Premise

Additional Information

QUORN PARK SOLAR FARM

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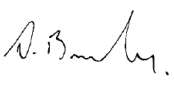
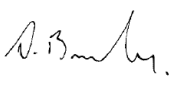
David Walker		Andrew Brownlow		Andrew Brownlow	

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APPENDIX

1. INTRODUCTION

This report has been prepared by Premise Australia Pty Ltd on behalf of Quorn Park Solar Farm Pty Ltd to provide additional information to Department of Planning Industry and Environment (DPIE) with regard to the extent of visual impacts of Quorn Park Solar Farm (QPSF) on all potentially impacted non-associated receivers and the potential impacts of the project on downstream flows and flooding. This document supports the Environmental Impact Statement dated October 2019 and subsequent responses to queries already provided to DPIE.

The requests for additional information consist of the following.

Visual: Provide further assessment detailing how the proposal has considered the full extent of visual impacts on all potentially impacted non-associated receivers including:

- a clear description of the impacts on each receiver;
- consideration of all elements of the project (including solar panels, on-site substation, inverters, transmission lines, battery storage, etc) and the full extent of the project (noting that it appears the visual assessment figures and photomontages consider a smaller layout than that proposed);
- details of the proposed mitigation measures to mitigate the potential visual impacts on receivers.

Surface Water: provide additional information regarding the potential impacts of the project on downstream flows and flooding, particularly regarding the infrastructure proposed in the south-western portion of the site (including the on-site substation), including measures proposed at all stages of the development to mitigate and manage surface water runoff.

Carpark: need to address what this temporary carpark looks like. Need to address in the traffic and transport section. Unclear where this will be placed if its within the project site or outside of the project boundary. If its outside of the project boundary, then the project needs to be amended to include this. Will the carpark be accessible from the current proposed access roads? what impacts on traffic (if any) as a result of constructing and/or using the car park. Does the car park require sealing? What has been discussed / agreed with Council on this?

Vehicle movements: we have noted some discrepancies in the figures cited in the EIS, Traffic Assessment and Noise Assessment regarding the maximum number of vehicle trips that will be generated during peak construction. The EIS and Traffic Impact Assessment both state that there will be a maximum of 185 vehicle movements / trips daily during peak construction, while the Noise Impact Assessment indicates that there will be 93 peak daily movements, but that there will be 185 daily vehicles.

Section 2 of this report focuses on those residents within the 2km radius of the development site and two residents from further away who made submissions to DPIE mentioning visual impact. The impact assessment contained in Section 10 of the EIS is expanded upon with more detail to support the assessment for each of these residents. The focus is on visual impact from each residence; properties without residences are not included in this report. The list of residences to be included was agreed in consultation with DPIE.

Section 3 addresses surface water and downstream flows from the development. Modelling demonstrates that the site is mostly free of flooding impacts and infrastructure will not impede downstream flows.

Section 4 responds to queries on the temporary carpark and vehicle movements.

Mitigation measures are proposed for responding to submissions. This includes applying additional setbacks which reduce the development footprint by 57hectares. The modified development footprint is included in **Appendix A**.

2. VISUAL IMPACTS

2.1 Impacted Non-Associated Receivers

The following table lists all receivers within a 2km radius of the development site. These are the same receivers identified in the EIS. It also includes R13, located approximately 5km from the development site and R14 located approximately 4.8km from the development site. Submissions from R13 and R14 were received mentioning visual impact and so have been included here for completeness. R14 is representative of a cluster of small holdings with relatively recently built houses. Although it was not possible to identify an actual resident from the submissions because no contact details were provided, one submission was from the developer of the subdivision. The views from the cluster are well represented by R14.

Table 1 – Impacted receivers

Receiver	Comment	Submission identified visual concerns
R1	Associated landowner	Yes
R2		Yes
R3	Screened by dense vegetation and far distant. Not included in this document	No
R4	Not included in this document	No
R5	Not included in this document	No
R6	Not included in this document	No
R7		Yes
R8		Yes
R9		Yes
R10		Yes
R11		Yes
R12	Does not oppose development. Not included in this document	No submission
R13 (MacGill Lane)	Not originally identified in the EIS. Located 4.8 km to the east of the development site.	Yes
R14 (Corcoran Road)	Representative of small holding development 4.8km to the east of the development site	Yes, from developer

R1, R2, R7, R8, R9, R10, R11, R13 and R14 are considered in more detail in this report. Note that R1 is an associated landowner who provided consent for QPSF development application, has been consulted extensively on its details and benefits commercially from the project. R3, R4, R5, R6 and R12 either did not make a submission or have not mentioned visual impact in their submissions nor in consultations.

Consultation with the community has been extensive, providing opportunities for neighbours to raise visual impacts should it be a concern. Quorn Park Solar Farm Pty Ltd sent letters to nearby neighbours in January 2018 and September 2018 during the impact assessments stage and prior to submitting the EIS advising

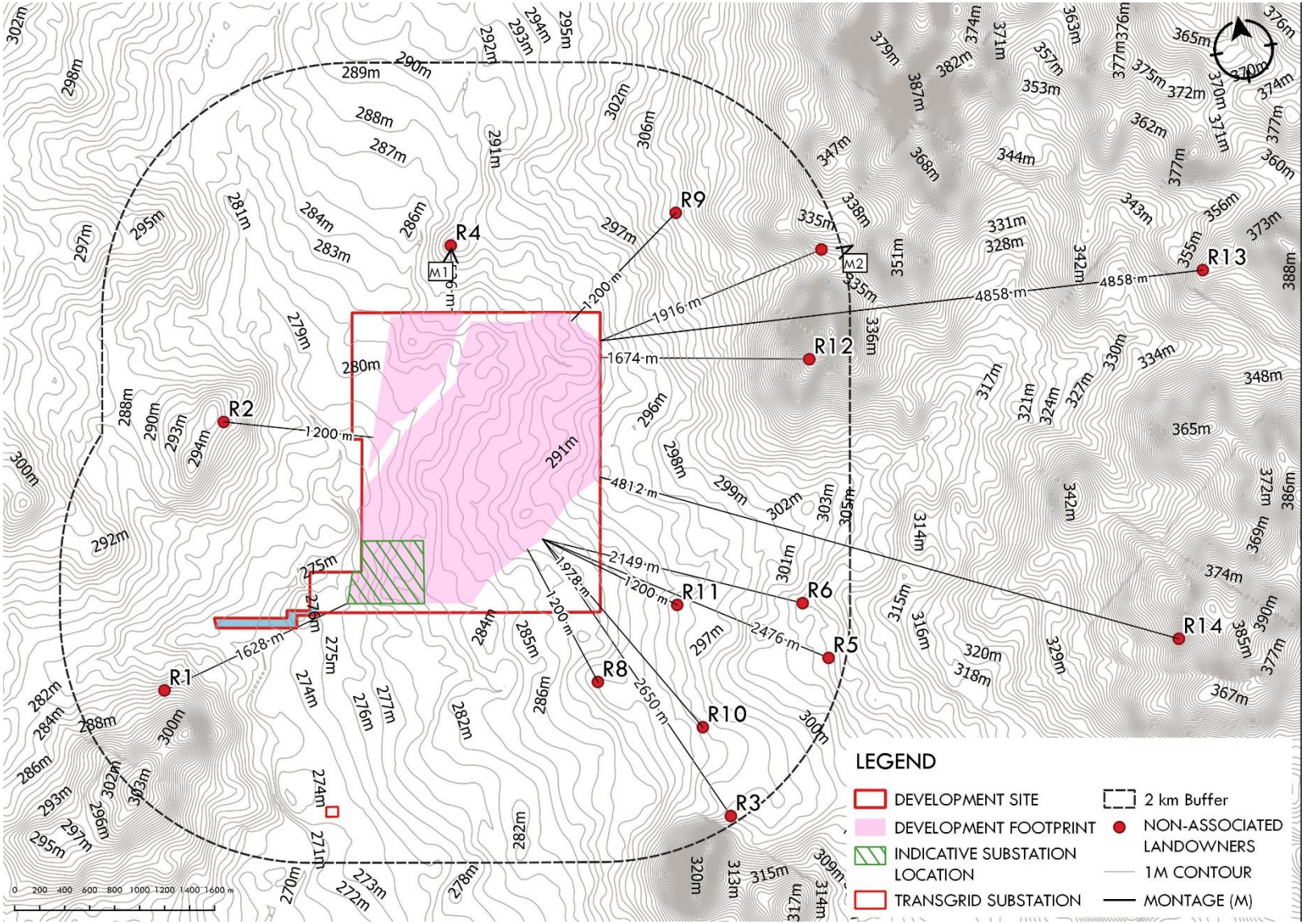
them of the proposal and offering private meetings or phone calls. Private meetings and calls were held with all neighbours who accepted the offer. An open day was held on 31st January 2020 in Parkes to which all nearby neighbours were invited by phone as well as through local advertising. All communications were logged.

Photomontages were prepared for R4 and R7 to demonstrate the appearance of the project and were included in the EIS. Offers to prepare photomontages were made to R2, R9 and R11 but they declined. Recently the offer was again made to prepare photomontages, but R11 did not respond and R1, R2, R8 and R10 declined due to Covid 19 risk. R8 is extensively screened from the site by trees and sheds and visual impact will be minor or negligible, hence a photomontage would simply show the screening. R9 advised on three occasions that he was offered that no further visual assessment was required. R10 is distant from the site and their visual impact will be minor. Hence no further photomontages are included in this report.

Figure 1 below shows the location of the receivers in relation to the development site and the development footprint. The development footprint has been reduced in size compared to the EIS. This modification has been made in response to submissions requesting setbacks from the development site boundary. The setbacks provided to mitigate visual impact are described later in this report.

