Appendix H Noise Management Plan

NOISE MANAGEMENT PLAN

Forest Glen Solar Farm

September 2021

Project Number: 20-492

BEGA • BRISBANE • CANBERRA • GOLD COAST • NEWCASTLE • SYDNEY • WAGGA WAGGA
W. www.nghconsulting.com.au

DOCUMENT VERIFICATION

Project Title:	Forest Glen Solar Farm
Project Number:	20-492
Project File Name:	20-492 Forest Glen Solar Farm

Revision	Date	Prepared by	Reviewed by	Approved by
Draft v1	30/06/2021	Jane Love	Brooke Marshall	Brooke Marshall
Final v1	15/09/2021	Jane Love	Minor changes	

NGH Consulting prints all documents on environmentally sustainable paper including paper made from bagasse (a by-product of sugar production) or recycled paper.

W. www.nghconsulting.com.au

E. ngh@nghconsulting.com.au

BEGA - ACT & SOUTH EAST NSW
Suite 11, 89-91 Auckland Street (PO Box 470) Bega NSW 2550 **T.** (02) 6492 8333

NEWCASTLE - HUNTER & NORTH COAST
Unit 2, 54 Hudson Street
Hamilton NSW 2303 **T.** (02) 4929 2301

BRISBANE
Suite 4, Level 5, 87 Wickham Terrace
Spring Hill QLD 4000 **T.** (07) 3129 7633

SYDNEY REGION
Unit 18, Level 3, 21 Mary Street
Surry Hills NSW 2010 **T.** (02) 8202 8333

CANBERRA - NSW SE & ACT
8/27 Yallourn Street (PO Box 62)
Fyshwick ACT 2609 **T.** (02) 6280 5053

WAGGA WAGGA - RIVERINA & WESTERN NSW
Suite 1, 39 Fitzmaurice Street (PO Box 5464)
Wagga Wagga NSW 2650 **T.** (02) 6971 9696

GOLD COAST
PO Box 466
Tugun QLD 4224 **T.** (07) 3129 7633

BEGA • BRISBANE • CANBERRA • GOLD COAST • NEWCASTLE • SYDNEY • WAGGA WAGGA

W. www.nghconsulting.com.au

ABN 31 124 444 622 ACN 124 444 622

TABLE OF CONTENTS

FIGURES

TABLE

ACRONYMS AND ABBREVIATIONS

AS	Australian Standard
dB(A)	Decibels
BCD	Biodiversity Conservation Division
DECC	Department of Climate Change (Now BCD)
DECCW	Department of Climate Change and Water (Now BCD)
EIS	Environmental Impact Statement
EPA	Environment Protection Authority
ICNG	Interim Construction Noise Guidelines
INP	*NSW Industrial Noise Policy*
km	kilometres
L_{Aeq}	Equivalent continuous noise level
LGA	Local Government Area
m	Metres
MW	Megawatt
NML	Noise Management Level
NMP	Noise Management Plan
NSW	New South Wales
POEO	*Protection of the Environment Operations Act 1997, NSW*
PV	Photovoltaic
RBL	Rating Background Level (background noise level)
RNP	NSW *Road Noise Policy*

1. INTRODUCTION

The construction of a solar farm comprises activities such as road construction, civil works, excavation and foundation construction and electrical infrastructure works requiring processes such as heavy vehicle movements, loaders, excavators, piling, generators and cranes.

A Construction and Operational Noise and Vibration Assessment for the proposed Forest Glen Solar Farm was undertaken by NGH Consulting as part of the Environmental Impact Statement (EIS)(2021). Noise emissions from the construction phase of the project were predicted to exceed the construction noise management levels at the nearest affected receivers.

In general, the most significant impact of construction occurs from any activity proposed at night (i.e. after 6pm and before 7am). The proposed hours of the construction of the solar farm are as follows:

- Monday to Friday: 7am to 6pm
- Saturday: 8 am to 1pm
- Sunday and Public Holidays: no work

With daytime only activity occurring at significant separation distances, the construction of Forest Glen Solar Farm is not expected to generate significant impacts, subject to implementation of the feasible and reasonable noise mitigation measures, as set out in this construction Noise Management Plan (NMP).

