

ASSESSMENT REPORT - **Project: 18079.02**

Burdett Solar Project **Noise Impact Assessment – RP3** Alberta, Canada

Prepared for:

Burdett Solar GP Corp
Suite 400, 214 – 11 Ave SW,
Calgary, Alberta T2R 0K1

Prepared by:




Kohl Clark, B. Eng.,



Payam Ashtiani, P. Eng., B.A.Sc.

May 11th, 2020



Applicant Information

Burdett Solar GP Corp.

Tom Bird

Director, Regulatory
400, 214 – 11 Ave SW
Calgary, AB
Canada
T2R 0K1

tom@bluearth.ca

www.bluearth.ca

Acoustical Practitioner Information

Aercoustics Engineering Ltd.

Kohl Clark, B.Eng.,

kohlcl@aecoustics.com

Payam Ashtiani, B.A.Sc., P.Eng.

payama@aecoustics.com

1004 Middlegate Road, Suite 1100
Mississauga, ON
L4Y 0G1

aecoustics.com

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Revision History

Revision Number	Description	Date
1	<i>Initial NIA Report Submission</i>	October 27, 2016
2	<i>NIA Report Amendment (RP2);</i> Site layout changed – total inverter counts reduced, new 2.5 MVA Inverter unit selected and grouped in pairs. Enclosures are no longer required; administrative noise control put in place.	June 4, 2018
3	<i>NIA Report Amendment (RP3);</i> Site layout changed – individual inverter counts reduced, new 3.15 MVA Inverter unit selected	May 11, 2020

1 Introduction

BluEarth Renewables has retained Aercoustics Engineering Limited on behalf of Burdett Solar GP Corp (the Applicant) to prepare an amendment to an existing Noise Impact Assessment. This Noise Impact Assessment (“NIA”) pertains to the Burdett Solar Project. The proposed facility (the “Project”) comprises a 20-megawatt alternating current (MWAC) solar facility located roughly 2 km southwest of Burdett, Alberta, on a plot of land measuring roughly 63 hectares.

The purpose of this pre-construction noise impact assessment is to ensure that the predicted noise levels at critical receptors surrounding the Project area are in compliance with Alberta Utilities Commission (“AUC”) Rule 012 [1], dated March 2, 2020. This report serves as an amendment to the existing noise report, dated June 4, 2018 (the “Previous NIA”), and addresses a change to the site layout and equipment. The facility comprises one (1) fewer solar inverters, and a new model of inverter has been selected.

2 Facility Description

The Project spans 63 hectares (156 Acres) of land situated roughly two (2) km south of Burdett, Alberta, in the county of Forty Mile No. 8. The specific UTM coordinates of the approximate centre of the Project are 460791 mE, 5518583 mN in Zone 12. The plot of land on which the Project is to be developed is designated SE-15-10-12 W4.

The solar facility will include an array of solar panels with seven (7) associated Sungrow SG3150U 3.15 megavolt-ampere (MVA) inverters, each with an associated 3.15 MVA pad-mounted transformer. A project layout has been included in Appendix A.

Although power production will only occur during daylight hours, both daytime and nighttime operation of the facility have been considered in this assessment. This conservative assumption accounts for days of the year where the sun rises before 07:00 AM.

AUC Rule 012 stipulates that any third-party energy-related facilities within 1.5 km of the Project receptors must be considered in the Noise Impact Assessment and that the cumulative noise impact for all such facilities, together with the ambient contribution, must meet the applicable Permissible Sound Limits (PSLs). Two facilities in the area meet this description. These include an Altalink transformer substation adjacent to the southeast of the Project as well as a Signalta diesel power generation facility located about 100 m to the southeast of the Project. An overview of the Project study area, including critical receptors and third-party noise sources is available in Figure 1.

3 Noise Sources

3.1 Project Noise Sources

The dominant noise sources associated with sustained operation of the Project are the seven (7) 3.15 MVA solar inverters and the seven (7) associated 3.15 MVA pad-mounted transformers. Each of the seven sets of equipment was modelled as a single point source to represent a Solar Inverter Station with a sound power level equal to the sum of that of the three parts (one inverter, one transformer). The solar panels are supported by a fixed-rack system and are therefore not considered to be a significant noise source. The locations of the Solar Inverter Stations within the Project are detailed in Figure 2.

Spectral sound data for the solar inverters (Sungrow SG3150U 3.15 MVA) is available in Appendix B and was provided in a manufacturer test report [2]. The spectral sound pressure values provided for the inverter units were converted to a sound power spectrum using ISO 3744 [4]. A summary of this calculation is provided in Appendix B. Spectral sound data for the selected GE Prolec 3.15 MVA transformers. The assumed sound power levels for the 3.15 MVA pad-mounted transformers were based on manufacturer data for similarly sized transformer units and adjusted based on NEMA TR 1-2013 [5] and Beranek's *Noise and Vibration Control Engineering* [6]. A summary of this derivation is given in Appendix B.

While the noise from the transformer itself is expected to have tonal components below 250 Hertz, the tonal character of the transformer is not anticipated to be audible at the receptor locations due to both the low predicted transformer-only noise impact as well as masking noise associated with ambient and third-party noise.

To assess the potential for a Low Frequency Noise condition, a comparison between the A- and C-weighted predicted sound levels from the Project was performed at critical receptors. This analysis is detailed further in Section 6.2 of this report. The sound power spectra for the two noise source components, as well as for the overall Solar Inverter Station, are stated in Table 1 below. Details for noise sources used in the model are summarized in Table 2 below.

Table 1 – Noise source Spectra

Noise Source	Frequency (Hz)									Total (dBA)
	31.5	63	125	250	500	1000	2000	4000	8000	
NEMA Estimate 3.15 MVA Transformer	83	89	91	86	86	80	75	70	63	86
SG3150U 3.15 MW Solar Inverter	86	90	100	98	94	90	88	91	82	98
Combined Source (Solar Inverter Station)	87	93	100	98	94	91	88	91	82	98

¹ – Test Data Provided in *SUNGROW Noise Test Report for SG3150U* [2].

3.2 Third-Party Noise Sources

There are two existing third-party energy-related facilities within 1.5 km of the receptors impacted by the Project. These are an AltaLink transformer substation and a Signalta diesel power generation facility. Sound power data for the transformer substation and diesel power generation facility were provided by AltaLink and Signalta, respectively. Octave data used for each third-party source has been included in Appendix B. A 5 dB positive adjustment has been applied to the AltaLink transformer and capacitor sources as their generated noise is expected to have a tonal characteristic with components below 250 Hz.

The location of all noise sources with respect to Project receptors has been included in Figure 1. The location of noise sources with respect to the Project is included in Figure 2. All noise sources considered in this Noise Impact Assessment are summarized in Table 2 below.

Table 2 – Noise Source Summary

Source ID	Source Name	Sound Power Level (dBA)	Source Location
IS1	3.15 MVA Solar Inverter Station	98 ^{1,2}	BSP
IS2	3.15 MVA Solar Inverter Station	98 ^{1,2}	BSP
IS3	3.15 MVA Solar Inverter Station	98 ^{1,2}	BSP
IS4	3.15 MVA Solar Inverter Station	98 ^{1,2}	BSP
IS5	3.15 MVA Solar Inverter Station	98 ^{1,2}	BSP
IS6	3.15 MVA Solar Inverter Station	98 ^{1,2}	BSP
IS7	3.15 MVA Solar Inverter Station	98 ^{1,2}	BSP
TP_cap1	Capacitor 1	87 ³	AltaLink
TP_cap2	Capacitor 2	87 ³	AltaLink
TP_tf1	Transformer 1	96 ³	AltaLink
TP_tf2	Transformer 2	102 ³	AltaLink
TP_tf3	Fan1	101 ⁴	Signalta
TP_tf4	Fan 2	101 ⁴	Signalta
TP_f1	Fan 3	101 ⁴	Signalta
TP_f2	Fan 4	101 ⁴	Signalta
TP_f3	Fan 5	101 ⁴	Signalta
TP_f4	Fan 6	101 ⁴	Signalta
TP_f5	Fan 7	101 ⁴	Signalta
TP_f6	Fan 8	101 ⁴	Signalta
TP_f7	Fan 9	101 ⁴	Signalta

Note: Further documentation in Appendix B.

1. Sound data for SG3150U Inverter is from *SUNGROW Noise Test Report for SG3150U* [2]
2. Assumed sound power data for the 3.15 MVA transformer based on NEMA Standard and measurement data from a comparable unit
3. Sound power data provided by AltaLink – See Appendix B. Final sound power includes 5 dB tonal adjustment.
4. Sound power data provided by Signalta – See Appendix B

4 Points of Reception

Residential dwellings within 1.5 km of the BSP site were identified as critical noise receptors. The locations of these receptors are shown in Figure 1 as R01-R08. Receptor R01 is a raised bungalow, with a plane-of-window height of 3 m confirmed by site observations. All other receptors were assumed to be two-storey residential dwellings.

The most impacted receptors identified were R01 and R02 as shown in Figure 1. R01 and R02 are, respectively, located approximately 60 m east and 250 m west from the fence of the BSP site. It is Aercoustics' understanding that the third-party facilities have existed prior to the construction of these dwellings (R01 and R02).

Satisfying AUC Rule 012 Noise Control guidelines at the closest critical receptors will ensure that all other points of reception will be in compliance.

Table 3 summarizes the locations of the nearest points of reception, including the distance and direction from the BSP site.

Table 3 – Receptor Summary Table

Receptor ID	Receptor description	Receptor Height	Approximate Location
R01	raised bungalow dwelling	3 m (plane of window)	60 m east
R02	two-storey dwelling	4.5m (plane of window)	250 m west
R03	two-storey dwelling	4.5m (plane of window)	1000 m north
R04	two-storey dwelling	4.5m (plane of window)	1000 m north-west
R05	two-storey dwelling	4.5m (plane of window)	1200 m north-west
R06	two-storey dwelling	4.5m (plane of window)	1000 m north-west
R07	two-storey dwelling	4.5m (plane of window)	1200 m west
R08	two-storey dwelling	4.5m (plane of window)	800 m south

¹ – Location with reference to the nearest Project noise source, direction from source to receptor.

5 Assessment Criteria

The permissible sound levels used in this study are based on AUC Rule 012. According to this publication, the Permissible Sound Level (PSL) must be decided at the critical receptors per the AUC defined category designation.

All the critical receptors listed above in Section 4 are more than 500 m from heavily travelled roads or rail lines and not subject to frequent aircraft flyovers. This is consistent with the Category 1 acoustic environment categorization as defined by AUC Rule 012.

The noise level predicted at the closest receptors, R01 and R02, is dominated by the existing third-party facilities (AltaLink and Signalta) as described in Section 2. These third-party facilities existed prior to the dwellings at R01 and R02.

Due to the presence of these facilities, permissible sound level at these effected dwellings is equal to the cumulative sound level existing at the time of construction, as per section 2.3.1 of AUC Rule 012. The construction dates of these third-party facilities are detailed below in Table 4. Construction completion dates of the relevant critical receptors are detailed in Table 5. The permissible nighttime sound levels used for these receptors, as determined by the predicted impact of the third-party sources, is listed below in Table 3. The relevant nighttime PSL at all other receptors is the 40 dBA basic sound level (BSL) fitting a category 1 classification.

