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North Byron Parklands
54 Jones Road
Wooyung
NSW 2483

Attention: Mat Morris

7 September 2020
Ref: 207402.0140_RepLet01.2.odt

Dear Mat

Re: ACOUSTIC ASSESSMENT OF CAMP GROUND EXTENSION – PARKLANDS EVENTS

The existing approval for North Byron Parklands provides for a maximum of 25,000 – 30,000 campers on site for specific events. The maximum number of campers allowed at North Byron Parklands is not proposed to increase, however a new camping area to the north is proposed to allow the festival precinct to increase in size where required to accommodate additional infrastructure, attractions and/or activities.

This letter presents the results of an acoustic assessment of the proposed camp ground extension. The assessment has involved completing computational modelling to compare the noise emissions for the existing and proposed camping footprint areas. The key noise sources considered in the assessment are as follows:

- Campers/patrons;
- Camping vehicles;
- Site vehicles (skids, tractors, carts);
- Fixed Plant (Generators, diesel light towers).

Noise modelling results have been compared with the appropriate noise criteria for camping activities, for both event operating hours (7am-2am) and out-of-hours noise criteria (2am – 7am). This document is intended as an addendum to the North Byron Parklands Acoustic Assessment for Permanent Approval[1].

This scope addresses the specific requirements of the SEARs and the comments from Tweed Shire Council and Byron Shire Council relating to potential noise and vibration impacts.

1 North Byron Parklands Acoustic Assessment for Permanent Approval, Billinudgel Property Pty Ltd, prepared by Air Noise Environment, 20 November 2017 (4881Rep02.pdf).

An acoustic glossary is provided in Appendix A to assist the reader.

CAMPING AREA

The existing approved camping area, and proposed extended footprint are shown in Figure 1.

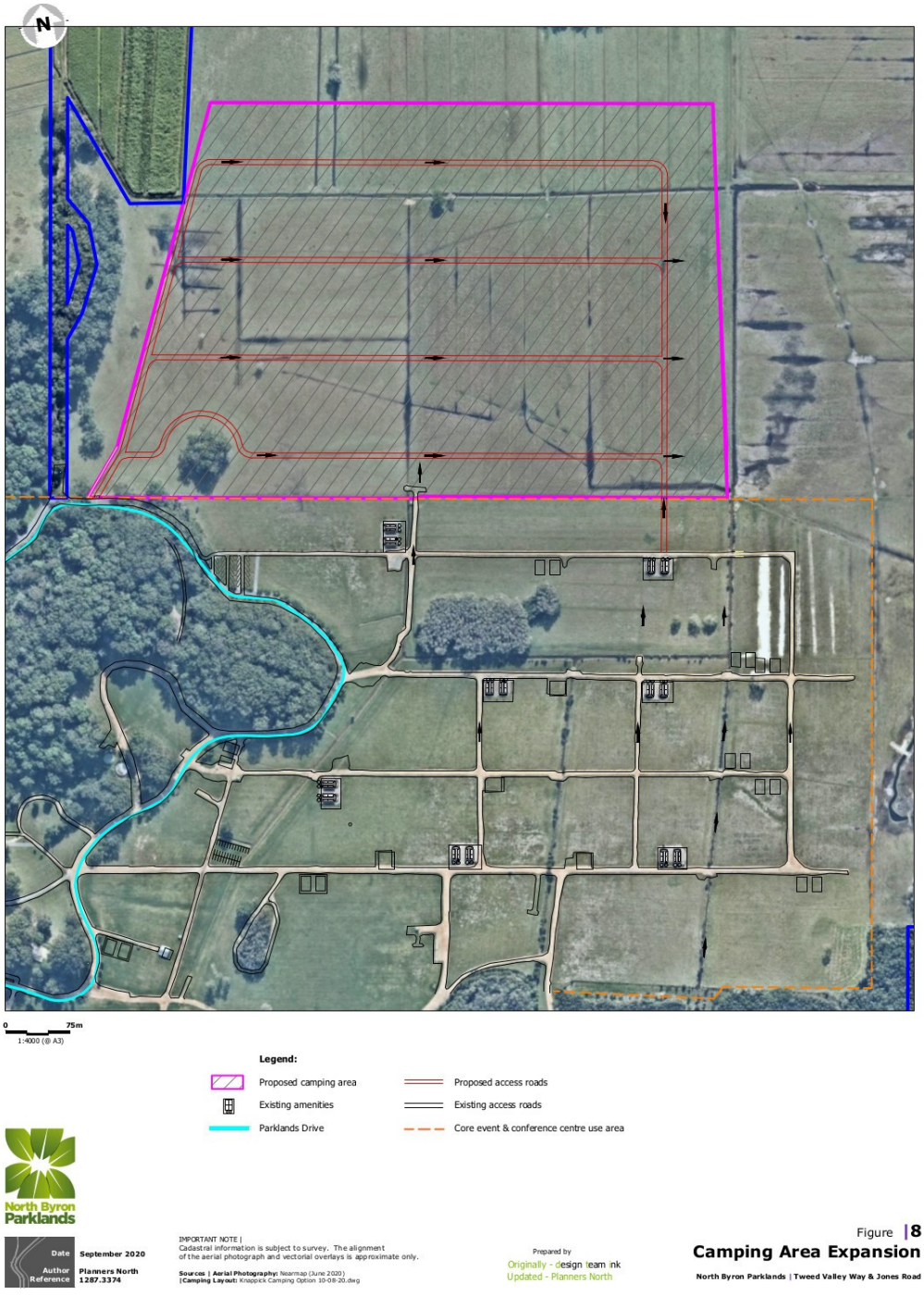

Figure 1: Existing Camping Area, and Proposed Extension Area

ASSESSMENT CRITERIA

The current approval defines specific acoustic criteria that apply when events are held at Parklands. The approval does not provide acoustic criteria for other periods when events are not being held. The acoustic criteria defined in the NSW Noise Policy for Industry (NPI) are appropriate for periods outside event hours (2am - 11am).