This draft NMP has been prepared in advance of the detailed design, to demonstrate the framework for noise management during construction. It would be updated prior to implementation as part of the Construction Environmental Management Plan.

It is not anticipated that the construction of the solar farm would adversely affect current noise levels. Although it will contribute to the existing traffic noise levels, at the most affecting residences along the surrounding roads, no additional mitigation measures will be required.

2. EXISTING ENVIRONMENT

2.1. SENSITIVE RECEIVERS

The proposal site is within the locality of Minore and approximately 16km west of Dubbo. The locality is sparsely populated with the existing noise sources being from the land uses on and adjacent to the proposal site generally consist of:

- Road traffic noise from local roads including Minore Road and Delroy Road, which would have low traffic volumes.
- Trains along the Main Western Railway line.
- Spraying, cultivation and harvesting of crops.
- Livestock grazing and management.

Onsite and on adjacent properties, existing noise generating equipment or activities include tractors, headers, bailers, grain and livestock transport, quad bikes, light vehicles, and heavy vehicles. These land uses characterise the background noise within the area. Noise levels from farm activities are concentrated at peak times during the year such as seeding and harvesting whereas noise from local roads is more continuous throughout the year.

The proposal site is generally flat elevation ranging from to 283m to 325m AHD. The majority of receivers within 2km of the Forest Glen SF are lower in the landscape or a similar elevation to the proposal site.

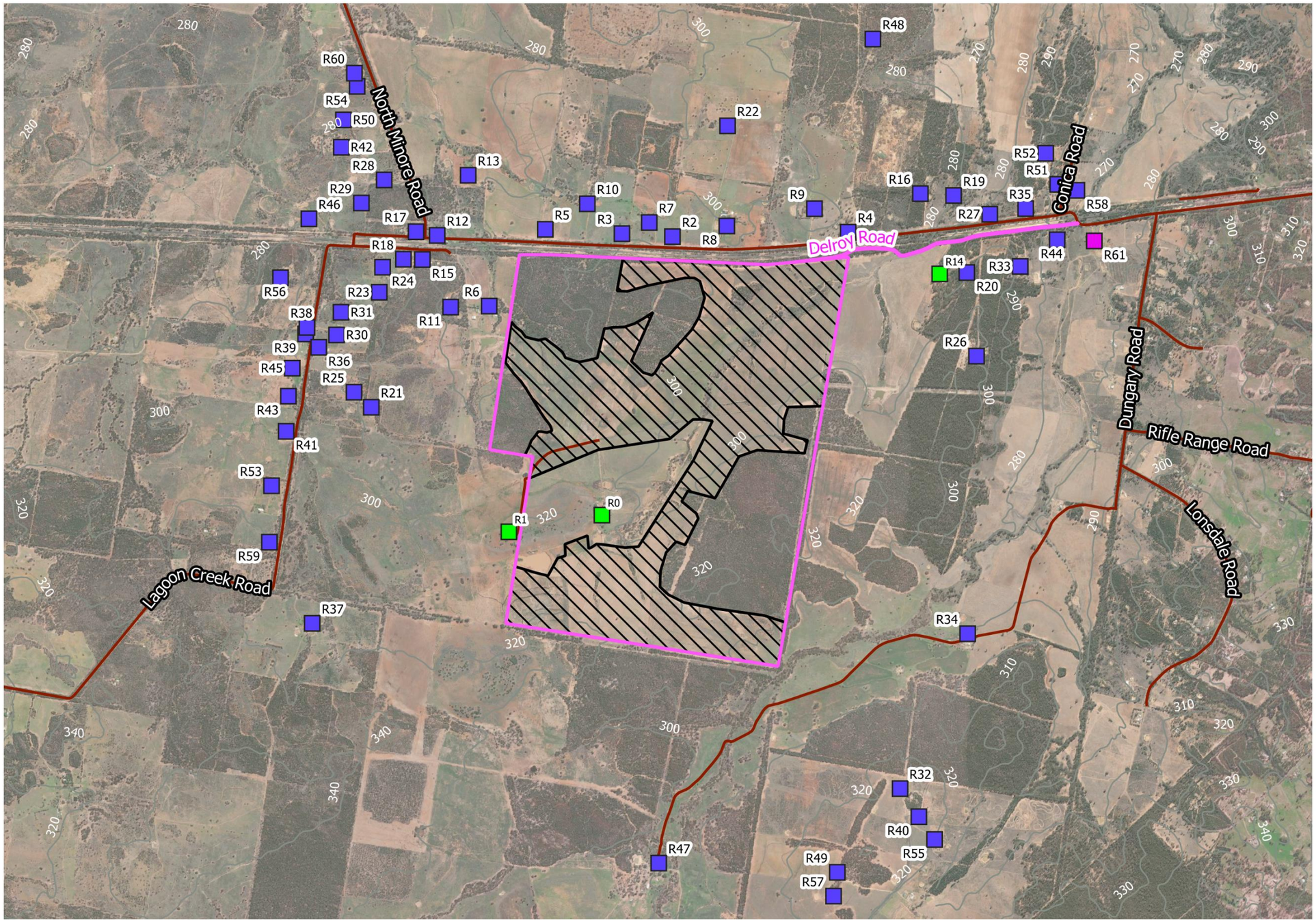
There are 20 receivers within 1km of the proposal site and 61 receivers within 2km of the proposal site. The residences are outlined in Table 2-1 and shown in Figure 2-1. The nearest non-associated residential dwelling is approximately 153m north of the proposal site (R2). There are three associated receivers including R0, R1, and R14, they are not considered as part of this assessment. The table also outlines distance to the proposed upgrade works to Minore and Delroy Road, as there would be some receivers closer to the proposed upgrade work rather than works within the proposal site. For the upgrades along Delory Road and intersection upgrades at Delroy and Minore Road, R61[1] is the closest non-associated receiver. Associated receivers are not considered as part of this assessment.