Table 4 – Third Party Facility Construction Dates

Facility	Construction Completion Date	Info Source
AltaLink – 368S Substation	1987	AltaLink
Signalta – Westfield 107S Substation	1963	Signalta

Table 5 – Critical Receptor Construction Dates

Receptor	Construction Completion Date	Info Source
R01	October 2014	Resident
R02	November 2016	Resident

An adjustment of 10 dB was applied above the nighttime basic sound level to determine the daytime permissible sound level. The nighttime and daytime permissible sound levels for each receptor are summarized in Table 6. Nighttime and daytime ambient sound levels of 35 dBA and 45 dBA, respectively, were added to the cumulative sound level at each receptor.

Table 6 – Permissible Sound Level Summary Table

Receptor ID	Nighttime (10 p.m. – 7 a.m.)	Daytime (7 a.m. – 10 p.m.)
R01	44	50
R02	42	50
R03	40	50
R04	40	50
R05	40	50
R06	40	50
R07	40	50
R08	40	50

6 Noise Impact Assessment

The noise impact calculations were performed using DataKustik's CadnaA environmental noise prediction software (2019 Version). The calculations are based on established environmental sound prediction methods outlined in *ISO 9613-2: A Standard for Outdoor Noise Propagation* [5]. The noise prediction methodology assumes downwind propagation at 70% relative humidity and 10 degrees Celsius. Flat ground topography and a global ground factor of $G=0.5$ have been conservatively assumed for this assessment as the area surrounding the Project is flat farmland or grassland. A summary of the calculation terms and methodology has been included in Appendix C.

6.1 Predictable Worst Case

A worst-case operating scenario has been assumed for the assessment. During the daytime, this scenario includes all seven Solar Inverter Stations as well as the AltaLink substation and Signalta power generation facility operating at 100% capacity. The nighttime worst-case operating scenario includes both third party facilities operating, in addition to all seven (7) 3.15 MVA transformers operating, with all seven (7) 3.15 MVA solar inverters turned off.

The predicted project-only sound levels corresponding to this worst-case scenario are detailed in Table 7 and Table 8 along with predicted third-party impact and assumed ambient. The cumulative noise impact from these components is compared to the applicable sound level limit at each receptor. Sample calculations including calculation parameters are included in Appendix C. A figure detailing the nighttime noise impact generated by third party sources and the assumed ambient is included in Figure 3. Cumulative noise Impact contours, including the Project, third party sources, and the assumed ambient is included in Figure 4.

Table 7 – Noise Impact Assessment Summary Table – Daytime

ID	Assumed ambient sound level (dBA)	AltaLink Substation alone, Sound Level (dBA)	Signalta Substation alone, Sound Level (dBA)	Burdett Solar Project alone, Sound Level (dBA)	Resultant Cumulative Sound Level (dBA)	Permissible Sound Level (dBA)	Compliance (Yes/No)
R01	45	37	42	45	49	50	Yes
R02	45	35	39	37	47	50	Yes
R03	45	19	25	28	45	50	Yes
R04	45	*	*	28	45	50	Yes
R05	45	*	*	26	45	50	Yes
R06	45	24	*	28	45	50	Yes
R07	45	26	31	28	45	50	Yes
R08	45	32	37	30	46	50	Yes

*- sound level at receptor insignificant

Table 8 – Noise Impact Summary Table – Nighttime

ID	Assumed ambient sound level (dBA)	AltaLink Substation alone, Sound Level (dBA)	Signalta Substation alone, Sound Level (dBA)	Burdett Solar Project alone, Sound Level (dBA)	Resultant Cumulative Sound Level (dBA)	Permissible Sound Level (dBA)	Compliance (Yes/No)
R01	35	37	42	26	44	44	Yes
R02	35	35	39	19	42	42	Yes
R03	35	19	25	10	36	40	Yes
R04	35	*	*	10	35	40	Yes
R05	35	*	*	8	35	40	Yes
R06	35	24	*	10	35	40	Yes
R07	35	26	31	10	37	40	Yes
R08	35	32	37	11	40	40	Yes

*- sound level at receptor insignificant

6.2 Low Frequency Noise Analysis

Low frequency analysis was performed as per section 4.5 of AUC Rule 012. Both the A-weighted and C-weighted impact was determined at each receptor, and the difference between both was calculated. These results are presented in Table 9 below.

Table 9 – Low Frequency Noise Analysis

Receptor ID	Day			Night		
	LAeq [dBA]	LCeq [dBC]	LCeq - LAeq	LAeq [dBA]	LCeq [dBC]	LCeq - LAeq
R01	45	51	6	26	35	9
R02	37	44	7	19	29	10
R03	28	36	8	10	21	11
R04	28	36	8	10	21	11
R05	26	34	9	8	19	12
R06	28	36	8	10	21	11
R07	28	37	8	10	22	11
R08	30	38	8	11	22	11

Given that the difference between the predicted A- and C-weighted sound pressure levels never exceeds 20 dB, the presence of a Low Frequency Noise condition according to the Guidelines is unlikely.

6.3 Changes in Predicted Sound Level

In order to ensure that project stakeholders are not adversely affected by the change in project layout and infrastructure, a comparison has been made between the cumulative sound levels associated with the Previous NIA and those associated with the revised layout and equipment. This comparison is provided in Appendix D and indicates that the changes outlined in Section 2 will result in an increase in cumulative sound level of 0.4 dBA or less for receptors R02 through R08 for both the daytime and nighttime operating scenarios with the incorporation of the noise control measures outlined in Section 7.1. An increase to the cumulative daytime sound level of 1.8 dBA is noted for receptor R01, which is understood to be the project landowner. The landowner at R01 has been made aware of the increase associated with the changes and has agreed to the change in project layout. This confirmation has also been included in Appendix D.

7 Noise Control Measures

The following administrative noise control measure must be enacted to ensure compliance with the relevant Permissible Sound Levels. The noise control measures pertaining to construction must be enacted according to Section 2.7.1 of AUC Rule 012.

7.1 Limited Nighttime Operation

The inverters associated with Inverter Stations IS1 through IS7 may not run outside of the daytime hours of 07:00 – 22:00. It is understood that the associated transformer will generate noise even when the inverters are not active – nighttime operation of this transformer has been accounted for in the modelling and is predicted to comply with the PSL of all critical receptors.

7.2 Construction Noise Mitigating Measures

To minimize the impact of the development of the Project on nearby dwellings, the following mitigation measures should be used as described in AUC Rule 012:

- a) Conduct construction activity between the hours of 7 a.m. and 10 p.m. to reduce the duration impact from construction noise,
- b) Advise nearby residents of significant noise-causing activities and schedule these events to reduce disruption to them,
- c) Ensure that all internal combustion engines are well maintained with muffler systems,
- d) Should a noise complaint be filed during construction, the licensee must respond expeditiously and take prompt action to address the complaint.

8 Conclusion

Aercoustics Engineering Limited has completed a Noise Impact Assessment for the Burdett Solar Project in Alberta.

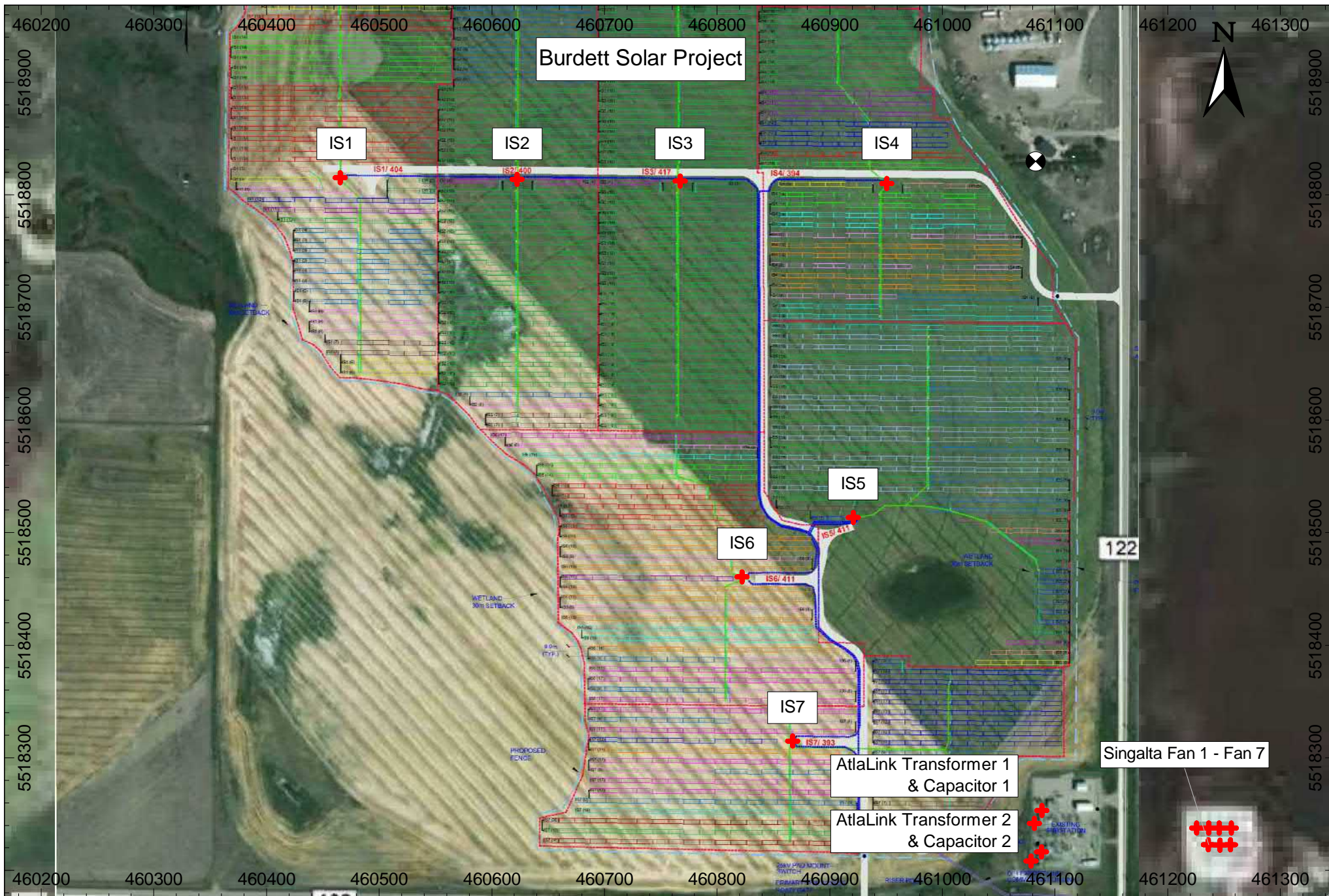
It was determined that the predicted cumulative noise impact from the contributing ambient, relevant third-party sources, and the proposed Burdett Solar Project is in compliance with AUC Rule 012.

9 References

- [1] Alberta Utilities Commission, “Rule 012 - Noise Control,” 2020.
- [2] SUNGROW, “Noise Test Report for SG3150U,” 2019.
- [3] ISO, “International Standard ISO 3744 - “Acoustics – Determination of sound power levels of noise sources using sound pressure - Engineering method in an essentially free field over a reflecting plane”,” Geneva, 1994.
- [4] National Electrical Manufacturers Association, “NEMA TR 1-2013 - Transformers, Step Voltage Regulators and Reactors,” National Electrical Manufacturers Association, Rosslyn, VA, 2014.
- [5] L. Beranek, “Noise and Vibration Control Engineering,” Institute of Noise Control Engineering, 1992.
- [6] ISO, “International Standard ISO 9613-2 “Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation”,” 1996.