For continuous noise sources, the NPI defines a noise criterion of existing background plus 5 dB(A). Previous ambient monitoring data has been reviewed to confirm the appropriate background noise level to adopt for the determination of the NPI criteria. Historic monitoring data confirms that Assessment (ABL1[2]) or Rating Background Levels (RBL) as low as 30 dB(A) occur from time to time. On this basis, the appropriate noise limit for continuous noise sources is 35 dB(A) based on the requirements of the NPI.

In summary, during events the following criteria apply:

- 11am – midnight:
  - Zone 1: $L_{Aeq,10\text{-}minutes}$ of 60 dB(A), $L_{eq(10\text{-}minutes)}$ in the 63Hz 1/1 octave band of 70 dB
  - Zone 2: $L_{Aeq,10\text{-}minutes}$ of 55 dB(A), $L_{eq(10\text{-}minutes)}$ in the 63Hz 1/1 octave band of 65 dB
- midnight-2am:
  - Zone1: $L_{Aeq,10\text{-}minutes}$ of 45 dB(A), $L_{eq(10\text{-}minutes)}$ in the 63Hz 1/1 octave band of 60 dB
  - Zone2: $L_{Aeq,10\text{-}minutes}$ of 45 dB(A), $L_{eq(10\text{-}minutes)}$ in the 63Hz 1/1 octave band of 55 dB

For out-of-hours periods during events, the following criteria have been adopted, based on the NPI for the nearest sensitive receivers (noting that this period is not specifically defined in the consent conditions):

- continuous noise L_{Aeq} of 35 dB(A)
- sleep disturbance criteria, intermittent noise, L_{Amax} of 45 dB(A).

MODELLED RECEIVERS

Table 1 and Figure 2 identify the nearest sensitive receptors in the area surrounding Parklands. All existing sensitive residential receivers within Zone 1 have been identified, and a representative selection of residential receptors most likely to be affected by noise from large events at Parklands for the surrounding Zone 2. These receptor positions are identified in Table 1.

For the receivers identified in Table 1 as having agreements, Parklands have advised that an agreement has been entered into with the owner of each property relating to management of impacts from the event. On the basis of these agreements, the property owner has formally agreed not to lodge complaints relating to future events at Parklands.

2 Determination of the assessment background level is by the tenth percentile method described in Appendix B of the NSW Industrial Noise Policy

Table 1: Noise Sensitive Receptors Considered in Acoustic Modelling

Receptor Number	Address / Description	Zone	Agreement	Coordinates	
				X	Y
1	Billinudgel Road, Billinudgel	1		56550466	6848271
2	Yelgun Road, Yelgun	1		56549841	6848737
3	Yelgun Road, Yelgun	2		56549272	6849152
4	Yelgun Road, Yelgun	1		56549890	6849356
5	Jones Road, Wooyung	1	Yes	56550475	6849851
6	Tweed Valley Way / Pacific Highway, Yelgun	2		56549278	6851074
7	Tweed Valley Way, Wooyung	1		56549782	6851201
8	Wooyung Road, Crabbes Creek	1		56549911	6851539
9	Wooyung Road, Wooyung	1		56550382	6851787
10	Wooyung Road, Wooyung	1	Yes	56550733	6851810
11	Wooyung Road, Wooyung	1	Yes	56551501	6851867
12	Jones Road, Wooyung	1		56552298	6849958
13	Jones Road, Wooyung	1	Yes	56552410	6850053
14	Mia Court, Ocean Shores	2		56553475	6848405
15	Flinders Way, Ocean Shores	2		56552578	6848002
16	Balemo Drive, Ocean Shores	2		56552197	6846959
17	Pacific Highway, Wooyung	1		56549897	6850497
18	Pacific Highway, Wooyung	1		56550212	6850739
19	Yelgun Road, Yelgun	1		56550103	6848687
20	Middle Pocker Road, Middle Pocket	2		56547389	6848120
21	The Pocket Road, The Pocket	2		56545003	6846851
22	Pimble Valley Road, Crabbes Creek	2		56545133	6851118
23	Bluegum Court, Crabbes Creek	2		56548244	6851563
24	Hulls Road, Crabbes Creek	2		56549443	6852637
25	Wooyung Road, Wooyung	1	Yes	56551275	6851844
26	Wooyung Road, Wooyung	2		56553046	6852236
27	Yelgun Road, Yelgun	2		56549266	6848944
28	Yelgun Road, Yelgun	2		56549179	6849099
29	The Pocket Road, Billinudgel	2		56550265	6847093
30	Hardy Avenue, Ocean Shores	2		56552970	6848562
31	The Tunnel Road, Billinudgel	2		56551603	6846410
32	Tweed Valley Way, Wooyung (Adjacent Venue Entry)	1		56550588	6848845
33	Brunswick Valley Way (Behind Yelgun Rest Stop)	1		56551204	6848092
34	Billinudgel Road, Billinudgel	1		56550380	6848394
35	Billinudgel Road, Billinudgel	1		56550324	6847879
36	Yelgun Road, Yelgun	1		56549445	6848764
37	Yelgun Road, Yelgun	1		56549366	6848979
38	Yelgun Road, Yelgun (Rental Unit fronting Yelgun Road)	1		56549387	6849021
39	Yelgun Road, Yelgun	1		56549516	6849087
40	Pacific Highway, Wooyung (Property before R17 on entry road)	1		56549736	6850583
41	Tweed Valley Way, Wooyung (Further up hill from R7)	1		56549752	6851142
42	Wooyung Road, Wooyung (Corner Wooyung / Pacific Motorway)	1		56549581	6851442
43	Jones Road, Wooyung	1	Yes	56552501	6850216
44	East of Jones Road, Wooyung (proposed development)	1		56552487	6849983
45	Tweed Valley Way, Yelgun	2		56549183	6851062
46	Yelgun Hill Road, Yelgun	2		56549200	6850879
47	Blue Gum Court, Crabbes Creek	2		56548030	6850988
48	Tweed Valley Way, Crabbes Creek	2		56548634	6852318
49	Hulls Road, Crabbes Creek	2		56549701	6852529
50	Hulls Road, Crabbes Creek	2		56549784	6852560
51	Hulls Road, Crabbes Creek	2		56550043	6852556
52	Hulls Road, Crabbes Creek	2		56550302	6852596
53	Hulls Road, Crabbes Creek	2		56550552	6852629
54	Hulls Road, Crabbes Creek	2		56550839	6852674
55	Hulls Road, Crabbes Creek (hill)	2		56551110	6852758
56	Hulls Road, Crabbes Creek (far end)	2		56551348	6852907
57	Wooyung Road, Wooyung	2		56552014	6852451
58	Wooyung Road, Wooyung	2		56552345	6852419
59	Wooyung Road, Wooyung	2		56552431	6852338
60	Wooyung Road, Wooyung	2		56552526	6852340

