

Appendix G: Noise impact assessment





Sandigo Solar
Farm:
Noise Impact
Assessment

February 2018

Sandigo Solar Farm

Noise Impact Assessment

AE1078.0_D3

February 2018

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Issued to	
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Abbreviations

AC	alternating current
DC	direct current
dB	decibel
dB(A)	A-weighted sound levels
dB(A) _{LA90}	the A-weighted sound pressure level that is exceeded for 90% of the measured time period
DPE	Department of Planning and Environment (NSW)
EIS	environmental impact statement
EPA	Environment Protection Authority
Ha	hectares
ICNG	Interim Construction Noise Guideline
km	kilometre
kV	kilovolt
Lw	sound power level
m	metres
MW	megawatts
NPI	Noise Policy for Industry
NSR	nearest sensitive receiver
PSNL	Preliminary Environmental Assessment
PCU	power conversion unit
RBL	rating background noise level
SEARs	Secretary's environmental assessment requirements
SPL	sound power level

1 Introduction

1.1 Project overview

The proposed Sandigo Solar Farm (the project) is a utility-scale renewable energy project that would generate up to 100 MW (AC) through the conversion of solar radiation to electricity via photovoltaic modules (solar panels). The solar panels would generate direct current (DC) electricity that would be inverted to alternating current (AC) electricity via Power Conversion Units (PCUs). The solar farm electricity output would then be supplied to the TransGrid electricity network via high voltage cables connecting to the 132 kV transmission line which transects the development site.

Sandigo was chosen as the location of the solar farm due to the high solar irradiance in the region and the capacity of the TransGrid electricity network to transmit the power generated by the farm. The project is located southeast of Narrandera in New South Wales (NSW) (Figure 1.1).

1.2 Site details

General information about the project location and uses of existing land is provided in Table 1.1 as well as in Figure 1.1.

Table 1.1. Sandigo Solar Farm project overview

Address	174 Mitchells Road, Sandigo, New South Wales, 2700
Applicant	ESCO Pacific Pty Ltd
Council	Narrandera Shire Council
Titles	<ul style="list-style-type: none"> • Lot 55 on Plan 754550 (168.1 ha) • Lot 33 on Plan 754550 (53.4 ha) • Lot 35 on Plan 754550 (9.1 ha)
Total indicative area	231 ha
Land Use	Cropping, grazing – high level of ground disturbance
Capacity	Up to 100 MW (AC)
Connection	TransGrid 132 kV Transmission line #994