This report provides more detail of the rationale for the assessment of impacts for the selected receivers using the framework in Section 10 of the EIS. This considers the relative altitude and distance of the residence from the development; the position and aspect of the residence; the proportion of their viewshed affected by the development and the visual screening already provided by existing vegetation and buildings. These parameters have been assessed from site visits and private consultation, overhead photography and contour maps. Photos of views from R13 and R14 are also included to highlight the long distance from the site.

Figure 1 – Receivers



2.2 Assessment Method

All components of the development infrastructure including solar modules, inverter stations, the substation, battery storage and overhead transmission lines are considered in the visual impact assessment. The EIS summarises their dimensions with all components less than 4m in height except for a few support structures for overhead lines near the substation.

As the EIS states, the final layout of infrastructure will be subject to engineering design. The layout will be optimised within the development footprint considering constraints including ground conditions, topography and good design practice. The development footprint is the maximum possible impacted area for the development. No infrastructure will be located outside it. However, the final layout will occupy only part of the development footprint. Visual assessments for each residence have been made considering the worst-case scenario, where the infrastructure is located as close as the footprint allows to each residence. The final layout will be included in the management plans which require approval prior to construction.

The visual impact assessment methodology is based on two dimensions – the sensitivity of the view (low, medium or high) and the magnitude of change created by the development (low medium or high). These two dimensions are combined to determine an overall visual impact assessment (negligible, minor, moderate or high). The method is described in Section 10 of the EIS and reproduced below.

Visual sensitivity refers to the susceptibility of a view to accommodate change without losing valued attributes. **Table 2** below summarises factors to consider when ascribing sensitivity levels for the development.

Table 2 – Visual sensitivity

Sensitivity Level	Description
Low	Views where visual amenity is important at a neighbourhood scale, such as views seen from local roads, briefly glimpsed views to landscape features, and views from small groups of non-associated landowners.
Medium	View of high quality or experienced by concentrations of residents and/or local recreational users, and/or large numbers of road or rail users.
High	Heavily experienced view to a feature or landscape that is iconic to a major portion of a city or a non-metropolitan region, or an important view from an area of regional open space.

Where views are important, but at a neighbourhood scale, such as from single or small groups of non-associated landowners, local roads or briefly glimpsed views to landscape features, the sensitivity level is considered low. Where views are of high quality or are experienced by concentrations of residents and/or local recreational users or they are experienced by large numbers of road or rail users, the sensitivity level is considered to be medium. Where the views to a feature or landscape that is iconic and is experienced by a large population, for example the major portion of a city or non-metropolitan region, or an important view from an area of regional open space, the sensitivity level is considered to be high.

The views of QPSF are restricted to a limited number of non-associated landowners and relatively light traffic on the Back Trundle Road and other nearby minor country roads. The roads do not attract significant numbers of tourists or recreational users. Most traffic uses Henry Parkes Way from where there are no views to the development. Views are important to the neighbours but at neighbourhood scale only. Hence the sensitivity level for each of the non-associated landowners in proximity to the development is considered low to medium. For the purpose of this assessment, a medium sensitivity level has been assigned to all receivers.

The magnitude of change refers to the extent of change that would be experienced by receivers. Relevant indicators include the landform or topography; the extent of land cover from vegetation or buildings; the land use; the distance from the development; the extent of the development visible and the backdrop. The indicators and magnitude of visual modification are summarised in **Table 3**.

Table 3 – Magnitude of visual modification

Indicator	**Magnitude of visual modification**		
	High	**Medium**	**Low**
Landform	Flat	Undulating	Mountainous
Land cover	Few trees and buildings	Scatter trees and buildings	Dense trees and/or building cover
Land use character	Rural or natural	Mixed residential and some farm buildings	Intensive agriculture or industrial
Distance	Foreground	Middle ground	Background
Extent of change visible	Large area of proposal visible	Moderate of proposal visible	Small area of proposal visible
Backdrop	Viewed against the sky	Viewed against background	Viewed against a hillside

The magnitude is high for development on flat terrain with no trees or buildings, is of rural nature and where the development is in the foreground for the receiver, the development occupies a large portion of their viewshed, is elevated or viewed against the sky. Magnitude is medium where the landform is undulating causing the development to recede to some extent, there are scattered trees or buildings, the land use is already modified with residential or farm buildings, the development is in the middle ground, the development occupies only a moderate portion of their viewshed and the landscape background diminishes the apparent vertical extent of the development. Magnitude is low where the landform is mountainous and provides features other than the development in the view, where cover is extensive with trees or buildings, where the land use is intensive agriculture or industry, the development is a long way from the viewer in the background, where the development occupies a small portion of their viewshed and is viewed against a hillside which diminishes the vertical extent of the development.

Not all the indicators in this framework apply for every receiver in proximity to QPSF. Some are more important than others. The magnitude of modification varies somewhat for each. However, it is low to medium in each case and the rationale is provided in the following section.

Visual impact is a combination of the visual sensitivity for the development and the magnitude of visual modification for each receiver. The matrix for assessing the degree of visual impact is detailed in **Table 4**.

Table 4 – Visual impact assessment

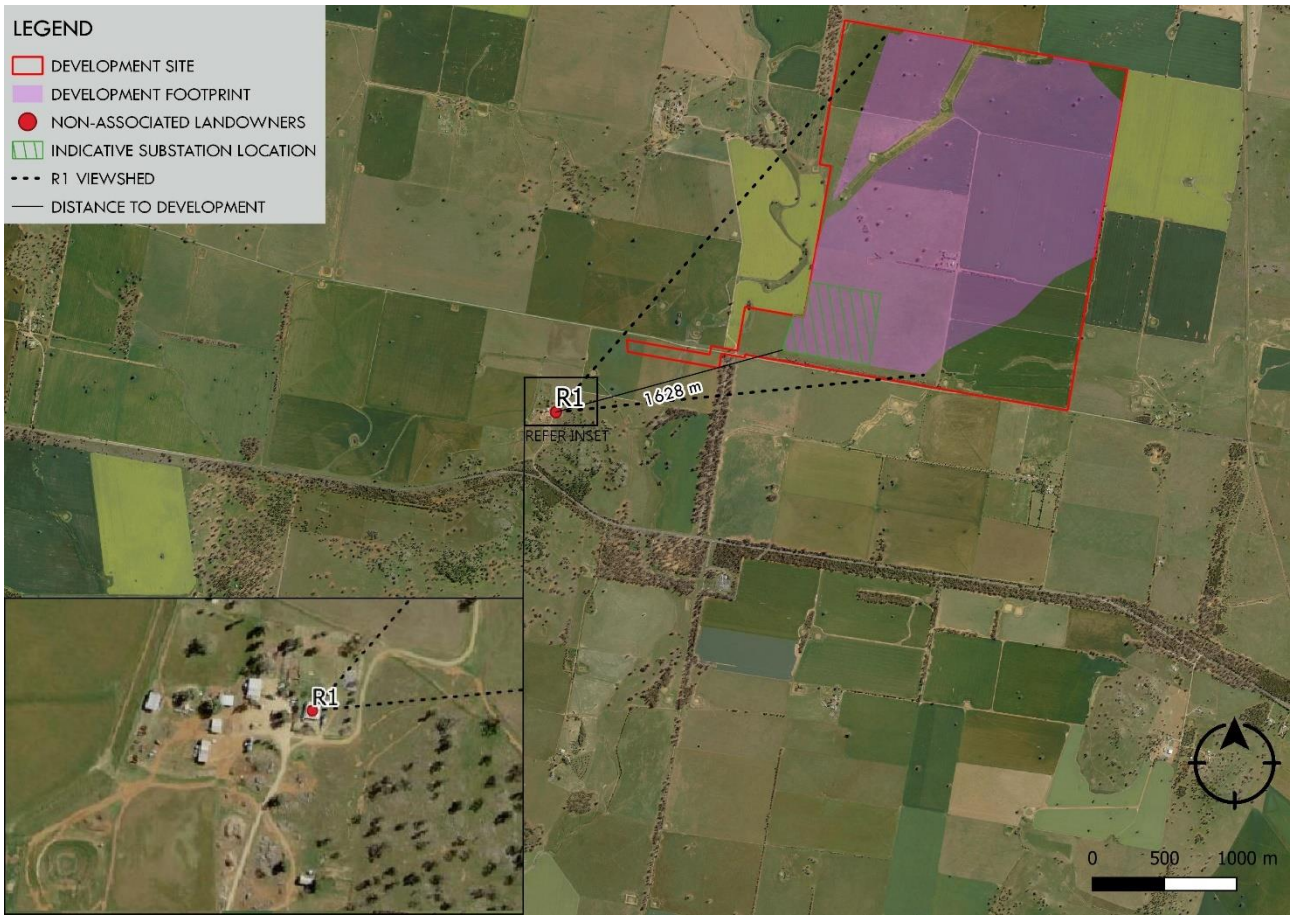
Magnitude of visual modification	**Visual sensitivity**		
	Low	**Medium**	**High**
High	Moderate	High	High
Medium	Minor	Moderate	High
Low	Negligible	Minor	Moderate

2.3 Receiver 1, R1

By reference to Intergovernmental Committee on Surveying and Mapping (ICSM) elevation data, the residence at R1 has an elevation of approximately 284 m AHD. The solar farm development site ranges in height from a low point in the south-west of approximately 275m AHD to a high point in the north-east of approximately 293m AHD. The development footprint closest to R1 is approximately 275m AHD. Hence R1 is slightly elevated compared to the development. Beyond the development site, the ground is undulating with elevations up to 366m AHD.

R1 is an associated landowner who has agreed to the grid connection line on their land. **Figure 3** shows an aerial photo of R1 relative to the development footprint including the grid connection. The view to the north east from R1 is toward the QPSF development site and would include all infrastructure. The figure shows the viewshed will be no more than 43 degrees. Since the final layout will occupy only part of the development footprint, subject to detailed design, the viewshed will be less. Hence only a limited portion of R1's 360 degree views would be affected.