FIGURES





Project ID: 18079.02

Scale: NTS
 Drawn by: KC
 Reviewed by: PA
 Date: May 7, 2020
 Revision: 1

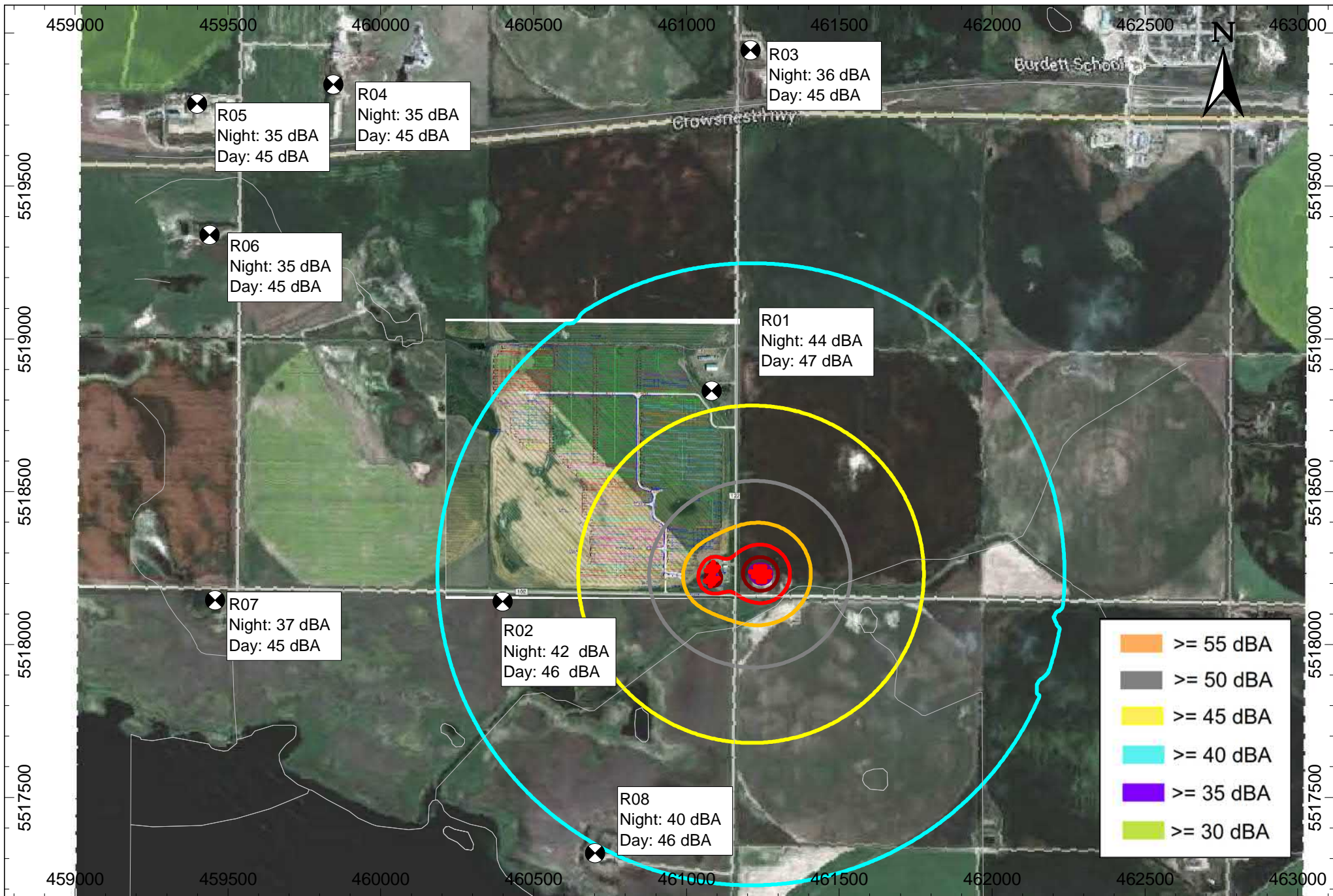
Project Name

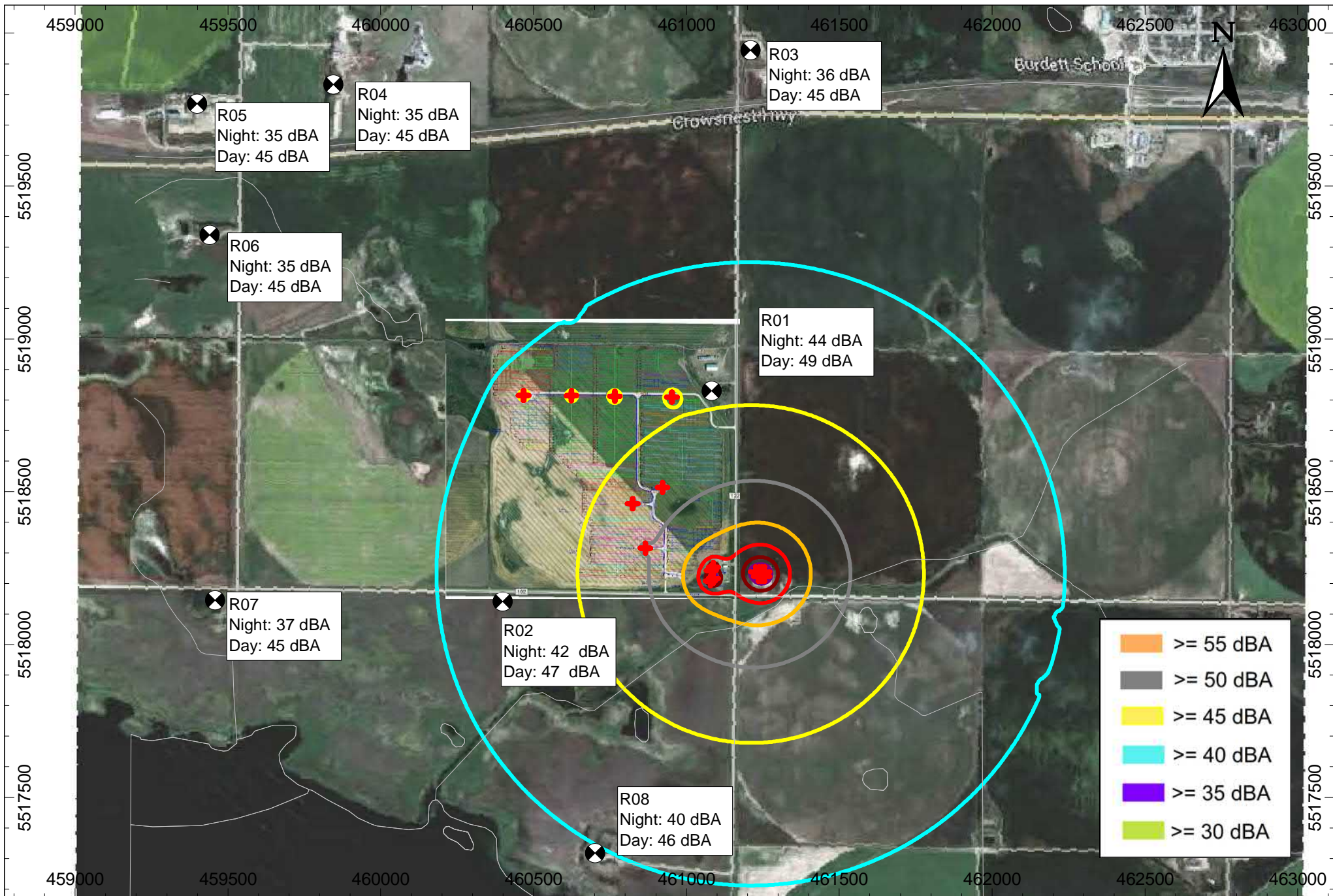
Burdett Solar Project- Noise Impact Assessment RP3

Figure Title

Noise Source Locations

Figure 1





APPENDIX A – Site Plan of Burdett Solar Project



CONSTRUCTION LEADERS

TORONTO DISTRICT
2201 Bristol Circle, Suite 500
Oakville, Ontario, L6H 0J8
Phone: 905-276-7600

LEGEND

1x(2 x 13) PANELS (PORTRAIT) PER TABLE SET
26 PV MODULES PER STRING (TYP.)

3 TABLE SETS = ±41.832m

2 TABLE SETS = ±27.788m

3.150 MVA INVERTER STATION
- 2.835 MW INVERTER
- 3.150 MVA TRANSFORMER

COMBINER BOX

SECURITY FENCE

25 kV AC COLLECTOR FEEDER

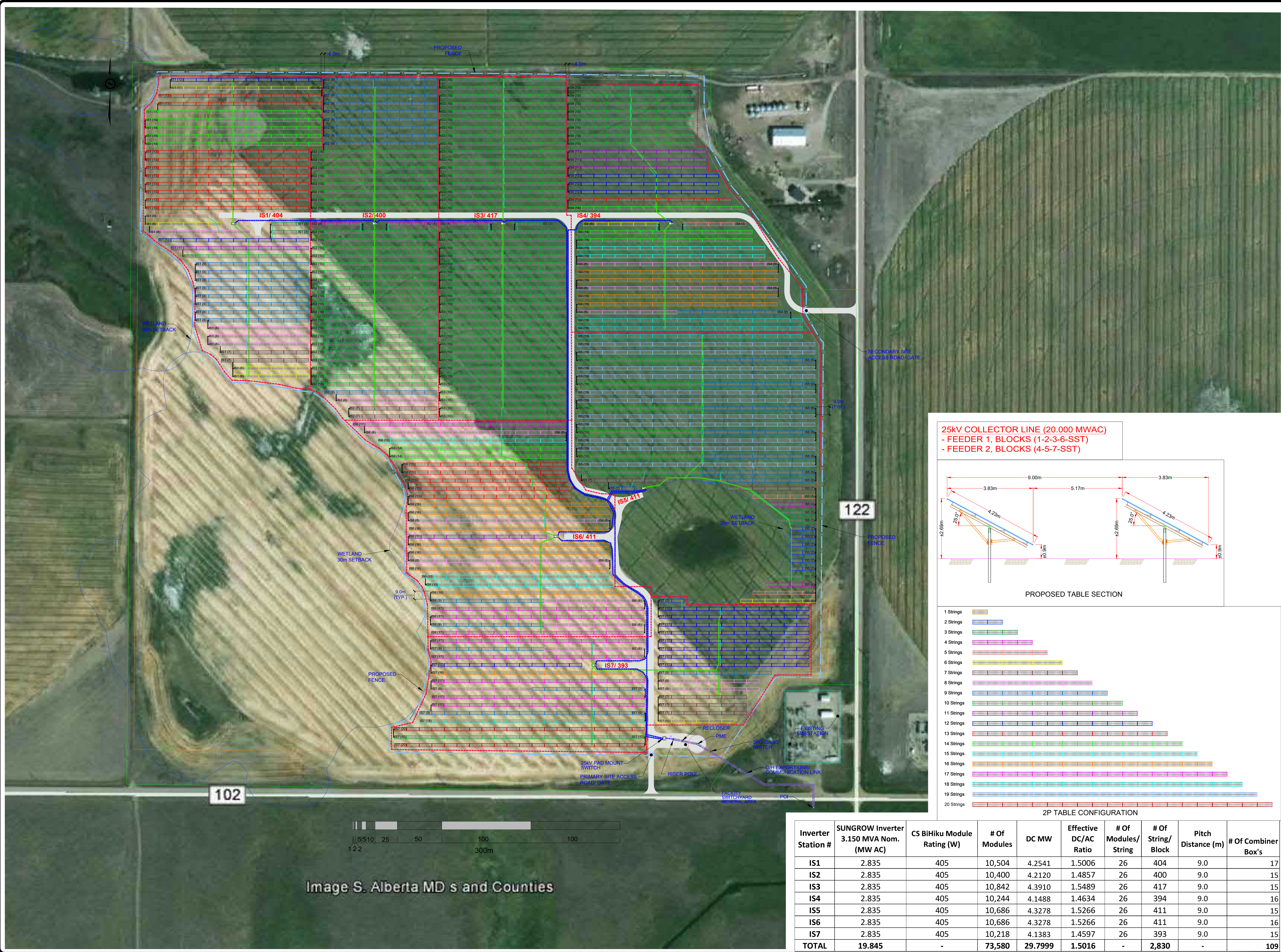
DC TRENCH

DC PV HARNESS IN UG PVC CONDUIT

BLOCK OUTLINE

GRAVEL ROAD

DAISY CHAIN



THIS DRAWING IS FOR THE SOLE USE OF ANY PCL OPERATING COMPANY, OR ANY PCL JOINT VENTURE COMPANY. IT IS NOT TO BE USED, ALTERED OR REPRODUCED WITHOUT THE WRITTEN PERMISSION OF THE PCL FAMILY OF COMPANIES.