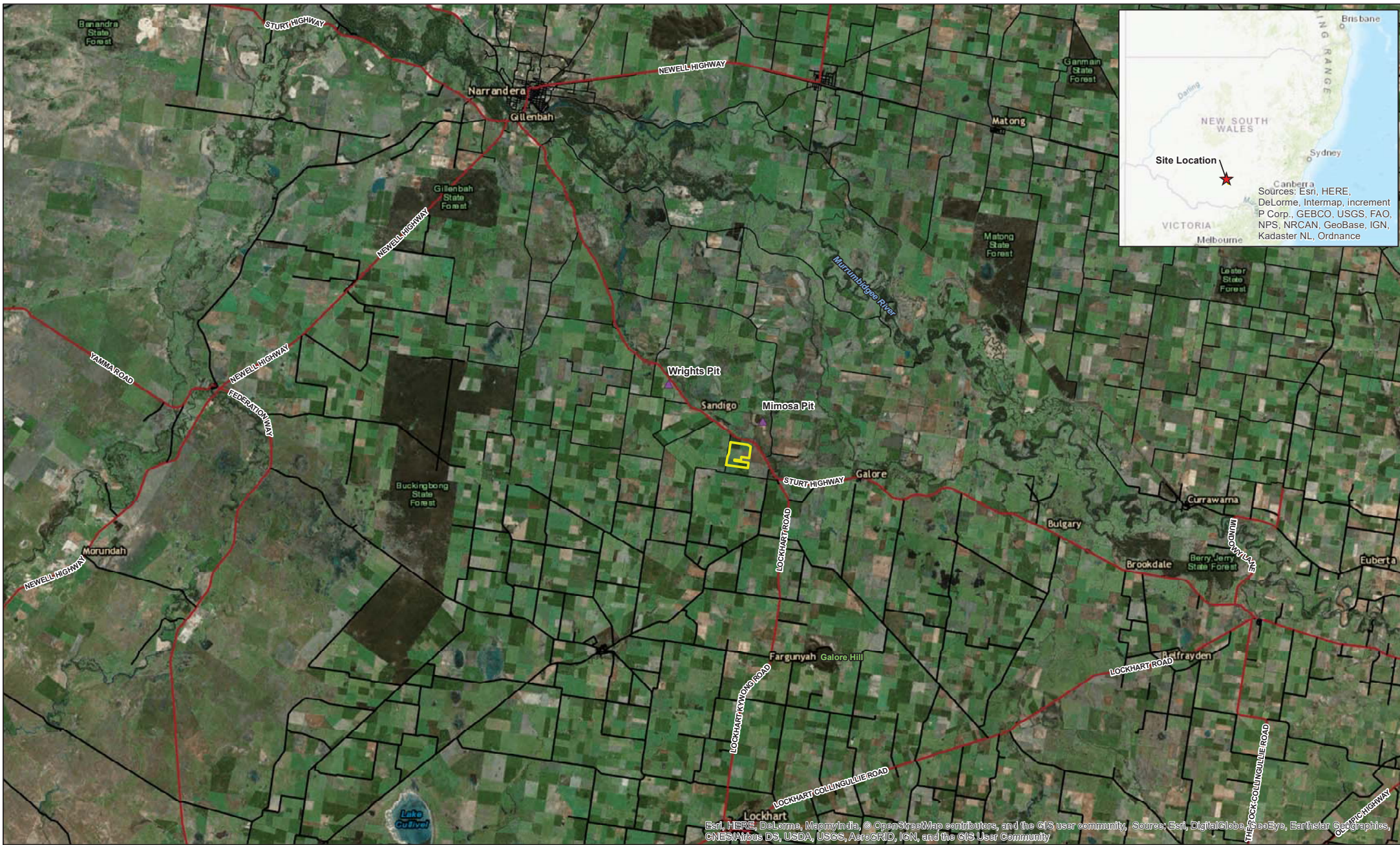
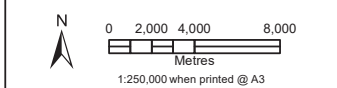


Figure 1.1
Regional Context
 Sandigo Solar Farm

Client: Esco Pacific
 Project: Sandigo Solar Farm
 Project No: AE1078
 Mapping by GeoEccentric 16/02/2018

- Legend**
- Development Site
 - Highway
 - Main Road



Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community, Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

2 Noise impact assessment

2.1 Project brief

An Environmental Impact Statement (EIS) is being prepared by for the Sandigo Solar Farm in accordance with the Secretary’s Environmental Assessment Requirements (SEARs) and agency comments, issued by DPE on 30 November 2017, and outcomes of community and stakeholder consultation. This noise assessment report has been prepared in support of the EIS. The report has been prepared to address the following SEAR:

an assessment of the construction noise impacts of the development in accordance with the Interim Construction Noise Guideline (ICNG) and operational noise impacts in accordance with the NSW Noise Policy for Industry 2017 and a draft noise management plan if the assessment shows construction noise is likely to exceed applicable criteria.

2.2 Existing conditions

The development site, covering approximately 231 ha of rural land, is located approximately 300 m south of Sturt Highway, 600 m north of Kywong Faithfull Road, 1.5 km west of Kywong Boree Creek Road, and is adjacent to Mitchells Road to the west. Sturt Highway is the nearest major road, is used by light and heavy vehicles, and is expected to be the main external noise source. The other roads experience local traffic and are used by light vehicles and occasionally farm machinery and other heavy vehicles – these roads are also expected to be sources of external noise.

Landuse in the vicinity of the development site is predominantly cropping and grazing, therefore the operation of noise generating machinery and equipment such as harvesters, boom sprayers and tractors, are a further source of external noise.

Other landuses in the vicinity of the site include extractive industry use, with the Mimosa Pit and Wrights Pit located approximately 2 km north and 6 km northwest, respectively, of the site. These pits operate intermittently, with Mimosa Pit not currently in operation. During extractive operations at these pits, there may be an increase in noise generated from vehicles travelling to and from the sites on Sturt Highway.

