.

To determine the potential extent of the VIA required, the following broad criteria are considered.

Table 1: Requirements for visual assessment

Areas with protection status, e.g. nature reserves	Closest Provincial Nature reserves - Soetdoring Nature reserve - 35km Sandveld Nature reserve – 85km Closest National Park - Mokala NP – 130km No reserves within potential viewshed area
Areas with proclaimed heritage sites or scenic routes	None known
Areas with intact wilderness qualities, or pristine ecosystems	Fragmented indigenous vegetation as identified by Botanical study
Areas with intact or outstanding rural or townscape qualities	None
Areas with a recognized special character or sense of place	None known
Areas with sites of cultural or religious significance	None known
Areas of important tourism or recreation value	None
Areas with important vistas or scenic corridors	None
Areas with visually prominent ridge lines or skylines.	No

Table 2: Nature of intended development

High-intensity type projects including large-scale infrastructure	Yes
A change in land use from the prevailing use	Yes.
A use that is in conflict with an adopted plan or vision for the area	None known
A significant change to the fabric and character of the area	Potentially

A significant change to the townscape or streetscape	Potentially
Possible visual intrusion in the landscape	Potentially
Obstruction of views of others in the area	Potentially

From the above, it is clear that the receiving environment holds a low level of visual elements which may be impacted upon by development of the site.

The potential however exists that the construction of the PV facility may have a visual impact. In order to assist authorities thus to make an informed decision, the input of a specialist is required to assist in the project design and assess the visual impact of the preferred project proposal.

The term visual and aesthetic is defined to cover the broad range of visual, scenic, cultural, and spiritual aspects of the landscape. The terms of reference for the specialist are to:

- Provide the visual context of the site with regard to the broader landscape context and site-specific characteristics.
- Provide input in compiling layout/design alternatives.
- To describe the affected environment and set the visual baseline for assessment
- Identify the legal, policy and planning context
- Identifying visual receptors
- Predicting and assessing impacts
- Recommending management and monitoring actions

3 Methodology and principles

3.1 Methodology

Table 4: Summary of methodology

Task undertaken	Purpose	Resources used
A screening of the site and environment	To obtain an understanding of the site and area characteristics and potential visual elements	Photographs Site visits
Identify visual receptors	To assess the visual impact from specific viewpoints	Photographs, profiles
Contextualize the site within the visual resources	To present an easy to understand context of the site within the visual resource baseline	Specialist: S Lategan Graphic presentation Superimposed photo's
Propose possible mitigation measures	To present practical guidelines to reduce any potential negative impacts.	Specialist: S. Lategan

Throughout the evaluation the following fundamental criteria applied:

- Awareness that “visual” implies the full range of visual, aesthetic, cultural and spiritual aspects of the environment that contribute to the area’s sense of place.
- Consideration of both the natural and cultural (urban) landscape, and their inter-connectivity.
- The identification of all scenic resources, protected areas and sites of special interest, as well as their relative importance in the region.
- Understanding of the landscape processes, including geological, vegetation and settlements patterns which give the landscape its particular character or scenic attributes.
- The inclusion of both quantitative criteria, such as visibility and qualitative criteria, such as aesthetic value or sense of place.
- The incorporation of visual input as an integral part of the project planning and design process, so that the findings and recommended mitigation measures can inform the final design and quality of the project.
- To test the value of visual/aesthetic resources through public involvement.

3.1.1 Principles

The following principles to apply throughout the project:

- The need to maintain the integrity of the landscape within a changing land use process
- To preserve the special character or ‘sense of place’ of the area
- To minimize visual intrusion or obstruction of views
- To recognize the regional or local idiom of the landscape.

3.1.2 Fatal flaw statement

A potentially fatal flaw is defined as an impact that could have a “no-go” implication for the project. A “no-go” situation could arise if the proposed project is to lead to (Oberholzer, 2005):

1. Non-compliance with Acts, Ordinance, By-laws and adopted policies relating to visual pollution, scenic routes, special areas or proclaimed heritage sites.
2. Non-compliance with conditions of existing Records of Decision.
3. Impacts that may be evaluated to be of high significance and that are considered by the majority of stakeholders and decision-makers to be unacceptable.

The screening of the site and initial project intentions did not reveal any of the above issues which may result in a fatal flaw.

3.1.3 Gaps, limitations and assumptions

1. The assessment is made on a broad development and technology concepts as detail site layout is not available.
2. Exact height of PV units is not provided and assessment is based on assumption that the units are maximum 3m in height when in a vertical position and therefore a maximum height of 3m will be assessed.
3. Transmission lines will connect to the ESKOM substation to the south. No detail alignment of this line is currently available and therefore the impact cannot be assessed in detail.
4. It is not known whether any new access roads will be constructed and therefore such infrastructure has not been assessed.
5. Regional thresholds for land use change to accommodate renewable energy nodes which may change the landscape, has not been determined and thus such statement cannot be made on a project level.

3.1.4 Assessment explained

The assessment of visual impact is done on two levels namely the absorption rate of the receiving environment and the individual view receptors. The absorption rate of the receiving environment is determined by various elements e.g. topography, land use etc. and the assessment will focus on the acceptable level of change of the area.

Visual receptors are assessed individually based on the sensitivity of the receptor, exposure to the development and intrusion rate.

The following framework is used in order to assess view receptors:

Criteria	High	Moderate	Low
Exposure	Dominant, clearly visible	Recognizable to the viewer	Not particularly noticeable to the viewer
Sensitivity	Residential, nature reserves, scenic routes	Sporting, recreational, places of work	Industrial, mining, degraded areas
Intrusion/Obstructive	A noticeable change, discordant with surroundings	Partially fits but clearly visible	Minimal change or blends with surroundings

A sensitive receptor with low exposure and/or low intrusion rate can be regarded as a low significance rating. A receptor of low sensitivity but with high exposure can be of high significance if the intrusion rate is also high but is reduced if the intrusion rate is medium or low.

The overall significance, therefore, depends not only on the sensitivity of the receptor but also on the exposure and intrusion rate and thus a combination of the criteria.

3.2 Legal Framework, Guidelines and policies

3.2.1 National Environmental Management Act, 107, 1998 and relevant Guidelines:

An assessment in terms of any activity that requires an EIA or Basic Assessment may be subjected to a specialist visual assessment in order to determine the significance of the potential impacts to result from a proposed activity.

3.2.2 Free State Provincial Spatial Development Framework, 2014

No specific references on this scale of development.

3.2.3 Lejeweleputswa IDP

This document support in principle the development of alternative energy sources within an environmentally sound context. The document provide no detail which will impact or provide policy guidelines on the development of such facilities.

4 Development Proposal

4.1 General Description PV units

The development will consist of solar panels mounted on steel supporting array structures and are configured into a number of sub array systems. The units will be able to tilt up and down but not rotate with the sun. The units will thus always be positioned in a northerly direction.

The development consists of the following elements

- 1) Solar Array and infrastructure
- 2) DC to AC Inverter stations
- 3) LV to MV transformer stations
- 4) MV to HV transformer stations and feed to Sub Station

Site needs some leveling. Expected height 2,4m but maximum height for any structures assumed at 3m above ground. Arrays orientated east-west with horizontal movement north-south



Figure 3: Typical single axis PV arrays

4.2 Project Site elements

Site circumscribed with fire access road and fence. Probably consisting of electrified, galvanized palisade fence of 2,4m in height.

Figure 3: Typical support infrastructure i.e. power lines, substation & switches, fences



4.2.1 Operational elements

Depending on the exact technology the operational activities can vary. For the typical units described above, teams will access the site and physically clean panels. This is done either by rope access or the use of “cherry pickers”. In areas of high dust conditions, cleaning can be more regular.

4.3 Construction elements

For the construction of the typical units describe above, large earth moving equipment will be used as well as high lift equipment and cranes. Large transport trucks for delivery will enter the site during construction. For technology that uses smaller units or static units the scale of equipment required for construction will be less.

Construction process entails:

- clearing and leveling of the site,
- construction of array mounting racks which may involve concrete bases and
- fitting of panels
- construction of internal and access roads
- Fencing and security infrastructure
- Construction of support facilities such as maintenance sheds, etc
- Construction of transmission lines

5 RECEIVING VISUAL ENVIRONMENT

5.1 Description

Understanding the potential impact of a proposed development, an understanding of the receiving environment is important. In this regard, the main elements of the receiving environment relate to the character of the current surrounding land use and the absorption capacity of the area. The character of the area entails the sense of place created by the current land use and the scale and type of infrastructure or physical elements within the immediate area. The absorption capacity relates to the density of physical elements and topographical variations of the landscape, which will determine the catchment area. The human eye will observe the horizon on a perfectly flat surface at a distance of 30km. This is however significantly reduced by landscape elements which obstruct the view or increased if the viewer is elevated above the site.

5.1.1 Catchment area

The site is situated in a rural area dominated by low intensity agricultural activities. Homesteads are spread out in the landscape, typically 3 -5km apart. A number of High Voltage power lines converge at the Perseus Substation to the south of the site. Perseus occupies approximately 140ha. The area thus display a typical rural landscape character with electricity network infrastructure very dominant in the landscape. The catchment area consists of low hills and shallow valleys with the maximum east-west elevation variation across the site of 20 -30m.

The catchment area is limited to the 1300 to 1320 relief line resulting in a fairly limited viewshed. The viewshed extend to the north as the area south of Dealesville slopes down towards the Modder river valley.

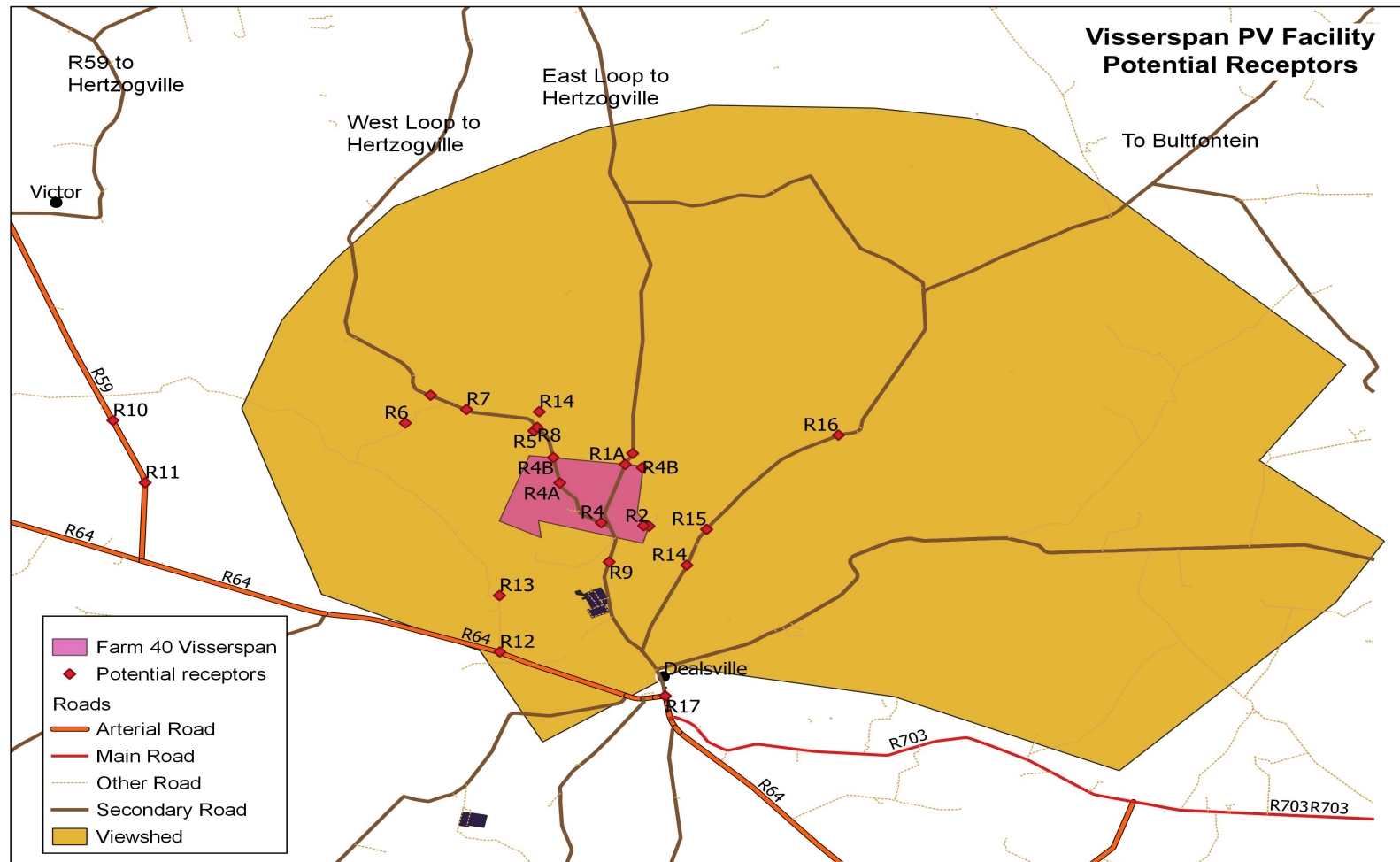


Figure 4: Viewshed

5.1.2 Sense of Place:

The site is situated in low intensive agricultural landscape with natural remnants which is primarily used for grazing. Some game farming occurs in the area. The area display a sense of remoteness with homesteads located well apart and Dealesville is a typical rural village. The area does however do not display a strong tourism sector and visitors are most probably visiting family, on business probably related to agriculture industry or simply passing through with little interest in the landscape itself. The existing Perseus substation and high voltage powerlines is a prominent element in the landscape which does reduce the rural atmosphere.