Table 2-1 Distance between the nearest non-involved residences to the proposal site and associated works

Residence	Distance (m)
To proposal site boundary	
R2	153
R3	160
R4	163
R5	165

[1] R61 is not within the 2km buffer zone from the proposal site that has been used to identify receivers that may be impacted by solar farm infrastructure, however due to the receivers proximity to intersection works it has been included in the noise assessment for scenario 2. Activities along Delroy road associated with the solar farm have been considered minor in comparison to the extent of works proposed for solar array structures, requiring approximately one week of work for minor upgrades to pavement.

Residence	Distance (m)
R6	180
R7	260
R8	261
R9	381
R10	390
R11	499
R12	677
R13	737
R15	783
R16	784
R17	892
R18	938
R19	970
To upgrades along Delroy Road including intersection	
R20	1000
R27	728
R33	587
R35	447
R44	214
R51	365
R52	637
R58	276
R61	190



Legend

- Proposal site
- Development Footprint
- Roads

Delroy Road

- contour(m)

Receivers

- Sensitive receivers
- Associated receivers
- Additional sensitive noise receiver (Scenario 2)

Ref: 20-492 Forest Glen\ NMP: Receivers
Author: kyle.m
Date created: 14.10.2021
Datum: GDA94 / MGA zone 55

0 500 1,000 1,500 m

NGH

Figure 2-1 Residential receivers adjacent to the proposal site.

2.2. BACKGROUND NOISE LEVELS

Assessment criteria and noise management levels for the construction and operational noise are derived from the existing noise environment of the sensitive receivers. The NSW Policy for Industry (NPfl) (EPA 2017) outlines methods for determining the background noise level of an area. For this assessment, the NPfl's minimum Rating Background Noise Level (RBL) from Table 2.1 of the NPfl has been adopted to describe the RBL of the areas around the proposal. Based on the identified receivers, existing environment and land zoning on and adjacent the proposal site, the noise environment is classified as rural. The RBL to be adopted for all receiver locations as part of this assessment are described below (Table 2-2). It is anticipated, however that at certain periods of the year that background noise levels would exceed the levels described in the NPfl guideline. As such this assessment of impacts is likely to be conservative and represents a worst-case scenario.