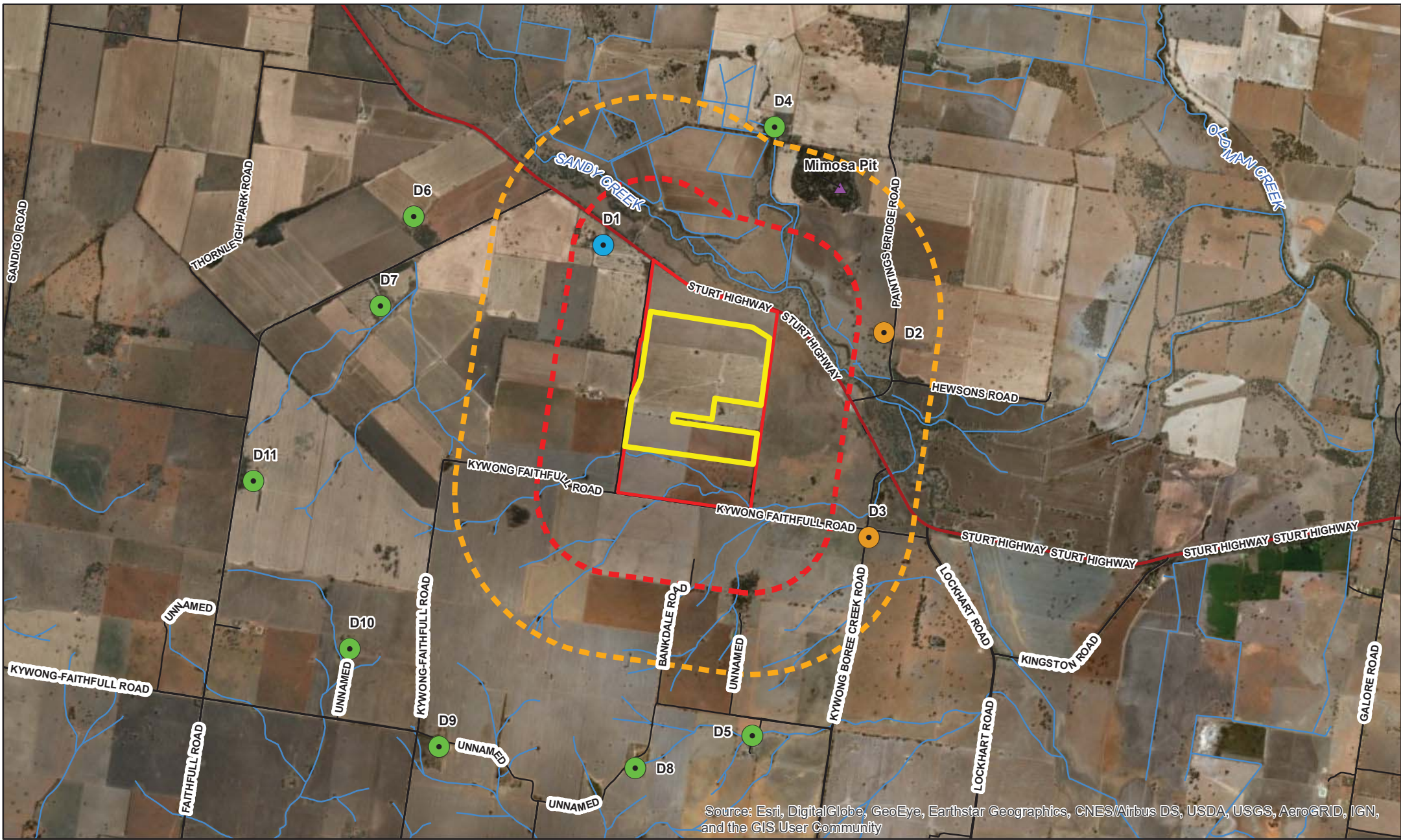
Dwellings in the landscape are sparse. These dwellings would be expected to generate low levels of noise as a result of equipment such as generators or on-site water pumps.

Noise from insects and wind through trees and vegetation would also contribute to background noise levels within and in the vicinity of the development site.

2.2.1 Sensitive land uses and receivers

Sensitive land uses were identified in the area surrounding the development site in accordance with the Interim Construction Noise Guideline (ICNG) (DECC 2009). Residences (hereafter called dwellings) have been identified as a sensitive land use potentially impacted by noise from the development site.

As shown on Figure 2.1, there are no dwellings within 1 km of the site lot boundaries except for the site landholder (D1), which is located 600 m from the lot boundaries. The site landholder is part of the commercial venture of the solar farm and therefore not considered a sensitive receiver for the purposes of this report.



Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Figure 2.1
Sensitive Receivers
Sandigo Solar Farm



N

0 450 900 1,800
Metres

1:60,000 when printed @ A4

Client: Esco Pacific
 Project: Sandigo Solar Farm
 Project No: AE1078
 Mapping by GeoEccentric 27/02/2018

Two dwellings (D2 and D3) are located within 1-2 km of the site lot boundaries. The next nearest receiver, D4, is located almost 2.5 km away – a significant distance from the site. As such only D2 and D3 have been identified as nearest sensitive receivers (NSRs) and assessed for noise impacts. Table 2.1 provides details on the two NSRs.

Table 2.1. Noise sensitive receptor locations

Sensitive Receiver	Location	Direction from Project	Distance to site lot boundaries (m)	Distance to development site* (m)	Distance from Sturt Highway (m)
D2	Paintings Bridge Road	Northeast	1,300	1,360	770
D3	Kywong Boree Road	Southeast	1,500	1,700	620

*Construction and operational activities will occur only within the development site, so these distances have been used in calculating noise impacts.

2.3 Construction noise

2.3.1 Construction activity

The project is expected to be constructed approximately over an eight-month period. The construction timeline is expected to include approximately four months of infrastructure preparation and civil works (months 1-4) approximately five months of equipment installation (months 3-7), and two months of commissioning (months 7-8).

2.3.2 Interim Construction Noise Guideline

The aim of the ICNG is to provide guidance on managing construction works to minimise noise (including airborne noise, ground-borne noise and blasting), with an emphasis on communication and cooperation with all involved in, or affected by, construction noise.

The steps for managing noise impacts from construction are:

- identify sensitive land uses that may be affected
- identify hours for the proposed construction works
- identify noise impacts at sensitive land uses
- select and apply the best work practices to minimise noise impacts.

Construction hours

The construction hours are in accordance with the ICNG recommended standard construction hours for construction work, with construction activities occurring during daytime, as follows:

- Monday to Friday, 7.00 am to 6.00 pm
- Saturday, 8:00 am to 1:00 pm
- no construction work on Sunday and public holidays.

Project noise management levels

The rating background noise level (RBL) is the level used in this report for noise assessment purposes. The RBL is the overall single-figure background level representing each assessment period (day/evening/night) over the whole monitoring period (EPA 2017).

Background noise monitoring was not undertaken as part of this assessment. As the worst case scenario it has been assumed that background levels may be less than 30 dB(A) during all time periods, and the

minimum assumed RBLs have been adopted. In accordance with the Noise Policy for Industry (NPI) (EPA 2017), where the rating background noise level is to be less than 30 dB(A) for the daytime period, then it is set to 30 dB(A); where it is to be less than 35 dB(A) for the evening and night periods, then it is set to 35 dB(A). For the current assessment, therefore, a value of 35 dB(A) has been adopted as the RBL for daytime periods and 30 dB(A) for evening and night periods.

Where noise from construction works is above the ‘noise affected’ management levels presented below, the proponent should apply all feasible and reasonable work practices to minimise noise.

Noise levels are to be rounded to the nearest integer (EPA 2017). The ICNG specifies the noise thresholds at NSRs for construction activities as listed in Table 2.2.

Table 2.2. Noise management levels at dwellings

Day time hours	Management level $L_{Aeq} (15 \text{ min})$	How to apply
<p>Recommended standard hours:</p> <p>Monday to Friday 7am to 6pm</p> <p>Saturday 8am to 1pm</p>	<p>Noise affected RBL + 10 dB</p>	<p>The noise affected level represents the point above which there may be some community reaction to noise.</p> <ul style="list-style-type: none"> • Where the predicted or measured $L_{Aeq} (15 \text{ min})$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
<p>No work on Sundays or public holidays</p>	<p>Highly noise affected 75 dB(A)</p>	<p>The highly noise affected level represents the point above which there may be strong community reaction to noise.</p> <ul style="list-style-type: none"> • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: <ul style="list-style-type: none"> – times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near dwellings) – if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.

Based on the adopted day time period RBL of 35 dB(A) for standard hours, the noise affected management level has a threshold of 45 dB(A) before specific management is required.

2.3.3 Construction noise sources

The construction activities include approximately four months of piling and installation of the mounting structures and approximately five months of installation of the PV modules and inverter assemblies.