Although the topography may appear fairly flat, the landscape is characterized by undulating rises and valleys which create significant visual screening for infrastructure with a low vertical extent. Any structures under 10m can be easily absorbed into the landscape.

5.2 Findings

The site is located in a rural area. However the Preseus substation and the High voltage power lines that converge at the substation dominate the landscape and thereby deduct from the the remoteness of the area.

Dealesville, the closest town, is situated 7km to the south of the site. Preseus substation dominates the view from the town towards the north.

No major roads pass or approach the site. The R64 pass south of the site in an east-west direction and do not approach the site directly. Only two lower order gravel roads access and pass the site being the road to Bultfontein and to Hertzogville. No scenic drives or tourism corridors or nodes have been identified.

Statement 1: *The area where the site is situated is characterized as a rural landscape with large scale infrastructure present. No land uses with high sensitivity towards scenic value has been identified. The area in general thus display a low visual sensitivity. The topography provides a medium level of visual absorption for low vertical extent objects.*

6 VISUAL RECEPTORS

Visual receptors are positions that are accessible or regularly accessed by people and from where the development site is potentially visible. Based on the character of the locality of the receptor, its sensitivity can be rated. Generally, residential areas and tourism-related destinations and routes are sensitive to visual intrusions as they relate to the well-being of residents and the tourism quality of the area. Receptors are not only fixed positions but can also be routes.

6.1 Potential Receptors

A number of routes exists within the viewshed area which has to be assessed. These are :

1. The R64 from Bloemfontein to Boshof
2. The R59 from the R64 to Herzogville
3. Gravel road from Dealesville to Bultfontein
4. Gravel road from Dealesville to Herzogville. This road split just south of Visserpan into an eastern loop and a western loop.
5. R703 to Soutpan
6. Various local tracks connecting farms

Other potential visual receptors are :

1. Homesteads
2. Tourism accommodation

The following potential visual receptors have been identified:

Potential Receptor	Comment	Screening
R64 connecting Bloemfontein and Boshof	Situated to the south running in an southeast-west direction, view is only directed in the direction of the site, south of Dealesville from where it turn westward. Screened by the landscape and dominated by HV power line	Assess profile. Low visibility expected (R12)
R59 to the west connecting the R64 with Herzogville	The road is running north-south direction but 12+km to the west. It is screened by low ridges. Not a high order road	Not a sensitive receptor. Low visibility expected. Assess profile (R10, R11)
Gravel road from Dealesville to Bultfontein	Low order road with low traffic volumes.	Not a sensitive receptor. Low visibility expected. Assess profile (R14, R15, R16)
Gravel road from Dealesville to Herzogville (east loop)	Low order road with low traffic volumes. The road skirt the site to the east	Assess profile. Not a sensitive receptor. (R9, R3, R1)
Gravel road from Dealesville to Herzogville (west loop loop)	Low order road with low traffic volumes. The road skirt the site to the east and potentially the receptor with the highest exposure to the site	Assess profile. High visibility expected (R4, R8, R7)

Potential Receptor	Comment	Screening
R703 to Soutpan	The road is on lower gradient and thus outside the viewshed	Outside viewshed.
Visserspan Homestead	Homestead will be amid the project.	Medium sensitivity but high exposure. Owner of property
Rooirand Homestead	Close to the site on same gradient. View directly towards PV arrays	Assess profile. Homestead of medium sensitivity (R85), medium exposure expected
Wonderkop Homestead	Towards the north on higher ground	Assess profile. Homestead of medium sensitivity (R6)
Melsetter homestead	Abutting eastern boundary of farm 40	Assess profile. Homestead of medium sensitivity (R2)
Mooihoek/Kinderdam Hunter's cottage	Mooihoek indicated tourism accommodation but on inquiry it was indicated the only unit is the Hunter's cottage to the east of the Bultfontein road	Assess Bultfontein road profile. Hunters cottage on same gradient (R14, R15)
Dealesville	The town is on a lower altitude and screened by the landscape and landscape elements	Assess Profile. Medium sensitivity. (R17)

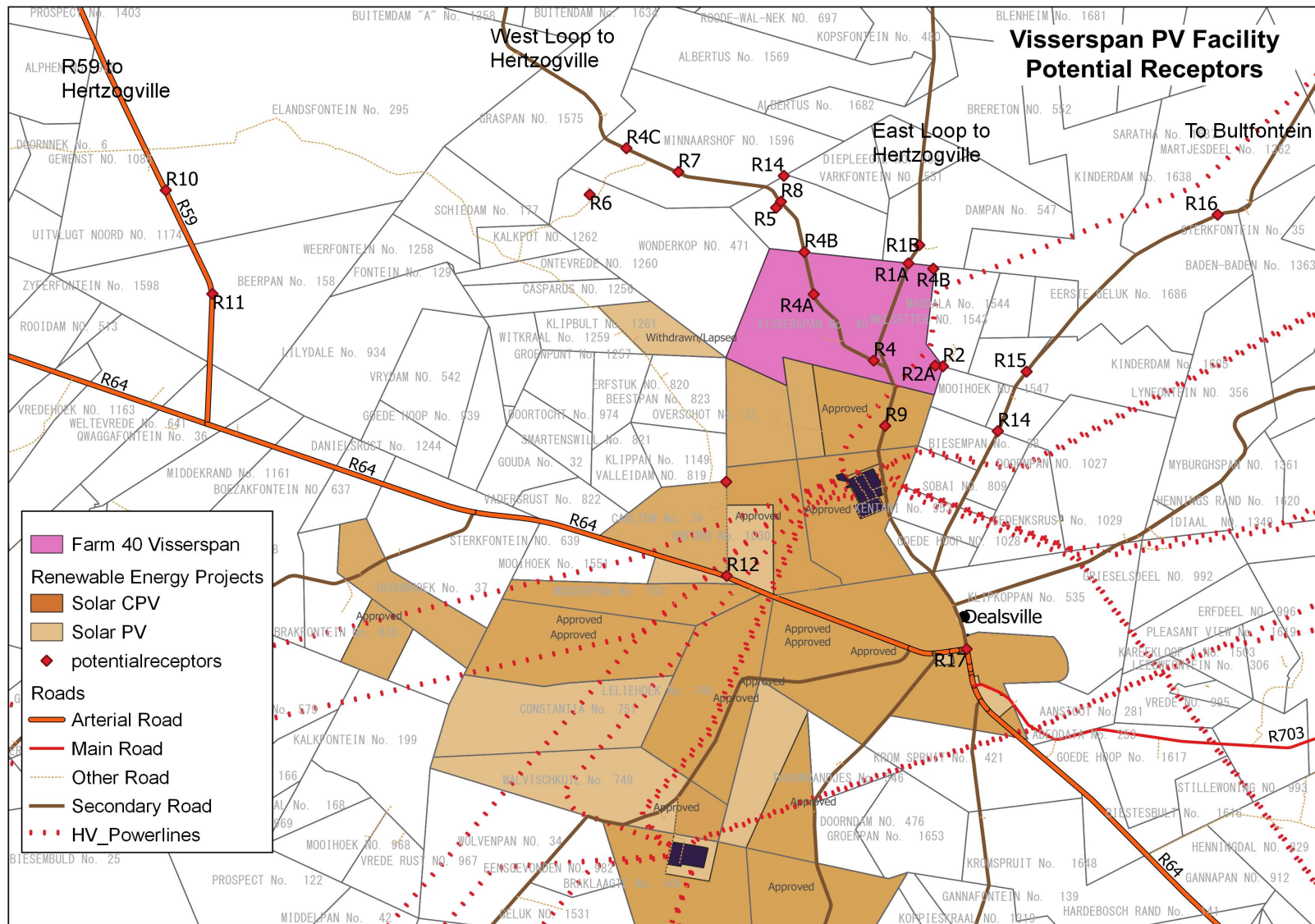


Figure 5: Potential Visual Receptors

6.2 Assessment of Receptors

Refer to Annexure A and B for detail profiles and photos.

6.2.1 R64 from Bloemfontein to Boshof

The R64 runs in a general southeast-northwest direction. As the travellers approach from Bloemfontein the direction is NNW to Dealesville where it turns in a westerly direction. Approaching from Bloemfontein the line of sight is thus towards Dealesville and the site, but due to the topography, landscape elements and distance from site, the site is not visible.

Passing through the town, the site is in the side view but also screened by the landscape and Preseus substation.

Travelling thus in a westerly direction the site is not visible.

If travel is in the opposite direction, the site will be slightly to the left. However the topography and landscape elements such as the High voltage transmission lines and Preseus substation, the site is screen and may only be visible vaguely for short periods of time but will mostly not be visible. (Refer Annexure A, Profile R12)

Table 3: R64 Assessed as receptor

Criteria	High	Moderate	Low
Exposure	dominant, clearly visible	recognizable to the viewer	not particularly noticeable to the viewer
Sensitivity	residential, nature reserves, scenic routes	sporting, recreational, places of work, national road	industrial, mining, degraded areas
Intrusion/Obstructive	noticeable change, discordant with surroundings	Partially fits but clearly visible	minimal change or blends with surroundings
Duration			short

The overall visual significance is low.

6.2.2 R59 from the R64 to Herzogville

The R59 is outside the viewshed and no impact is expected.

6.2.3 Gravel road from Dealesville to Bultfontein

This road is a lower order road primarily used by local farmers. The road follows mostly lower lying area and to a great extent screened by the low rise to the west. Only glimpses of the site may be visible and thus for a short period of time (Refer Annexure A, Profile R14, R15, R16)

Table 4: Bultfontein Road assessed as receptor

Criteria	High	Moderate	Low
Exposure	dominant, clearly visible	recognizable to the viewer	not particularly noticeable to the viewer
Sensitivity	residential, nature reserves, scenic routes	sporting, recreational, places of work, national road	industrial, mining, degraded areas
Intrusion/Obstructive	noticeable change, discordant with surroundings	Partially fits but clearly visible	minimal change or blends with surroundings
Duration			short

The visual significance is rated as low.

6.2.4 Gravel road from Dealesville to Herzogville - East loop

Approaching from Dealesville the travellers pass the substation at which point the site is not yet visible. Before the road split into the east and west loops, the site remains out of site due to the low rise in the landscape which screen the site (Refer Annexure A, Profile R9). The site only comes into view when the traveller is less than 1km from the boundary.

The road skirt the site for about 500m. Along this stretch of road the site is in clear view but after the split the road turns north east, directing the view away from the site.

A low rise in the landscape between the East and the West loop, create a screen from the East loop to the site. The site might be visible intermittently but only for short periods of time and also in the side view of the traveller. (Refer Annexure A, Profile R1, R3, R4)

The overall visual significance is thus rated as low.

Table 5: Hertzogville East Loop assessed as Receptor

Criteria	High	Moderate	Low
Exposure	dominant, clearly visible	recognizable to the viewer	not particularly noticeable to the viewer
Sensitivity	residential, nature reserves, scenic routes	sporting, recreational, places of work, national road	industrial, mining, degraded areas
Intrusion/Obstructive	noticeable change, discordant with surroundings	Partially fits but clearly visible	minimal change or blends with surroundings
Duration	Constant		short

6.2.5 Gravel road from Dealesville to Herzogville - West loop

The roads runs along the sites perimeter fence for about 3,5km and will thus be a full view. Travelling from the north, the road runs over a few high points from where the site may be visible in the distance. Closer to the site a small hill screen the site from the traveller. The traveller will be aware of a change in landscape elements but it will be short exposures and not intrusive or obstructive. The overall visual significance is thus rated as low. A slight glare may be experienced off the panels when the PV arrays are directed north. This will be mostly in the winter when the sun is furthest north and panels directed in most extreme north position. Due to the low vertical extent of the panels, it will be screened by the perimeter fence, thus reducing the glare effect for motorist. A motorist eye level will also be below the perimeter fence. As a safety precaution, road signs can be considered to make drivers aware of possible

The overall visual significance is thus rated as moderate to low.

Table 5: Hertzogville West Loop assessed as visual receptor

Criteria	High	Moderate	Low
Exposure	dominant, clearly visible	recognizable to the viewer	not particularly noticeable to the viewer
Sensitivity	residential, nature reserves, scenic routes	sporting, recreational, places of work, national road	industrial, mining, degraded areas
Intrusion/Obstructive	noticeable change, discordant with surroundings	Partially fits but clearly visible	minimal change or blends with surroundings
Duration	Constant		short

6.2.6 R703 to Soutpan

The site is out of view of this road.