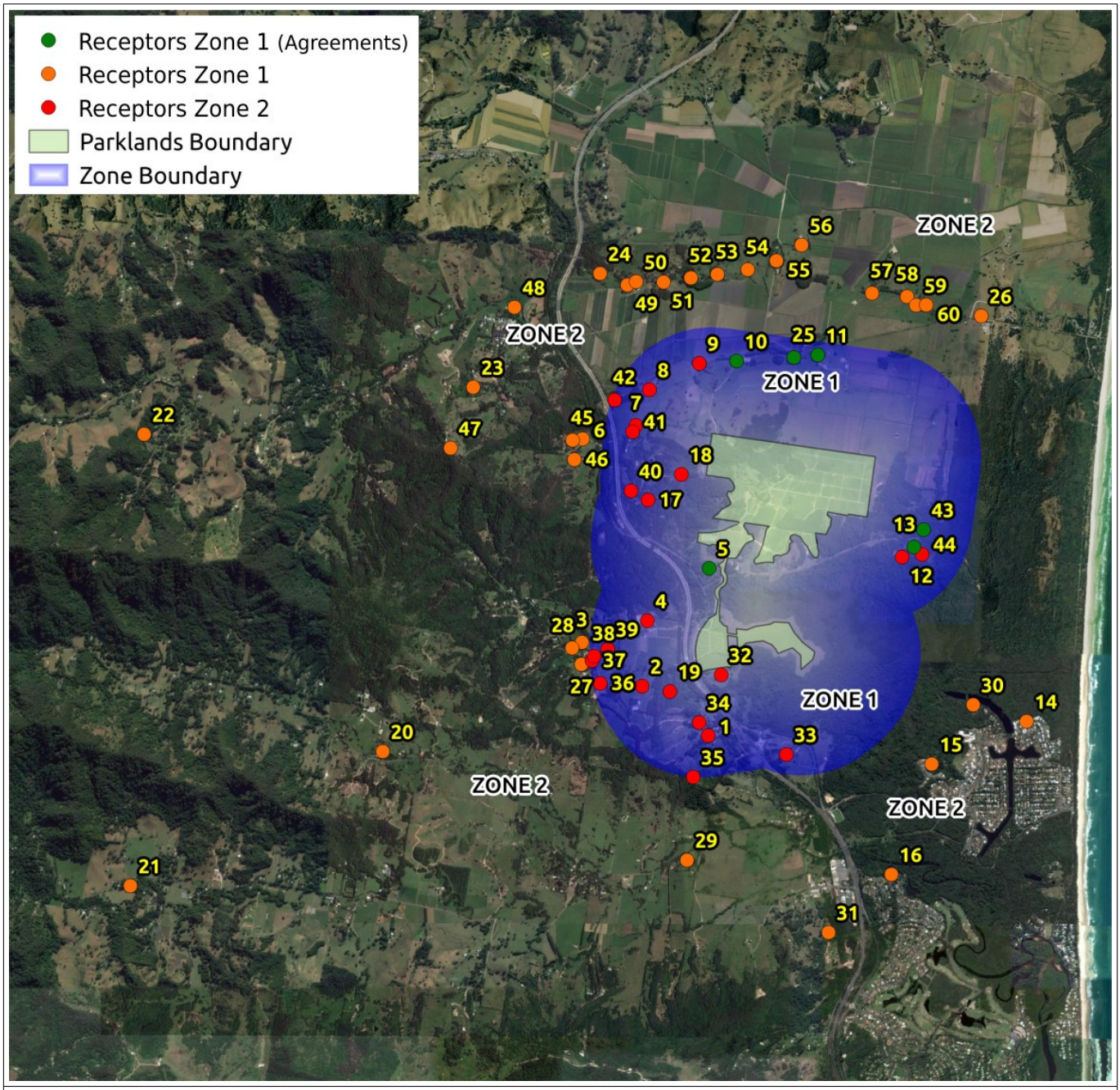

Figure 2: Site location and Noise Sensitive Receptors Considered in Acoustic Modelling

MODELLING METHODOLOGY

For the purposes of predicting impacts from the camping ground area during large events held at Parklands, an environmental noise model of the sources and surrounding region was developed. The model package was developed using the proprietary software Cadna/A (Computer Aided Noise Abatement Model) developed by DataKustik. Cadna/A incorporates the influence of meteorology, terrain, ground type and air absorption in addition to source characteristics to predict noise impacts at receptor locations. This modelling approach provides for the following:

- calculations in accordance with the 'ISO 9613-2:1996 Acoustics – Attenuation of Sound During Propagation Outdoors – Part 2: General Method of Calculation' methodologies;
- prediction of impacts of all activities occurring individually or cumulatively (simultaneously) to each sensitive receiver;
- inclusion of screening effects, ground topography, attenuation and absorption; and
- confirmation of compliance to all sensitive areas.

All predictions have been undertaken in accordance with *ISO Standard 9613 (1996) Acoustics - Attenuation of sound during propagation outdoors,* which assumes source-to-receiver wind conditions (1 to 3 m/s) or a temperature inversion under calm conditions. It is important to recognise that this approach adopts a theoretic worst case meteorological scenario for each receptor. In reality, under more typical meteorology, compliance will be achieved for higher source noise levels than are considered in the modelling.

The following sections describe in detail the model inputs and assumptions.

MODELLED SOURCES

As the general operations of historic events have been demonstrated to achieve a reasonable level of amenity, the modelling has focused on the potential impacts specific to the camping grounds areas, and the relative change from extending the footprint. Noise from vendors, amplified activities, and main event area have been completed historically in various documents, including the application for the permanent approval[3].