Figure 2 – R1 viewshed



R1 is located at least 1,628m from the modified development footprint at its closest point. In response to submissions, the development footprint has been reduced in the south western corner. No infrastructure apart from the grid connection will be built on R1's side of the existing overhead 132kV line. The development is in R1's middle ground with farmland in front and behind. Between R1 and the development site are three overhead high voltage lines (2x132kV and 1x 66kV) and many trees. There is a dense avenue of

mature trees on McGrath Lane, many paddock trees and a tree corridor along Back Trundle Road which will break up views to the development.

There is higher ground further to the north and east of the development site and the solar farm would be seen against a background of undulating hills. There are scattered trees and farm buildings across R1's viewshed. The land use is extensive farming.

The main property access for R1 is via a driveway from Henry Parkes Way to the south that winds around a hill which will provide screening to the development. There would be transitory views of the development on approach to the residence. The dwelling is aligned to the west towards the driveway and a cluster of farm sheds. An outdoor sitting area on the driveway side of the dwelling will be screened from the development by the dwelling. There is a number of mature trees planted around the house and buildings. Some of these trees on the eastern side will break up views towards the development site.

R1's visual sensitivity is considered medium. The magnitude of the visual modification created by the development is considered low, with a capacity for the landscape to accommodate the solar farm without significant loss of valued attributes. Specifically, development infrastructure would be located at a distance and sit low in the landscape, with infrastructure no higher than 4m apart from support structures in the substation. Based on medium sensitivity and low magnitude of change, the visual impact of the QPSF from R1 is considered minor.

If requested by the resident, vegetation screen planting is offered on the north eastern side within the curtilage of the house. The effect of this mitigation measure and the setback in the footprint will reduce visual impact significantly from the residence. The impact after mitigation will be minor to negligible.

Table 5 – Summary of visual impact for R1

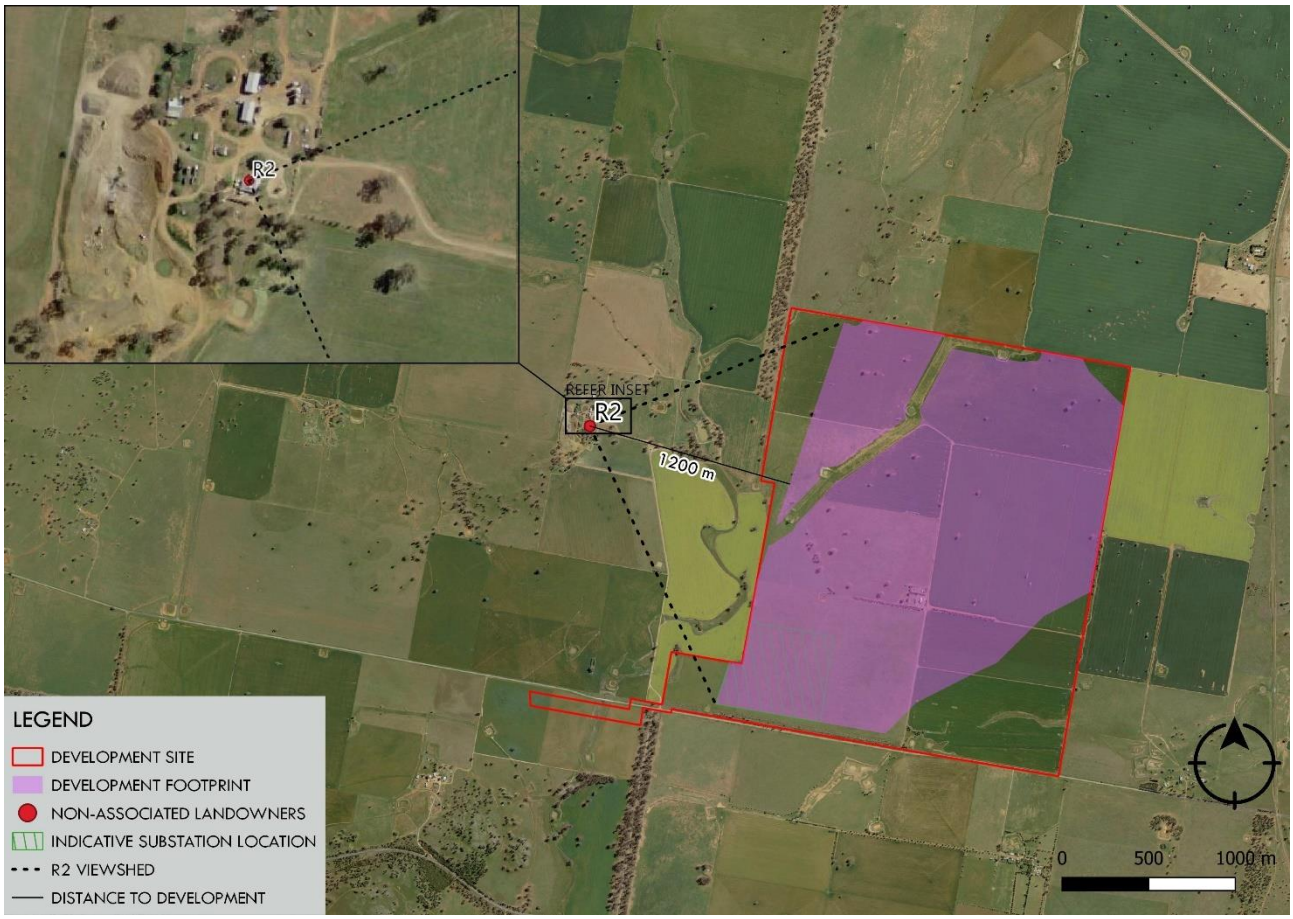
Viewpoint	Sensitivity	Magnitude of modification	Impact	Impact with mitigation
Associated landowner, R1	Medium	Low	Minor	Minor - Negligible

2.4 Receiver 2, R2

By reference to ICSM elevation data, the residence at R2 has an elevation of approximately 294 m AHD. The solar farm development site ranges in height from a low point in the south-west of approximately 275m AHD to a high point in the north-east of approximately 293m AHD. The development footprint closest to R2 ranges in height from 278 – 282 m AHD. R2 overlooks the development. To the east of the development site the ground is undulating with elevations up to 366 m AHD.

Views to the east from R2 would look out over much of the QPSF development site. The view would include all infrastructure. **Figure 3** shows an aerial photo of R2 relative to the development footprint and shows the viewshed will be no more than 85 degrees. Since the final layout will occupy only part of the development footprint, subject to detailed design, the viewshed will be less. Hence only a portion of R2's 360 degree views would be affected.

Figure 3 – R2 viewshed



R2 is located at least 1,200 m from the modified development footprint at its closest point. In response to R2's submission, the development footprint has been set back from the site boundary to provide a minimum 1200m distance from R2. The development is in R2's middle ground with farmland in front and behind.

There is higher ground further to the east of the development site and the solar farm would be seen against a background of undulating hills. There are scattered trees and farm buildings across R2's viewshed. The land use is extensive farming.

The main property access for R2 is from Back Trundle Road to the south. The driveway will have relatively unimpeded but transitory views of the development. The development is on the same elevation and drivers will neither overlook it nor view it against the sky. The dwelling has an aspect which overlooks the development and is located with a cluster of farm buildings and structures located primarily to the north and west. There are a number of mature trees planted around the house and buildings. Some of these mature paddock trees on the eastern side will provide screening and break up views towards the development site. Existing intervening vegetation to the east along the property boundary and along Ridgey Creek would provide limited partial screening.

R2's visual sensitivity is considered medium. The magnitude of the visual modification created by the development is considered moderate, with a capacity for the landscape to accommodate the solar farm without significant loss of valued attributes. Specifically, development infrastructure would be located at a distance and sit low in the landscape, with infrastructure no higher than 4m apart from support structures in the substation. Based on a medium sensitivity and medium magnitude of change, the visual impact of the QPSF from R2 is considered moderate.

As this resident has raised concerns about visual impact an increased setback to the R2 residence has been adopted in the modified development footprint. The proposed setback will mean that the closest infrastructure in the development will be at least 1,200 m distant and as far as 3,000m from R2. No infrastructure will be located west of the 132kV overhead powerline that currently traverses the site.

In addition, if requested by the resident, further vegetation screen planting is offered on the eastern side within the curtilage of the house. The effect of these mitigation measures will reduce visual impacts to some extent from the residence. The impact after mitigation will be minor to moderate.