6.2.7 Rooirand Homestead (R5)

The Rooirand Homestead is situated adjacent the site. The homestead is however in a degraded state and only occupied by a farm worker family. The perimeter fence and the first row of PV arrays of Project 1 will be in clear site from the farm worker cottage. Project 2 is screened by Project 1. Trees on the Rooirand property however provide some screening. The overall visual significance is rated low due to the degraded state of the homestead and the screening provided by landscape elements which reduce the intrusive level of the facility

Table 6: Rooirand Homestead assessed as visual receptor

Criteria	High	Moderate	Low
Exposure	dominant, clearly visible	recognizable to the viewer	not particularly noticeable to the viewer
Sensitivity	residential, nature reserves, scenic routes	sporting, recreational, places of work, national road	industrial, mining, degraded areas Degraded homestead
Intrusion/Obstructive	noticeable change, discordant with surroundings	Partially fits but clearly visible	minimal change or blends with surroundings
Duration	Constant		short

6.2.8 Wonderkop Homestead (R6)

The Wonderkop Homestead is situated well to the northwest of the site but is screened from the site by a range of low hills between the homestead and the site. The site would not be visible from the homestead. (Refer Annexure A, Profile R6)

6.2.9 Mooihoek Hunter's Cottage (R14, R15)

The Mooihoek farm provides limited tourism facilities. Accommodation is provided in the "Hunters cottage" situated to the east of the Bultfontein road. Both the homestead and cottage are screened by low rises to the west. The site will not be visible from the farm or cottage and thus no impact is expected.

6.2.10 Melsetter and adjacent homesteads

Although these farms are in close proximity to the site, the topography allows significant screen to the reduce the intrusive level. The top of the PV arrays may be visible but not obstructive. Various landscape elements also provide some screening, thereby lowering the impact. (Refers Annexure A, R2)
The overall visual significance is rated as low.

Table 6: Melsetter & adjacent homesteads assessed as visual receptors

Criteria	High	Moderate	Low
Exposure	dominant, clearly visible	recognizable to the viewer	not particularly noticeable to the viewer
Sensitivity	residential, nature reserves, scenic routes	sporting, recreational, places of work, national road	industrial, mining, degraded areas
Intrusion/Obstructive	noticeable change, discordant with surroundings	Partially fits but clearly visible	minimal change or blends with surroundings
Duration	Constant		short

6.2.11 Dealesville

The town is on the perimeter of the viewshed. It is located lower than the site. The Preseus substation and the High voltage power lines also create a visual barrier towards the site. The site would thus not be visible from town.

Statement:

The overall visual impact on the identified receptors are low and require no mitigation measures to reduce visual impact. Pre-cautionary roadsigns can be applied on the Hertzogville road to warn of possible seasonal glare which may reduce visibility.

Table 6: Summary of assessment of visual receptors

Potential Receptor	Comment	Assessment
R64 connecting Bloemfontein and Boshof	Situated to the south running in an southeast-west direction, view is only directed in the direction of the site, south of Dealesville from where it turn westward. Screened by the landscape and dominated by HV power line	Low.
R59 to the west connecting the R64 with Herzogville	The road is running north-south direction but 12+km to the west. It is screened by low ridges. Not a high order road	Beyond viewshed. No impact
Gravel road from Dealesville to Bultfontein	Low order road with low traffic volumes. Low ridges to the west screen the site. Intermittent views possible but short duration	Low
Gravel road from Dealesville to Herzogville (east loop)	Low order road with low traffic volumes. Screened by low rises	Low
Gravel road from Dealesville to Herzogville (west loop loop)	Low order road with low traffic volumes. The road skirt the site to the east but due to vertical extent of infrastructure, not intrusive. Potential seasonal glare effect. Intermittent views thus short duration	Moderate to Low
R703 to Soutpan	The road is on lower gradient and thus outside the viewshed	Low
Visserspan Homestead	Homestead will be midst the project.	Low
Rooirand Homestead	Close to the site on same gradient. View directly towards PV arrays. Screened by on-site trees.	Low
Wonderkop Homestead	Towards the north on higher ground	Not visible. No impact
Melsetter homestead	Abutting eastern boundary of farm 40. Screened by landscape elements and low rises	Low
Mooihoek/Kinderdam Hunter's cottage	Screened by low ridges to the west	Not visible. No impact
Dealesville	The town is on a lower altitude and screened by the landscape and landscape elements	Not visible. No impact

7 CUMULATIVE IMPACT

The Department of Environment and Tourism issued a guideline document in terms of which cumulative impacts should be assessed.¹ This guideline document identifies types and characteristics of different cumulative effects as summarized in the table below.

As per Figure 5 below, a large number of PV facilities have already been approved to the south of the site, extending beyond the R64. It is not clear whether these or which of these will be implemented. Should all these projects be constructed it will create a node of high intensity PV development which will change the visual character of the landscape. Thresholds for such nodes within areas of high renewable energy potential has not been determined on a regional level and it is not possible to include such an assessment on a project level.

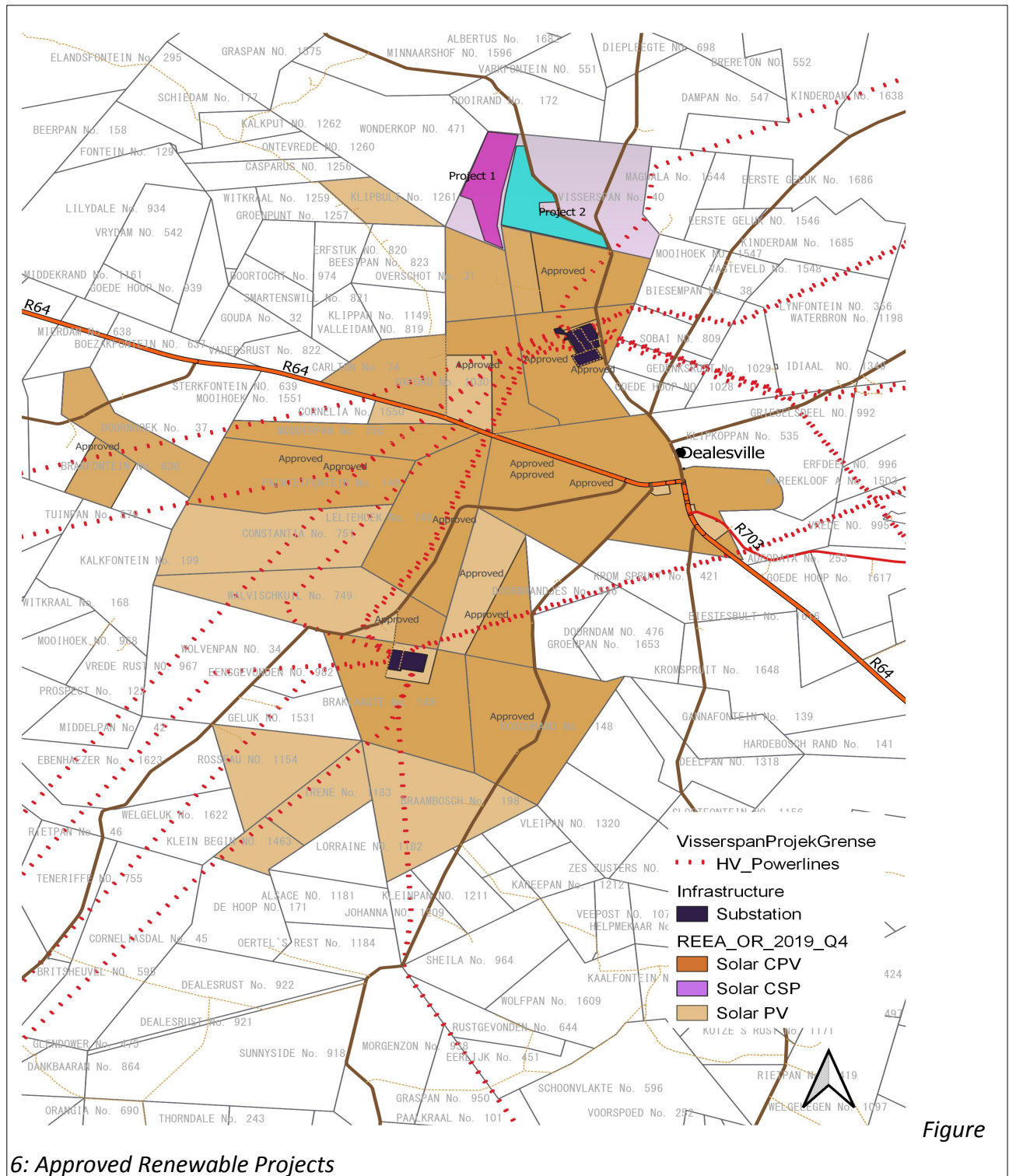
Table 7: Types and characteristics of cumulative effects

TYPE	CHARACTERISTIC	IDENTIFY POTENTIAL IMPACT
Time Crowding	Frequent and repetitive effects.	Activity remains at same pace, frequency and intensity over time. No time crowding impacts.
Time Lags	Delayed effects.	No time lag impacts.
Space Crowding	High spatial density of effects.	A number of PV projects have been approved in the area. The total area directly south of the site beyond the R64 has been approved for PV development. Project 1 and 2 combined increase the pro rate contribution to this impact. Project 2 extent the area along the road which is bordered by PV arrays with another 3,5km. A concentration of PV facilities are created and the cumulative impact may result in a more industrial visual appearance to the area.
Cross-boundary	Effects occur away from the source.	No impact
Fragmentation	Change in landscape pattern.	Due to the fact that the site abuts other approved PV plants and the presence of substation, the landscape pattern is not fragmented but a new landscape character may evolve creating a renewable energy node. If not all the developments proceed, the landscape may be fragmented.
Compounding Effects	Effects arising from multiple sources or pathways.	No compounding impacts.
Indirect Effects	Secondary effects.	No impact
Triggers and Thresholds	Fundamental changes in system functioning and structure.	Visual thresholds for renewable energy facilities in areas identified suitable for such facilities have not been determined.

Statement:

The cumulative impact of Project 2 of the Visserspan PV facility contribute little to the overall cumulative impact of the total number of PV facilities already approved. Due to the fact that thresholds have not been determined on a regional level, a statement to that effect on a project level is not appropriate.

¹ DEAT (2004) Cumulative Effects Assessment, Integrated Environmental Management, Information Series 7, Department of Environmental Affairs and Tourism (DEAT), Pretoria



8 CONSTRUCTION

During construction, various types of vehicles and equipment will be transported to the site and work on the site. This will impact on the general experience of viewers. This impact is however temporary and not uncommon during construction of infrastructure. Communities have fairly high tolerance levels for such activities if it contributes to the infrastructure and economic growth of the area.

Rating: Low

9 FINDINGS

The undulating landscape and the low vertical extent of the planned infrastructure results in a low overall visual impact.

The small extent of the project in relation to the number of approved PV facilities as well as the fact that the site abuts the approved projects and is in close proximity to the Preseus substation result in a low contribution to the cumulative impact with regards to crowding. Project 2 combined with Project 1 does increase the pro rata contribution but is still low.

10 MITIGATION MEASURES

As a pre-cautionary measure, road signs can be provided on the Hertzogville West loop approaching from the north, to make drivers aware of possible glare which may reduce visibility.

Due to the low overall visual impact, no other mitigation measures are required.