Rev. No.	Initials	Date	Description
0	LS	04/02/20	ISSUED FOR REVIEW

Plot Scale:	AS SHOWN	Date:	April, 02, 2020
Drawn By:	T.N.	Checked By:	W.S.
Sheet Title:	Burdett Solar 2P Fixed - 405W Modules PCL Site Layout		
PCL Job No.:			
Sheet No.:	PCL-1		

APPENDIX B – Sound Data Sheets

Noise Test Report

TYPE TEST SHEET

This Type Test sheet shall be used to record the results of the type testing of Generating Unit			
Type Tested reference number		SG3150U	
Generating Unit technology		Grid-connected PV Inverter	
System supplier name		Sungrow Power Supply Co., Ltd.	
Address		No.1699 Xiyou Rd., New & High Technology Industrial Development Zone, Hefei, P.R. China	
Tel	+86 551 65327834	Fax	+86 551 6532 7800
E:mail	info@sungrow.cn	Web site	www.sungrowpower.com
Maximum export capacity, use separate sheet if more than one connection option.	N/A	kW single phase, single, split or three phase system	
		kW three phase	
	N/A	kW two phases in three phase system	
	N/A	kW two phases split phase system	
Compiled by		On behalf of	Sungrow Power Supply Co., Ltd.
		Test Date	2019-5-13
<p>Note that testing can be done by the manufacturer of an individual component, by an external test house, or by the supplier of the complete system, or any combination of them as appropriate.</p> <p>Where parts of the testing are carried out by persons or organisations other than the supplier then the supplier shall keep copies of all test records and results supplied to them to verify that the testing has been carried out by people with sufficient technical competency to carry out the tests.</p>			

The aim of this test is to determine the noise level when the PV Grid inverter in rated working condition

Used settings of the measurement device for Noise measurement

Measurement device	Date of measurement
AWA6228	2019-5-13

The condition s during testing are specified below:

PGU operation mode	Rated Working Condition
Voltage range	800-1300V
Grid frequency range	50Hz/ 45-55Hz
Distance	1m
Date	2019-5-13

The system noise level please check the table below.

Orientation	Noise (dB)
Front	77.2
Behind	77.5
Left	78.1
Right	79

Photo:
Operation Condition:



Front Test :



Test Record

Frequency(Hz)	Noise(dB)	Frequency(Hz)	Noise(dB)
16	53.9	1k	68.7
31.5	56.3	2k	66.6
63	69.3	4k	71.8
125	80.7	8k	59.6
250	76.8	16k	42.4
500	71.8	W_A	77.2

Behind:



Test Record

Frequency(Hz)	Noise(dB)	Frequency(Hz)	Noise(dB)
16	55.9	1k	70.6
31.5	64.8	2k	68.3
63	69.5	4k	69.7
125	77.6	8k	59.6
250	77.4	16k	43.1
500	74.4	W_A	77.5

Left:



Test Record

Frequency(Hz)	Noise(dB)	Frequency(Hz)	Noise(dB)
16	56.3	1k	70.7
31.5	67.7	2k	68.4
63	69.7	4k	71.3
125	78.6	8k	62.5
250	78.8	16k	52.9
500	73.1	W_A	78.1

Right:



Test Record

Frequency(Hz)	Noise(dB)	Frequency(Hz)	Noise(dB)
16	57.1	1k	71.7
31.5	67.9	2k	69.6
63	72.7	4k	71.4
125	81.4	8k	63.9
250	78.4	16k	53.2
500	75.4	W_A	79.0

Sungrow Power Supply Co., Ltd.
Add: No. 1699 Xiyao Road, Hefei, China
Tel: +86 551 6532 7834
Email: info@sungrow.cn
Website: www.sungrowpower.com



Additional comments

Sound Power Used for Analysis - SPL to PWL Conversion for Inverter

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Created on: 2020-04-30

3.15 MVA - SG3150U Inverter Sound Power Calculation

Measurement Distance from Unit [m]	1
Unit Dimensions (LxWxH) [m]	2.9 x 3 x 2.4
Area at Measurement Distance from Unit [m ²]	95
SPL to PWL Area Adjustment ¹ [dB]	20



SG3150U 3.15 MVA Inverter Spectral Sound Data

	31.5	63	125	250	500	1000	2000	4000	8000	Total (dBA)
Average Sound Pressure Spectrum [2]	66	71	80	78	74	71	68	71	62	-
Sound Power Level [dB]	86	90	100	98	94	90	88	91	82	98

[1] Based on ISO 3744 - Determination of PWL using SPL (engineering method over reflecting plane)

[2] Average sound power spectrum from SUNGROW Noise Test Report for SG3150U

Sound Power Used for Analysis - Combined Source

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Created on: 2020-04-30

3.15 MVA - Medium Voltage Transformer Sound Power Estimate

Rated Capacity	3.15 MVA
NEMA Sound Pressure Estimate [1]	63 dBA
Assumed Surface Area	24 m ²



	31.5	63	125	250	500	1000	2000	4000	8000	Total (dBA)
Frequency Spectrum Adjustment [2]	-3	3	5	0	0	-6	-11	-16	-23	-
Sound Power Level (dB)	74	80	82	77	77	71	66	61	54	77

[1] Based on NEMA TRI-1993 (R2000), Table 0-2, Immersed Power Transformers

[2] from Beranek, Noise and Vibration Control Engineering, 1992. Table 18.1, Line 28

3.15 MVA Transformer and SG3150U 3.15 MVA Inverter [3.15 MVA Inverter Station]

Noise Source	31.5	63	125	250	500	1000	2000	4000	8000	Total (dBA)
NEMA Estimate 3.15 MVA Transformer	74	80	82	77	77	71	66	61	54	77
SG3150U 3.15MVA Solar Inverter	86	90	100	98	94	90	88	91	82	98
Combined Source	86	91	100	98	94	90	88	91	82	98

APPENDIX C – ISO Calculation

Receiver: R01

Project: Burdett Solar Project - NIA

Project Number: 18079.02

Time Period	Total (dBA)
Day	49

Receiver Name	Receiver ID	X	Y	Z
R01	R01	461082.89 m	518829.82 m	96.00 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	66.9	0.0	-1.2	0.0	1.1	0.0	0.0	0.0	0.0	0.0	20
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	66.4	0.0	-1.1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	21
TP_f1	Fan1	461255.9	5518222.9	790.5	0	101	0.0	A	67.0	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f2	fan2	461246.3	5518222.5	790.5	0	101	0.0	A	67.0	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f3	fan3	461236.2	5518222.7	790.6	0	101	0.0	A	66.9	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f4	Fan4	461256.5	5518237.6	790.7	0	101	0.0	A	66.8	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f5	Fan5	461245.9	5518237.8	790.7	0	101	0.0	A	66.8	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f6	Fan6	461236.4	5518237.5	790.7	0	101	0.0	A	66.7	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f7	Fan7	461225.6	5518237.8	790.8	0	101	0.0	A	66.7	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
IS4	Sungrow Inverter Station	460950.8	5518809.9	796.6	0	98	0.0	A	53.5	0.0	-0.8	0.0	1.3	0.0	0.0	0.0	0.0	0.0	44
IS3	Sungrow Inverter Station	460767.1	5518812.4	795.7	0	98	0.0	A	61.0	0.0	-1.3	0.0	2.3	0.0	0.0	0.0	0.0	0.0	36
IS5	Sungrow Inverter Station	460920.7	5518513.6	793.9	0	98	0.0	A	62.0	0.0	-1.3	0.0	2.5	0.0	0.0	0.0	0.0	0.0	34
IS6	Sungrow Inverter Station	460822.3	5518460.6	792.0	0	98	0.0	A	64.1	0.0	-1.4	0.0	2.9	0.0	0.0	0.0	0.0	0.0	32
IS2	Sungrow Inverter Station	460622.3	5518813.8	792.8	0	98	0.0	A	64.3	0.0	-1.4	0.0	2.9	0.0	0.0	0.0	0.0	0.0	32
IS7	Sungrow Inverter Station	460867.0	5518315.0	791.1	0	98	0.0	A	65.9	0.0	-1.4	0.0	3.2	0.0	0.0	0.0	0.0	0.0	30
IS1	Sungrow Inverter Station	460465.5	5518815.1	790.9	0	98	0.0	A	66.8	0.0	-1.4	6.2	3.4	0.0	0.0	0.0	0.0	0.0	23
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	66.2	0.0	-1.8	0.0	1.7	0.0	0.0	0.0	0.0	0.0	30
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	66.8	0.0	-1.9	0.0	1.8	0.0	0.0	0.0	0.0	0.0	35

Project Contribution (dBA)	45
3rd Party Contribution (dBA)	43
Ambient Contribution (dBA)	45