Table 6 – Summary of visual impact for R2

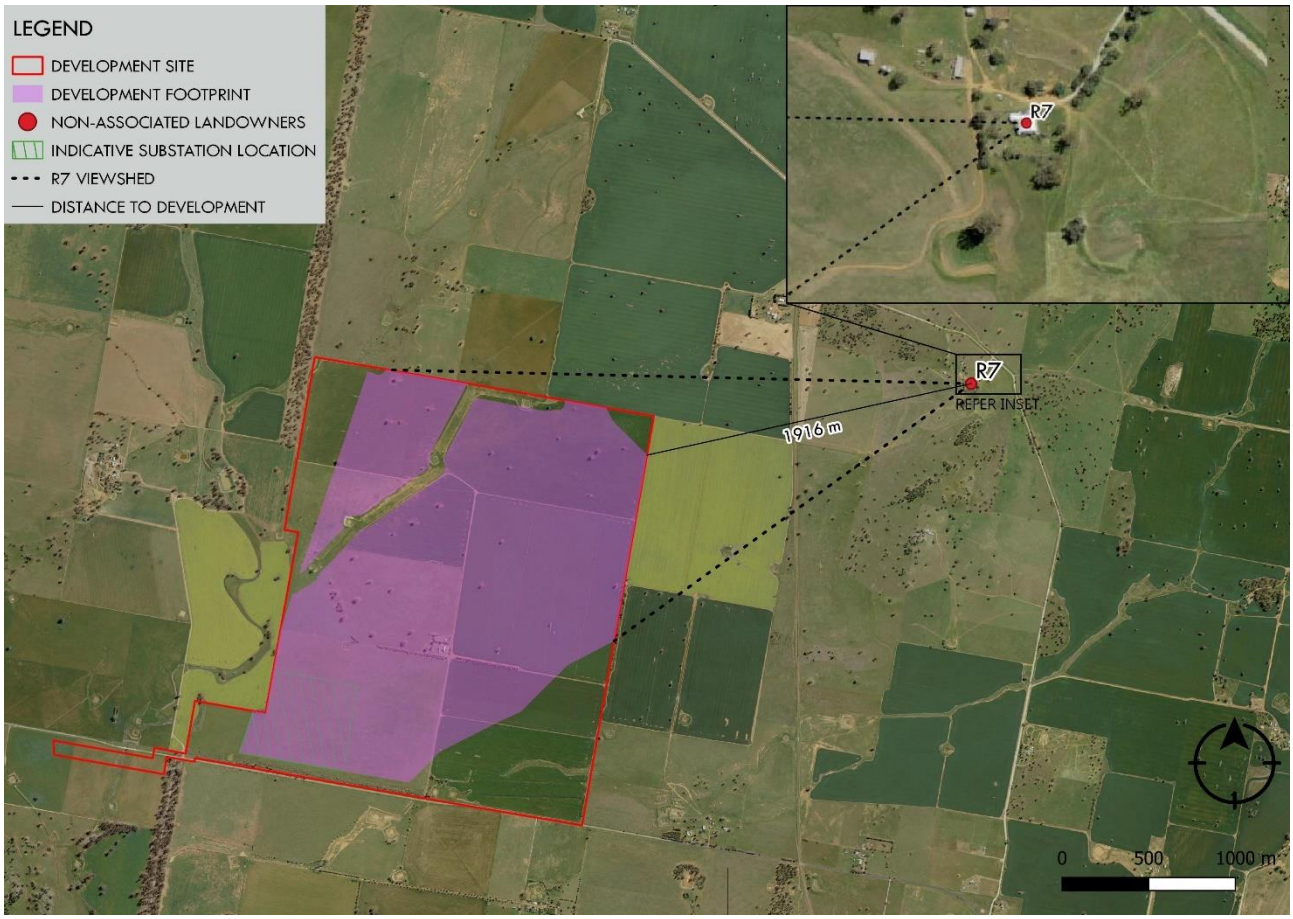
Viewpoint	Sensitivity	Magnitude of modification	Impact	Impact with mitigation
Non-associated landowner, R2	Medium	Medium	Moderate	Minor-Moderate

2.5 Receiver 7, R7

By reference to ICSM elevation data, the residence at R7 has an elevation of approximately 330 m AHD. The solar farm development site ranges in height from a low point in the south-west of approximately 275m AHD to a high point in the north-east of approximately 293m AHD. The development footprint closest to R7 is approximately 293m AHD. Hence R7 is elevated to some extent compared to the development.

R7 is located north east of the QPSF development site. The residence has mature trees on all sides which will screen the development to a significant extent. Farm buildings are located to the west and north of the residence and do not provide screening. The following Figure 3 shows an aerial photo of R7 relative to the development footprint. The inset photo shows the trees and sheds around the house. It shows the potential viewshed disregarding existing screening would be no more than 37 degrees. Since the final layout will occupy only part of the development footprint, the potential viewshed will be less. Hence only a limited portion of R7's potential total viewshed is affected if at all.

Figure 4 – R7 viewshed



R7 is located 1,916m from the modified development footprint at its closest point. In response to R9's submission, the development footprint has been set back from the site boundary and this also increases the setback for R7. The development is in R7's background with farmland in front and behind. The intervening topography slopes between the residence and the development site. The residence does not overlook the development site and existing vegetation around the residence provides screening in the direction of the development.

The photomontage for R7 was included in Figure 20 of the EIS. This disregards existing vegetation screening. It includes all elements of the infrastructure including solar modules, inverter stations, the substation and battery storage. Since the site slopes away from R7, the substation and battery storage are unlikely to be visible. It includes several paddock trees which break up the views to the development.

The main property access for R7 is via a short driveway from Nanardine Lane to the north east. At most, transitory and partial glimpses of parts of the development site, at least 2.2km distant, would be visible from Nanardine Lane with the Inland Rail Line between this public road and the development site.

The house is located with some farm buildings and structures. Mature trees are planted around the house and buildings. These trees provide extensive screening on the western curtilage of the home. It is possible that some glimpses of the development may be visible from R7's curtilage however the screening already provided will ensure these are limited.

R7's visual sensitivity is considered medium. The magnitude of visual modification created by the proposed development is medium with existing screening providing limited views to the development. The landscape

has capacity to accommodate the low level solar farm infrastructure without the loss of valued attributes. The infrastructure would be located at distance and will sit in the background with intervening paddock trees resulting in limited visibility from the residence. Based on a medium sensitivity and medium magnitude of change, the visual impact of the QPSF from R7 is considered moderate.

Through consultation, R7 was the only landowner to accept the offer of preparation of a photomontage. They also raised visual impact in their submission. The modified development footprint has an increased setback from the northern eastern corner which is closest to R7. The proposed setback will mean that the closest infrastructure in the development will be at least 1,916 m distant from R7. In addition, if requested by the resident, further screen planting is offered around the curtilage of the house. The effect of these mitigation measures will reduce visual impacts to minor from the residence.

Table 7 – Summary of visual impact for R7

Viewpoint	Sensitivity	Magnitude of modification	Impact	Impact with mitigation
Non-associated landowner, R7	Medium	Medium	Moderate	Minor

2.6 Receiver 8, R8

By reference to ICSM elevation data, the residence at R8 has an elevation of approximately 291m AHD. The solar farm development site ranges in height from a low point in the south-west of approximately 275m AHD to a high point in the north-east of approximately 293m AHD. The development footprint closest to R8 is approximately 286m AHD. Hence R8 is approximately on the same level as the development.

R8 is located south of the QPSF development site. It has some windows on the northern side. An outdoor living area and pool is located south of the residence and will have no views of the development. The view of any infrastructure from R8 would be very limited if any at all. **Figure 5** shows an aerial photo of R8 relative to the development footprint. The inset photo shows the extensive trees and sheds around the house. It shows the potential viewshed disregarding existing screening would be no more than 75 degrees. Since the final layout will occupy only part of the development footprint, subject to detailed design, the viewshed will be less. Hence only a limited portion of R8's total viewshed is potentially affected, if at all.

Figure 5 – R8 viewshed

As a result of the submission received, the development footprint has been set back from the site boundary to provide a minimum 1200m distance from R8. The development is in R8's background with farmland in front and behind. The intervening topography is relatively flat between the residence and the development site. The residence does not overlook the development site and existing vegetation and farm buildings around the residence provides extensive screening in the direction of the development.

The main property access for R8 is from Henry Parkes Way to the south. Existing trees line the driveway to the house. It is highly unlikely that any of the development will be visible on the driveway due to screening from the trees and buildings surrounding the house. There is also paddock access to the rear of the property off Back Trundle Road. The development will be visible from this rear entrance, however the development is on the same elevation and drivers will neither overlook it nor view it against the sky. Views from this rear access will be transitory.

The house is located with a cluster of farm buildings and structures. Extensive mature trees are planted around the house and buildings. These trees and structures provide extensive screening towards the north and the north-west from the curtilage of the home. It is possible that some glimpses of the development may be visible from R8's curtilage however the screening already existing will ensure these are very limited. There are no unobstructed views towards the development site from the residence.

R8's visual sensitivity is considered medium. The magnitude of visual modification created by the proposed development is low with extensive existing screening providing limited views to the development if any at all. The landscape has capacity to accommodate the solar farm infrastructure without the loss of valued attributes. The infrastructure would be located at distance and will sit low in the background with

intervening vegetation and farm buildings providing screening resulting in very limited visibility, if any, from the residence. Based on a medium sensitivity and low magnitude of change, the visual impact of the QPSF from R8 is considered minor.

As this resident has raised concerns about visual impact, an increased setback from Back Trundle Road has been adopted for the south eastern corner of the modified development footprint. The proposed setback will mean that the closest infrastructure in the development will be at least 1,200 m distant from R8. In addition, if requested by the resident, further screen planting is offered around the curtilage of the house. The effect of these mitigation measures will reduce visual impacts to almost none from the residence.