R1 Hertzogville East Loop

R2 Melsetter & abutting Homesteads

R5 Rooirand Homesteads

R6 Wonderkop Homesteads

R7 Hertzogville road west loop

R9 Hertzogville road before split

R12 R64

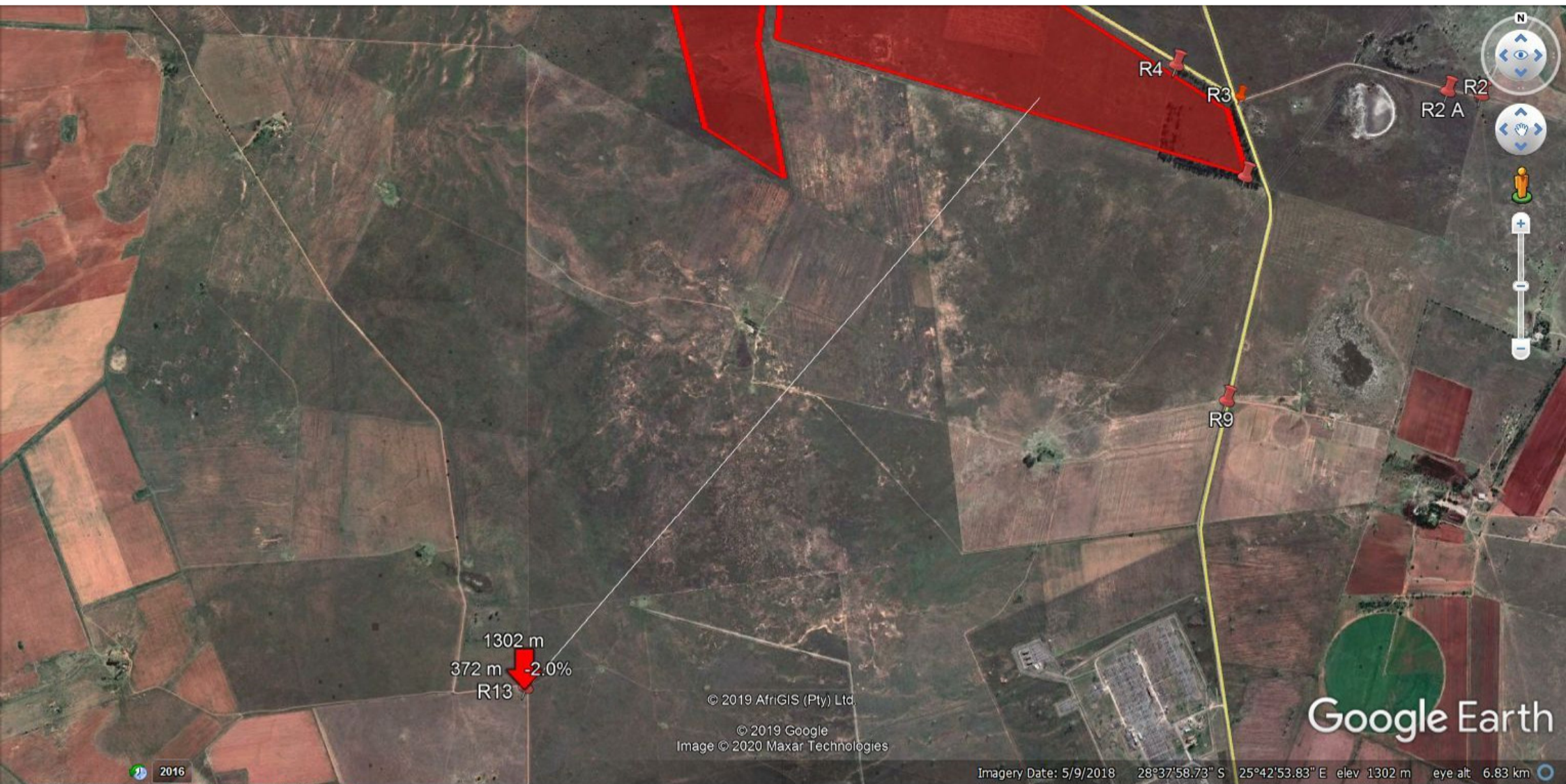
R13 Farm access road to westerly

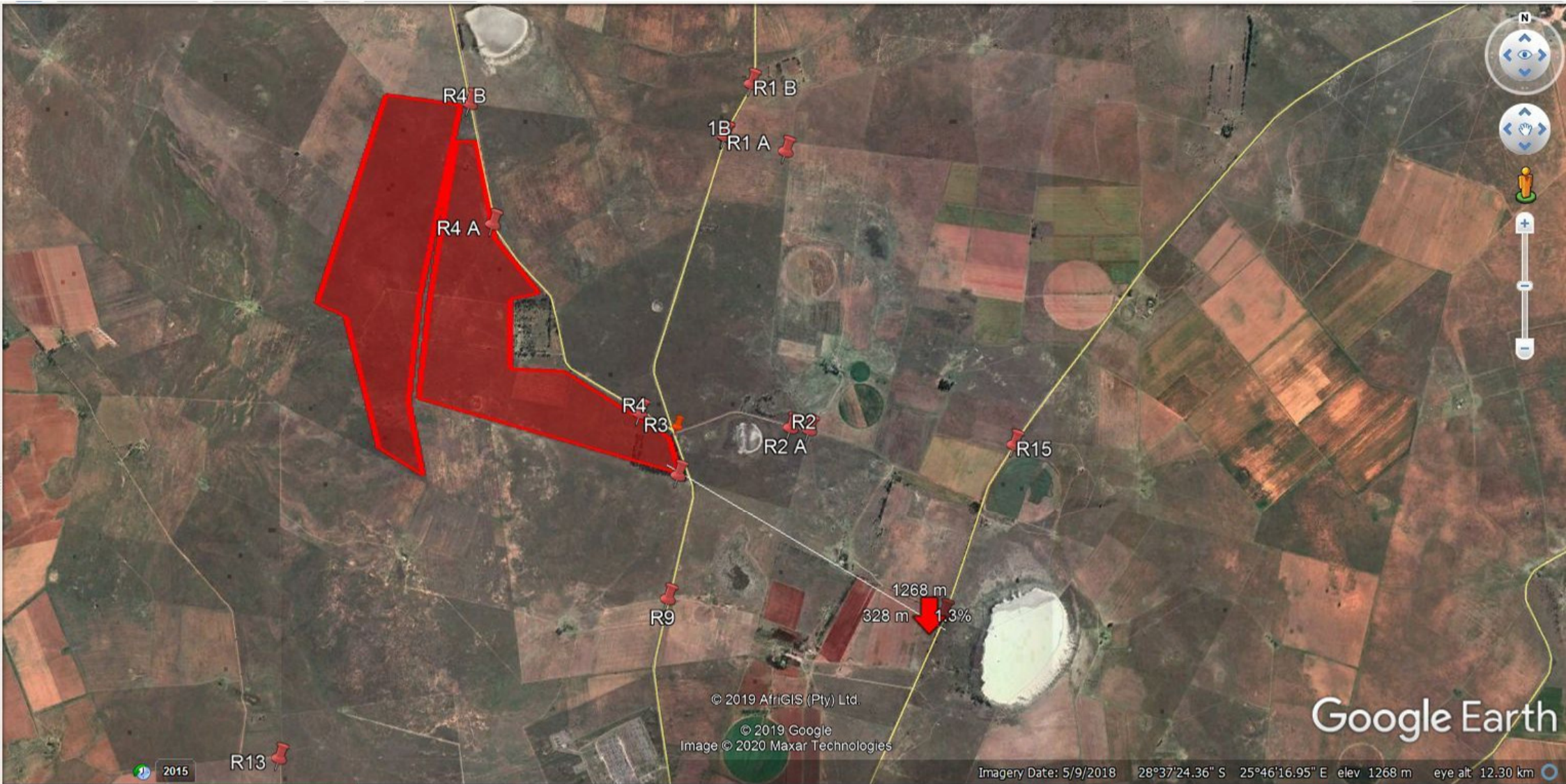
R14 Mooihoek entrance on Boshof road

R15 Hunter's cottage entrance on Boshof Road

R16 Boshof road

R17 Dealesville

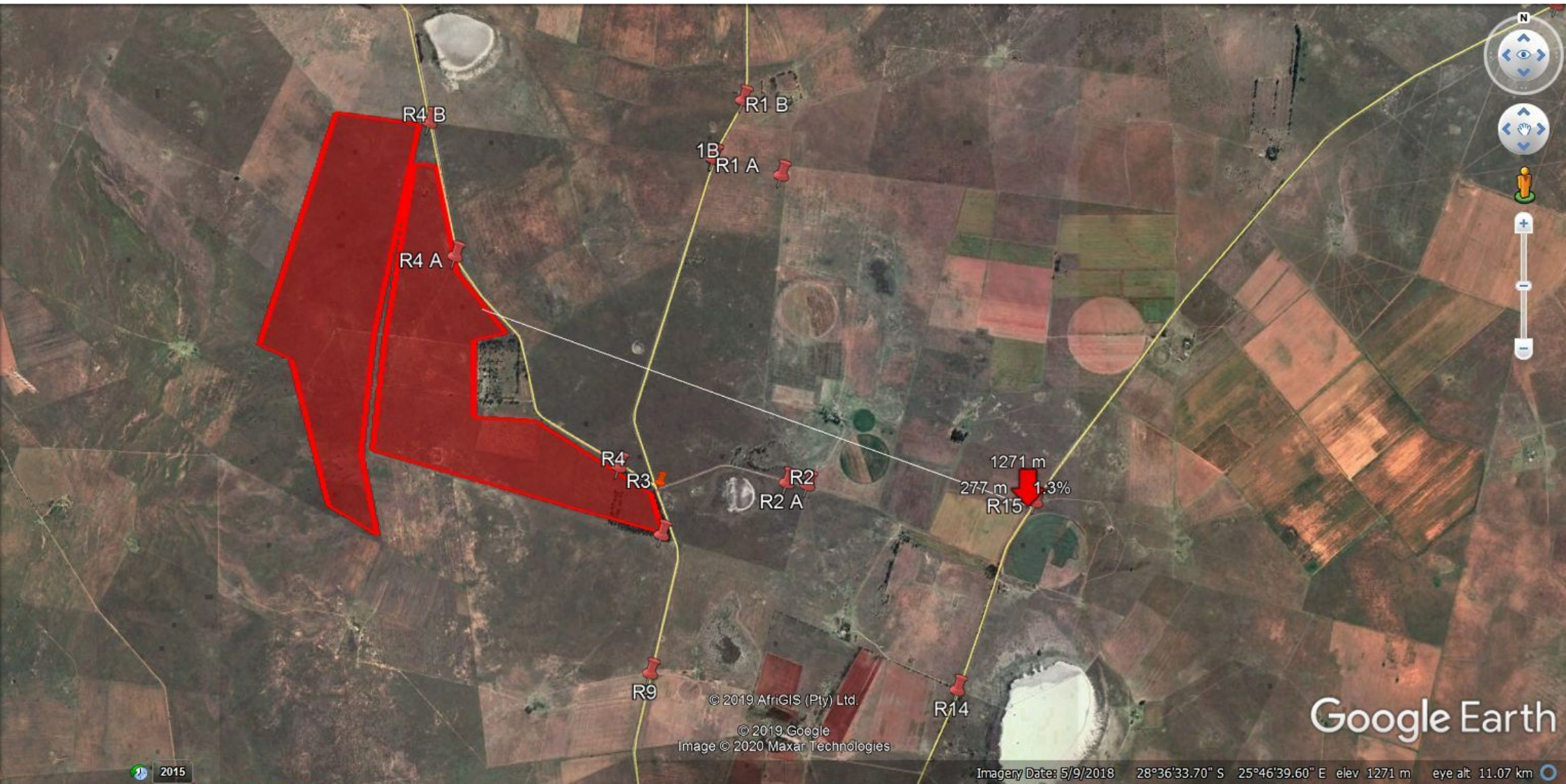




Graph: Min. Avg. Max Elevation: 1264, 1276, 1286 m

Range Totals: Distance: 2.94 km Elev Gain/Loss: 33.6 m, -13.4 m Max Slope: 6.0%, -4.4% Avg Slope: 1.8%, -1.2%