Table 2-2 Rating background noise level dB(A)

Time of day	Applicable Rating Background Noise Level, dB(A)
Day	**35**
Evening	**30**
Night	**30**

3. NOISE CRITERIA

3.1. CRITERIA

The NSW Interim Construction Noise Guideline (ICNG DECC 2009) deals with managing construction noise impacts. According to the guideline, a quantitative assessment of noise impacts is warranted when works are likely to impact an individual or sensitive land use for more than three weeks in total. The construction of the Forest Glen Solar Farm would be 10-18 months with peak construction for 10 months and therefore meets the requirements of a quantitative assessment.

3.1.1. Residential Receivers

The guideline specifies noise targets, or 'noise management levels', for residences and other noise sensitive receivers (Table 3-1). The RBL is used when determining the management level. The RBL is the overall single-figure background noise level measured in each relevant assessment period. Residential receivers are considered 'noise affected' where construction noise levels are greater than the noise management levels identified below.

Table 3-1 Noise Management Levels at residential receivers.

Time of day	Management Level
Recommended standard hours: **Monday to Friday** **7am to 6pm** **Saturday 8am to 1pm** **No work on Sundays or public holidays**	Noise affected Rating Background Level + 10dB(A)
	Highly noise affected 75dB(A)
Outside recommended standard hours	Noise affected Rating Background Level + 5dB(A)

Table 3-2 identifies the adopted construction Noise Management Levels (NMLs) for the nearest noise sensitive residential receivers (refer to Figure 2-1). The NMLs for the receiver locations are derived from the RBLs represented by the background noise levels and NSW ICNG (DECC 2009) criteria (Table 3-1). Furthermore, during standard construction hours, a highly affected noise objective of 75 dB(A) applies at all receivers.

Table 3-2 Construction Noise Management Levels at residential recievers.

Location description	Day L_{A90} Background Noise Level (RBL)	Day Noise Management L_{A90} (15min)
All residential receivers	35[1]	45

3.2. ROAD TRAFFIC NOISE CRITERIA

Noise impact from the potential increase in traffic on the surrounding road network due to construction is assessed against the NSW 'Road Noise Policy' (RNP) (DECCW 2011). The RNP sets out criteria to be applied to particular types of road and land uses. Minore Road is categorised as a sub-arterial road and Delroy Road as a local road. Criteria for the roads are outlined in Table 3-3.

Table 3-3 RNP Road Traffic Noise Criteria, dB(A)

Road Category	Type of Proposal /Land Use	Assessment Criteria dB(A)	
		Day 7am-10pm	**Night 10pm-7am**
Freeway/arterial/sub-arterial roads	Existing residences affected by additional traffic on existing freeways/arterial/sub-arterial roads generated by land use developments	$L_{Aeq,(15\ hour)}$ 60 (external)	$L_{Aeq,(9\ hour)}$ 55 (external)
Local roads	Existing residences affected by additional traffic on existing local roads generated by land use developments	$L_{Aeq,(15\ hour)}$ 55 (external)	$L_{Aeq,(9\ hour)}$ 50(external)

4. ENVIRONMENTAL IMPACTS AND ASSESSMENT

4.1. CONSTRUCTION NOISE SOURCES

Construction noise impacts would likely be from the operation of construction equipment. Several key activities on the site that are likely to produce the most noise include:

- Site establishment and earthworks for the construction of access roads, compounds and hard stands.
- Upgrade works along Delory Road and at the intersection with Minore Road.
- Pile driving for solar panel mounting system and trenching for the installation of cabling.
- Assembly of frames and panels, substation and transformers.

The equipment associated with these four scenarios would dominate the noise from the works. The equipment noise has been used to predict the likely noise associated with each scenario. The equipment and their sound power level to be used within the proposal site for each scenario are in Table 4-1.