Noise sources included in the construction noise calculation include:

- piling drill rig
- crane
- trencher

- loader
- generator
- forklift.
- 1 x truck and dog for civil works
- D6 dozer or equivalent for levelling and road development
- 24 tonne excavator for earthworks
- grader for road development and levelling activities
- 7 tonne vibrating roller for road construction
- front end loader for the movement and loading of soil and aggregate materials
- piling rig for installing PV piles
- Franna crane for the lifting of loads, erection of steel, and movement of heavy plant
- two trenchers for the installation of underground conduits and cabling
- portable generator for temporary site power.

2.3.4 Sound power levels

Sound power levels (Lw) data for noise sources were sourced from typical values for the listed equipment types and are listed in Table 2.3. Lw is the intrinsic noise output of a piece of plant or equipment, and does not depend on distance or orientation of the machine. The Lw values in Table 2.3 are conservative in nature, representing the higher end of typical ranges.

Table 2.3. Sound power levels for construction noise sources

Plant	Sound power level (Lw) (dB(A))
Truck and dog	103
D6 dozer	86
24 tonne excavator	101
Grader	106
Vibrating roller	109
Front end loader	110
Piling rig	107
Franna crane	107
Trenchers	97
Generator	73

2.3.5 Assessment

Consistent with the requirements of the ICNG, construction noise impacts have been quantified by:

- predicting the realistic worst-case or conservative noise levels from the identified sources
- applying them to assessment locations representing the most noise-exposed dwellings
- taking into account the construction activities in Section 2.3.1.

The assessment has assumed that one of each plant item listed in Section 2.3.1 is concurrently in operation at the nearest point to the receiver and generating the L_w values listed in Table 2.3. The assessment is conservative as it does not take the usage factors into account, instead assuming continuous operation. In accordance with the ICNG, a calculation was used to estimate the magnitude of expected noise levels. The relationships between the sound power and sound pressure level enables a prediction of attenuation over distance:

$$L_p = L_w - [20 \times \log_{10}(r)] - 8 \text{ dB}$$

L_w = Sound Power level (dB(A))

L_p = Sound Pressure level (dB(A))

r = distance (m)

The formula for combining the sound pressure levels to calculate the sum level:

$$L_p = 10 \times \log_{10}(10^{L_1/10} + 10^{L_2/10} + \dots + 10^{L_n/10})$$

$L\Sigma$ = Total level and L_1, L_2, \dots, L_n = sound pressure level of the separate sources in dB SPL

2.3.6 Predicted construction noise levels

Table 2.4 shows the resultant maximum noise levels predicted at the NSRs during project construction compared with the relevant noise management levels derived in Section 2.3.2.

Table 2.4. Predicted maximum construction noise levels at NSRs, $L_{Aeq,15min}$ dB(A)

Receiver (dwelling)	Noise management level dB(A)	Predicted construction noise levels $L_{Aeq,(15min)}$ dB(A)	Exceed noise management level
D2	45	45*	No
D3	45	43*	No

* Note: Predicted noise levels have been rounded up to the nearest integer

The predicted construction noise levels at the development site would attenuate to a level of 45 dB(A) at the nearest sensitive receptor (D2) located at a distance of 1,360 m.

The predicted maximum construction noise levels are based on the worst case scenario:

- All plant and equipment are assumed to be operating together and at the closest point of the development site to each sensitive receptor. This situation would not occur on site due to the spatial and temporal separation of civil work and construction activities.
- Construction noise levels would also vary over the construction period due to the location, type and duration of construction being undertaken. Equipment utilisation would vary throughout the day and these factors would also see a reduction of the construction noise levels in this prediction.
- The noise level predictions do not take into account the implementation of noise attenuation measures, such as barriers, use of topographical features for shielding, or possible noise control treatments on plant and equipment.
- The noise level predictions do not take into account the potential shielding effects of topography and vegetation, such as the vegetation that lines Sturt Highway and Sandy Creek between the development site and D2.

It is therefore predicted that the construction noise management levels will not be exceeded even when works are conducted at the closest point to the NSRs.

As construction noise levels at all NSRs are predicted to be substantially lower than the 'highly noise affected' level of 75 dB(A) (as defined by the ICNG and listed in Table 2.2), a strong community reaction to noise levels is therefore unlikely.