Table 8 – Summary of visual impact for R8

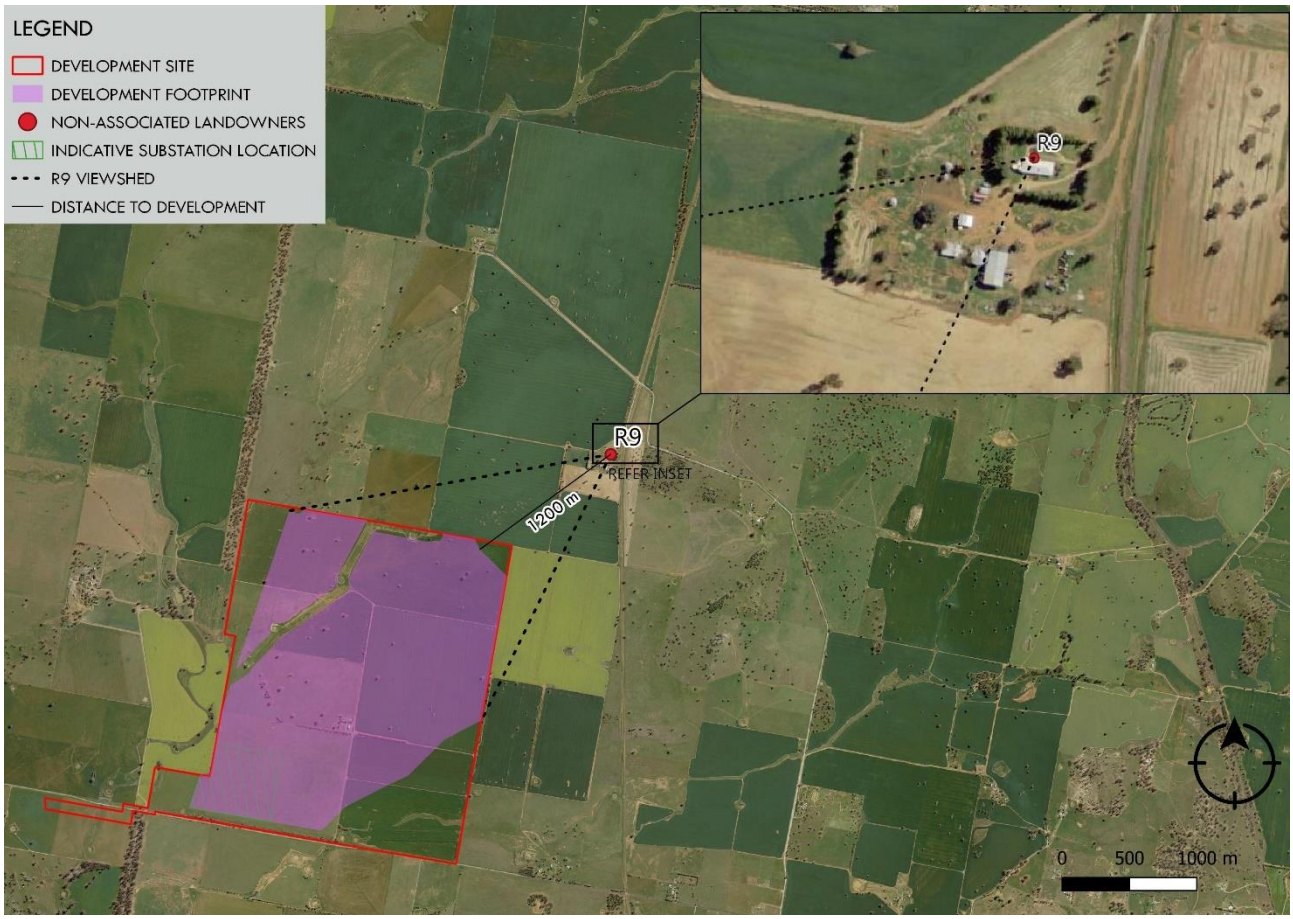
Viewpoint	Sensitivity	Magnitude of modification	Impact	Impact with mitigation
Non-associated landowner, R8	Medium	Low	Minor	Minor- Negligible

2.7 Receiver 9, R9

By reference to ICSM elevation data, the residence at R9 has an elevation of approximately 307 m (AHD). The solar farm development site ranges in height from a low point in the south-west of approximately 275m AHD to a high point in the north-east of approximately 293m AHD. The development footprint closest to R9 is approximately 291m AHD. Hence R9 is slightly elevated relative to the development.

R9 is located north east of the QPSF development site. It is immediately adjacent the Inland Railway on the western side. The residence is surrounded by mature hedging, trees and farm buildings. The view of any infrastructure from R9 would be very limited if any at all. **Figure 6** shows an aerial photo of R9 relative to the development footprint. It shows the potential viewshed disregarding existing screening would be no more than 57 degrees. Since the final layout will occupy only part of the development footprint, subject to detailed design, the potential viewshed will be less. Hence only a limited portion of R9's total viewshed is potentially affected if at all.

Figure 6 – R9 viewshed



R9 is located 1,200 m from the modified development footprint at its closest point. In response to their submission, the development footprint has been set back from the site boundary to provide a minimum 1200m distance from R9. The development is in R9's background with farmland in front and behind. The intervening topography slopes between the residence and the development site. The residence does not overlook the development site and existing vegetation and farm buildings around the residence provides extensive screening in the direction of the development.

The main property access for R9 is from Nanardine Lane to the east. At most, transitory and partial glimpses of parts of the development site, some 1.5km distant, would be visible from Nanardine Lane with the Inland Rail Line between this public road and the development site.

The house is located with a cluster of farm buildings and structures. Extensive mature trees are planted around the house and buildings. These trees and structures provide extensive screening around the curtilage of the home. It is possible that some glimpses of the development may be visible from R9's curtilage however the screening already provided will ensure these are very limited. There are no unobstructed views towards the development site from the residence.

R9's visual sensitivity is considered medium. The magnitude of visual modification created by the proposed development is low with extensive existing screening providing limited views to the development. The landscape has capacity to accommodate the solar farm without the loss of valued attributes. The infrastructure would be located at distance and will sit in the background with intervening vegetation and farm buildings providing screening resulting in very limited visibility, if any, from the residence. Based on a medium sensitivity and low magnitude of change, the visual impact of the QPSF from R9 is considered minor.

Through consultation, R9 advised that visual impact was not a significant concern and declined any meetings or the preparation of a photomontage. Notwithstanding, since they raised visual impact in their submission, an increased setback from the northern boundary has been adopted for the north eastern corner of the modified development footprint. The proposed setback will mean that the closest infrastructure in the development will be at least 1,200 m distant from R9. In addition, if requested by the resident, further screen planting is offered around the curtilage of the house. The effect of these mitigation measures will reduce visual impacts to almost none from the residence.

Table 9 – Summary of visual impact for R9

Viewpoint	Sensitivity	Magnitude of modification	Impact	Impact with mitigation
Non-associated landowner, R9	Medium	Low	Minor	Minor- Negligible

2.8 Receiver 10, R10

By reference to ICSM elevation data, the residence at R10 has an elevation of approximately 294m AHD. The solar farm development site ranges in height from a low point in the south-west of approximately 275m AHD to a high point in the north-east of approximately 293m AHD. The development footprint closest to R10 ranges from 283 m AHD in the south to 295 m AHD in the north-east. Hence R10 is on approximately the same elevation as the development and does not overlook it.

R10 is located south east of the QPSF development site. The residence is screened on its western side by mature trees and farm buildings which will partially restrict views to the infrastructure. **Figure 7** shows an aerial photo of R10 relative to the development footprint and shows the potential viewshed disregarding existing screening would be no more than 59 degrees. Since the final layout will occupy only part of the development footprint, subject to detailed design, the potential viewshed will be less. Hence only a limited portion of R10's total viewshed is potentially affected if at all.

Figure 7 – R10 viewshed

R10 is located 1,978 m from the modified development footprint at its closest point. The development is in R10's background with farmland in front and behind. The intervening topography is relatively flat between the residence and the development site. The residence does not overlook the development site and existing vegetation and farm buildings around the residence provides extensive screening in the direction of the development.

The main property access for R10 is from Henry Parkes Way in the south via a tree lined driveway. Any views of the development will be transitory and at a distance of more than 2,000m, with screening provided by the trees on the western side of the driveway.

R10's visual sensitivity is considered medium. The magnitude of visual modification created by the proposed development is low with existing screening providing limited views to the development. The landscape has capacity to accommodate the solar farm without the loss of valued attributes. The infrastructure would be located at distance and will sit in the background with intervening vegetation and farm buildings providing screening resulting in limited visibility from the residence. Based on a medium sensitivity and low magnitude of change, the visual impact of the QPSF from R10 is considered minor.

Through consultation, R10 did not raise visual impact as a concern and recently declined the preparation of a photomontage. Notwithstanding, they raised visual impact in their submission. The increased setback from Back Trundle Road in the south eastern corner of the modified development footprint means that the closest infrastructure in the development will be at least 1,978 m distant from R10. In addition, if requested by the resident, further screen planting is offered around the curtilage of the house. The effect of these mitigation measures will reduce visual impacts to almost none from the residence.

Table 10 – Summary of visual impact for R10

Viewpoint	Sensitivity	Magnitude of modification	Impact	Impact with mitigation
Non-associated landowner, R10	Medium	Low	Minor	Minor - Negligible

2.9 Receiver 11, R11

By reference to ICSM elevation data, the residence at R11 has an elevation of approximately 295 m AHD. The solar farm development site ranges in height from a low point in the south-west of approximately 275m AHD to a high point in the north-east of approximately 293m AHD. The development footprint closest to R11 ranges from 283 m AHD in the south to 295 m AHD in the north-east. R11 sits at a similar elevation and does not overlook the development site.

R11 is located south east of the QPSF development site. The residence is partially screened on its north and western sides by mature trees and farm buildings which will restrict to some extent the views to the infrastructure. **Figure 8** shows an aerial photo of R11 relative to the development footprint and shows the potential viewshed disregarding existing screening would be no more than 78 degrees. Since the final layout will occupy only part of the development footprint, subject to detailed design, the potential viewshed will be less. Hence only a portion of R11's total viewshed is potentially affected.

Figure 8 – R11 viewshed

R11 is located at least 1200m from the modified development footprint at its closest point. The development is in R11's background with farmland in front and behind. The intervening topography is relatively flat between the residence and the development site. The residence does not overlook the development site and existing vegetation and farm buildings around the residence provides limited screening in the direction of the development.

The main property access for R11 is from Back Trundle Road. Any views of the development will be transitory and limited due to screening provided by the trees on the western side of the driveway.

R11's visual sensitivity is considered medium. The magnitude of visual modification created by the proposed development is low with some existing screening of views to the development. The landscape has capacity to accommodate the low level solar farm infrastructure without the loss of valued attributes. The infrastructure would be located at distance and will sit in the middle ground with existing trees on the site boundary providing some screening from the residence. Based on a medium sensitivity and low magnitude of change, the visual impact of the QPSF from R11 is considered minor.

As this resident has raised concerns about visual impact in their submission, an increased setback from R11 has been adopted for the south eastern corner of the modified development footprint. The proposed setback will mean that the closest infrastructure in the development will be at least 1,200 m distant from R11. In addition, if requested by the resident, further screen planting is offered around the curtilage of the house. The effect of these mitigation measures will reduce visual impacts to the residence.