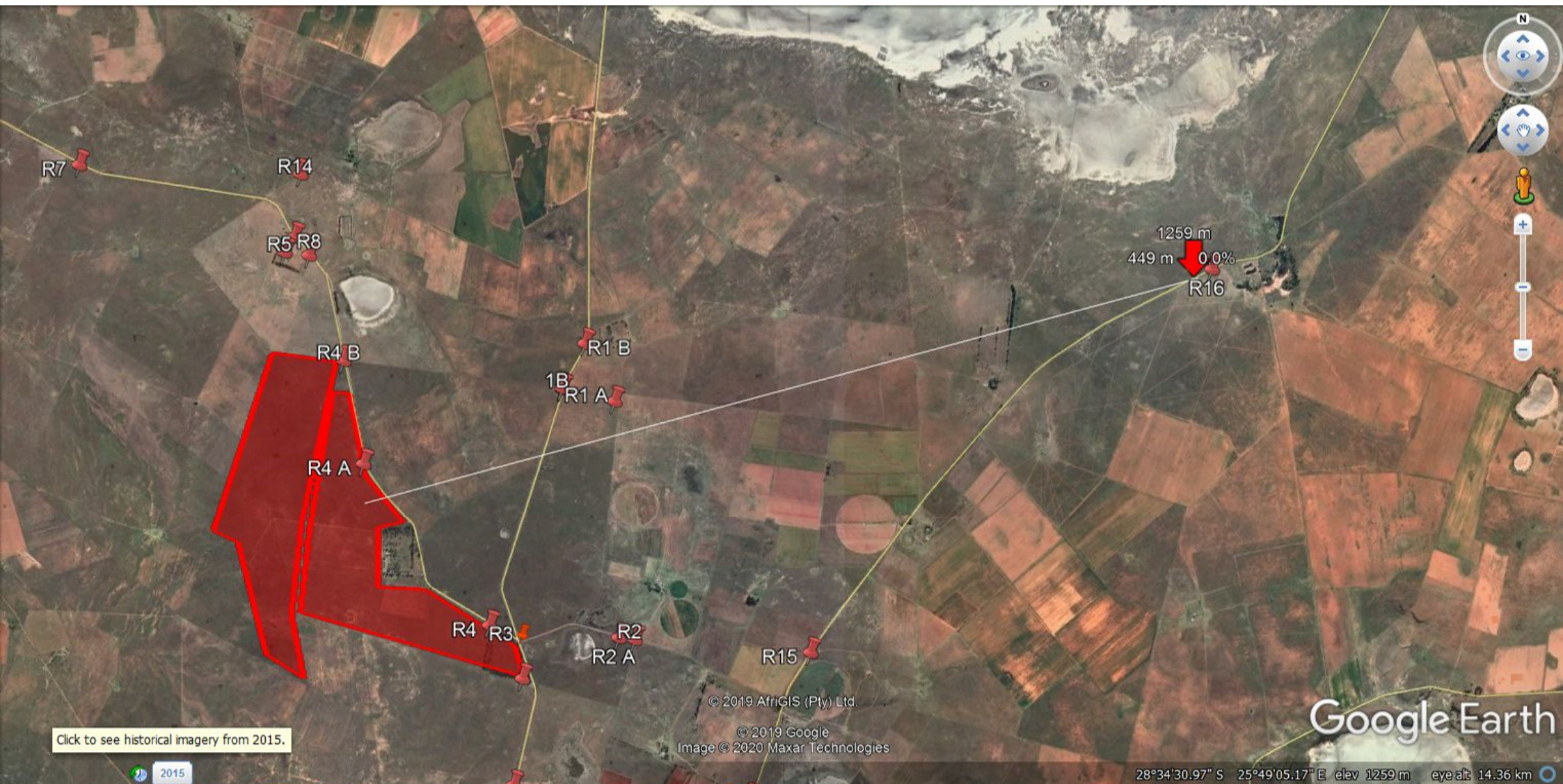


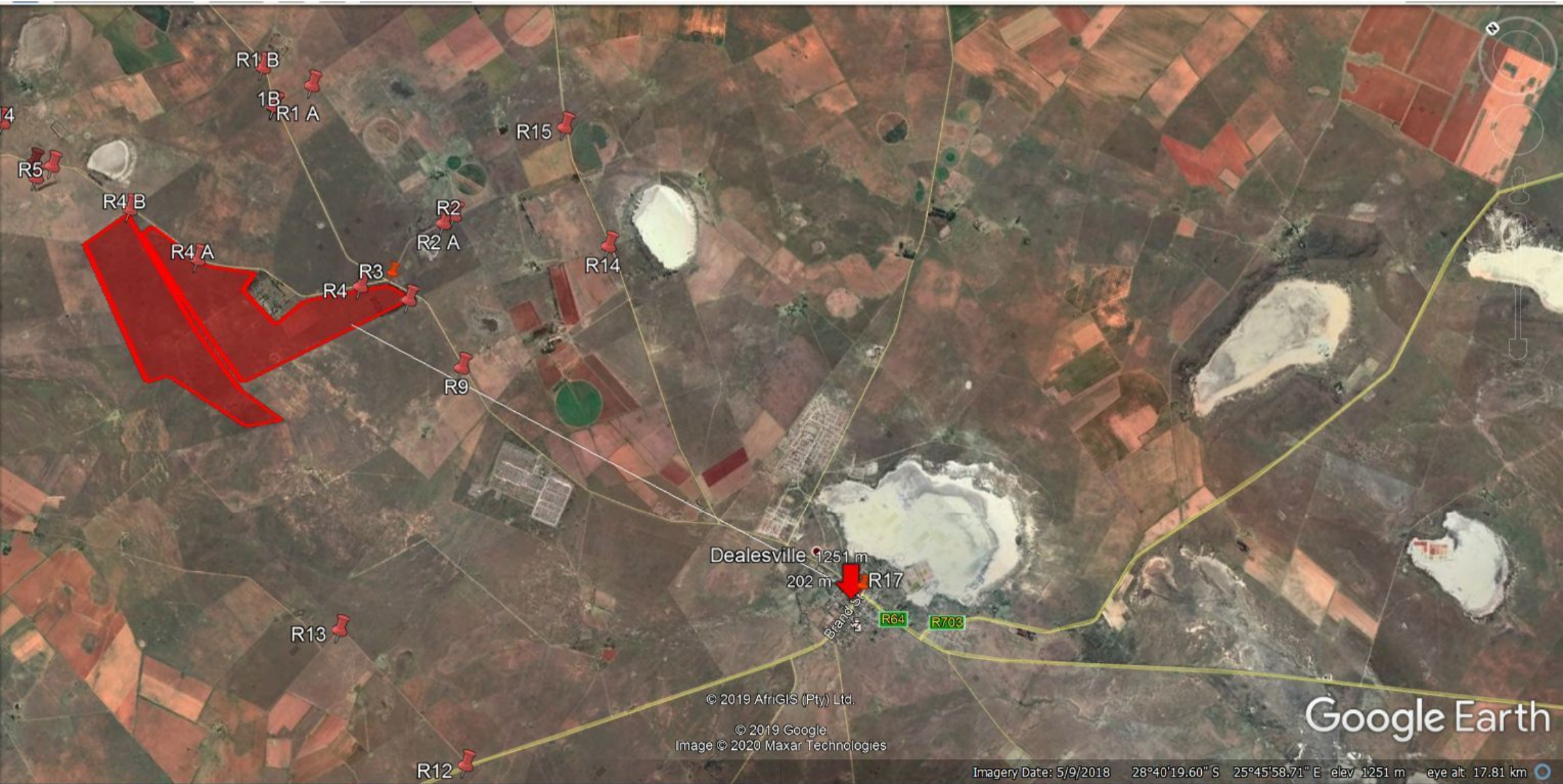


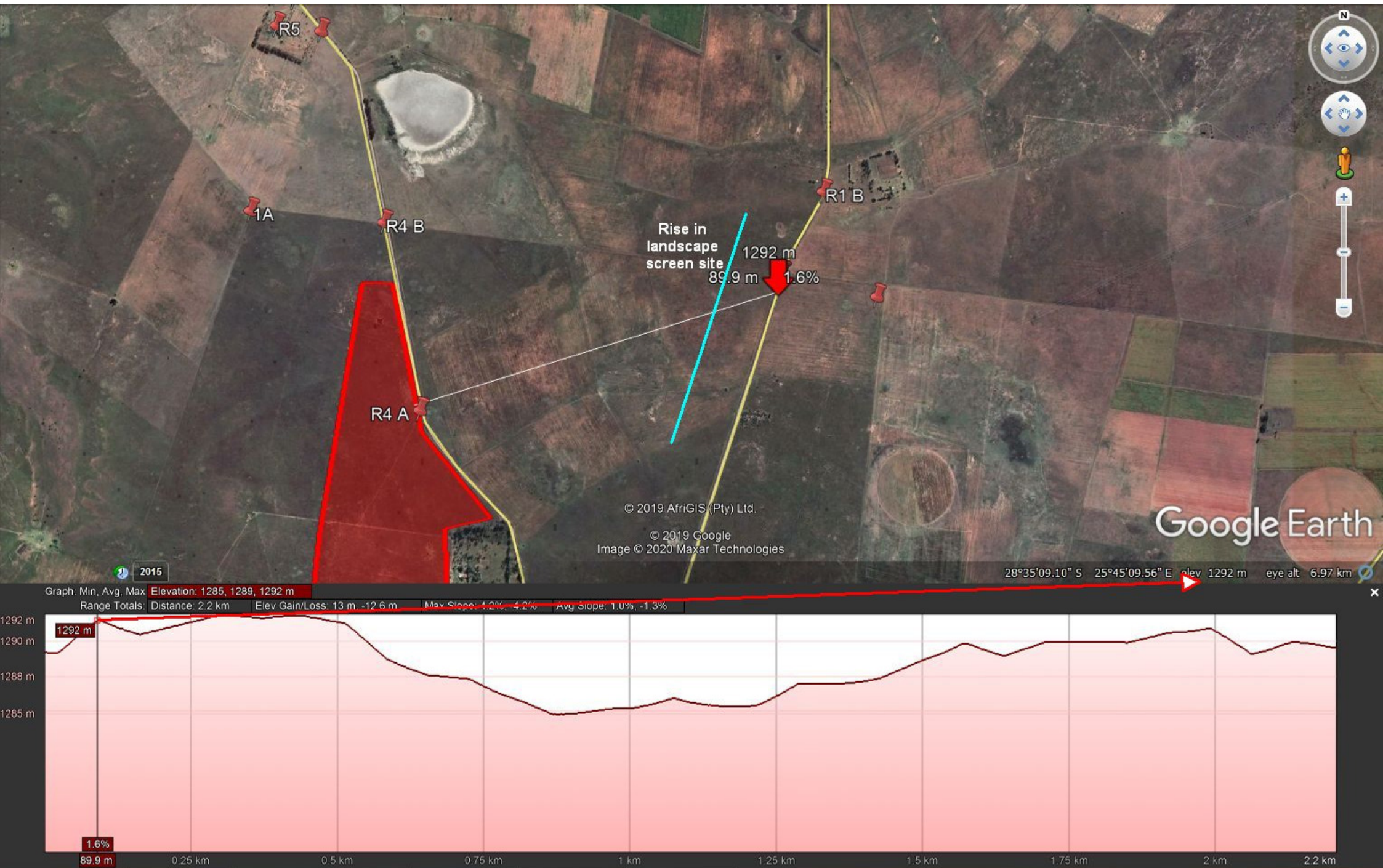
Graph: Min. Avg. Max Elevation: 1270, 1279, 1289 m

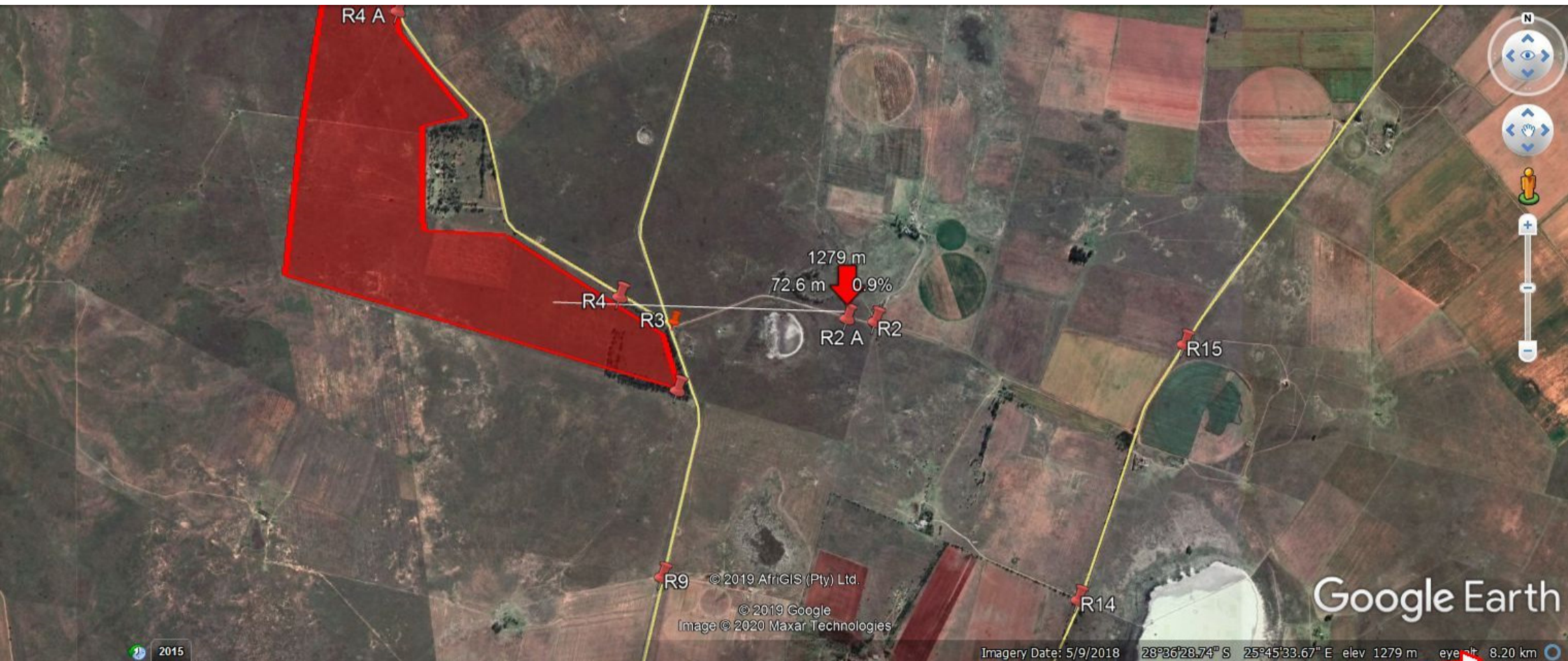
Range Totals: Distance: 4.76 km Elev Gain/Loss: 32.2 m, -13.5 m Max Slope: 3.4%, -2.7% Avg Slope: 1.0%, -0.9%