Table 4-1 Construction equipment sound power levels

Construction equipment	Sound pressure level @ 7m ((dB(A))	No. of units
Scenario 1 – Site establishment and earthworks		
Light vehicle	78	5
Grader	85	2
Excavator (tracked) 35t	85	4
Water cart	83	2
Vibratory roller	84	2
Dump truck	83	2
Scenario 2 –Upgrade works along Delroy Road and at the Minore Road intersection		
Light vehicle	78	1
Grader	85	1
Smooth drum roller	82	1
Dump truck	83	1
Asphalt truck & sprayer	81	1
Scenario 3 – Piling of panel supports and trenching for cabling		
Front end loader	88	2
Dump truck/road truck	83	2
Piling rig	89	3

Construction equipment	Sound pressure level @ 7m ((dB(A))	No. of units
Light vehicle	78	5
Power hand tools	80	2
Trencher	80	1
Scenario 4 – Assembly of frames and panels, substation and transformers		
Front end loader/telehandler	88	2
Light vehicle	78	5
Power hand tools	80	3
Crane	88	2
Generator	78	1

4.2. CONSTRUCTION NOISE ASSESSMENT

The Transport for NSW construction noise calculator is a standard tool that can be used to model the noise of construction equipment. It was used to quantify the likely impact of noise at each non-associated receiver within 1km of the proposal site during construction. The calculator uses the following to model the noise impact:

- Relevant noise source data.
- Separation distances between sources and receivers.
- Ground type between sources and receivers, either green fields or concrete urban areas.
- Mitigation from barriers (natural and purpose built).

Plant and equipment were modelled for three construction scenarios representative of noise generating construction conditions. The predicted levels are considered a worst-case scenario based on the three noisiest plant and machinery items operating continuously and concurrently. Construction activities are proposed to be progressive and would occur at several locations simultaneously.

Table 4-2 presents the noise levels likely to be experienced at the nearby affected receiver locations during the construction works.

Table 4-2 Predicted $L_{Aeq\ 15\ min}$ construction noise levels at receiver locations for each scenario

Receiver location	Noise management level[2]	Predicted construction noise Level, $L_{Aeq\ (15\ min)}$ [3]	Compliance with criteria? (exceedance)	Comment Clearly audible = < 10 dB (A) above NML Moderately intrusive = >10 dB (A) above NML Highly affected = > 75 dB (A)
Scenario 1 – Site establishment and earthworks				
R2	45	57	**No (12)**	**Moderately Intrusive**
R3		56	**No (11)**	**Moderately Intrusive**
R4		56	**No (11)**	**Moderately Intrusive**
R5		56	**No (11)**	**Moderately Intrusive**
R6		55	**No (10)**	**Moderately Intrusive**
R7		50	**No (5)**	**Clearly Audible**
R8		50	**No (5)**	**Clearly Audible**
R9		45	**Yes**	**NA**
R10		44	**Yes**	**NA**
R11		41	**Yes**	**NA**
R12		37	**Yes**	**NA**
R13		36	**Yes**	**NA**
R15		35	**Yes**	**NA**
R16		35	**Yes**	**NA**
R17		33	**Yes**	**NA**
R18		32	**Yes**	**NA**
R19		32	**Yes**	**NA**

[2]Noise management for standard day time construction works (i.e. Monday to Friday 7am to 6pm and Saturday 8am to 1pm).

[3] Worst case scenario of the 3 noisiest plant and equipment being used concurrently and continuously.

Receiver location	Noise management level[2]	Predicted construction noise Level, $L_{Aeq\ (15\ min)}$ [3]	Compliance with criteria? (exceedance)	Comment Clearly audible = < 10 dB (A) above NML Moderately intrusive = >10 dB (A) above NML Highly affected = > 75 dB (A)
Scenario 2 – Upgrade works along Delroy Road and at the Minore Road intersection				
R61	45	48	**No (3)**	**Clearly Audible**
R44		47	**No (2)**	**Clearly Audible**
R58		43	**Yes**	**NA**
R51		40	**Yes**	**NA**
R35		37	**Yes**	**NA**
R33		33	**Yes**	**NA**
R52		32	**Yes**	**NA**
R27		30	**Yes**	**NA**
R20		26	**Yes**	**NA**
Scenario 3 – Piling of panel supports and trenching for cabling				
R2	45	59	**No (14)**	**Moderately Intrusive**
R3		58	**No (13)**	**Moderately Intrusive**
R4		58	**No (13)**	**Moderately Intrusive**
R5		58	**No (13)**	**Moderately Intrusive**
R6		57	**No (12)**	**Moderately Intrusive**
R7		52	**No (7)**	**Clearly Audible**
R8		52	**No (7)**	**Clearly Audible**
R9		47	**No (2)**	**Clearly Audible**
R10		46	**No (1)**	**Clearly Audible**
R11		43	**Yes**	**NA**
R12		39	**Yes**	**NA**