Table 6 – Summary of visual impact for R11

Viewpoint	Sensitivity	Magnitude of modification	Impact	Impact with mitigation
Non-associated landowner, R11	Medium	Low	Minor	Minor

2.10 Receiver 13, R13

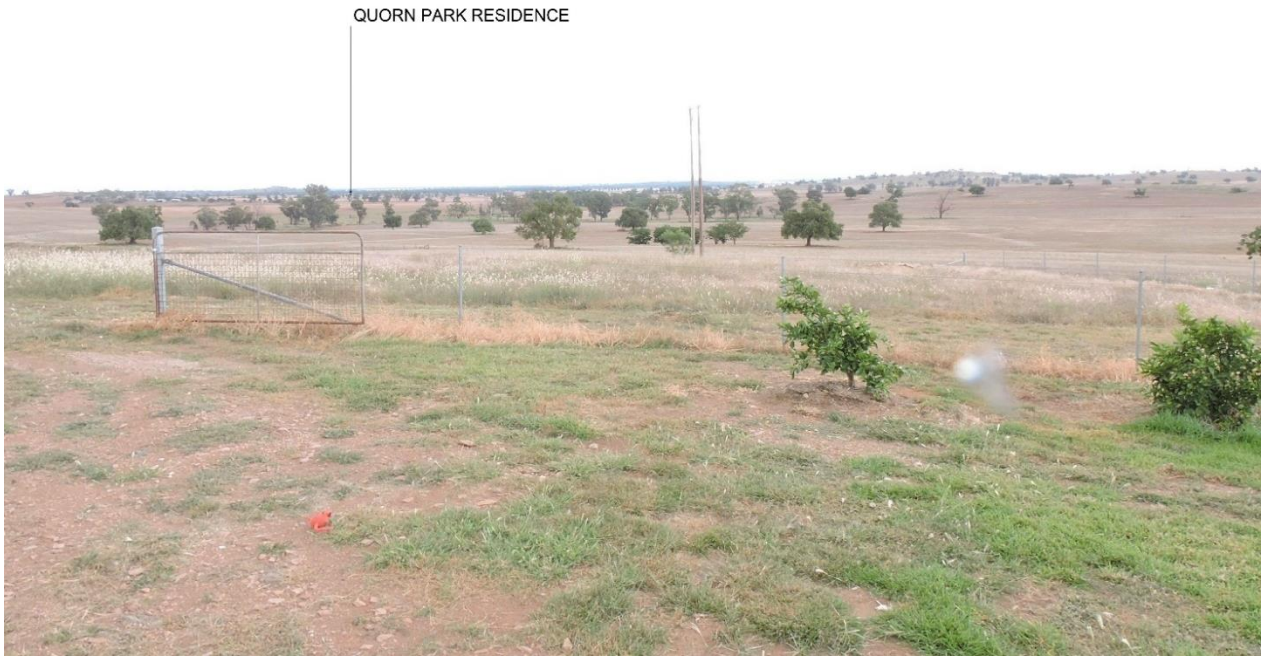
By reference to ICSM digital elevation data, the residence at R13 has an elevation of approximately 361 m AHD and is located at a distance of 4,858 metres from the eastern edge of the proposed development footprint. The solar farm development site ranges in height from a low point in the south-west of approximately 275m AHD to a high point in the north-east of approximately 293m AHD. The development footprint closest to R13 is approximately 293 m AHD. R13 is elevated relative to the development site.

R13 is located east of the QPSF development site. **Figure 9** shows an aerial photo of R13 relative to the development footprint and shows the potential viewshed disregarding existing significant stands of vegetation would be no more than 22 degrees. Since the final layout will occupy only part of the development footprint, subject to detailed design, the potential viewshed will be less. Hence a very limited portion of R13's total viewshed is potentially affected.

Figure 9 – R13 viewshed

Figure 10 provides an image taken from R13 together with landscape features for context. From this image it is clear that the proposed development site is sufficiently removed from R13 such that a significant visual impact is not anticipated.

Figure 10 – Image taken from R13



R13 is located at least 4,858 m from the modified development footprint at its closest point. The development is in R13's background with farmland on all sides, in front and behind. The intervening topography is undulating and includes a large hill which will screen out most of the development site. In addition, there are extensive paddock trees and farm buildings between the residence and the development site. From the residence it is extremely difficult to discern the development site from R13.

The main property access for R13 is from Bogan Road to its east via a short driveway and the development will not be visible.

R13's visual sensitivity is considered medium. The magnitude of visual modification created by the proposed development is low with views to the development being so distant and extensively blocked. The landscape has capacity to accommodate the solar farm without the loss of valued attributes. The infrastructure would be located at distance and will sit in the background. Based on a medium sensitivity and low magnitude of change, the visual impact of the QPSF from R13 is considered minor.

Table 72 – Summary of visual impact for R13

Viewpoint	Sensitivity	Magnitude of modification	Impact
Non-associated landowner, R13	Medium	Low	Minor

2.11 Receiver 14, R14

The head of the cul-de-sac at Corcoran Road is located at a distance of 4,812m from the closest part of the development footprint. R14 at Corcoran Road has been selected to represent the rural residential lots that are being developed in the immediate locality. A submission was received from the developer of the subdivision and identified visual impact as a concern.

Based on ICSM digital elevation data, R14 has an elevation of approximately 364m AHD. The solar farm development site ranges in height from a low point in the south-west of approximately 275m AHD to a high point in the north-east of approximately 293m AHD. Hence R14 is elevated compared to the development.

Figure 3 shows an aerial photo of R14 relative to the development footprint and shows the potential viewshed disregarding existing screening would be no more than 25 degrees. Since the final layout will occupy only part of the development footprint, subject to detailed design, the potential viewshed will be less. Hence a very limited portion of R14's total viewshed is potentially affected.

Figure 3 – R14 viewshed

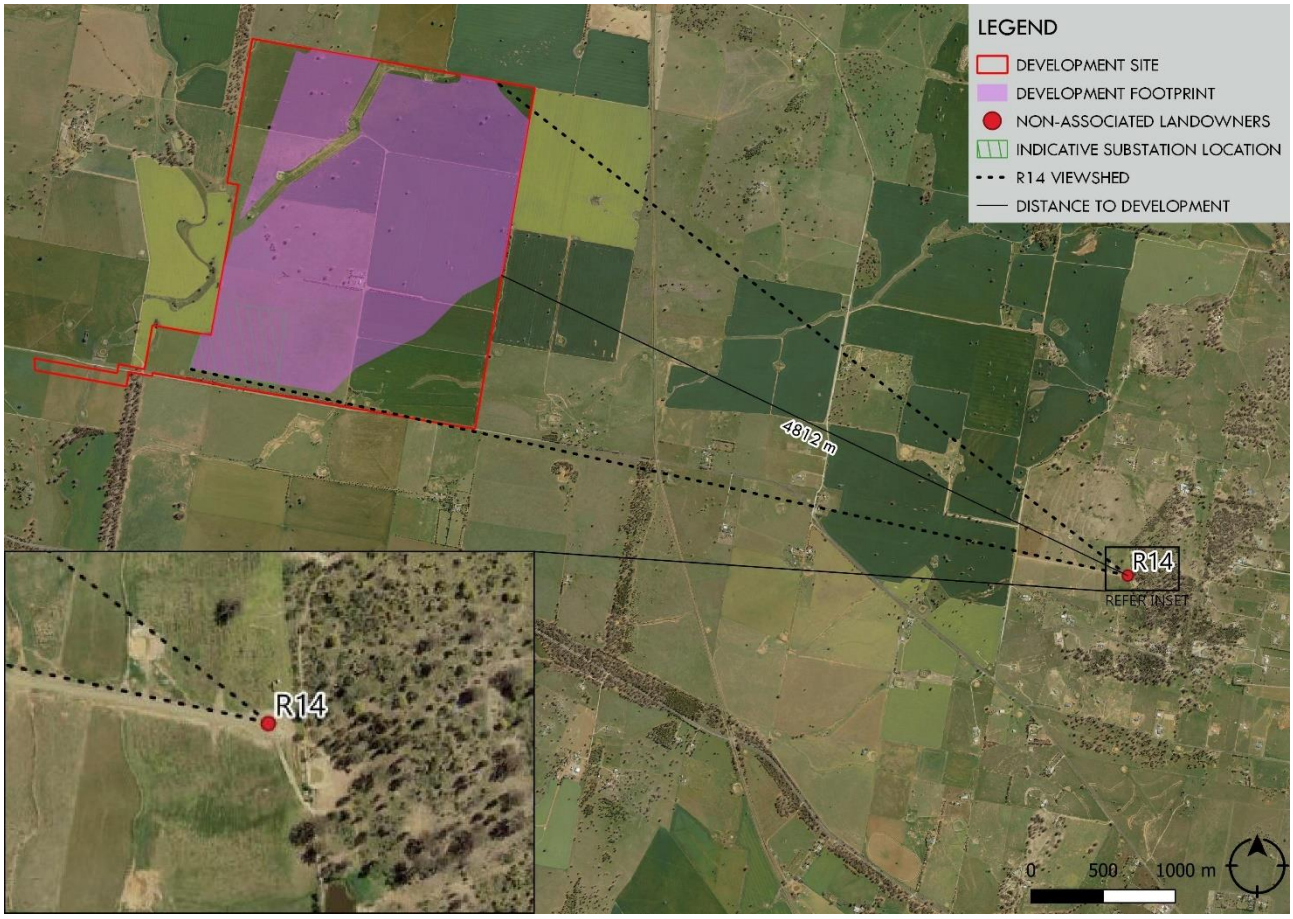
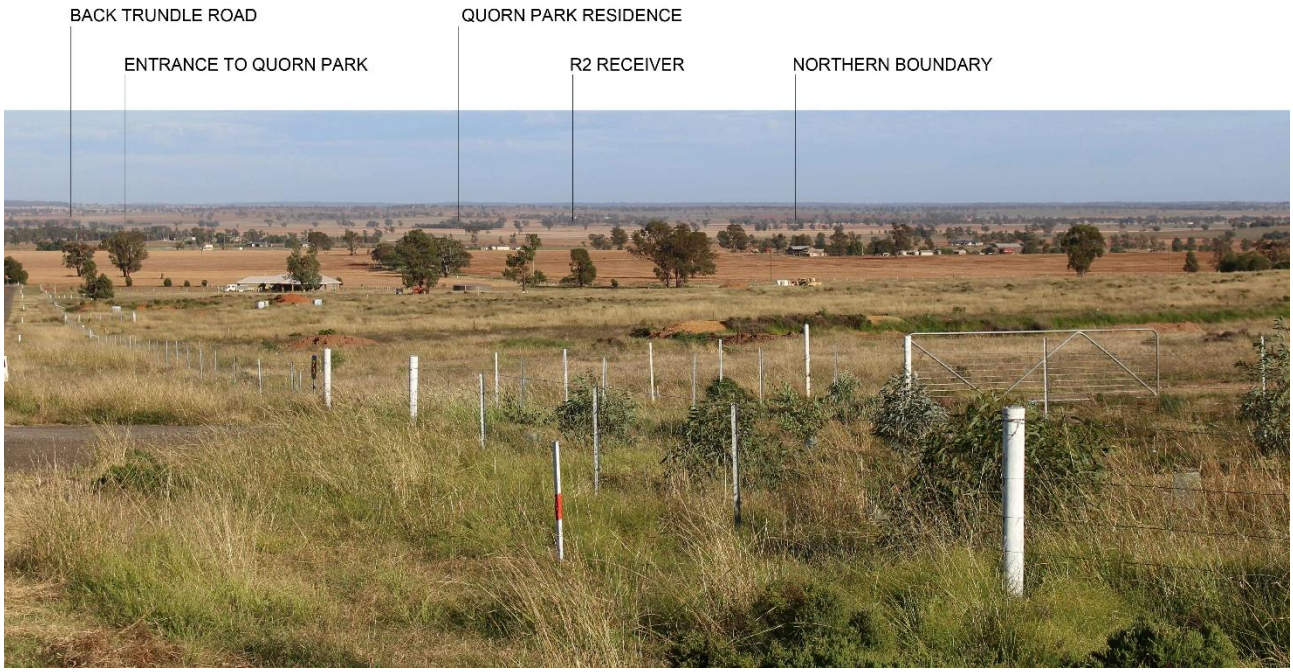