Note however, that ESCO Pacific are also proposing the use of a mulcher on site to assist with removing scattered paddock trees. Depending upon model, design and noise mitigation measures, mulchers can potentially emit sound power levels of up to 120 dB(A). At an L_w of 120 dB(A), the noise calculation predicts noise levels (when combined with the other equipment) of 51 dB(A) at D2 and 49 dB(A) at D3. The calculation predicts that a distance of approximately 2.5 km is required between the sensitive receiver and the mulcher to avoid achieve compliance with noise management levels. The short term use of a mulcher on site is therefore likely to require management to avoid exceeding noise management levels – although the conservatism inherent in the noise level predictions, as outlined above, should be taken into consideration.

2.4 Operational noise

2.4.1 Operational activities

The development site is a solar photovoltaic plant with a capability of generating up to 100 MW of renewable energy. During operations, it is expected that there will be just four staff based at the facility to manage site activities and to support routine plant operations and maintenance.

The solar panels will be fixed to a horizontal mounting structure which slowly track the movement of the sun. The PV modules are set out in regular arrays connected by cabling to centrally located inverters enclosed in modified shipping containers. An office workshop and substation that houses the main step-up transformer will be located to the north of site.

ESCO Pacific has advised that the main operational noise generating activities on site will include:

- approximately 4000 NexTrack motors that allow the solar panels on the horizontal mounting structure to track the sun across the sky. These motors will be evenly spread across the arrays of PV modules
- approximately 30 central inverters that are located in containers at the end of each block of PV modules
- the main step-up transformer in the switchyard.

The equipment will operate continuously during daylight hours only.

2.4.2 Noise Policy for Industry

Noise from the operation of the development site has been assessed in accordance with the NPI. Assessment under the NPI has two components:

- controlling intrusive noise impacts in the short term for dwellings
- maintaining noise level amenity for particular land uses for dwellings and other land uses.

The NPI defines the time of day as follows:

- day – the period from 7 am to 6 pm Monday to Saturday or 8 am to 6 pm on Sundays and public holidays
- evening – the period from 6 pm to 10 pm
- night – the remaining periods.

Intrusiveness criteria

The intrusiveness criterion for residential noise receptors as set out in the NPI is as follows:

$$L_{Aeq, 15 \text{ minute}} \leq RBL \text{ (dB(A) } L_{A90}) + 5 \text{ dB(A)}$$

The applicable intrusiveness noise criteria are presented in Table 2.5.

Table 2.5. Intrusive noise level

Time of day	Minimum assumed RBL dB(A)	Minimum project intrusive LAeq dB(A)
Day	35	40
Evening	30	35
Night	30	35

Amenity criteria

The nearest NSRs are dwellings located in a rural area. Based on the nature of these receivers, the amenity criteria (LAeq) for rural residential properties will be applied. The applicable amenity noise criteria are presented in Table 2.6.

Table 2.6. Amenity noise level

Receiver	Noise amenity area	Time of day	Amenity noise level LAeq dB(A)
Residential	Rural	Day	50
		Evening	45
		Night	40

Project specific noise levels

The intrusiveness and amenity criteria that apply for day, evening and night periods are shown in Table 2.7. Under the NPI, the lower of the two (intrusiveness or amenity) is adopted as the project specific noise level (PSNL).

Table 2.7. Project specific noise levels based on NSW NPI

Period	RBL dB(A)	Intrusiveness criteria LAeq dB(A)	Acceptable amenity criteria LAeq dB(A)	Adopted PSNL LAeq dB(A)
Day	35	40	50	40
Evening	30	35	45	35
Night	30	35	40	35

Table 2.7 shows that the intrusiveness criteria are lower for day, evening and night periods than the amenity criteria. Therefore, the intrusiveness criteria have been adopted as the PSNL.

'Modifying Factor' Adjustments

Where a noise source contains certain characteristics, such as tonality, intermittency, irregularity or dominant low-frequency content, there is evidence to suggest that it can cause greater annoyance than other noise at the same noise level (EPA 2017). The NPI provides guidance on applying adjustments where the noise may be considered annoying. For each aspect an adjustment of 5 dB(A) can be added to the predicted value, up to a total of 10 dB(A) to penalise the noise for its potential increase in annoyance.

2.4.3 Sound power levels

Sound power data for noise sources during operations were provided by ESCO (sourced from equipment suppliers). Sound power totals used in the noise calculations are shown in Table 2.8.