During large events at Parklands, there are additional noise sources occurring as part of the event activities. A significant noise sources is that of lighting generators throughout the site, which have the potential to operate after midnight and 2 am time period. Some small scale generators operate power to the commercial vendors and areas of the site, however they are generally smaller scale.

It is noted that in addition to the lighting towers, there are generators located at the large event

3 North Byron Parklands Acoustic Assessment for Permanent Approval, Billinudgel Property Pty Ltd, prepared by Air Noise Environment, 20 November 2017 (4881Rep02.pdf).

stages, however these are all powered down after completion of entertainment. During the event, noise emissions from the stages are typically 10 dB or more higher. Therefore, it is not considered necessary to consider the generators in the noise assessment.

Modelling of the most commonly installed diesel power light towers has been completed for the larger scale camping event (Falls Festival). Table 2 presents an average measured Sound Power Level (SWL) for typical sources operating within the camp grounds at the Parklands festival events, and Figure 3 presents the modelled locations. It is noted that a mix of barrel light towers and flood-light towers are utilised, and the barrel light towers are not typically diesel powered, and operate at a much lower volume. As a conservative assumption, all light towers have been modelled as the louder units.

Table 2: Modelled Noise Sources – Sound Power Level (SWL) dB

Source	1/1/ Octave Frequency Band (Hz)									Total	
	31.5	63	125	250	500	1000	2000	4000	8000	dB(A)	dB(Lin)
Average/Continuous (L_{Aeq})											
Generator	103	114	107	98	94	88	83	78	71	97	116
Light Tower	96	107	100	91	87	81	76	71	64	90	109
10 patrons	67	73	72	70	76	75	72	64	52	79	82
Car accelerating	67	67	79	71	76	76	76	74	68	82	84
Skid steer	89	94	85	85	85	101	86	79	77	101	102
Tractor	78	83	74	74	74	90	75	68	66	90	91
Non-continuous (L_{Amax})											
Maximal Shout	79	79	92	96	99	91	88	85	73	98	102
Car Door	95	81	83	86	87	87	83	81	77	91	97
Car Horn	46	46	49	87	89	91	103	109	94	111	110
Garbage Truck	91	96	87	87	87	103	88	81	79	103	104