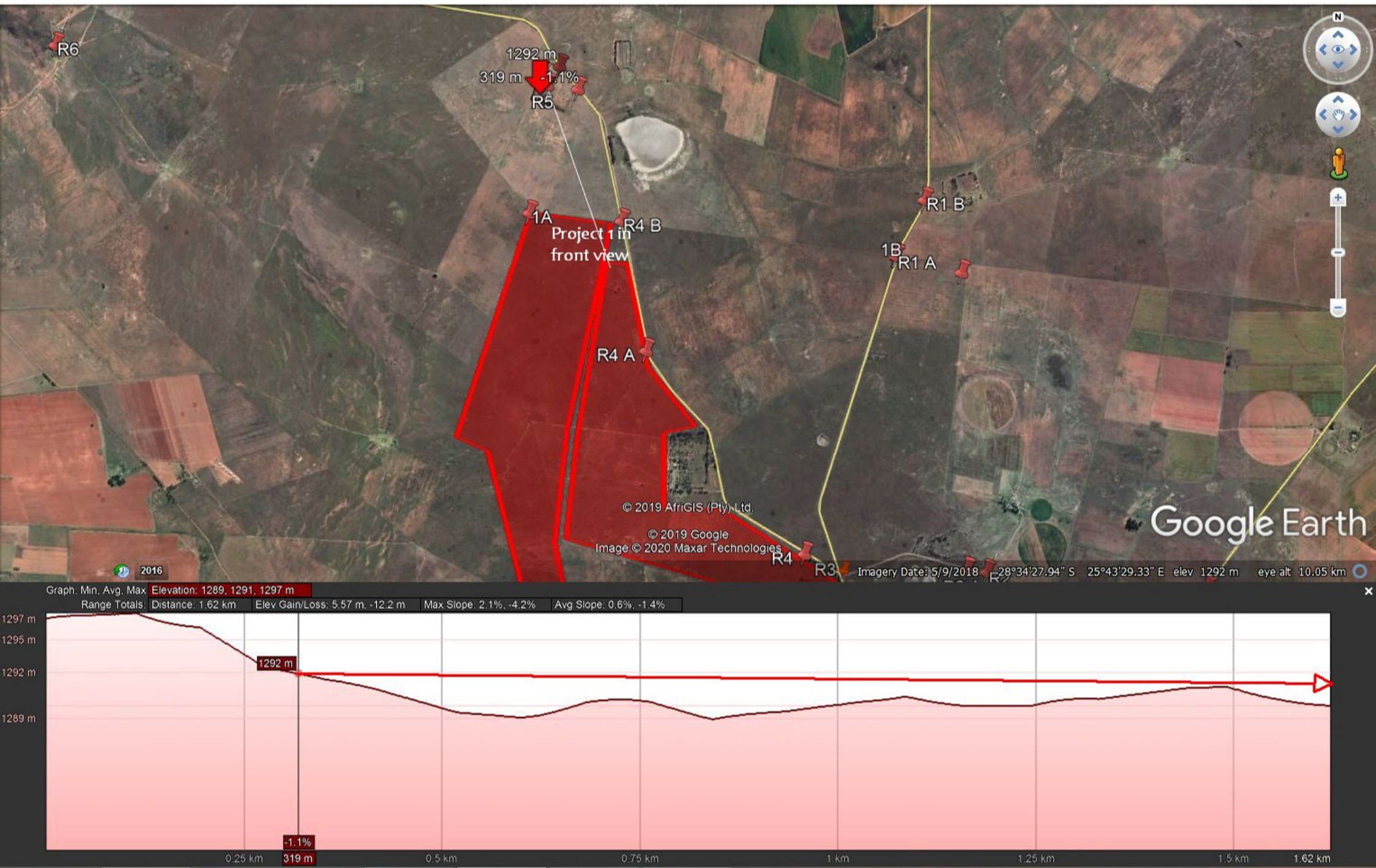


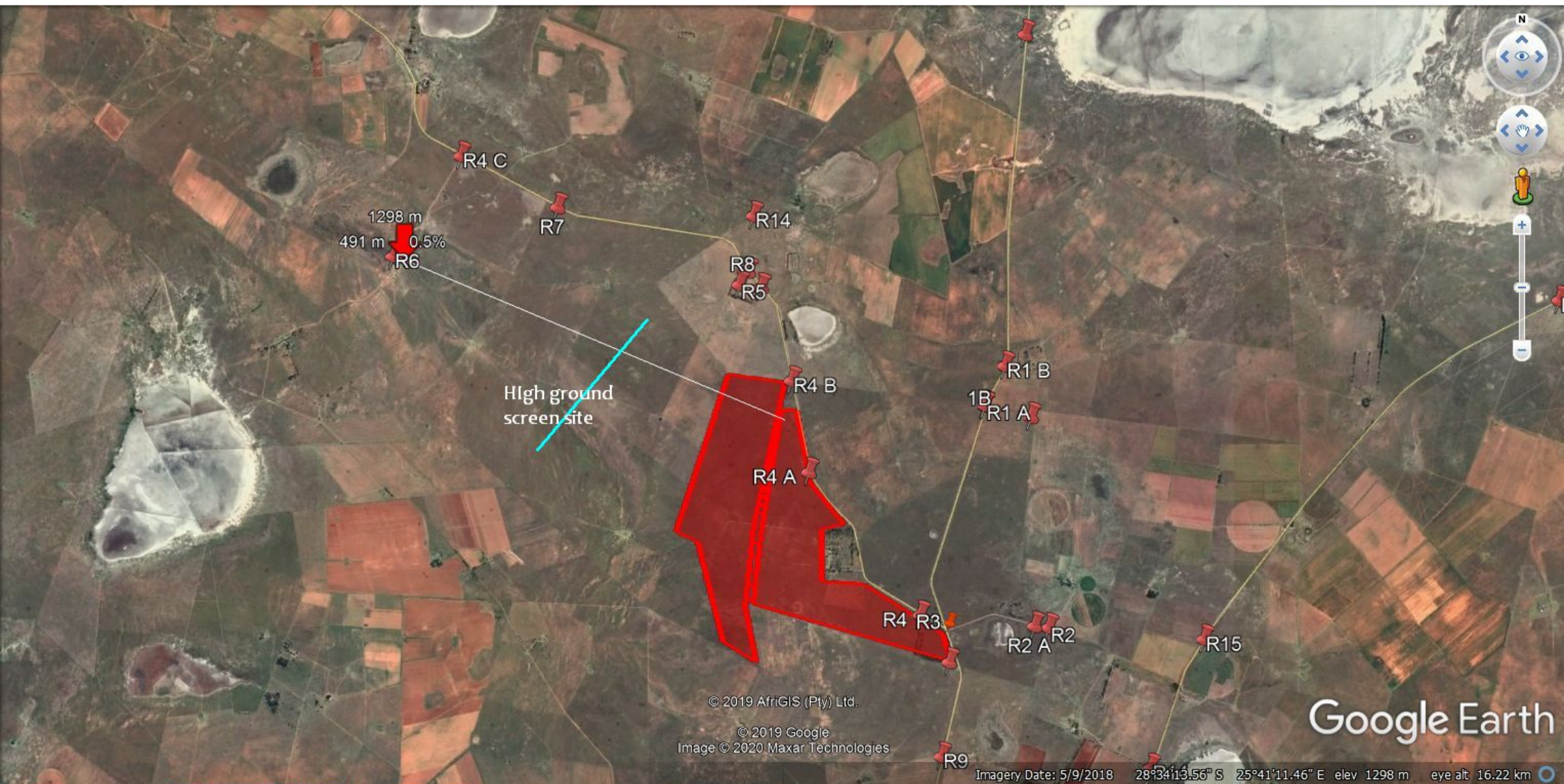


Graph: Min, Avg, Max Elevation: 1275, 1280, 1286 m

Range Totals: Distance: 1.78 km Elev Gain/Loss: 16.2 m, -8.28 m Max Slope: 3.5%, -6.1% Avg Slope: 1.3%, -1.6%