Receiver: R02
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Day	47

Receiver Name	Receiver ID	X	Y	Z
R02	R02	460398.20 m	518140.51 m	91.98 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	67.7	0.0	-1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	19
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	67.8	0.0	-1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	19
TP_f1	Fan1	461255.9	5518222.9	790.5	0	101	0.0	A	69.7	0.0	-1.7	0.0	2.7	0.0	0.0	0.0	0.0	0.0	31
TP_f2	fan2	461246.3	5518222.5	790.5	0	101	0.0	A	69.6	0.0	-1.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31
TP_f3	fan3	461236.2	5518222.7	790.6	0	101	0.0	A	69.5	0.0	-1.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31
TP_f4	Fan4	461256.5	5518237.6	790.7	0	101	0.0	A	69.7	0.0	-1.7	0.0	2.7	0.0	0.0	0.0	0.0	0.0	31
TP_f5	Fan5	461245.9	5518237.8	790.7	0	101	0.0	A	69.6	0.0	-1.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31
TP_f6	Fan6	461236.4	5518237.5	790.7	0	101	0.0	A	69.5	0.0	-1.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31
TP_f7	Fan7	461225.6	5518237.8	790.8	0	101	0.0	A	69.4	0.0	-1.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31
IS7	Sungrow Inverter Station	460867.0	5518315.0	791.1	0	98	0.0	A	65.0	0.0	-1.5	0.0	3.0	0.0	0.0	0.0	0.0	0.0	31
IS6	Sungrow Inverter Station	460822.3	5518460.6	792.0	0	98	0.0	A	65.5	0.0	-1.5	0.0	3.1	0.0	0.0	0.0	0.0	0.0	31
IS5	Sungrow Inverter Station	460920.7	5518513.6	793.9	0	98	0.0	A	67.2	0.0	-1.5	0.0	3.4	0.0	0.0	0.0	0.0	0.0	29
IS1	Sungrow Inverter Station	460465.5	5518815.1	790.9	0	98	0.0	A	67.6	0.0	-1.5	0.0	3.5	0.0	0.0	0.0	0.0	0.0	28
IS2	Sungrow Inverter Station	460622.3	5518813.8	792.8	0	98	0.0	A	68.0	0.0	-1.5	0.0	3.6	0.0	0.0	0.0	0.0	0.0	28
IS3	Sungrow Inverter Station	460767.1	5518812.4	795.7	0	98	0.0	A	68.7	0.0	-1.5	0.0	3.8	0.0	0.0	0.0	0.0	0.0	27
IS4	Sungrow Inverter Station	460950.8	5518809.9	796.6	0	98	0.0	A	69.8	0.0	-1.5	0.0	4.0	0.0	0.0	0.0	0.0	0.0	25
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	67.9	0.0	-2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	28
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	67.8	0.0	-2.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	34

Project Contribution (dBA)	37
3rd Party Contribution (dBA)	41
Ambient Contribution (dBA)	45

Receiver: R03
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Day	45

Receiver Name	Receiver ID	X	Y	Z
R03	R03	461209.33 m	519944.53 m	93.90 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	75.8	0.0	-1.5	0.0	2.5	0.0	0.0	0.0	0.0	0.0	10
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	75.6	0.0	-1.5	0.0	2.5	0.0	0.0	0.0	0.0	0.0	10
TP_f1	Fan1	461255.9	5518222.9	790.5	0	101	0.0	A	75.7	0.0	-1.6	6.4	4.3	0.0	0.0	0.0	0.0	0.0	17
TP_f2	fan2	461246.3	5518222.5	790.5	0	101	0.0	A	75.7	0.0	-1.6	6.4	4.3	0.0	0.0	0.0	0.0	0.0	17
TP_f3	fan3	461236.2	5518222.7	790.6	0	101	0.0	A	75.7	0.0	-1.6	6.4	4.3	0.0	0.0	0.0	0.0	0.0	17
TP_f4	Fan4	461256.5	5518237.6	790.7	0	101	0.0	A	75.6	0.0	-1.6	6.4	4.2	0.0	0.0	0.0	0.0	0.0	17
TP_f5	Fan5	461245.9	5518237.8	790.7	0	101	0.0	A	75.6	0.0	-1.6	6.4	4.2	0.0	0.0	0.0	0.0	0.0	17
TP_f6	Fan6	461236.4	5518237.5	790.7	0	101	0.0	A	75.6	0.0	-1.6	6.4	4.2	0.0	0.0	0.0	0.0	0.0	17
TP_f7	Fan7	461225.6	5518237.8	790.8	0	101	0.0	A	75.6	0.0	-1.6	6.4	4.2	0.0	0.0	0.0	0.0	0.0	17
IS4	Sungrow Inverter Station	460950.8	5518809.9	796.6	0	98	0.0	A	72.3	0.0	-1.5	0.0	4.7	0.0	0.0	0.0	0.0	0.0	22
IS3	Sungrow Inverter Station	460767.1	5518812.4	795.7	0	98	0.0	A	72.7	0.0	-1.5	0.0	4.8	0.0	0.0	0.0	0.0	0.0	22
IS2	Sungrow Inverter Station	460622.3	5518813.8	792.8	0	98	0.0	A	73.1	0.0	-1.5	0.0	4.9	0.0	0.0	0.0	0.0	0.0	21
IS1	Sungrow Inverter Station	460465.5	5518815.1	790.9	0	98	0.0	A	73.6	0.0	-1.5	6.3	5.1	0.0	0.0	0.0	0.0	0.0	14
IS5	Sungrow Inverter Station	460920.7	5518513.6	793.9	0	98	0.0	A	74.3	0.0	-1.5	0.0	5.3	0.0	0.0	0.0	0.0	0.0	20
IS6	Sungrow Inverter Station	460822.3	5518460.6	792.0	0	98	0.0	A	74.7	0.0	-1.5	6.2	5.4	0.0	0.0	0.0	0.0	0.0	13
IS7	Sungrow Inverter Station	460867.0	5518315.0	791.1	0	98	0.0	A	75.4	0.0	-1.4	6.2	5.7	0.0	0.0	0.0	0.0	0.0	12
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	75.6	0.0	-2.1	6.9	4.0	0.0	0.0	0.0	0.0	0.0	12
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	75.8	0.0	-2.2	7.0	4.1	0.0	0.0	0.0	0.0	0.0	17

Project Contribution (dBA)	28
3rd Party Contribution (dBA)	26
Ambient Contribution (dBA)	45

Receiver: R04
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Day	45

Receiver Name	Receiver ID	X	Y	Z
R04	R04	459844.49 m	519832.06 m	96.67 m

Source ID	Source Name	X	Y	Z	Ref.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
IS1	Sungrow Inverter Station	460465.5	5518815.1	790.9	0	98	0.0	A	72.5	0.0	-1.5	0.0	4.7	0.0	0.0	0.0	0.0	0.0	22
IS2	Sungrow Inverter Station	460622.3	5518813.8	792.8	0	98	0.0	A	73.2	0.0	-1.5	0.0	4.9	0.0	0.0	0.0	0.0	0.0	21
IS3	Sungrow Inverter Station	460767.1	5518812.4	795.7	0	98	0.0	A	73.8	0.0	-1.5	0.0	5.1	0.0	0.0	0.0	0.0	0.0	20
IS4	Sungrow Inverter Station	460950.8	5518809.9	796.6	0	98	0.0	A	74.6	0.0	-1.5	0.0	5.4	0.0	0.0	0.0	0.0	0.0	19
IS6	Sungrow Inverter Station	460822.3	5518460.6	792.0	0	98	0.0	A	75.5	0.0	-1.4	0.0	5.7	0.0	0.0	0.0	0.0	0.0	18
IS5	Sungrow Inverter Station	460920.7	5518513.6	793.9	0	98	0.0	A	75.6	0.0	-1.4	0.0	5.7	0.0	0.0	0.0	0.0	0.0	18
IS7	Sungrow Inverter Station	460867.0	5518315.0	791.1	0	98	0.0	A	76.2	0.0	-1.4	0.0	6.0	0.0	0.0	0.0	0.0	0.0	17

Project Contribution (dBA)	28
3rd Party Contribution (dBA)	-73
Ambient Contribution (dBA)	45

Receiver: R05
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Day	45

Receiver Name	Receiver ID	X	Y	Z
R05	R05	459399.51 m	519768.87 m	300.08 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
IS1	Sungrow Inverter Station	460465.5	5518815.1	790.9	0	98	0.0	A	74.1	0.0	-1.5	0.0	5.2	0.0	0.0	0.0	0.0	0.0	20
IS2	Sungrow Inverter Station	460622.3	5518813.8	792.8	0	98	0.0	A	74.8	0.0	-1.4	0.0	5.4	0.0	0.0	0.0	0.0	0.0	19
IS3	Sungrow Inverter Station	460767.1	5518812.4	795.7	0	98	0.0	A	75.4	0.0	-1.4	0.0	5.7	0.0	0.0	0.0	0.0	0.0	18
IS4	Sungrow Inverter Station	460950.8	5518809.9	796.6	0	98	0.0	A	76.2	0.0	-1.4	0.0	5.9	0.0	0.0	0.0	0.0	0.0	17
IS6	Sungrow Inverter Station	460822.3	5518460.6	792.0	0	98	0.0	A	76.7	0.0	-1.4	0.0	6.1	0.0	0.0	0.0	0.0	0.0	16
IS5	Sungrow Inverter Station	460920.7	5518513.6	793.9	0	98	0.0	A	76.9	0.0	-1.4	0.0	6.2	0.0	0.0	0.0	0.0	0.0	16

Project Contribution (dBA)	26
3rd Party Contribution (dBA)	-73
Ambient Contribution (dBA)	45

Receiver: R06
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Day	45

Receiver Name	Receiver ID	X	Y	Z
R06	R06	459439.84 m	519340.02 m	95.80 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	77.0	0.0	-1.5	0.0	2.8	0.0	0.0	0.0	0.0	0.0	9
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	76.9	0.0	-1.5	0.0	2.8	0.0	0.0	0.0	0.0	0.0	9
IS1	Sungrow Inverter Station	460465.5	5518815.1	790.9	0	98	0.0	A	72.2	0.0	-1.5	0.0	4.6	0.0	0.0	0.0	0.0	0.0	22
IS2	Sungrow Inverter Station	460622.3	5518813.8	792.8	0	98	0.0	A	73.2	0.0	-1.5	0.0	4.9	0.0	0.0	0.0	0.0	0.0	21
IS3	Sungrow Inverter Station	460767.1	5518812.4	795.7	0	98	0.0	A	74.1	0.0	-1.5	0.0	5.2	0.0	0.0	0.0	0.0	0.0	20
IS4	Sungrow Inverter Station	460950.8	5518809.9	796.6	0	98	0.0	A	75.1	0.0	-1.4	0.0	5.5	0.0	0.0	0.0	0.0	0.0	19
IS6	Sungrow Inverter Station	460822.3	5518460.6	792.0	0	98	0.0	A	75.3	0.0	-1.4	0.0	5.6	0.0	0.0	0.0	0.0	0.0	18
IS5	Sungrow Inverter Station	460920.7	5518513.6	793.9	0	98	0.0	A	75.6	0.0	-1.4	0.0	5.7	0.0	0.0	0.0	0.0	0.0	18
IS7	Sungrow Inverter Station	460867.0	5518315.0	791.1	0	98	0.0	A	75.9	0.0	-1.4	0.0	5.8	0.0	0.0	0.0	0.0	0.0	17
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	76.9	0.0	-2.1	0.0	4.5	0.0	0.0	0.0	0.0	0.0	17
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	77.0	0.0	-2.2	0.0	4.6	0.0	0.0	0.0	0.0	0.0	23

Project Contribution (dBA)	28
3rd Party Contribution (dBA)	24
Ambient Contribution (dBA)	45