Receiver location	Noise management level[2]	Predicted construction noise Level, $L_{Aeq\ (15\ min)}$ [3]	Compliance with criteria? (exceedance)	Comment Clearly audible = < 10 dB (A) above NML Moderately intrusive = >10 dB (A) above NML Highly affected = > 75 dB (A)
R13		38	**Yes**	**NA**
R15		37	**Yes**	**NA**
R16		37	**Yes**	**NA**
R17		35	**Yes**	**NA**
R18		35	**Yes**	**NA**
R19		34	**Yes**	**NA**
Scenario 4 – Assembly of frames and panels, substation and transformers				
R2		57	**No (12)**	**Moderately Intrusive**
R3		57	**No (12)**	**Moderately Intrusive**
R4		57	**No (12)**	**Moderately Intrusive**
R5		56	**No (11)**	**Moderately Intrusive**
R6		55	**No (10)**	**Moderately Intrusive**
R7		50	**No (5)**	**Clearly Audible**
R8		50	**No (5)**	**Clearly Audible**
R9	45	45	**Yes**	**NA**
R10		45	**Yes**	**NA**
R11		42	**Yes**	**NA**
R12		37	**Yes**	**NA**
R13		36	**Yes**	**NA**
R15		35	**Yes**	**NA**
R16		35	**Yes**	**NA**
R17		34	**Yes**	**NA**

Receiver location	Noise management level[2]	Predicted construction noise Level, $L_{Aeq\ (15\ min)}$ [3]	Compliance with criteria? (exceedance)	Comment Clearly audible = < 10 dB (A) above NML Moderately intrusive = >10 dB (A) above NML Highly affected = > 75 dB (A)
R18		33	**Yes**	**NA**
R19		33	**Yes**	**NA**

Based on the construction noise levels presented in the table above, during site establishment / earthworks and assembly of frames and panels, substation and transformers (Scenario 1 and 3), the construction noise management levels would be exceeded for non-associated receivers R2 - R8.

- At R2 - R6 the predicted noise levels would exceed the noise management levels by 10-12 dB,
- At R7 and R8 the predicted exceedance is by 5 dB.

For the remaining non-associated receivers (R9 to R19) the predicted noise levels during construction of scenario 1 and 3 would be below the noise management level (<45dB).

During piling of panel supports and trenching for cabling (Scenario 3) the construction noise management levels would be exceeded for non-associated receivers R2 to R10.

- At R2 - R6 the predicted noise levels would exceed the noise management levels by 12 to14 dB.
- At R7 - R10 the exceedance of the noise management level by 1 to 7 dB.

For the remaining non-associated receivers (R11 to R19) the predicted noise levels during Scenario 3 would be below the noise management level (<45dB).

For the proposed upgrades along Delroy Road and at its intersection with Minore Road (Scenario 2), the construction noise management levels would be only exceeded for two non-associated receivers R61 and R44 by 3 and 2 dB respectively. In consideration of the solar farm construction techniques and time period (12-18 months), these road works would be minor and generate minimal noise over a short period of time (approximately 1 week). Therefore the works would be low risk and manageable with the general mitigation measures proposed.

No residence during any of the scenarios is predicted to be highly noise affected (>75dB(A)) under the ICNG.

4.3. ROAD TRAFFIC NOISE ASSESSMENT

Site access would be off Delroy Road. The anticipated peak vehicle movements during the construction stage of the project are presented in Table 4-3 Vehicle movements will only occur during the daytime period when construction works occur.