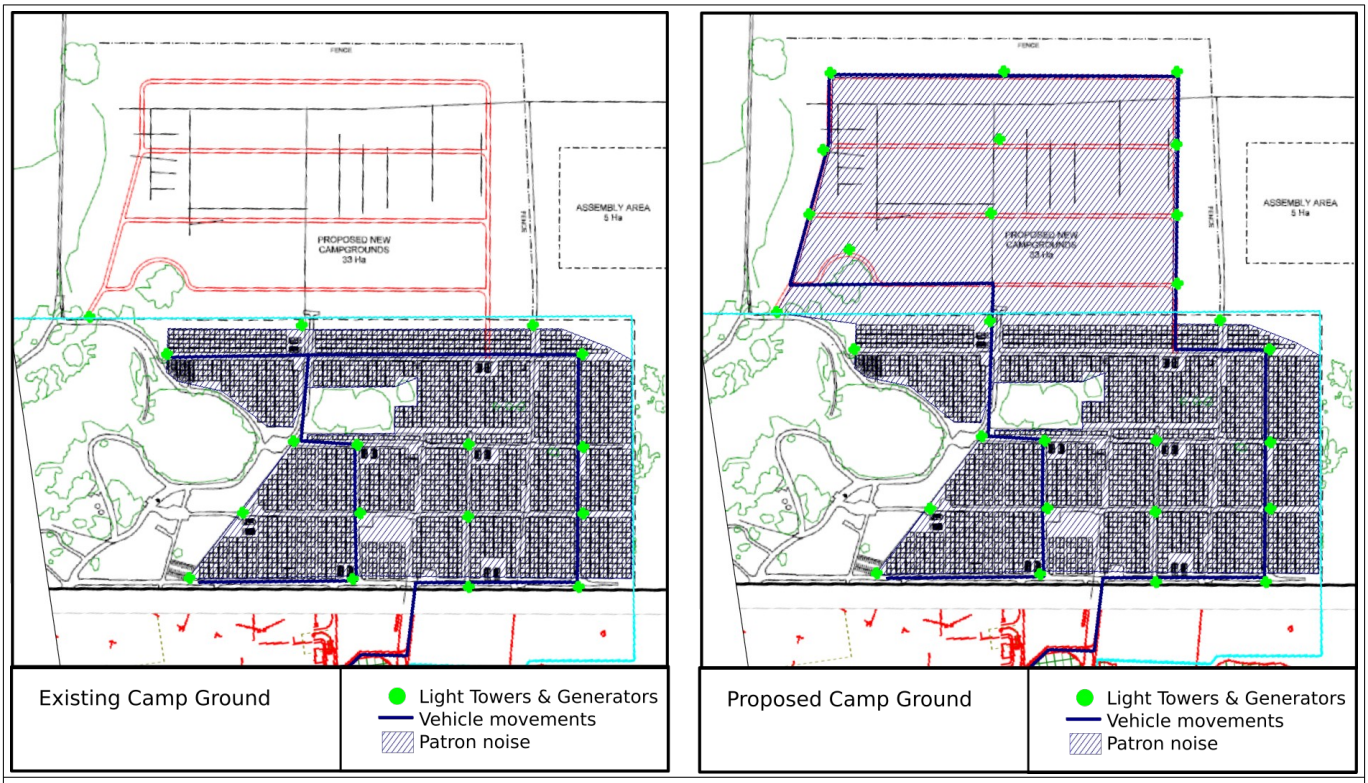

Figure 3: Modelled Sources

Note: Sporadic/Maximum noise sources have been modelled at boundary edges at light tower locations.

MODELLED SCENARIOS

Modelling scenarios have been completed for two main scenarios, during operational hours, and during the night hours. Iterative models of the individual source groups have also been completed to aid in identification of the determining source of noise. A summary of the modelling assumptions are identified below:

During Event with Amplified Music

- Camping patron noise – all patrons throughout the camp area, up to 30,000 total.
- Camping vehicle noise – patron vehicles, up to 1000 vehicles per hour (conservative - assumed to travel through the entire area).
- Site Vehicles noise – 6 skid movements, 6 tractor movements throughout.
- Lighting generators/towers at every road junction or ancillary facility.
- Generators at ancillary facilities (until 2am).
- Garbage trucks during daytime hours (7 am – 6 pm).

Non-Event Hours

- Camping patron noise – all patrons throughout the camp area, up to 7,500 (¼ of the 30,000 total).

- Camping patron Vehicle noise – patron vehicles, up to 500 vehicles per hours (conservative assumed to travel through the entire area).
- Site Vehicles noise – 3 skid movements, 3 tractor movements throughout.
- Lighting generators/towers at every road junction or ancillary facility.

RESULTS

Tables 3 – 4 present the L_{Aeq} (average) values for event hours (10 am to 2 am) and out-of-hours (2 am to 10 am), assuming all sources are operating simultaneously. Table 5 presents the L_{Amax} values for various activities likely to occur within the camp area, to assess the potential for sleep disturbance impacts.

Table 3: Predicted L_{Aeq} Results – Out-of-Hours (dB(A))

Receptor Number	Existing	Proposed	Change	Criteria	Discussion
1	15.2	15.8	0.6	35	
2	15.6	16.2	0.6	35	
3	14.4	15.2	0.8	35	
4	18.3	18.8	0.5	35	
5	26.4	26.5	0.1	35	
6	16.9	18.2	1.3	35	
7	19.3	20.4	1.1	35	
8	19.3	20.9	1.6	35	
9	19	22.2	3.2	35	
10	24.1	29.6	5.5	35	Increase but well below criteria
11	31	**35.8**	4.8	35	Marginal exceedance – agreement in place
12	25.1	25.1	0	35	
13	30.4	30.3	-0.1	35	
14	13.6	14.2	0.6	35	
15	14.1	15	0.9	35	
16	9.9	10.8	0.9	35	
17	22	22.6	0.6	35	
18	23.4	24.7	1.3	35	
19	16	16.6	0.6	35	
20	6.1	7.7	1.6	35	
21	0.7	2.7	2	35	
22	2.8	4.8	2	35	
23	10.8	12.5	1.7	35	
24	13.7	16.4	2.7	35	
25	30	**35.4**	5.4	35	Marginal exceedance – agreement in place
26	22	24.1	2.1	35	
27	13.9	14.7	0.8	35	
28	13.9	14.8	0.9	35	
29	9.4	10.5	1.1	35	
30	16	16.3	0.3	35	
31	8.1	9.2	1.1	35	
32	19.1	19.4	0.3	35	
33	15.5	16.2	0.7	35	
34	15.7	16.2	0.5	35	
35	18.3	19.4	1.1	35	
36	14	14.8	0.8	35	
37	14.4	15.2	0.8	35	
38	14.7	15.4	0.7	35	
39	15.4	16.1	0.7	35	
40	20.4	21.2	0.8	35	
41	19.4	20.5	1.1	35	
42	18.2	19.6	1.4	35	