Receiver: R07
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Day	45

Receiver Name	Receiver ID	X	Y	Z
R07	R07	459457.21 m	518144.90 m	93.50 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	75.2	0.0	-1.5	0.0	2.4	0.0	0.0	0.0	0.0	0.0	11
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	75.2	0.0	-1.5	0.0	2.4	0.0	0.0	0.0	0.0	0.0	11
TP_f1	Fan1	461255.9	5518222.9	790.5	0	101	0.0	A	76.1	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f2	fan2	461246.3	5518222.5	790.5	0	101	0.0	A	76.1	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f3	fan3	461236.2	5518222.7	790.6	0	101	0.0	A	76.0	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f4	Fan4	461256.5	5518237.6	790.7	0	101	0.0	A	76.1	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f5	Fan5	461245.9	5518237.8	790.7	0	101	0.0	A	76.1	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f6	Fan6	461236.4	5518237.5	790.7	0	101	0.0	A	76.0	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f7	Fan7	461225.6	5518237.8	790.8	0	101	0.0	A	76.0	0.0	-1.6	0.0	4.3	0.0	0.0	0.0	0.0	0.0	23
IS1	Sungrow Inverter Station	460465.5	5518815.1	790.9	0	98	0.0	A	72.7	0.0	-1.5	0.0	4.8	0.0	0.0	0.0	0.0	0.0	22
IS2	Sungrow Inverter Station	460622.3	5518813.8	792.8	0	98	0.0	A	73.6	0.0	-1.5	0.0	5.0	0.0	0.0	0.0	0.0	0.0	21
IS6	Sungrow Inverter Station	460822.3	5518460.6	792.0	0	98	0.0	A	73.9	0.0	-1.5	0.0	5.2	0.0	0.0	0.0	0.0	0.0	20
IS7	Sungrow Inverter Station	460867.0	5518315.0	791.1	0	98	0.0	A	74.0	0.0	-1.5	0.0	5.2	0.0	0.0	0.0	0.0	0.0	20
IS3	Sungrow Inverter Station	460767.1	5518812.4	795.7	0	98	0.0	A	74.3	0.0	-1.5	0.0	5.3	0.0	0.0	0.0	0.0	0.0	20
IS5	Sungrow Inverter Station	460920.7	5518513.6	793.9	0	98	0.0	A	74.6	0.0	-1.5	0.0	5.4	0.0	0.0	0.0	0.0	0.0	19
IS4	Sungrow Inverter Station	460950.8	5518809.9	796.6	0	98	0.0	A	75.3	0.0	-1.4	0.0	5.6	0.0	0.0	0.0	0.0	0.0	18
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	75.3	0.0	-2.1	0.0	3.9	0.0	0.0	0.0	0.0	0.0	19
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	75.3	0.0	-2.2	0.0	3.9	0.0	0.0	0.0	0.0	0.0	25

Project Contribution (dBA)	10
3rd Party Contribution (dBA)	24
Ambient Contribution (dBA)	35

Receiver: R08
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Day	46

Receiver Name	Receiver ID	X	Y	Z
R08	R08	460701.43 m	517317.53 m	93.11 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	70.7	0.0	-1.4	0.0	1.6	0.0	0.0	0.0	0.0	0.0	16
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	71.0	0.0	-1.4	0.0	1.6	0.0	0.0	0.0	0.0	0.0	16
TP_f1	Fan1	461255.9	5518222.9	790.5	0	101	0.0	A	71.5	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	29
TP_f2	fan2	461246.3	5518222.5	790.5	0	101	0.0	A	71.5	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	29
TP_f3	fan3	461236.2	5518222.7	790.6	0	101	0.0	A	71.4	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	29
TP_f4	Fan4	461256.5	5518237.6	790.7	0	101	0.0	A	71.6	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	28
TP_f5	Fan5	461245.9	5518237.8	790.7	0	101	0.0	A	71.6	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	28
TP_f6	Fan6	461236.4	5518237.5	790.7	0	101	0.0	A	71.5	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	29
TP_f7	Fan7	461225.6	5518237.8	790.8	0	101	0.0	A	71.5	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	29
IS7	Sungrow Inverter Station	460867.0	5518315.0	791.1	0	98	0.0	A	71.1	0.0	-1.5	0.0	4.3	0.0	0.0	0.0	0.0	0.0	24
IS6	Sungrow Inverter Station	460822.3	5518460.6	792.0	0	98	0.0	A	72.2	0.0	-1.5	0.0	4.6	0.0	0.0	0.0	0.0	0.0	22
IS5	Sungrow Inverter Station	460920.7	5518513.6	793.9	0	98	0.0	A	72.7	0.0	-1.5	0.0	4.8	0.0	0.0	0.0	0.0	0.0	22
IS3	Sungrow Inverter Station	460767.1	5518812.4	795.7	0	98	0.0	A	74.5	0.0	-1.5	0.0	5.3	0.0	0.0	0.0	0.0	0.0	19
IS2	Sungrow Inverter Station	460622.3	5518813.8	792.8	0	98	0.0	A	74.5	0.0	-1.5	0.0	5.3	0.0	0.0	0.0	0.0	0.0	19
IS4	Sungrow Inverter Station	460950.8	5518809.9	796.6	0	98	0.0	A	74.6	0.0	-1.5	0.0	5.4	0.0	0.0	0.0	0.0	0.0	19
IS1	Sungrow Inverter Station	460465.5	5518815.1	790.9	0	98	0.0	A	74.6	0.0	-1.5	0.0	5.4	0.0	0.0	0.0	0.0	0.0	19
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	71.1	0.0	-2.1	0.0	2.7	0.0	0.0	0.0	0.0	0.0	24
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	70.8	0.0	-2.2	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31

Project Contribution (dBA)	30
3rd Party Contribution (dBA)	38
Ambient Contribution (dBA)	45

Receiver: R01
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Night	44

Receiver Name	Receiver ID	X	Y	Z
R01	R01	461082.89 m	518829.82 m	96.00 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	66.9	0.0	-1.2	0.0	1.1	0.0	0.0	0.0	0.0	0.0	20
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	66.4	0.0	-1.1	0.0	1.0	0.0	0.0	0.0	0.0	0.0	21
TP_f1	Fan1	461255.9	5518222.9	790.5	0	101	0.0	A	67.0	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f2	fan2	461246.3	5518222.5	790.5	0	101	0.0	A	67.0	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f3	fan3	461236.2	5518222.7	790.6	0	101	0.0	A	66.9	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f4	Fan4	461256.5	5518237.6	790.7	0	101	0.0	A	66.8	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f5	Fan5	461245.9	5518237.8	790.7	0	101	0.0	A	66.8	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f6	Fan6	461236.4	5518237.5	790.7	0	101	0.0	A	66.7	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
TP_f7	Fan7	461225.6	5518237.8	790.8	0	101	0.0	A	66.7	0.0	-1.5	0.0	2.1	0.0	0.0	0.0	0.0	0.0	34
Trans_IS4	Stand-alone Transformer	460953.5	5518809.7	796.6	0	77	0.0	A	53.3	0.0	-0.8	0.0	0.5	0.0	0.0	0.0	0.0	0.0	24
Trans_IS3	Stand-alone Transformer	460764.6	5518812.1	795.7	0	77	0.0	A	61.1	0.0	-1.4	0.0	1.0	0.0	0.0	0.0	0.0	0.0	17
Trans_IS5	Stand-alone Transformer	460922.1	5518513.7	793.9	0	77	0.0	A	62.0	0.0	-1.5	0.0	1.1	0.0	0.0	0.0	0.0	0.0	16
Trans_IS6	Stand-alone Transformer	460825.3	5518460.8	792.1	0	77	0.0	A	64.1	0.0	-1.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	14
Trans_IS2	Stand-alone Transformer	460624.0	5518814.3	792.8	0	77	0.0	A	64.2	0.0	-1.6	0.0	1.3	0.0	0.0	0.0	0.0	0.0	13
Trans_IS7	Stand-alone Transformer	460865.4	5518315.3	791.0	0	77	0.0	A	65.9	0.0	-1.6	0.0	1.6	0.0	0.0	0.0	0.0	0.0	12
Trans_IS1	Stand-alone Transformer	460467.9	5518815.0	791.0	0	77	0.0	A	66.8	0.0	-1.6	6.4	1.7	0.0	0.0	0.0	0.0	0.0	4
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	66.2	0.0	-1.8	0.0	1.7	0.0	0.0	0.0	0.0	0.0	30
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	66.8	0.0	-1.9	0.0	1.8	0.0	0.0	0.0	0.0	0.0	35

Project Contribution (dBA)	26
3rd Party Contribution (dBA)	43
Ambient Contribution (dBA)	35

Receiver: R02
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Night	42

Receiver Name	Receiver ID	X	Y	Z
R02	R02	460398.20 m	518140.51 m	91.98 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	67.7	0.0	-1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	19
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	67.8	0.0	-1.2	0.0	1.2	0.0	0.0	0.0	0.0	0.0	19
TP_f1	Fan1	461255.9	5518222.9	790.5	0	101	0.0	A	69.7	0.0	-1.7	0.0	2.7	0.0	0.0	0.0	0.0	0.0	31
TP_f2	fan2	461246.3	5518222.5	790.5	0	101	0.0	A	69.6	0.0	-1.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31
TP_f3	fan3	461236.2	5518222.7	790.6	0	101	0.0	A	69.5	0.0	-1.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31
TP_f4	Fan4	461256.5	5518237.6	790.7	0	101	0.0	A	69.7	0.0	-1.7	0.0	2.7	0.0	0.0	0.0	0.0	0.0	31
TP_f5	Fan5	461245.9	5518237.8	790.7	0	101	0.0	A	69.6	0.0	-1.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31
TP_f6	Fan6	461236.4	5518237.5	790.7	0	101	0.0	A	69.5	0.0	-1.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31
TP_f7	Fan7	461225.6	5518237.8	790.8	0	101	0.0	A	69.4	0.0	-1.7	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31
Trans_IS7	Stand-alone Transformer	460865.4	5518315.3	791.0	0	77	0.0	A	65.0	0.0	-1.6	0.0	1.4	0.0	0.0	0.0	0.0	0.0	13
Trans_IS6	Stand-alone Transformer	460825.3	5518460.8	792.1	0	77	0.0	A	65.5	0.0	-1.6	0.0	1.5	0.0	0.0	0.0	0.0	0.0	12
Trans_IS5	Stand-alone Transformer	460922.1	5518513.7	793.9	0	77	0.0	A	67.2	0.0	-1.7	0.0	1.8	0.0	0.0	0.0	0.0	0.0	10
Trans_IS1	Stand-alone Transformer	460467.9	5518815.0	791.0	0	77	0.0	A	67.6	0.0	-1.7	0.0	1.8	0.0	0.0	0.0	0.0	0.0	10
Trans_IS2	Stand-alone Transformer	460624.0	5518814.3	792.8	0	77	0.0	A	68.0	0.0	-1.7	0.0	1.9	0.0	0.0	0.0	0.0	0.0	9
Trans_IS3	Stand-alone Transformer	460764.6	5518812.1	795.7	0	77	0.0	A	68.7	0.0	-1.7	0.0	2.0	0.0	0.0	0.0	0.0	0.0	8
Trans_IS4	Stand-alone Transformer	460953.5	5518809.7	796.6	0	77	0.0	A	69.8	0.0	-1.8	0.0	2.3	0.0	0.0	0.0	0.0	0.0	7
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	67.9	0.0	-2.0	0.0	2.0	0.0	0.0	0.0	0.0	0.0	28
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	67.8	0.0	-2.0	0.0	1.9	0.0	0.0	0.0	0.0	0.0	34

Project Contribution (dBA)	19
3rd Party Contribution (dBA)	41
Ambient Contribution (dBA)	35