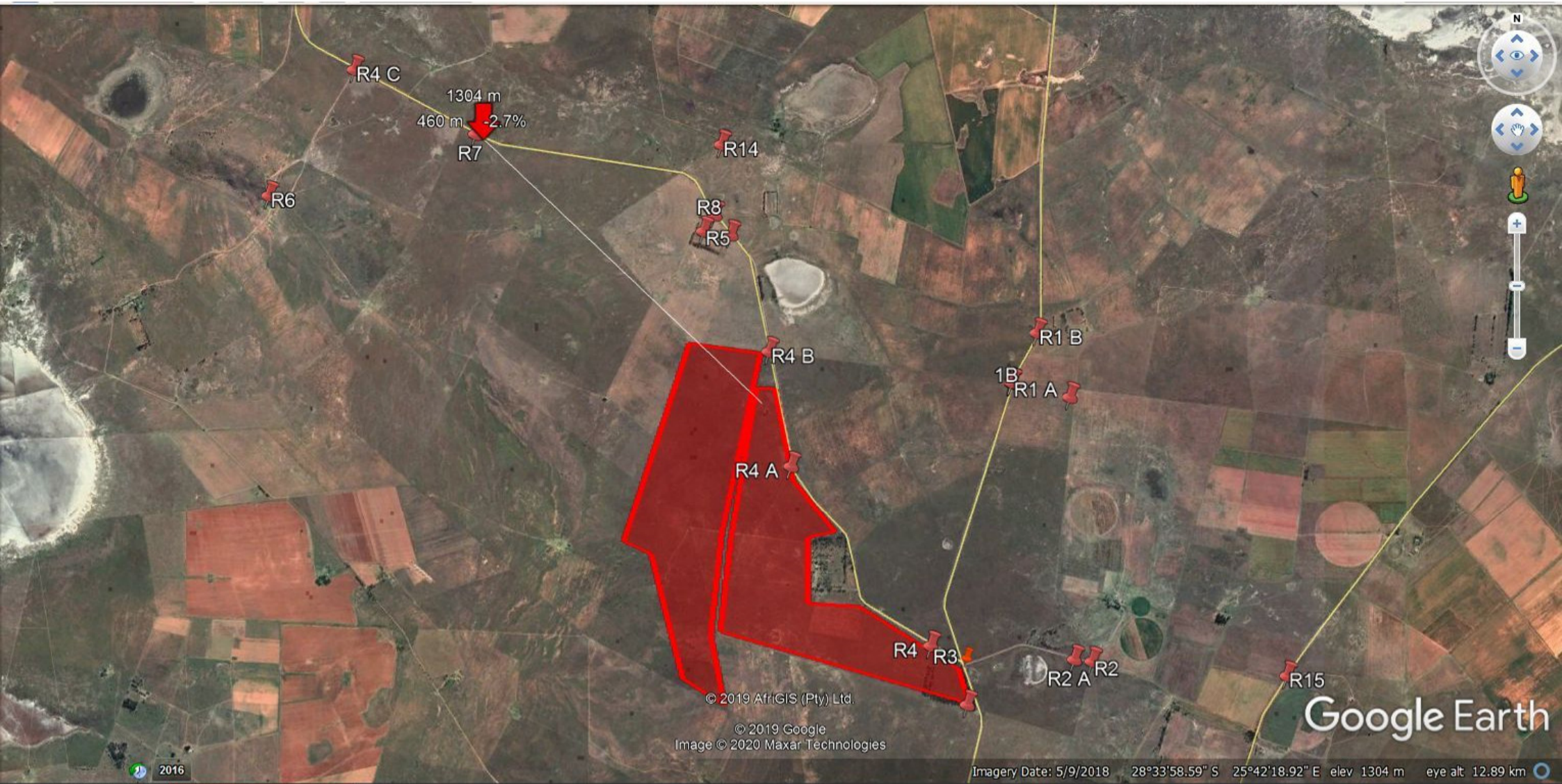


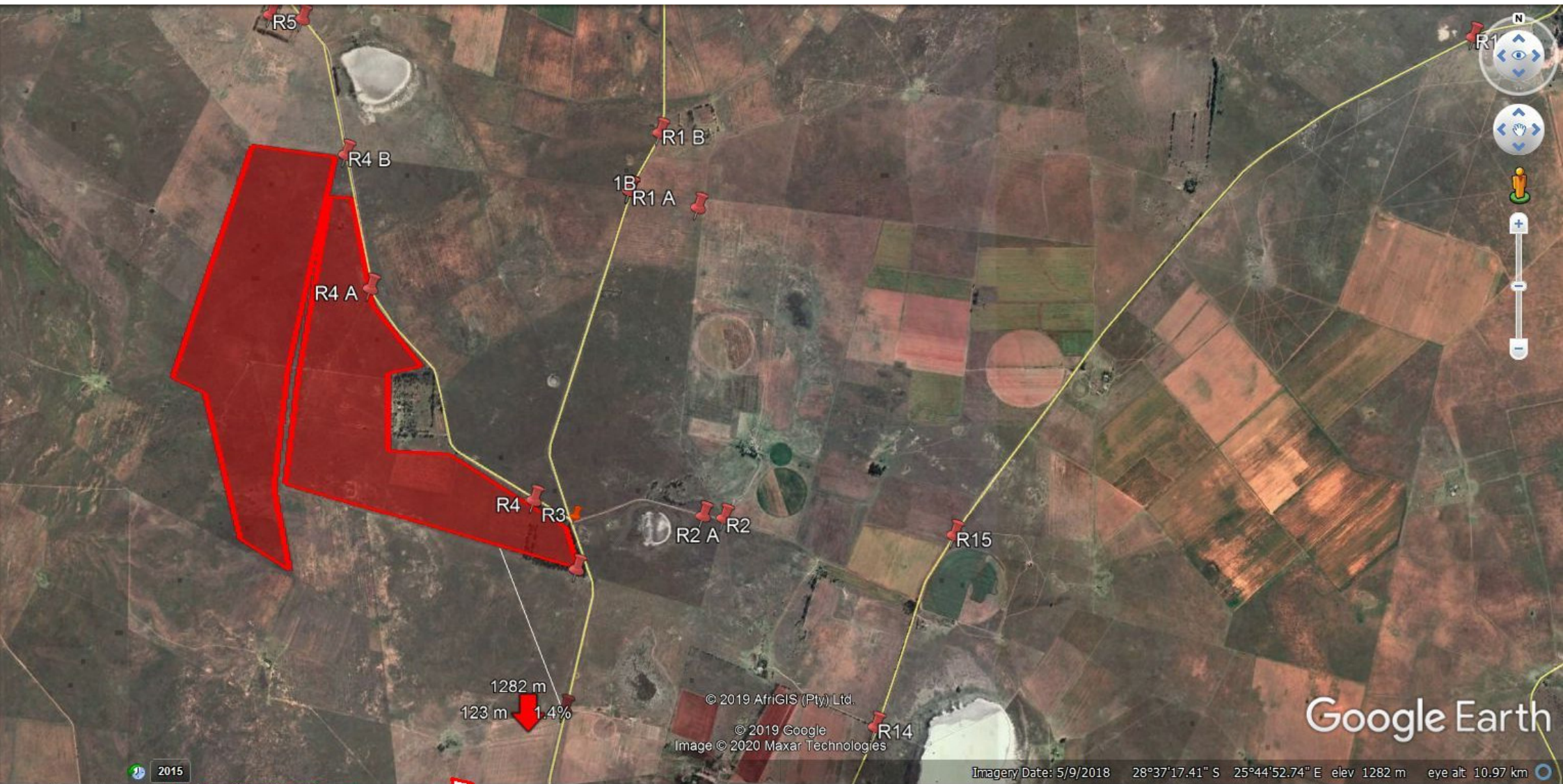


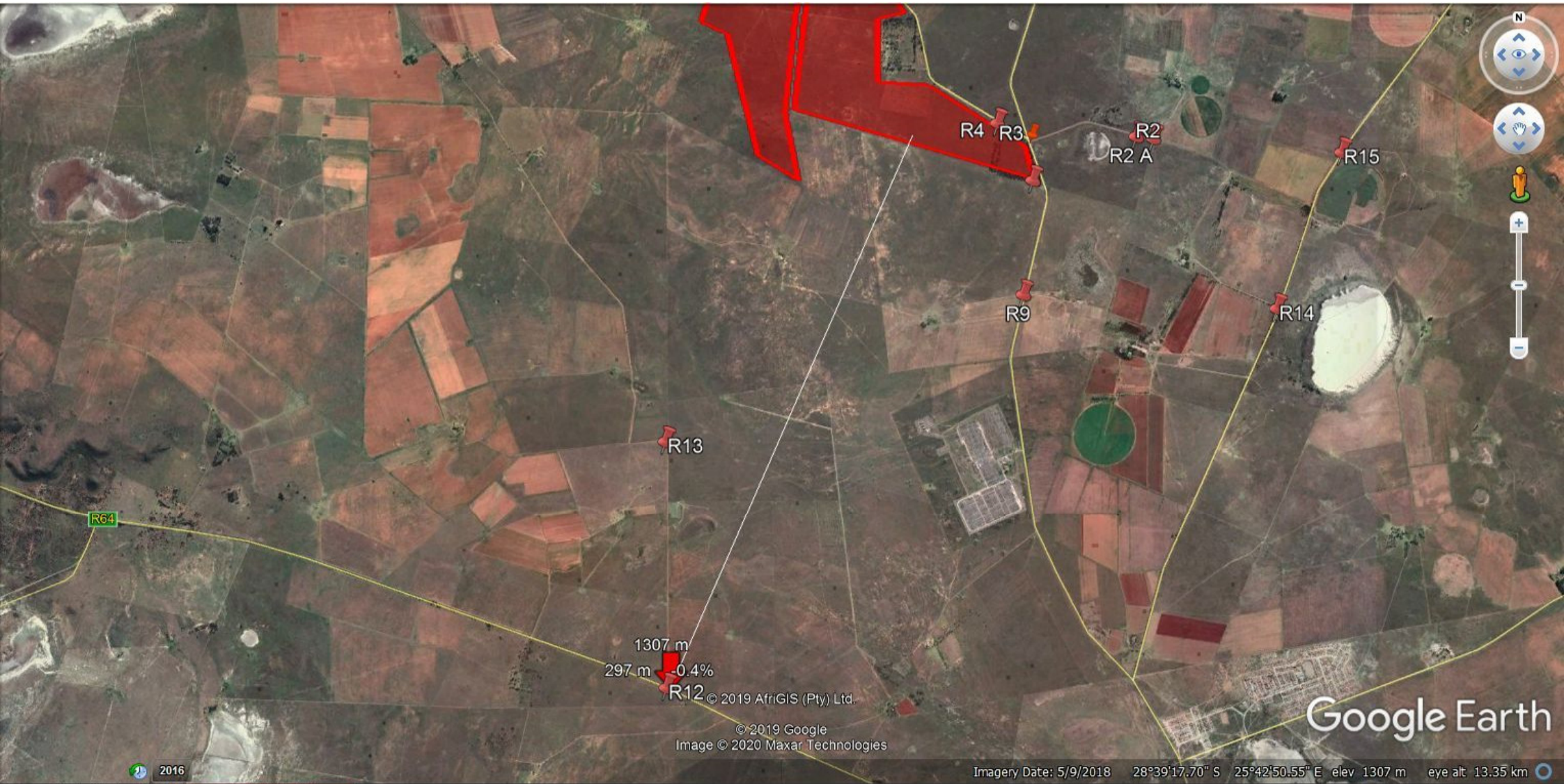
Graph: Min. Avg. Max Elevation: 1290, 1302, 1313 m

Range Totals: Distance: 5.03 km Elev Gain/Loss: 24.1 m, -34.5 m Max Slope: 2.9%, -3.9% Avg Slope: 1.0%, -1.2%









Visual Receptors

Receptors1

NAME	X	Y	Z	Description	Project relevant	Impact	Mitigation
R1A	25.75395	-28.584559917	1229	Hertzogville Rd (East). On northern boundary of P3, P4E	P3,P4E	Moderate, Cumulative P3,P4E	Roadsigns – glare effect
R1B	25.756408334	-28.580313802	1228	Hertzogville Rd (East). Just north of northern boundary of P3, P4E	P3,P4E	Moderate to Low	
R2	25.761771679	-28.608469725	1218	Melsetter Gate	P4	Low	
R2A	25.760045409	-28.608300686	1218	Melsetter Access road	P4	Low	
R3				Intersection Melsetter access road and Hertzogville Rd	P2,P4W,P4E	Low	
R4	25.746070266	-28.607125759	1222	Hertzoville Rd (West) abutting P2, P4W	P2,P4W	Moderate to Low. Cumulative	
R4A	25.732440114	-28.59172225	1229	Hertzogville Rd (West) between P2,P3	P2,P3	Moderate to Low. Cumulative	
R4B	25.730307102	-28.58191967	1229	Hertzogville Rd (West) on northern boundary of P1,P2,P3	P1,P2,P3	Moderate to Low. Cumulative	Roadsigns – glare effect
R4C	25.689903259	-28.557813525	1247	Hertzogville Rd (West) north approach	P1,P2,P3,P4	Low	
R5	25.723922253	-28.571625233	1234	Rooirand homestead	P1,P3	Low	
R6	25.681578755	-28.568590641	1244	Wonderkop homestead	P1	Low	
R7	25.701715708	-28.563324332	1250	Wonderkop access intersection with Hertzogville Rd (west)	P1-P4	Low	
R8	25.724988103	-28.570227027	1239	Rooirand access intersection with Hertzogville Rd (west)	P1-P4	Low	
R9	25.748659849	-28.622290492	1229	Hertzoville Rd Dealesville approach before split	P1-P4	Low	
R10	25.585311413	-28.567570806	1227	R59	Outside viewshed	N/A	
R11	25.595911741	-28.591648579	1231	R59	Outside viewshed	N/A	
R12	25.712676644	-28.657107949	1232	R64	P1-P4	Low	
R13	25.712576747	-28.635273814	1226	Farm access road to west	P1-P4	Low	
R14	25.774254322	-28.623517752	1189	Mooihoek entrance, Bultfontein Rd	P2,P4	Low	
R15	25.780772805	-28.609698057	1193	Entrance to Hunter's cottage, Bultfontein Rd	P4E	Low	
R16	25.824173808	-28.573246717	1186	Bultfontein Rd	P3,P4E	Low	
R17				Dealesville town	P1-P4	Low	