Table 4-3 Summary of estimated construction traffic volumes during peak.

Vehicle type	Trips per day
Semi-trailers	24
MRV/HRV	20
AV	24
Cars/light vehicles	80
Buses	9
Total	**157**

Table 4-4 Predicted road traffic noise contribution levels along public roads, dB(A).

Receiver	Road	Criteria	Truck traffic movements	Speed (km/h)	Distance to Road	Predicted Noise Level	Comply? (Yes/No)
Residences on Minore Road	Sub-arterial	$L_{Aeq,\ (15\ hour)}$ 60	refer to Table 4-3	80	30m	59 dB(A)	Yes
Residences on Delroy Road	Local	$L_{Aeq,\ (15\ hour)}$ 55	refer to Table 4-3	60	155m	49 dB(A)	Yes

From Table 4-4 it can be seen that road traffic noise level contributions from the truck movements associated with the construction works are at least 4dB(A) below the applicable noise criteria based on dwellings being 30m from the road. Therefore, traffic noise levels as a result of the construction works for the solar farm would not adversely contribute to the existing traffic noise levels at the most affected residences along the surrounding roads and require no specific mitigation.

5. PROPOSAL MITIGATION MEASURES

Exceedances of noise criteria are expected to be limited to R2 to R10 over the three scenarios (1, 3 and 4), and for R61 and R44 (only for Scenario 2).

The following recommendations provide feasible and reasonable noise control solutions to reduce noise impacts to sensitive receivers, and specifical including works near R2 to R8, R44 an R61.

Where actual construction activities differ from those provided in this report, more detailed design of noise control measures may be required. Appendix A outlines possible noise reductions from using some recommended control methods.

5.1. PHYSICAL NOISE CONTROLS

Physical noise controls set out in Appendix A would be investigated where exceedances are predicted for specific activities:

- Doubling of distance between a source and receiver.
- Temporary acoustics barriers.
- Engine casing lagged with insulation and plywood.

5.2. GENERAL MINIMISATION MEASURES

In addition to physical noise controls, the following general noise management measures should be followed:

- Use less noisy plant and equipment, where feasible and reasonable.
- Plant and equipment should be properly maintained.
- Provide special attention to the use and maintenance of ‘noise control’ or ‘silencing’ kits fitted to machines to ensure they perform as intended.
- Strategically position plant on site to reduce the emission of noise to the surrounding neighbourhood and to site personnel.
- Avoid any unnecessary noise when carrying out manual operations and when operating plant.
- Any equipment not in use for extended periods during construction work should be switched off.

5.3. TIMING RESTRICTIONS

For construction works conducted within approximately 480m of the dwelling building of R2 to R8, potential noise impacts to these locations will be managed by implementing time restrictions and/or providing periods of repose for residents, where feasible and reasonable. That is, daily periods of respite from noisy activities may also be scheduled for building occupants during business hours. Timing restrictions are not required for the Delroy Road upgrade works due to the minor works and short time frame of works (approximately one week).

Between 10am and 3pm Monday to Friday (with one-hour break for lunch between 12pm and 1pm), noisy activities will occur with no noise level restrictions. Outside these hours but within the construction hours of the of the project, 7am to 10am and 3pm to 6pm and Saturdays, noise level restrictions will apply. This means that all noise levels are required be below the noise management levels set out for the project, this can be achieved by using less machinery at once in the same location or completing work further than 480m away from the dwellings.

Residents would be consulted to determine appropriate respite periods and will be notified of the potential noise impact during this time period so that they can organise their day around the noisy period.

Some items of plant may exceed noise limits even after noise treatment is applied. To reduce the overall noise impact, the use of noisy plant may be restricted to within certain time periods, where feasible and reasonable and to be negotiated with Council and the residents. Allowing the construction activities to proceed, despite the noise exceedance may be the preferred method in order to complete the works expeditiously.

6. COMPLIANCE MANAGEMENT

6.1. MONITORING

The aim of a monitoring procedure is to ensure works are being carried out in accordance with the NMP. On site monitoring should include the following elements.