Receiver: R03
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Night	36

Receiver Name	Receiver ID	X	Y	Z
R03	R03	461209.33 m	519944.53 m	93.90 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	75.8	0.0	-1.5	0.0	2.5	0.0	0.0	0.0	0.0	0.0	10
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	75.6	0.0	-1.5	0.0	2.5	0.0	0.0	0.0	0.0	0.0	10
TP_f1	Fan1	461255.9	5518222.9	790.5	0	101	0.0	A	75.7	0.0	-1.6	6.4	4.3	0.0	0.0	0.0	0.0	0.0	17
TP_f2	fan2	461246.3	5518222.5	790.5	0	101	0.0	A	75.7	0.0	-1.6	6.4	4.3	0.0	0.0	0.0	0.0	0.0	17
TP_f3	fan3	461236.2	5518222.7	790.6	0	101	0.0	A	75.7	0.0	-1.6	6.4	4.3	0.0	0.0	0.0	0.0	0.0	17
TP_f4	Fan4	461256.5	5518237.6	790.7	0	101	0.0	A	75.6	0.0	-1.6	6.4	4.2	0.0	0.0	0.0	0.0	0.0	17
TP_f5	Fan5	461245.9	5518237.8	790.7	0	101	0.0	A	75.6	0.0	-1.6	6.4	4.2	0.0	0.0	0.0	0.0	0.0	17
TP_f6	Fan6	461236.4	5518237.5	790.7	0	101	0.0	A	75.6	0.0	-1.6	6.4	4.2	0.0	0.0	0.0	0.0	0.0	17
TP_f7	Fan7	461225.6	5518237.8	790.8	0	101	0.0	A	75.6	0.0	-1.6	6.4	4.2	0.0	0.0	0.0	0.0	0.0	17
Trans_IS4	Stand-alone Transformer	460953.5	5518809.7	796.6	0	77	0.0	A	72.3	0.0	-1.8	0.0	2.8	0.0	0.0	0.0	0.0	0.0	4
Trans_IS3	Stand-alone Transformer	460764.6	5518812.1	795.7	0	77	0.0	A	72.7	0.0	-1.8	0.0	2.9	0.0	0.0	0.0	0.0	0.0	4
Trans_IS2	Stand-alone Transformer	460624.0	5518814.3	792.8	0	77	0.0	A	73.1	0.0	-1.8	0.0	3.1	0.0	0.0	0.0	0.0	0.0	3
Trans_IS5	Stand-alone Transformer	460922.1	5518513.7	793.9	0	77	0.0	A	74.3	0.0	-1.8	0.0	3.4	0.0	0.0	0.0	0.0	0.0	1
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	75.6	0.0	-2.1	6.9	4.0	0.0	0.0	0.0	0.0	0.0	12
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	75.8	0.0	-2.2	7.0	4.1	0.0	0.0	0.0	0.0	0.0	17

Project Contribution (dBA)	10
3rd Party Contribution (dBA)	26
Ambient Contribution (dBA)	35

Receiver: R04
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Night	35

Receiver Name	Receiver ID	X	Y	Z
R04	R04	459844.49 m	519832.06 m	96.67 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
Trans_IS1	Stand-alone Transformer	460467.9	5518815.0	791.0	0	77	0.0	A	72.5	0.0	-1.8	0.0	2.9	0.0	0.0	0.0	0.0	0.0	4
Trans_IS2	Stand-alone Transformer	460624.0	5518814.3	792.8	0	77	0.0	A	73.2	0.0	-1.8	0.0	3.1	0.0	0.0	0.0	0.0	0.0	3
Trans_IS3	Stand-alone Transformer	460764.6	5518812.1	795.7	0	77	0.0	A	73.8	0.0	-1.8	0.0	3.2	0.0	0.0	0.0	0.0	0.0	2
Trans_IS4	Stand-alone Transformer	460953.5	5518809.7	796.6	0	77	0.0	A	74.6	0.0	-1.8	0.0	3.5	0.0	0.0	0.0	0.0	0.0	1

Project Contribution (dBA)	10
3rd Party Contribution (dBA)	-73
Ambient Contribution (dBA)	35

Receiver: R05
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Night	35

Receiver Name	Receiver ID	X	Y	Z
R05	R05	459399.51 m	519768.87 m	300.08 m

Source ID	Source Name	X	Y	Z	Ref.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
Trans_IS1	Stand-alone Transformer	460467.9	5518815.0	791.0	0	77	0.0	A	74.1	0.0	-1.8	0.0	3.4	0.0	0.0	0.0	0.0	0.0	2
Trans_IS2	Stand-alone Transformer	460624.0	5518814.3	792.8	0	77	0.0	A	74.8	0.0	-1.8	0.0	3.6	0.0	0.0	0.0	0.0	0.0	1

Project Contribution (dBA)	8
3rd Party Contribution (dBA)	-73
Ambient Contribution (dBA)	35

Receiver: R06
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Night	35

Receiver Name	Receiver ID	X	Y	Z
R06	R06	459439.84 m	519340.02 m	95.80 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	77.0	0.0	-1.5	0.0	2.8	0.0	0.0	0.0	0.0	0.0	9
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	76.9	0.0	-1.5	0.0	2.8	0.0	0.0	0.0	0.0	0.0	9
Trans_IS1	Stand-alone Transformer	460467.9	5518815.0	791.0	0	77	0.0	A	72.2	0.0	-1.8	0.0	2.8	0.0	0.0	0.0	0.0	0.0	4
Trans_IS2	Stand-alone Transformer	460624.0	5518814.3	792.8	0	77	0.0	A	73.2	0.0	-1.8	0.0	3.1	0.0	0.0	0.0	0.0	0.0	3
Trans_IS3	Stand-alone Transformer	460764.6	5518812.1	795.7	0	77	0.0	A	74.1	0.0	-1.8	0.0	3.3	0.0	0.0	0.0	0.0	0.0	2
Trans_IS4	Stand-alone Transformer	460953.5	5518809.7	796.6	0	77	0.0	A	75.1	0.0	-1.7	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0
Trans_IS6	Stand-alone Transformer	460825.3	5518460.8	792.1	0	77	0.0	A	75.3	0.0	-1.7	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	76.9	0.0	-2.1	0.0	4.5	0.0	0.0	0.0	0.0	0.0	17
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	77.0	0.0	-2.2	0.0	4.6	0.0	0.0	0.0	0.0	0.0	23

Project Contribution (dBA)	10
3rd Party Contribution (dBA)	24
Ambient Contribution (dBA)	35

Receiver: R07
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Night	37

Receiver Name	Receiver ID	X	Y	Z
R07	R07	459457.21 m	518144.90 m	93.50 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	75.2	0.0	-1.5	0.0	2.4	0.0	0.0	0.0	0.0	0.0	11
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	75.2	0.0	-1.5	0.0	2.4	0.0	0.0	0.0	0.0	0.0	11
TP_f1	Fan1	461255.9	5518222.9	790.5	0	101	0.0	A	76.1	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f2	fan2	461246.3	5518222.5	790.5	0	101	0.0	A	76.1	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f3	fan3	461236.2	5518222.7	790.6	0	101	0.0	A	76.0	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f4	Fan4	461256.5	5518237.6	790.7	0	101	0.0	A	76.1	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f5	Fan5	461245.9	5518237.8	790.7	0	101	0.0	A	76.1	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f6	Fan6	461236.4	5518237.5	790.7	0	101	0.0	A	76.0	0.0	-1.6	0.0	4.4	0.0	0.0	0.0	0.0	0.0	23
TP_f7	Fan7	461225.6	5518237.8	790.8	0	101	0.0	A	76.0	0.0	-1.6	0.0	4.3	0.0	0.0	0.0	0.0	0.0	23
Trans_IS1	Stand-alone Transformer	460467.9	5518815.0	791.0	0	77	0.0	A	72.7	0.0	-1.8	0.0	2.9	0.0	0.0	0.0	0.0	0.0	4
Trans_IS2	Stand-alone Transformer	460624.0	5518814.3	792.8	0	77	0.0	A	73.6	0.0	-1.8	0.0	3.2	0.0	0.0	0.0	0.0	0.0	2
Trans_IS6	Stand-alone Transformer	460825.3	5518460.8	792.1	0	77	0.0	A	73.9	0.0	-1.8	0.0	3.3	0.0	0.0	0.0	0.0	0.0	2
Trans_IS7	Stand-alone Transformer	460865.4	5518315.3	791.0	0	77	0.0	A	74.0	0.0	-1.8	0.0	3.3	0.0	0.0	0.0	0.0	0.0	2
Trans_IS3	Stand-alone Transformer	460764.6	5518812.1	795.7	0	77	0.0	A	74.3	0.0	-1.8	0.0	3.4	0.0	0.0	0.0	0.0	0.0	1
Trans_IS5	Stand-alone Transformer	460922.1	5518513.7	793.9	0	77	0.0	A	74.6	0.0	-1.8	0.0	3.5	0.0	0.0	0.0	0.0	0.0	1
Trans_IS4	Stand-alone Transformer	460953.5	5518809.7	796.6	0	77	0.0	A	75.3	0.0	-1.7	0.0	3.7	0.0	0.0	0.0	0.0	0.0	0
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	75.3	0.0	-2.1	0.0	3.9	0.0	0.0	0.0	0.0	0.0	19
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	75.3	0.0	-2.2	0.0	3.9	0.0	0.0	0.0	0.0	0.0	25

Project Contribution (dBA)	10
3rd Party Contribution (dBA)	32
Ambient Contribution (dBA)	35

Receiver: R08
 Project: Burdett Solar Project - NIA
 Project Number: 18079.02

Time Period	Total (dBA)
Night	40

Receiver Name	Receiver ID	X	Y	Z
R08	R08	460701.43 m	517317.53 m	93.11 m

Source ID	Source Name	X	Y	Z	Refl.	Lw	L/A	Freq	Adiv	K0	Agr	Abar	Aatm	Afol	Ahous	Cmet	Dc	RL	Lr
TP_cap1	Capacitor1	461078.9	5518208.3	797.1	0	87	0.0	A	70.7	0.0	-1.4	0.0	1.6	0.0	0.0	0.0	0.0	0.0	16
TP_cap2	capacitor2	461081.6	5518241.8	797.8	0	87	0.0	A	71.0	0.0	-1.4	0.0	1.6	0.0	0.0	0.0	0.0	0.0	16
TP_f1	Fan1	461255.9	5518222.9	790.5	0	101	0.0	A	71.5	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	29
TP_f2	fan2	461246.3	5518222.5	790.5	0	101	0.0	A	71.5	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	29
TP_f3	fan3	461236.2	5518222.7	790.6	0	101	0.0	A	71.4	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	29
TP_f4	Fan4	461256.5	5518237.6	790.7	0	101	0.0	A	71.6	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	28
TP_f5	Fan5	461245.9	5518237.8	790.7	0	101	0.0	A	71.6	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	28
TP_f6	Fan6	461236.4	5518237.5	790.7	0	101	0.0	A	71.5	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	29
TP_f7	Fan7	461225.6	5518237.8	790.8	0	101	0.0	A	71.5	0.0	-1.7	0.0	3.1	0.0	0.0	0.0	0.0	0.0	29
Trans_IS7	Stand-alone Transformer	460865.4	5518315.3	791.0	0	77	0.0	A	71.1	0.0	-1.8	0.0	2.5	0.0	0.0	0.0	0.0	0.0	6
Trans_IS6	Stand-alone Transformer	460825.3	5518460.8	792.1	0	77	0.0	A	72.2	0.0	-1.8	0.0	2.8	0.0	0.0	0.0	0.0	0.0	4
Trans_IS5	Stand-alone Transformer	460922.1	5518513.7	793.9	0	77	0.0	A	72.7	0.0	-1.8	0.0	2.9	0.0	0.0	0.0	0.0	0.0	4
Trans_IS3	Stand-alone Transformer	460764.6	5518812.1	795.7	0	77	0.0	A	74.5	0.0	-1.8	0.0	3.5	0.0	0.0	0.0	0.0	0.0	1
Trans_IS2	Stand-alone Transformer	460624.0	5518814.3	792.8	0	77	0.0	A	74.5	0.0	-1.8	0.0	3.5	0.0	0.0	0.0	0.0	0.0	1
Trans_IS4	Stand-alone Transformer	460953.5	5518809.7	796.6	0	77	0.0	A	74.6	0.0	-1.8	0.0	3.5	0.0	0.0	0.0	0.0	0.0	1
Trans_IS1	Stand-alone Transformer	460467.9	5518815.0	791.0	0	77	0.0	A	74.6	0.0	-1.8	0.0	3.5	0.0	0.0	0.0	0.0	0.0	1
TP_tf1	Transformer1	461088.4	5518253.2	791.5	0	96	0.0	A	71.1	0.0	-2.1	0.0	2.7	0.0	0.0	0.0	0.0	0.0	24
TP_tf2	Transformer2	461088.0	5518216.6	791.4	0	102	0.0	A	70.8	0.0	-2.2	0.0	2.6	0.0	0.0	0.0	0.0	0.0	31