Table 2.8. Sound power levels for operational noise sources

Plant	Sound power (L _w) (dB(A))
NexTracker (each)	58
SC2200 Inverter (each)	94
Transformer	75

2.4.4 Assessment

Noise impacts from project operations have been quantified by:

- predicting the realistic worst-case or conservative noise levels from the identified sources
- applying them to assessment locations representing the most noise-exposed dwellings.

The calculation used to estimate the magnitude of expected noise levels is the same as used for project construction (see Section 0).

2.4.5 Predicted noise levels during operations

Table 2.9 shows the resultant noise levels predicted at the NSRs during project operations compared with the relevant PSNLs derived in Section 2.4.2.

Table 2.9. Predicted L_{Aeq,15min} noise levels at NSRs during operations dB(A)

Receiver (dwelling)	PSNL (intrusiveness criteria) L _{Aeq} dB(A)			Predicted operational noise levels L _{Aeq,(15min)2} dB(A)		Exceed intrusive criterial
	Day	Evening	Night	Neutral conditions	Modifying Factor*	
D2	40	35	35	<30	33	No (all)
D3	40	35	35	<30	31	No (all)

* Modifying factor conservatively set at maximum +10 dB(A)

The predicted noise levels at all NSRs comply with all the nominated criteria under neutral conditions and modifying factors. Noise levels during project operations are also predicted to comply at the site landholder’s residence under most conditions, located approximately 1 km away.

It should be noted that the noise emissions during operations were predicted to comply without the implementation of noise attenuation measures, such as shielding or other treatments on plant and equipment with all equipment operating at the closest point of the development site to each sensitive receptor.

2.5 Road traffic

2.5.1 Existing traffic activity

Road traffic data for this assessment was sourced from the traffic impact assessment for the development, prepared by Impact Traffic Engineering Pty Ltd (Impact 2018).

Traffic during construction and operations will access the development site from north, exiting the Sturt Highway at Kywong Boree Creek Road, turning into Kywong Faithfull Road and then entering the site from Mitchells Road.

The Sturt highway is a State arterial road that generally carries in the order of 1,200 vehicles per day in the locality of the development site. Kywong Boree Creek Road and Kywong Faithfull Road are local Council roads with low existing traffic volumes and Mitchells Road is a small access road (controlled by Council) which also has low existing traffic volumes.

2.5.2 NSW Road Noise Policy

The NSW Road Noise Policy (DECCW 2011) sets out noise assessment criteria for existing dwellings affected by land use development. The policy sets different noise limits dependent upon the road category and type of project and land use.

Based on the road categories in the traffic impact assessment (Impact 2017), Sturt Highway falls within the category of 'existing freeways/arterial/sub-arterial roads' and Kywong Boree Creek Road, Kywong Faithfull Road and Mitchells Road are 'local roads'.

2.5.3 Noise sensitive receptors

After traffic exits the Sturt Highway there is only one dwelling (D3) within 1 km of the site access route. D3 is located approximately 130 m southeast of the access route on the intersection of Kywong-Boree Road and Kywong Faithfull Road.

2.5.4 Standard hours

The ICNG specifies standard construction hours that limit construction activities and traffic movement to the day period hours listed in Section 2.3.2. Operational traffic will also conform to these hours.

2.5.5 Construction phase

Construction traffic will comprise a combination of light vehicle and heavy movements as equipment, materials and personnel are transported to site. Expected construction traffic movements are summarised in Table 2.10, taken from Impact (2018).

Table 2.10. Estimated construction traffic

Type of vehicle	Total vehicle movements	Peak daily movements
Heavy vehicle (HV)	Approximately 1,570 total HV movements	Peak of 14 daily HV movements
Light vehicle (LV)	Approximately 2,816 total LV movements	Peak of 16 daily LV movements
Total	4,351 total movements	Peak of 30 daily movements

'Movements', as shown above, correspond to 'round trips' to the site and are inclusive of both the inbound and outbound vehicle trips. The total traffic generation for the site, and each of the peak hours would therefore be twice that shown in the table.

As an average of 1,200 vehicles per day currently use the Sturt Highway (see Section 2.5.1), the 30 additional daily movements (60 uses of the highway) during the peak construction phase comprises an increase of only 5%. Accordingly, the associated increase in traffic noise from the Stuart Highway during this period is also expected to be minor.