R4 Hertzogville Rd West Loop, South

P2





R5 Rooidam Homestead

P1 arrays will be behind trees





R4 C

R7

R8

R5

R6

DSC_0113.JPG

R4 B

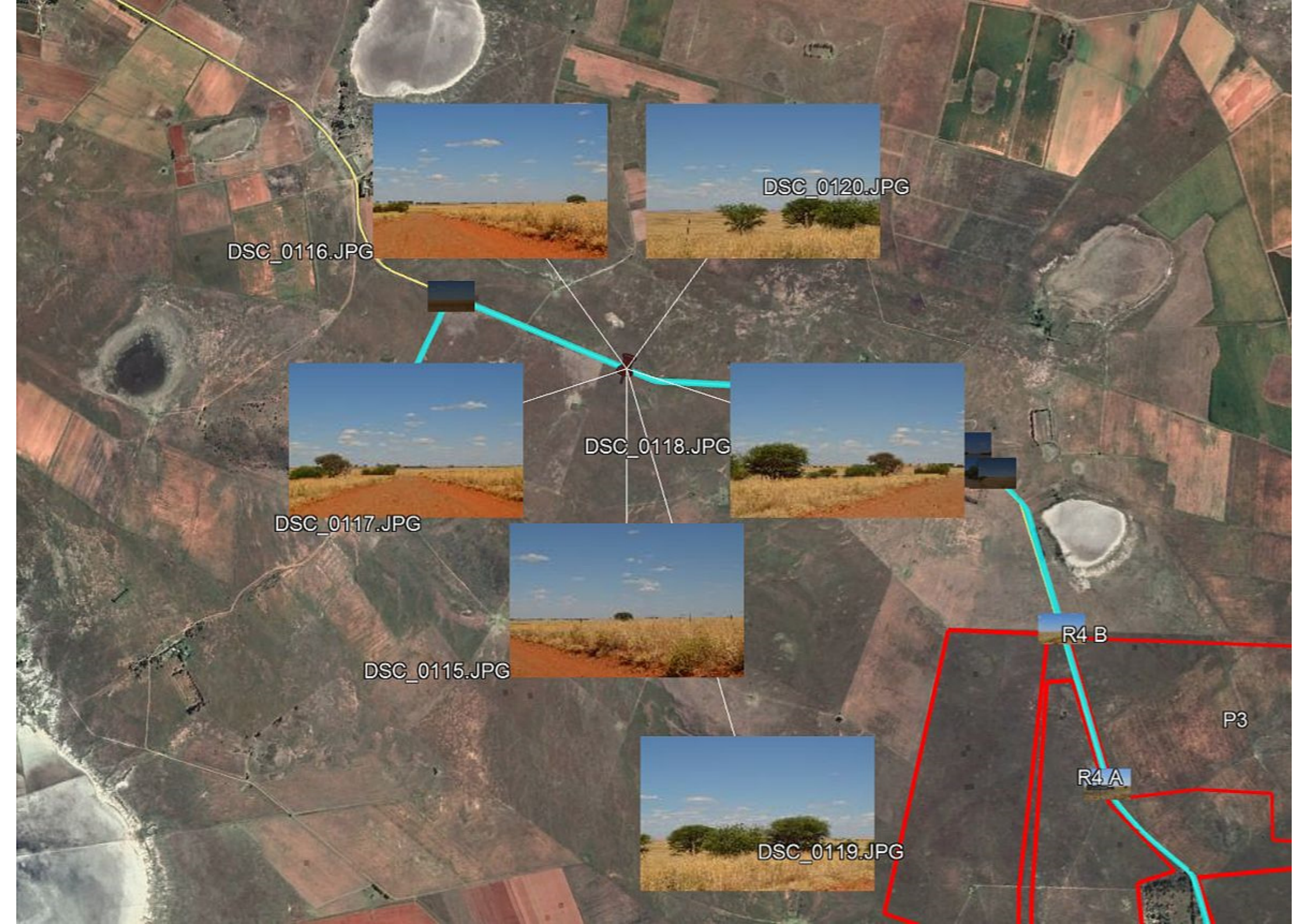
R4 A

P1

R6 Wonderkop Homestead

Low hills screen site





DSC_0116.JPG

DSC_0120.JPG

DSC_0118.JPG

DSC_0117.JPG

DSC_0115.JPG

DSC_0119.JPG

R4 B

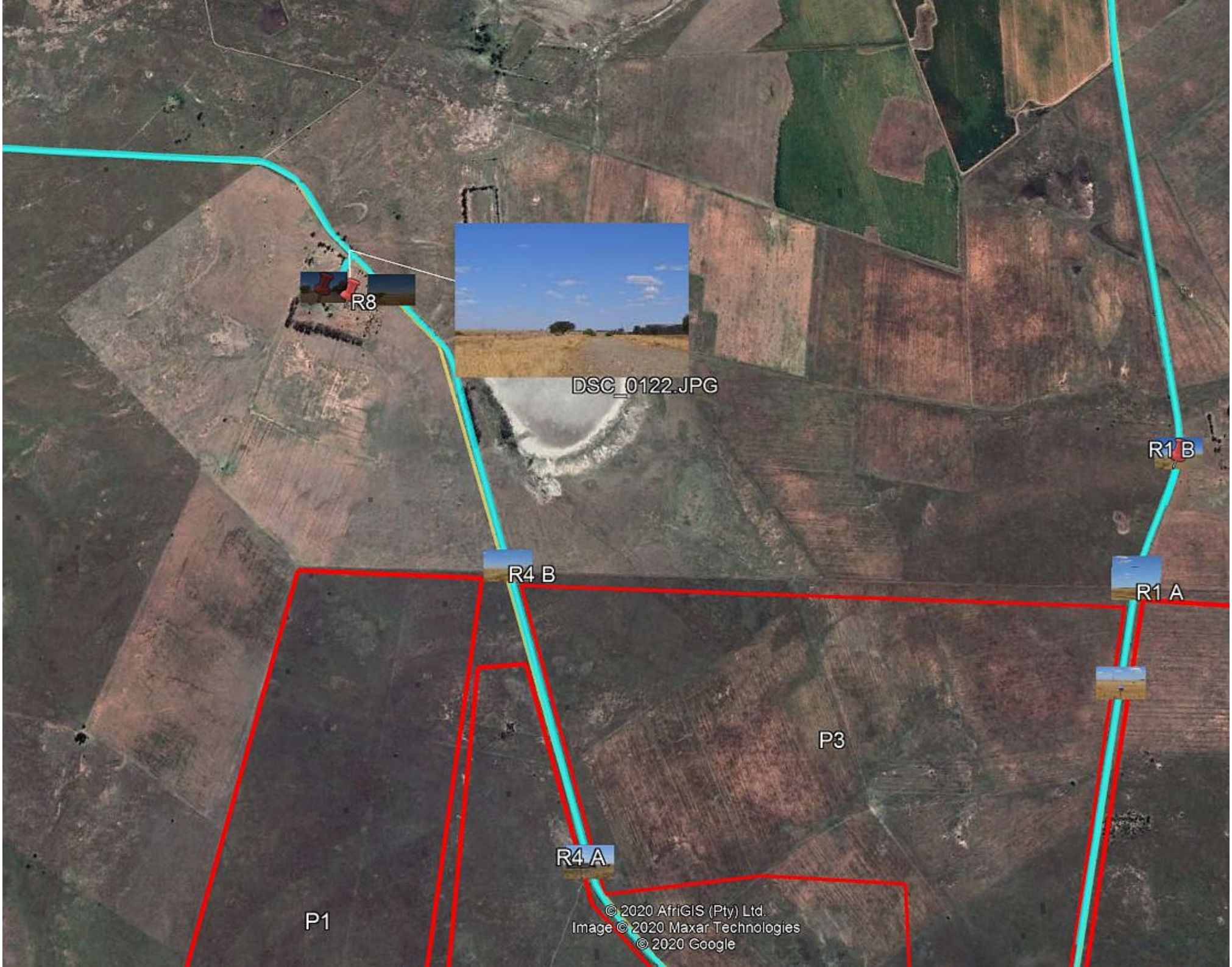
R4 A

P3

R7 View to south

P1 screened from observer





P4 East

DSC_0131.JPG



DSC_0132.JPG



DSC_0130.JPG



DSC_0136.JPG



DSC_0129.JPG



DSC_0134.JPG



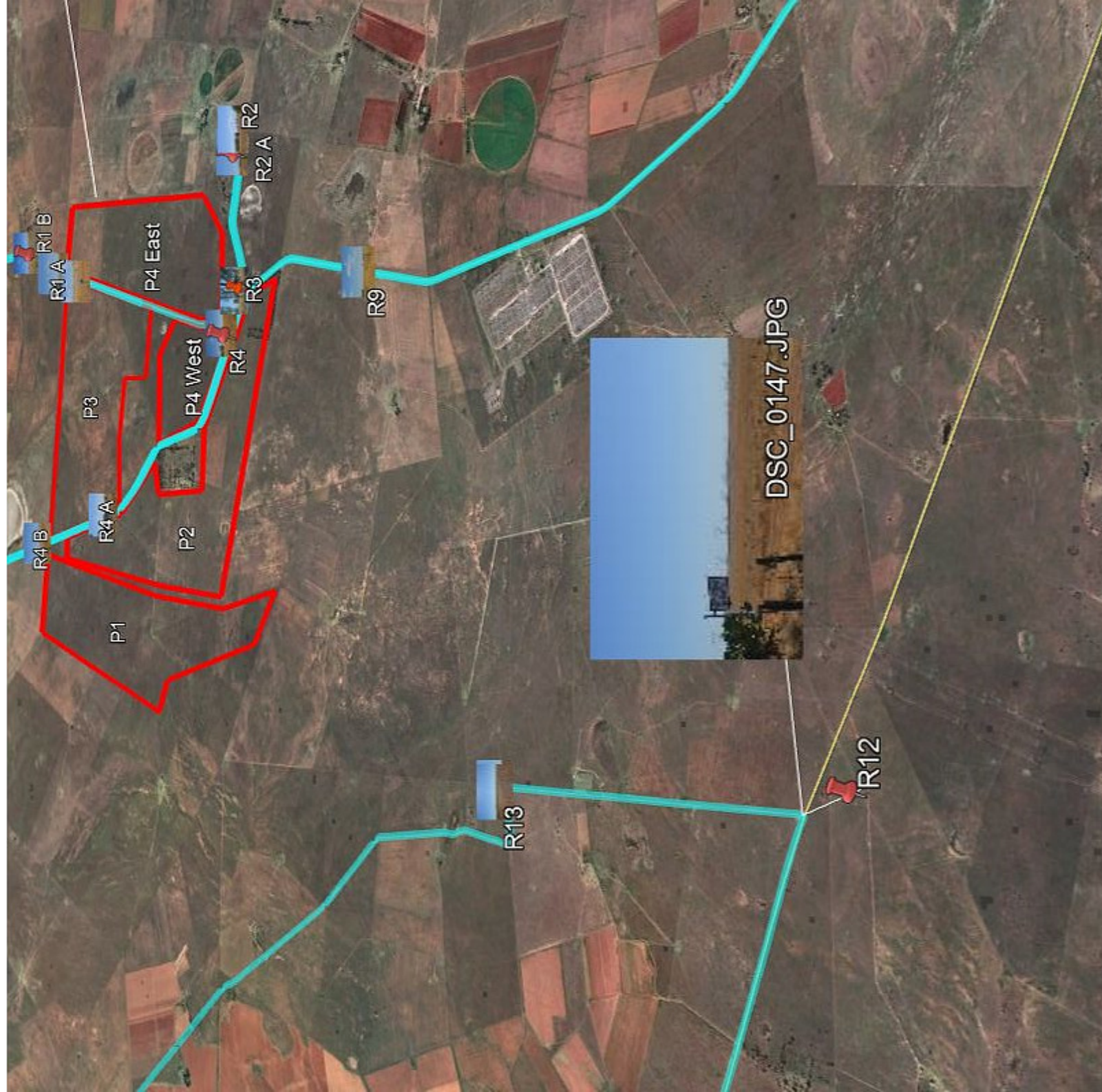
DSC_0133.JPG





P2 behind trees

R9 Hertzogville Rd northward



R12 View from R64



R15 Bultfontein road

Visserspan out of view



R13

Visserspan in the distance
PV arrays not visible



DSC_0033.JPG



DSC_0040.JPG



DSC_0035.JPG



DSC_0032.JPG



DSC_0036.JPG



DSC_0031.JPG





P4 East

P3

R1A Hertzogville road East loop
Approaching from north

R1 A Hertzogville road East
Loop approaching from the north

P4 East

P3





R1 B

DSC_0030.JPG

P3

P4 East

P2 Melsetter road

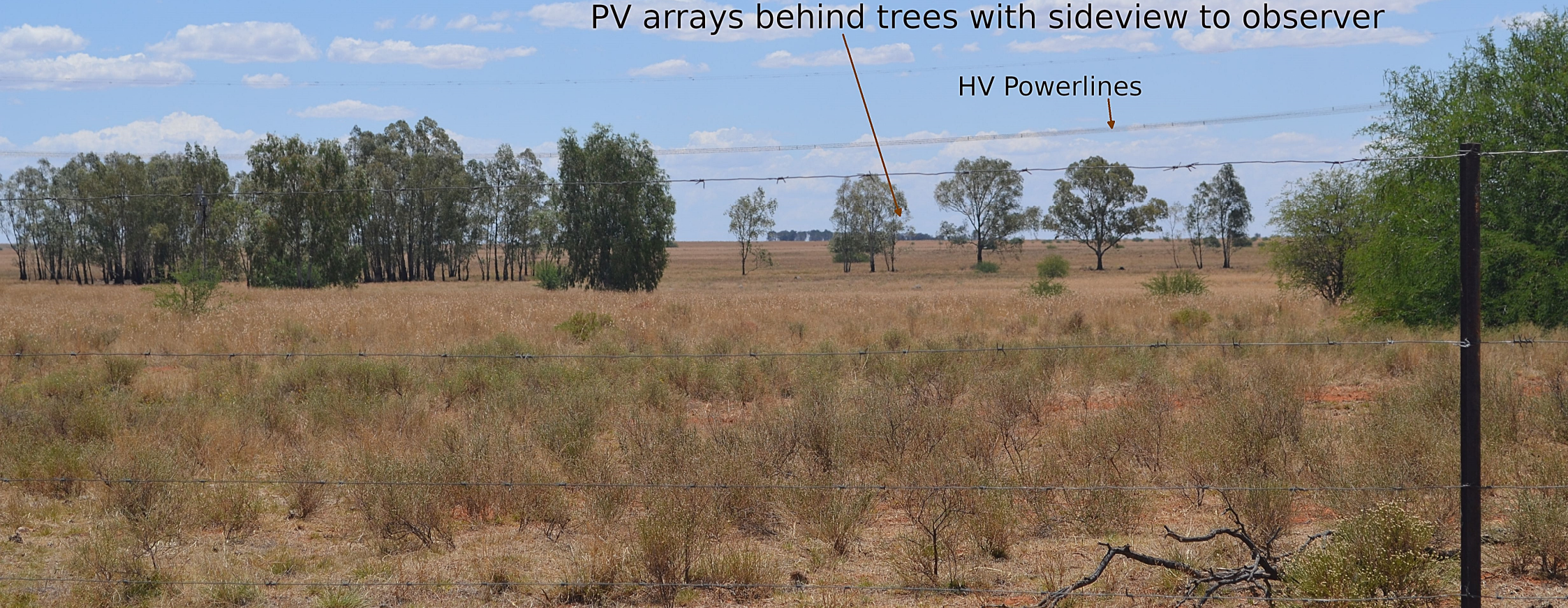
P4 East



R2 Melsetter Homestead

PV arrays behind trees with sideview to observer

HV Powerlines





R2 A

R2

DSC_0042.JPG



P4 East

P4 West

R4

R3



DSC_0051.JPG



DSC_0049.JPG



DSC_0048.JPG

R2 Melsetter gate towards Hertzogville road intersection





P4 East

P2

DSC_0053.JPG

DSC_0056.JPG

R3

DSC_0054.JPG

DSC_0055.JPG

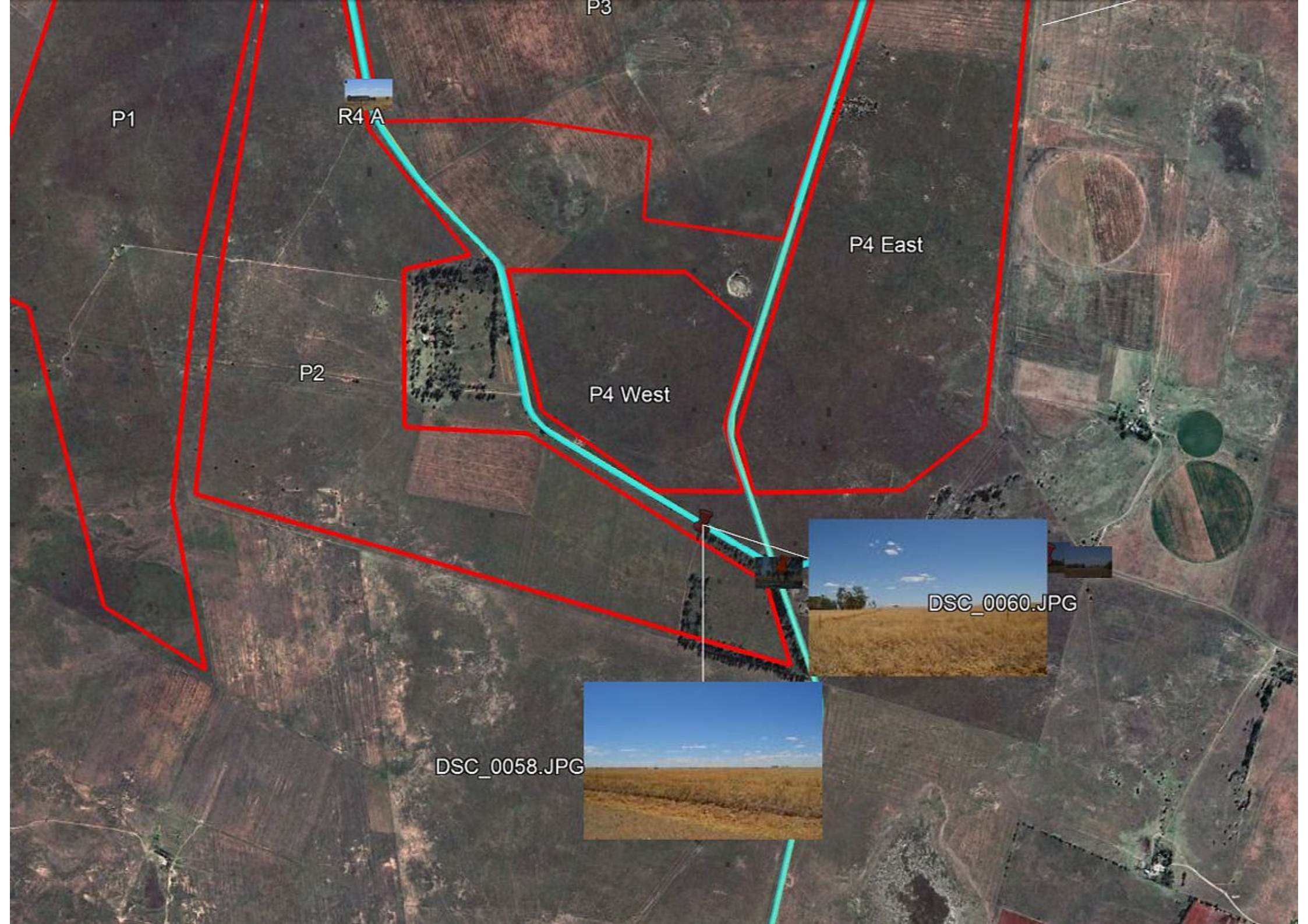


Trees to be removed



Sideview of arrays

R3 Melsetter intersection with Hertzogville Rd



P1

P3

R4 A

P2

P4 West

P4 East

DSC_0060.JPG

DSC_0058.JPG

R4 Northview from Hertzogville Rd, West loop