Project Contribution (dBA)	11
3rd Party Contribution (dBA)	38
Ambient Contribution (dBA)	35

APPENDIX D – Changes in Predicted Sound Level

Cumulative Noise Impact Comparison

Project: Burdett Solar Project - Noise Impact Assessment RP3

Report ID: 18079.02

Page 1 of 1

Created on: 2020-05-07



Comparison of Cumulative Noise Impact Levels - Current Layout and Previous NIA Layout (NIA Dated June 04, 2018)								
Noise Receptor ID	Time Period	New Cumulative Sound Level [dBA]	New Project-Only Sound Level [dBA]	Permissible Sound Level (PSL) [dBA]	Previous Cumulative Sound Level [dBA]	Previous Project-Only Sound Level [dBA]	Increase above PSL [dBA]	Increase above Previous Cumulative Sound Level [dBA]
R01	Day	49.2	44.9	50.0	47.6	37.1	-0.8	1.6
	Night	44.0	25.9	44.0	44.3	34.2	0.0	-0.4
R02	Day	46.9	37.1	50.0	46.5	30.0	-3.1	0.4
	Night	41.9	18.7	42.0	42.1	29.5	-0.1	-0.2
R03	Day	45.1	27.7	50.0	45.1	19.6	-4.9	0.1
	Night	35.5	9.5	40.0	35.6	18.4	-4.5	-0.1
R04	Day	45.1	28.1	50.0	45.0	20.4	-4.9	0.1
	Night	35.0	9.9	40.0	35.1	19.9	-5.0	-0.1
R05	Day	45.0	25.6	50.0	45.0	18.4	-5.0	0.0
	Night	35.0	7.5	40.0	35.1	17.9	-5.0	-0.1
R06	Day	45.1	28.1	50.0	45.0	20.5	-4.9	0.1
	Night	35.3	9.9	40.0	35.4	20.0	-4.7	-0.1
R07	Day	45.3	28.4	50.0	45.2	21.1	-4.7	0.1
	Night	36.8	10.3	40.0	36.9	20.6	-3.2	-0.1
R08	Day	45.9	29.5	50.0	45.8	21.8	-4.1	0.1
	Night	39.8	11.3	40.0	39.9	21.1	-0.2	-0.1

Kohl Clark

From: Ard Oldenzijl <ardold1977@gmail.com>
Sent: April 24, 2020 5:28 PM
To: Jared Sproule
Subject: Re: Burdett Solar Inverter Change
Attachments: image003.png

Hi Jared.

I agree with the proposed changes to the inverters.

Thanks for keeping us in the loop.

Ard Oldenzijl.

On Fri., Apr. 24, 2020, 3:15 p.m. Jared Sproule, <jared@bluearth.ca> wrote:

Good Afternoon Arend,

As discussed on the phone this afternoon.

BluEarth has changed the type of inverter to be used at the Burdett Solar Project. The change was made because technology has improved and the new inverters are better suited for the project in terms of overall cost and energy production. The new inverters produce slightly more noise than the inverters that were originally considered. However, the noise levels are still predicted to be less than the noise limits set by the Alberta Utilities Commission.

The previous design had 10 inverter-transformers which were predicted to have a noise level of 44.3 decibels (dBA) at your home at night and 47.6 dBA during the day.

The new design proposes to have 7 inverter-transformers which are predicted to have noise level of 44.0 decibels (dBA) at your home at night and 49.2 dBA during the day.

This results in a slight decrease of predicted night time noise by -0.4 dBA and a slight increase in predicted day time noise by +1.6 dBA.

To achieve the night time noise reduction, the inverters will be shut off between the hours of 10pm and 7am each night.

Please let us know if you have any concerns with these changes.

Kind Regards, Jared

JARED SPROULE | Lead, Business Development & Community Relations

DIRECT: 587.324.2497

MOBILE: 403.901.7733

EMAIL: jared@bluearth.ca

BLUEARTH RENEWABLES SUITE 400, 214 – 11TH AVENUE S.W. CALGARY, ALBERTA T2R 0K1 BLUEARTH.CA



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APPENDIX E – Acoustical Practitioner Information

kohl clark

BEng

profile

Kohl Clark is an Engineer in Training (EIT) in the Province of Ontario and holds a Bachelor's degree in Mechanical Engineering from McMaster University. He has 3.5 years of experience in the field of Acoustics and has been involved in different aspects of environmental noise and vibration.

education + career milestones

B.Eng., Mechanical Engineering, McMaster University, June 2016
joined Aercoustics full time in 2016 as a noise and vibration consultant.
Member of Professional Engineers of Ontario.

selected projects

Noise modelling and assessment

Loyalist Solar Farm	Stone Mills, Lenox, & Addington County, ON
Oshawa Asphalt Plant	Oshawa, ON
Coleraine Drive Asphalt Plant	Bolton, ON
Derry Heights Commercial Development	Milton, ON
Rogers 333 Bloor Generator Upgrade	Toronto, ON
Loblaws Supermarkets	Various locations within Canada

Wind Farm noise measurements and compliance verification

Headwaters Wind Farm	Randolph County, IN
Snowy Ridge Wind Farm	Kawartha Lakes, ON
Port Ryerse Wind Farm	Port Dover, ON
K2 Wind Project Wind Project	Kincardine, ON
Belle River Wind Farm	Lakeshore, ON
Grey Highlands Wind Projects	Grey County, ON

payam ashtiani

BASc PEng ASA

profile

Payam Ashtiani is a Professional engineer in good standing, with a Bachelor's degree in Mechanical Engineering from the University of Toronto. He has 8 years of experience in the field of Acoustics with a specific focus on noise from wind turbines. Apart from completing numerous noise assessments for wind projects, and extensive wind turbine noise measurement campaigns, he has authored multiple research papers on the topic and presented at international technical conferences. His experience has included providing expert advice to regulatory bodies such as the Ontario Ministry of Environment, and the Vermont Public Service Department on the topic of wind turbine noise, and has appeared as expert witness in cases such as the Kent Breeze Environmental Review Tribunal, and the Alberta Utilities Commission Hearing for the Bull Creek Wind Farm. Payam also oversees the technical group responsible for carrying out IEC 61400-11 measurements – the only such group accredited to ISO 17025 in Canada.

education + career milestones

B.A.Sc., Mechanical Engineering, University of Toronto, 2005
joined aeroustics in 2006 as a noise and vibration consultant.
Member of

Canadian Acoustical Association,
Professional Engineers of Ontario,
Acoustical Society of America

publications

Detection of Amplitude Modulation in Southern Ontario Wind Farms, Halstead, D., Suban-Loewen, S, **Ashtiani P**, 6th International Conference of Wind Turbine Noise, Glasgow, Scotland, 20-23 April 2015

[Spectral discrete probability density function of measured wind turbine noise in the far field](#), **Ashtiani P** and Denison A (2015). Front. Public Health 3:52. doi: 10.3389/fpubh.2015.00052

[Health-based audible noise guidelines account for infrasound and low-frequency noise produced by wind turbines](#). Berger RG, **Ashtiani P**, Olson CA, Whitfield Aslund M, McCallum LC, Leventhall G and Knopper LD (2015) Front. Public Health 3:31. doi: 10.3389/fpubh.2015.00031

Generating a better picture of noise immissions in post construction monitoring using statistical analysis, **Ashtiani, P.**, 5th International Conference of Wind Turbine Noise, Denver, Colorado, 28 - 30 August 2013

[A new software tool to facilitate NURB based geometries in acoustic design](#), O'Keefe J., Ashtiani, P., Grant D., International Symposium on Room Acoustics, Toronto, Canada, 9 June 2013

Analysis of noise immission levels measured from wind turbines, Ashtiani, P., Titus, S, Wind Turbine Noise 2011, Rome, Italy, 11-14 April 2011

Improved noise audit technique for wind farms, Titus S., Ashtiani P., INTER-NOISE 2010, Lisbon, Portugal, 13-16 June 2010

[Concerns with using simplified wind profiles in determining noise impacts of wind turbines](#), Gambino, V., Ashtiani, P., Preager, T., Ramakrishnan, R., INTER-NOISE 2009, Ottawa, Canada, August 23-26, 2009

[Acoustic Performance Considerations For A "Once Through Steam Generator"](#), Gambino, V., Ashtiani, P., 2006.

selected projects

Noise modelling and assessment

Wolfe Island EcoPower Centre	Wolfe Island, ON
McLeans Mountain Wind Farm	Manitoulin Island, ON
Grand Bend Wind Farm	Grand Bend, ON
Bull Creek Wind Farm	Provost, AB
Ingredion (formerly CASCO) facility NIA	Cardinal, ON
Kraft Foods NIA and noise abatement plans	Various locations within Ontario
Q9 Networks data centres	Various locations within ON, AB, BC
Oldcastle building products (Permacon Group)	Various locations within Ontario

Wind Turbine noise measurements and compliance verification

Kingsbridge wind plant (K1)	Goderich, ON
Melancthon EcoPower Centre	Melancthon, ON
Wolfe Island EcoPower Centre	Wolfe Island, ON
Gosfield Wind Project	Essex County, ON
Comber Wind Project	Essex County, ON
South Kent Wind Project	Chatham-Kent, ON
Port Dover Nanticoke Wind Project	Nanticoke, ON
South Dundas Wind Project	South Dundas, ON
HAF Wind Energy Project	West Lincoln, ON
Wainfleet Wind Energy Project	Wainfleet, ON
Vestas R&D Acoustics Testing	Undisclosed locations
GE R&D Acoustic Testing	Undisclosed locations
Hybridyne wind Systems	Various locations with Ontario

Peer Review, expert witness, and expert advice

Various Wind Turbine Noise submissions to Public Service Board	Montpellier, VT
Ontario Ministry of Environment wind turbine noise measurement protocol	Ontario
Dufferin Wind Power project noise study peer review	Dufferin County, ON
Kent Breeze ERT (Erickson vs. Director)	Chatham-Kent, ON