Increases to traffic volumes on local roads during construction will be proportionately more significant, and traffic-related noise impacts are expected to increase accordingly. Dwelling D3 is located within 130 m of the site access route and is expected to be subject to intermittent nuisance traffic noise levels during daytime hours for the eight-month construction period.

The construction traffic on local roads will not pass within 1 km of any other dwelling, so other than for dwelling D3 no noise-related impacts are anticipated.

2.5.6 Operational phase

During the operational phase, the project will continue to generate traffic on the Sturt Highway, Kywong Boree Creek Road, Kywong Faithfull Road and Mitchells Road.

However, as only four staff will be typically based at the solar facility, operational activities are anticipated to have a negligible impact upon traffic volumes on the Sturt Highway and the local road network, and a minor impact on associated noise levels.

2.5.7 Cumulative Impacts

Potential cumulative road noise impacts may result should project construction overlap with extraction of materials from two nearby pits – Wrights Pit located approximately 6 km northwest of the site and Mimosa Pit located approximately 2 km north of the site.

These pits operate intermittently. If extractive operations were to coincide with solar farm construction, there may be a local increase in road noise along the Sturt Highway, resulting in a small cumulative impact. However, due to the low numbers of vehicles compared with background traffic on the Sturt Highway, it is expected that the magnitude of such an impact would be negligible.

3 Proposed management

The noise assessment undertaken for the Sandigo Solar Farm was conservative. However, it is proposed that noise monitoring be undertaken during construction to confirm predictions and determine any need for noise management measures. In particular, the use of a mulcher on site will be subject to noise monitoring and, if noise management levels are exceeded at the two NSRs, management measures such as the following will be implemented to achieve compliance:

- Locating the mulcher within the site so as to maintain a specified minimum distance (e.g. 2,600 m) to the NSRs.
- Operating the mulcher within designated time periods rather than in an ad hoc manner to minimise the frequency of intrusion.
- Positioning the mulcher to make use of any natural shielding.
- Application of noise shielding or noise suppression measures at the mulcher.
- Consultation with the landholders at D2 and D3 to agree on measures.

If management measures such as the above are required and implemented, noise levels during construction are not predicted to exceed applicable criteria. The preparation of a noise management plan to address construction noise is therefore not considered necessary.

Any measures to manage nuisance traffic noise at D3 during the construction period, if required, will be agreed in consultation with the landholder or tenant.

4 Conclusions

A noise impact assessment has been undertaken for the Sandigo Solar Farm. Construction noise impacts have been assessed in accordance with the ICNG and operational noise impacts have been assessed in accordance with the NSW Noise Policy for Industry 2017. Assessment of road noise impacts has also been undertaken in accordance with the NSW Road Noise Policy.

The assessment has concluded the following:

- The nearest sensitive receivers to the development site are dwellings D2, located 1,350 m northeast of the site and D3 located 1,500 m to the southeast.
- Provided the proposed use of a mulcher is managed effectively, noise levels during construction are predicted to comply with noise management levels even when works are conducted at the closest points within the development site to the NSRs.
- As noise levels during construction are not predicted to exceed applicable criteria (assuming the use of the mulcher is managed effectively), the preparation of a noise management plan to address construction noise is not considered necessary.
- Noise monitoring will be undertaken during construction to confirm predictions and determine any need for noise management measures.
- Noise levels during operations are predicted to comply with noise management levels under neutral conditions and when modifying factors are assumed to apply.
- Increases to traffic volumes on the Sturt Highway during construction and associated increases to noise levels are expected to be minor.
- Dwelling D3 is located within 130 m of the site access route and is expected to be subject to intermittent nuisance traffic noise levels during daytime hours for the eight-month construction period.

5 References

EPA (2017). *Noise Policy for Industry*. NSW Environment Protection Authority. October 2017.

DECC (2009). *Interim Construction Noise Guideline*. Department of Environment and Climate Change NSW. July 2009.

DECCW (2011). *NSW Road Noise Policy*. Department of Environment, Climate Change and Water NSW. March 2011.

Impact (2018). *Sandigo Traffic Impact Assessment, Sandigo Solar Farm – Old Mitchells Road, Sandigo*. Prepared for ESCO Pacific by Impact Traffic Engineering Pty Ltd. IMP171113REP01F02. 17 February 2018.