Receptor Number	Existing	Proposed	Change	Criteria	Discussion
1	15.2	15.8	0.6	35	
43	28.6	28.2	-0.4	35	
44	29.8	29.8	0	35	
45	16.4	17.8	1.4	35	
46	16.6	17.9	1.3	35	
47	11.5	13.4	1.9	35	
48	11.5	13.4	1.9	35	
49	15.2	17.8	2.6	35	
50	15.4	17.6	2.2	35	
51	16.5	19.3	2.8	35	
52	19	23.3	4.3	35	Increase but well below criteria
53	20.6	22.9	2.3	35	
54	21.1	23.8	2.7	35	
55	21.5	24.1	2.6	35	
56	17.9	20.8	2.9	35	
57	24.1	26.7	2.6	35	
58	20.5	24.2	3.7	35	
59	20.8	24.2	3.4	35	
60	20.5	23.5	3	35	

Table 4: Predicted L_{Aeq} Results – Event Hours (dB(A))

Receptor Number	Existing	Proposed	Change	Criteria	Discussion
1	21.6	22.4	0.8	45	
2	21.8	22.7	0.9	45	
3	20.9	21.9	1	45	
4	24.4	25.1	0.7	45	
5	31.5	31.8	0.3	45	
6	23.3	24.8	1.5	45	
7	25.6	26.9	1.3	45	
8	25.6	27.4	1.8	45	
9	25.5	28.7	3.2	45	
10	30.1	36.1	6	45	Increase but well below criteria
11	37.4	42	4.6	45	Increase but below criteria
12	31.4	31.5	0.1	45	
13	36.6	36.6	0	45	
14	20.3	21.2	0.9	45	
15	20.7	21.9	1.2	45	
16	16.9	18	1.1	45	
17	27.8	28.7	0.9	45	
18	29.3	30.9	1.6	45	
19	22.3	23.1	0.8	45	
20	13.4	15.1	1.7	45	
21	8.3	10.3	2	45	
22	10.3	12.4	2.1	45	
23	17.7	19.6	1.9	45	
24	20.4	23.3	2.9	45	
25	36.4	41.7	5.3	45	Increase but below criteria
26	28.9	31	2.1	45	
27	20.4	21.5	1.1	45	
28	20.4	21.5	1.1	45	
29	16.4	17.7	1.3	45	
30	22.5	23.1	0.6	45	
31	15.2	16.6	1.4	45	
32	25	25.5	0.5	45	
33	21.8	22.9	1.1	45	
34	22	22.8	0.8	45	
35	25.6	26.9	1.3	45	
36	20.5	21.6	1.1	45	
37	20.9	21.9	1	45	
38	21.1	22.1	1	45	

Receptor Number	Existing	Proposed	Change	Criteria	Discussion
1	21.6	22.4	0.8	45	
39	21.8	22.7	0.9	45	
40	26.5	27.5	1	45	
41	25.7	26.9	1.2	45	
42	24.5	26.1	1.6	45	
43	34.5	34.1	-0.4	45	
44	36.3	36.5	0.2	45	
45	22.8	24.4	1.6	45	
46	23	24.5	1.5	45	
47	18.6	20.7	2.1	45	
48	18.4	20.5	2.1	45	
49	21.7	24.6	2.9	45	
50	21.9	24.3	2.4	45	
51	22.9	25.8	2.9	45	
52	25.8	30.3	4.5	45	Increase but well below criteria
53	27.4	29.5	2.1	45	
54	27.9	30.6	2.7	45	
55	28.3	30.9	2.6	45	
56	24.3	27.3	3	45	
57	30.9	33.1	2.2	45	
58	26.8	30.7	3.9	45	
59	27.1	30.8	3.7	45	
60	26.8	30	3.2	45	

Table 5: Predicted L_{Amax} Results - Sleep Disturbance (dB(A))