Figure 4 provides an image taken from R14 together with landscape features for context. From this image it is clear that the proposed development site is sufficiently removed from R14 such that a visual impact is not anticipated.

Figure 4 – Image taken from R14



R14 is located at least 4,812 m from the modified development footprint at its closest point. The development is in R14's background with farmland to all sides, in front and behind. The intervening topography is undulating and includes extensive paddock trees and farm buildings between the location and the development site. from this representative viewpoint it is extremely difficult to discern the development site from R14.

R14's visual sensitivity is considered medium. The magnitude of visual modification created by the proposed development is low with views to the development being distant. The landscape has capacity to accommodate the solar farm without the loss of valued attributes. The infrastructure would be located at distance and will sit in the background. Based on a medium sensitivity and low magnitude of change, the visual impact of the QPSF from R14 is considered minor.

Table 8 – Summary of visual impact for R14

Viewpoint	Sensitivity	Magnitude of modification	Impact
Non-associated landowner, R14	Medium	Low	Minor

2.12 Mitigation Measures

The proposed mitigation measures to minimize visual impacts for non-associated residents located within 2km of the development footprint include increasing setbacks from the development infrastructure to the development site boundary and the offer of vegetation screen planting around the curtilage of homes upon request from landowners. Both of these are discussed below.

Adding to the vegetation screening already existing on the perimeter of the development is not proposed. It is not likely to be an effective screen for the affected residences. R2, for example, would overlook any trees planted on the western boundary regardless of their maturity. New planting in proximity to affected residences which request it is considered to be much more effective in screening views.

2.12.1 DEVELOPMENT FOOTPRINT

The development footprint has been modified to provide additional setbacks for neighbours who have raised concerns about visual impact. The details have been identified in the prior sections where each affected residence is assessed. The area cut from the development footprint with these additional setbacks is 57 hectares. The modified development footprint area is now 354 hectares compared to the development site area of 470 hectares, excluding the grid connection area.

In the modified layout, in relation to receiver R2, no solar farm infrastructure, with the exception of the grid connection, would be located west of the existing 132 kV overhead power line that traverses the development site. This will provide a setback for R2 of at least 1,200m to the solar farm development footprint. Since the final layout will occupy only a portion of the development footprint, the actual setback is likely to be greater.

For receivers R8, R9 and R11 the development footprint has been modified to provide a setback of 1,200m from the solar farm development footprint to each of these residences. Since the final layout will occupy only a portion of the development footprint, the actual setback is likely to be greater. These setbacks modify the development footprint in the north east corner for R9 and in the south east corner for R8 and R11.

R7, R10, R13 and R14 also mentioned visual impact in submissions and will be located between 1916 m (R7) and 4812 m (R14) from the modified development footprint.

Refer **Appendix A** for the modified Development Footprint which shows the new setbacks.

2.12.2 CURTILAGE PLANTINGS

Quorn Park Solar Farm Pty Ltd confirms that any resident within 2 km of the development site who requests vegetation screening around the curtilage of their home will be accommodated. Specifically, Quorn Park Solar Farm Pty Ltd proposes the following practice.

As design progresses and after the farm layout is finalised, which will detail the extent and location of infrastructure within the development footprint, Quorn Park Solar Farm Pty Ltd will meet with these residents to initiate discussions on their requirements for curtilage plantings.

For each resident who requests curtilage plantings, a site-specific Landscaping Plan will be prepared. This plan will detail the number, location and species composition of the plantings proposed and will be prepared in consultation with the landowner. Sourcing and physical planting of the trees and shrubs would be at Quorn Park Solar Farm Pty Ltd's cost.

Planting will be undertaken prior to construction and/or as soon as favourable seasonal conditions permit. Any mortalities within three (3) years of planting would be replaced by Quorn Park Solar Farm Pty Ltd.

3. SURFACE WATER

3.1 Summary

The solar farm infrastructure once constructed will not affect downstream flows and flooding. There may be effects during construction, but these can be contained by deploying standard good practice civil engineering methods. Details of stormwater management will be detailed in a management plan prior to construction and an operations management plan prior to final commissioning and will be subject to consultation and approval with DPIE.

The development site was specifically selected to avoid areas of flood risk. As detailed in the EIS, the site is not flood prone and has no history of flooding. However, there will be occasional inundation resulting in temporary local surface water. The Premise hydrologist confirms that solar modules once installed will not slow down nor speed up surface water flows. The waterflows for neighbours after construction will be unchanged.

It is important to confirm that the substation and battery storage will avoid flooding. Hence the Premise hydrologist modelled the flow of stormwater across the site for the 1 in 100 year storm event (1% Average Exceedance Probability, AEP). The details of the modelling follow in section 3.2. The modelling demonstrates that the area identified for the substation and battery storage site is clear of flooding.

In response to submissions that mentioned potential impact on water flows in the creeks in the south west portion of the site, all infrastructure has been removed from the western side of the existing overhead line. Infrastructure has also been removed from the north western portion west of the overhead line to the boundary with R2. The modified development footprint is included in Appendix A and shows there will be no infrastructure in these portions of the site.

As detailed in section 20.4 of the EIS, prior to construction, a detailed Soil and Water Management Plan will be prepared that complies with Landcom's 2004 Managing Urban Stormwater: Soils and Construction 4th Edition. This will be in consultation with DPIE and subject to approval. Until detailed design, it is premature to provide further details.

3.2 Flood modelling

3.2.1 APPROACH

A hydraulic model (XPSWMM) was created to identify the flood constraints on the site. The developable extents and possible locations of infrastructure were sought to be determined in order to inform the EIS.

3.2.2 DATA

Data used in the preparation of this report and information about the site was gathered from the following sources:

- Aerial LiDAR data supplied by ELVIS data;
- Aerial Imagery by Nearmap (Accessed on January 2020).
- ARR2016 hydrologic data
- Bureau of Meteorology (BOM) IFD data

3.2.3 HYDROLOGIC AND HYDRAULIC MODEL

A hydrologic and hydraulic model was generated using XPSWMM for the 1% AEP event which was assumed to be the defined flood event and the main event used for development constraints. Whilst other AEP events may need to be considered throughout the design process of the solar farm this was considered adequate for setting development footprint and locating infrastructure.

The model integrates the use of hydrology and hydraulics. The hydrologic information for the 1% AEP obtained from the ARR2016 data hub and the BOM were input into the model to determine the rainfall runoff for the site catchment. The catchment which contributes to flows at the site was the tributary to Ridgey Creek. The Ridgey catchment upstream of Back Trundle Road was also considered due to its tailwater influence at the confluence of the waterways.

LiDAR and other data obtained from site visits was used to generate a hydraulic model of the creek and drainage lines to determine the 1% AEP flood extent. The methodology used was considered conservative in order to obtain a flood extent which could be used for preliminary planning purposes.