Regular onsite inspections will be undertaken to identify:

- Equipment has quality mufflers installed.
- Equipment is well maintained and fitted with adequately maintained silencers which meet the design specifications.
- Silencers and enclosures are intact and closed, rotating parts are balanced, loose bolts are tightened, frictional noise is reduced through lubrication and cutting noise reduced by keeping equipment sharp.
- Site personnel are using only necessary power to complete the task.
- Plant and equipment that is noisier than other similar machines.
- Care is being taken to place material in trucks rather than being dropped.
- Plant emitting noise strongly in one direction is orientated so that the noise is directed away from noise sensitive areas if practicable.
- Machines that are used intermittently are being shut down in the intervening periods between works or throttled down to a minimum.

6.2. COMPLAINTS RESOLUTION

The aim of the complaints resolution process is to respond promptly to complaints, identify any feasible and reasonable measures that may further reduce impacts following a complaint, and to provide feedback to the community on the above process within a reasonable timeframe.

The proponent would:

- Take prompt and direct actions to develop good relations with people living and working in the vicinity of a construction site at the beginning of a project and this would be maintained throughout the project, as this is of paramount importance.
- Keep people living and working in the vicinity of a construction site informed of progress.
- Appoint a person to liaise with the community who is adequately trained and experienced in such matters.

The complaints resolution process should implement the following noise elements;

- Establishment of a complaints mechanisms for the community via either telephone or email.
- Notification of the relevant project contact details through the community consultation process.
- Take all complaints seriously and deal with them expeditiously.
- Assess whether the issue can be resolved easily and take immediate action if possible.
- If not, ensures that the appropriate consultation has been undertaken for the activity.
- Ensures the on-site inspections of the NMP have been carried out regularly for the activity.
- Assesses the construction site and activities to determine whether there is any reason to believe the noise exposure of receivers is higher than anticipated.
- Undertake monitoring of noise levels where this cannot be confirmed, with the aim of establishing if the exposure of receivers is higher than anticipated by the NMP.
- Take remedial action if any of the above cannot be confirmed.
- Advise of complainant of action taken.

- Maintain a record of the above to enable review by an independent authority such as EPA.

7. CONCLUSION

NGH Consulting has completed an environmental noise and vibration assessment of the proposed Forest Glen Solar Farm. Noise emissions from the construction phase of the proposal were predicted to exceed the construction noise management levels at the nearest affected receivers in limited situations, modelled on a worst case scenario basis. The assessment did not identify any highly affected receivers.

Feasible and reasonable noise control solutions to reduce noise impacts to sensitive receivers are included in this NMP, and will be implemented specifically to address modelled exceedances at R2 to R8, as well as the overall noise management of the construction site.

The NMP provides a framework document that the construction contractor can use to develop and implement action plans for each individual construction activities. It has been prepared in advance of the detailed design, to demonstrate the framework for noise management during construction and would be updated prior to implementation.

8. REFERENCES

AS 2436, 2010, *Guide to noise and vibration control on construction, demolition and maintenance sites*, Standards Australia.

DECC, 2009, *Interim Construction Noise Guideline*, Department of Environment, Climate Change and Water, Sydney, New South Wales.

DECCW, 2011, *NSW Road Noise Policy,* Department of Environment, Climate Change and Water, Sydney, New South Wales.

NGH (2021). *Environmental Impact Statement Forest Glen Solar Farm*. Prepared for X-Elio by NGH Pty Ltd, Bega NSW.

APPENDIX A EFFECTIVENESS OF NOISE CONTROLS

Table 8-1 Relative Effectiveness of Various Forms of Noise Control, dB(A)

Noise control method	Practical examples	Typical noise reduction possible in practice	Maximum noise reduction possible in practice
		AS 2436-2010	**AS 2436-2010**
Distance	Doubling of distance between source and receiver	6	6
Screening	Acoustics barriers such as earth mounds, temporary or permanent noise barriers	5 to 10	15
Acoustic enclosures	Engine casing lagged with insulation and plywood	15 to 25	50
Engine Silencing	Residential class mufflers	5 to 10	20