Receptor Number	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Criteria
	Shouting Camper		Car Doors		Car Horn		Garbage Collection		
1	12.8	11.8	5.9	4.8	5.2	4	13.6	12.4	45
2	13.2	12.6	6.3	5.6	6	4.9	14.2	13.2	45
3	12.2	11.1	5.2	4.1	4.3	2.9	12.7	11.2	45
4	16.3	14.9	9.5	8.2	10.4	9	17.6	16.2	45
5	23	21.7	17.6	16.2	22.6	21.3	26.2	25	45
6	15.7	14.9	8.9	8.2	8.3	8.7	16	16.2	45
7	17.9	17.8	11	10.8	11.9	12	18.8	18.8	45
8	17.9	18.6	11.1	12.2	12.2	14.8	19	20.8	45
9	17.2	20.9	10.1	14.5	9.8	17.9	16.7	22.9	45
10	22.3	26.1	16.5	21.9	19.5	29.7	24.8	30.5	45
11	27	31.8	23	28.7	27.6	37.5	31.2	37.4	45
12	23.5	22.7	17.5	16.6	21.4	20.8	25.8	25.2	45
13	29.3	28.8	25.7	25.2	33.6	33.3	34.4	34	45
14	11.5	10.9	4.5	4	3.7	2.8	12.3	11.4	45
15	11.8	11.2	4.8	4.7	4.2	3.3	12.8	12.1	45
16	6.8	6.2	-0.3	-0.9	-3	-3.9	5.9	4.9	45
17	19.3	19.9	13.1	13.3	17	16	22.7	21.7	45
18	20.6	22	13.9	15.7	19.7	19.4	24.4	24.1	45
19	13.5	12.8	6.7	6	6.6	5.7	14.7	13.9	45
20	1.7	1.3	-5.1	-5.4	-9.4	-10.1	-1.3	-2.3	45
21	-8.4	-8.4	-12.7	-12.7	-20.9	-21.4	-13.5	-14	45
22	-4.1	-3.9	-9.7	-9.6	-16.2	-16.1	-8.9	-8.8	45
23	8.5	8.1	1.2	0.8	-2.2	-2	6.4	6.5	45
24	12.3	12.6	5.4	6.4	2.8	6	11.4	14.4	45
25	26.9	32.1	22.7	29.2	26.2	38.6	30	37.7	45
26	17.9	19.4	12.2	14.5	14.3	18.1	21.4	23.8	45
27	11.6	11.1	4.6	4	3.5	2.6	12.1	11.1	45
28	11.7	10.7	4.6	3.6	3.4	2.1	11.9	10.6	45
29	6.2	5.3	-0.9	-1.7	-3.9	-4.9	5.1	3.9	45
30	14	13.4	7.2	6.5	7.5	6.5	15.5	14.5	45
31	4.4	3.8	-2.6	-3.1	-6	-6.9	2.7	1.7	45
32	16.5	15.6	9.9	8.8	11.1	9.8	18.3	17.1	45
33	13	12.2	6.1	5.3	5.8	4.6	14.2	13	45

Receptor Number	Existing	Proposed	Existing	Proposed	Existing	Proposed	Existing	Proposed	Criteria
	Shouting Camper		Car Doors		Car Horn		Garbage Collection		
34	13.2	12.4	6.3	5.5	6.1	5	14.4	13.3	45
35	10.9	10.1	6.1	5	4	3	13.4	12.4	45
36	11.7	11.2	4.7	4.1	3.8	2.9	12.4	11.5	45
37	12.2	11.7	5.2	4.5	4.3	3.3	12.7	11.8	45
38	12.4	11.9	5.5	4.7	4.7	3.6	13	12	45
39	13.3	12.4	6.3	5.4	5.8	4.7	14	12.8	45
40	18.2	18.8	11.7	12.3	15.3	14.6	21.5	20.8	45
41	18	17.6	11.3	10.8	12.3	12.2	19.1	18.9	45
42	17.1	16.4	10.4	9.9	10.3	11.5	17.5	18.4	45
43	26.8	26.3	21.8	21.2	28.6	27.7	30.9	30	45
44	26	25.3	22.1	21.2	28.9	27.9	31.4	30.2	45
45	15.1	14.6	8.3	7.7	7.6	7.9	15.4	15.7	45
46	15.2	14.9	8.2	7.9	7.9	8	15.7	15.7	45
47	8.3	8.5	1.3	1.5	-0.8	-0.7	8.1	8.2	45
48	9.6	9.5	2.5	2.5	-0.6	0.6	8.2	9.3	45
49	14	14.1	7.1	7.4	5	8	13.4	15.5	45
50	14.2	14.4	7.4	7.7	5.3	8.4	13.6	15.9	45
51	15.4	15.9	8.8	9.7	7.5	11.7	15.4	18.5	45
52	16.6	17.9	11.1	13.4	9.4	16.5	17.4	22.6	45
53	17.4	18.7	12	14	10.5	17.8	18.3	23.2	45
54	17.6	19.5	11.4	14.8	11.5	18.9	19.1	23.9	45
55	19.3	21.1	12.6	15.3	13	19	20.2	23.9	45
56	16.7	18.6	10.1	12.1	10	14.7	17.6	20.8	45
57	20.2	22.1	14.8	16.5	17.7	20.7	24	25.4	45
58	19.3	21.1	13	15.1	14.6	18.9	21.1	24	45
59	19.6	21.3	13.3	15.4	15.1	19.3	21.5	24.3	45
60	19.2	20.9	12.9	14.8	14.6	18.5	21.1	23.7	45

DISCUSSION

Tables 3 and 4 confirm that the only predicted exceedences of the assessment criteria are marginal non-compliances (less than 1 dB) at Receiver 11 and Receiver 25. These receivers are located adjacent to the camp area extension and, in the case of Receiver 11, on shared land. Given the conservative assumptions adopted in the modelling (approximately 7,500 campers talking simultaneously during the night period, 500 vehicle movements an hour, and worst case meteorological conditions) it is likely that compliance with the 35 dB(A) criteria will occur at all receivers for the majority of the time. In the case of Receivers 11 and 25, Parklands has agreements in place with both property owners.