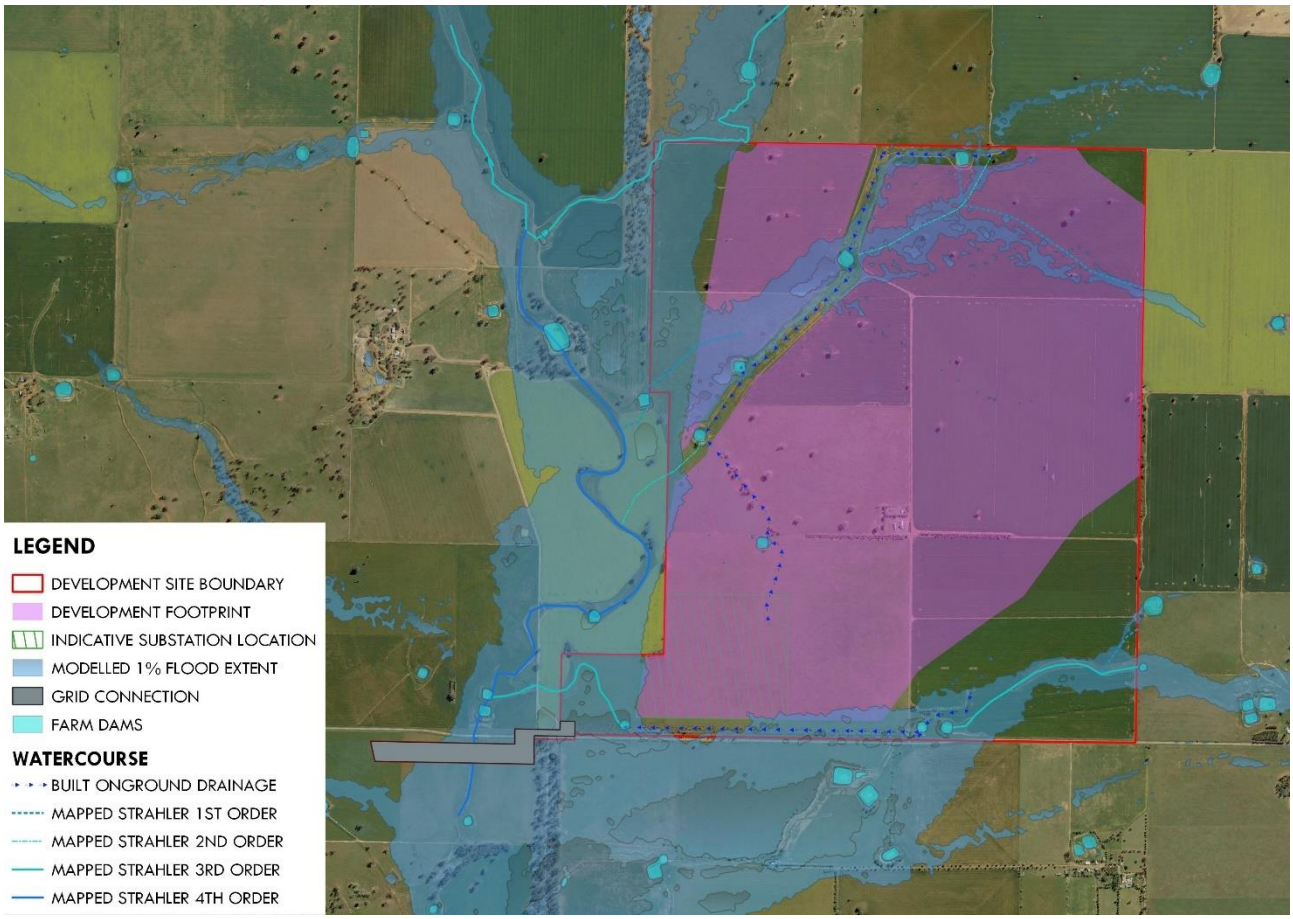
3.2.4 CRITICAL INFRASTRUCTURE & DEVELOPMENT EXTENT

Flood inundation informed the development footprint. As solar panels do not result in additional run off and as they don't result in an appreciable impedance to flow, solar panels are proposed in some inundation areas. This is in areas that are:

- Not the active flow path or
- Do not have a flood depth greater than 0.5m; or
- Do not have a flow velocity greater than 1.5 m/s

The substation and battery storage have been located on flood free land. Therefore impacts on downstream flows will not be significant. **Figure 5** shows the development extents and substation location being outside the flooded area.

Figure 5 – Development Footprint & Substation Location



3.2.5 SUMMARY

A hydrologic and hydraulic model was created for the site to identify flood constraints for the 1% AEP. The flood modelling enabled the identification of a development footprint and a suitable location for the proposed substation with minimal risk of flooding.

3.3 Mitigation Measures

In response to submissions mentioning the potential for impact on downstream water flows and flooding due to infrastructure in the south western portion of the site, the development footprint has been reduced. In the modified development footprint there will be no infrastructure on the western side of the existing overhead line, with the exception of the grid connection. This applies in the north western and the south western corners of the site. Refer to **Appendix A** for the modified Development Footprint.

4. CARPARK, VEHICLE MOVEMENTS

The temporary carpark will be located within the development footprint in Appendix A. It will be accessed via the existing site entrance and the proposed site access tracks. It will not be sealed but constructed of road base. The vehicle movements for transporting the road base have been included in the heavy vehicle movements in the EIS.

The query raised about vehicle movements is linked to two specific areas where the EIS used a wrong descriptor and an ambiguous descriptor. In general, DPIE's definition is adopted of one vehicle movement = one vehicle entering and then later leaving the site (two trips).

Section 12.4 (Road Traffic Noise) of the EIS, 2nd paragraph states:

The assessment has considered the potential impacts associated with noise emissions from the maximum peak daily expected 60 light and 125 heavy vehicle movements from the site entry along the local access road (Back Trundle Road) onto McGrath Lane and Henry Parkes Way.

It should state:

The assessment has considered the potential impacts associated with noise emissions from the maximum peak daily expected 60 light and 125 heavy vehicle trips from the site entry along the local access road (Back Trundle Road) onto McGrath Lane and Henry Parkes Way.

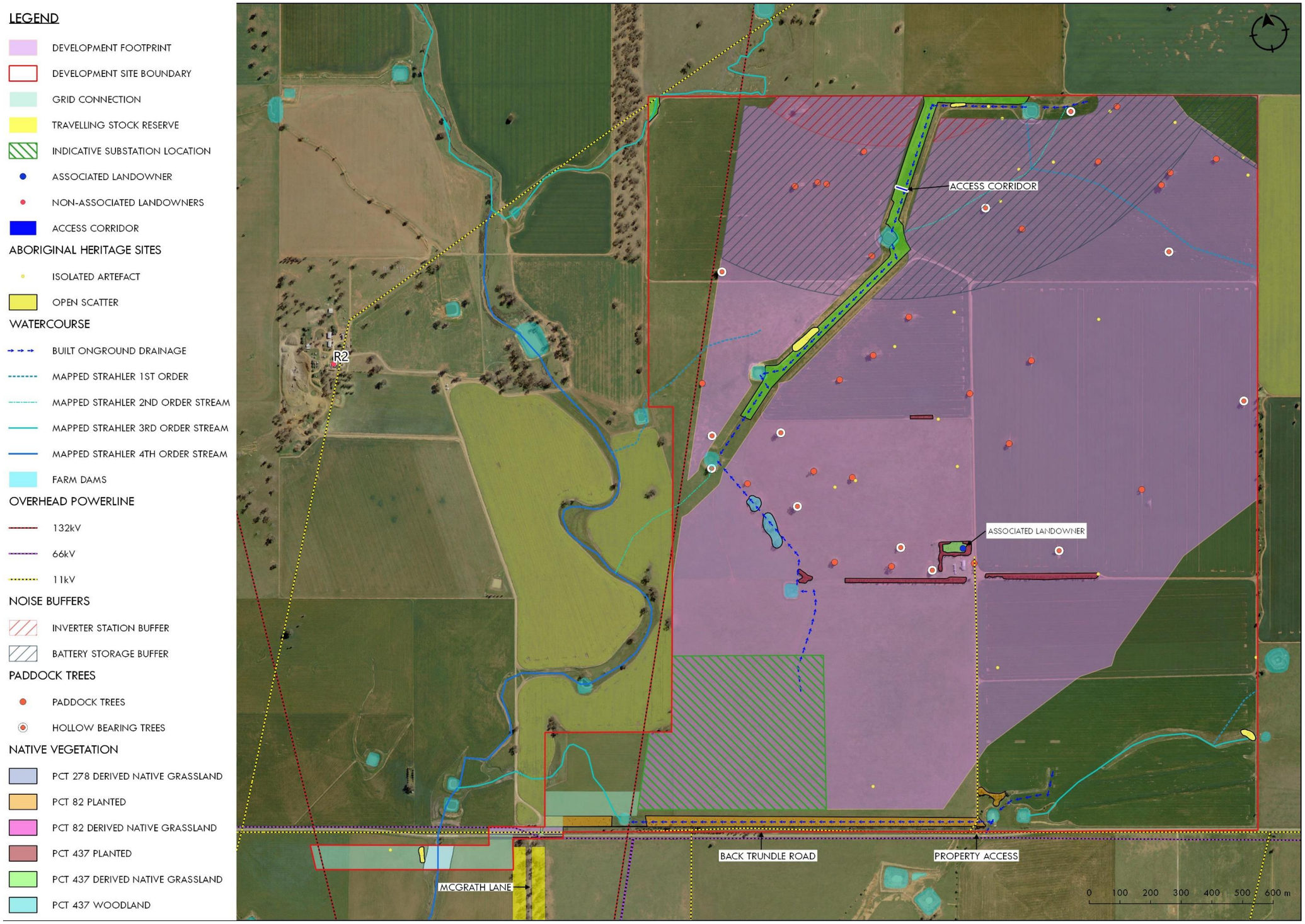
Appendix F (Noise Impact Assessment) of the EIS, Section 5.1, Table 14, right hand column is titled *Number Vehicles*. A clearer and more succinct descriptor for this column would have been *Vehicle Trips*. Premise confirms that the road traffic noise assessment has been based on the correct number of peak daily vehicle trips of 185 (equating to 93 vehicle movements).

Further, Premise confirms that there would not be 1 oversize/over mass vehicle per day. With the possible exception of the transformer for the substation, there would not be a need for any over mass or oversize deliveries. This heavy vehicle would be one of the 125 heavy vehicle trips (equating to 63 heavy vehicle movements) and as such has been considered in the road traffic noise assessment.

APPENDIX A

MODIFIED DEVELOPMENT FOOTPRINT

Figure 1 – Modified Development Footprint



Premise