Review of the maximum predicted sound pressure levels indicate full compliance with the sleep disturbance criteria, even assuming multiple sources occur simultaneously.

In terms of opportunities for noise management, it is recommended that plant with low source noise levels are selected. In addition, the appropriate orientation of plant (generators and lighting towers) in locations close to sensitive receivers should be adopted to minimise noise impacts.

CONCLUSION

Overall the predicted impact from diesel powered lighting towers and camp grounds through the camp area is minimal, with minor increases to the receivers directly north of the new area. This is consistent with post event noise measurements completed for historic events at the Parklands venue.

The predicted noise levels comply with the assessment criteria for all sensitive receivers, with the exception of Receiver 11 and 25. These receivers are predicted to have <1 dB(A) exceedance of the target criteria. It is noted that these receivers have existing agreements with Parklands. Furthermore, highly conservative modelling assumptions have been adopted and in reality lower receiver noise levels are likely to occur for the majority of the time.

It is further noted that the events aim to provide restful sleep to the camp ground areas during the night period, and as such management should result in noise levels significantly lower than those predicted.

Yours sincerely

for Air Noise Environment Pty Ltd

Beau Weyers BEng(Mech), MAAS, RPEQ
Senior Environmental Engineer

Air Noise Environment
Environmental Monitoring and Assessment
A Trinity Consultants Company

Attachment: Appendix A – Partial Modelling Results

Note: All professional advice provided by Air Noise Environment, including any information contained in this letter, is subject to the terms of the Disclaimer shown on our website at ANE Disclaimers

APPENDIX A – PARTIAL MODELLING RESULTS

Table A1: Predicted L_{Aeq} Results – Out-Of-Hours (dB(A))

Receptor Number	Patrons			Vehicles			Light Towers			Criteria
	Existing	Proposed	Change	Existing	Proposed	Change	Existing	Proposed	Change	
Max	34.4	37.7		23.5	30.1		26.6	31.1		35
1	13.6	12.4	-1.2	9	9.2	0.2	11.3	12.9	1.6	35
2	14.2	13.2	-1	9.5	9.8	0.3	11.5	13.2	1.7	35
3	12.7	11.2	-1.5	7.7	8	0.3	10.9	12.6	1.7	35
4	17.6	16.2	-1.4	12.9	13.1	0.2	13.4	15.1	1.7	35
5	26.2	25	-1.2	23.5	23.6	0.1	18.3	19.7	1.4	35
6	16	16.2	0.2	9.9	10.7	0.8	12.8	15	2.2	35
7	18.8	18.8	0	12.1	13.1	1	14.5	16.7	2.2	35
8	19	20.8	1.8	12	13.5	1.5	14.6	17.1	2.5	35
9	16.7	22.9	6.2	11.5	15.2	3.7	15.1	18.4	3.3	35
10	24.8	30.5	5.7	17.8	22.7	4.9	17.7	25.9	8.2	35
11	31.2	37.4	6.2	23.5	30.1	6.6	26.6	31.1	4.5	35
12	25.8	25.2	-0.6	17.5	18.2	0.7	19.9	21.1	1.2	35
13	34.4	34	-0.4	23.1	23.3	0.2	24.8	26	1.2	35
14	12.3	11.4	-0.9	5.2	5.8	0.6	10.4	12.1	1.7	35
15	12.8	12.1	-0.7	6.3	6.7	0.4	10.7	12.9	2.2	35
16	5.9	4.9	-1	0.8	1.3	0.5	7.7	9.4	1.7	35
17	22.7	21.7	-1	17.1	17.4	0.3	16.1	18	1.9	35
18	24.4	24.1	-0.3	18	18.8	0.8	17.8	20	2.2	35
19	14.7	13.9	-0.8	9.9	10.1	0.2	11.9	13.6	1.7	35
20	-1.3	-2.3	-1	-4.5	-3.9	0.6	4.9	6.9	2	35
21	-13.5	-14	-0.5	-12.8	-11.8	1	0.3	2.4	2.1	35
22	-8.9	-8.8	0.1	-10.2	-9.2	1	2.2	4.4	2.2	35
23	6.4	6.5	0.1	1.8	2.8	1	8.4	10.7	2.3	35
24	11.4	14.4	3	5.3	7.2	1.9	10.6	14.2	3.6	35
25	30	37.7	7.7	22.4	29.5	7.1	25.8	31	5.2	35
26	21.4	23.8	2.4	12	14.9	2.9	19.3	21.6	2.3	35
27	12.1	11.1	-1	7.1	7.4	0.3	10.5	12.3	1.8	35
28	11.9	10.6	-1.3	7.1	7.4	0.3	10.5	12.3	1.8	35
29	5.1	3.9	-1.2	0.2	0.6	0.4	7.4	9.2	1.8	35
30	15.5	14.5	-1	8.4	8.8	0.4	12	13.6	1.6	35
31	2.7	1.7	-1	-1.6	-1.1	0.5	6.4	8.2	1.8	35
32	18.3	17.1	-1.2	14.1	14.3	0.2	13.8	15.3	1.5	35

Receptor Number	Patrons			Vehicles			Light Towers			Criteria
	Existing	Proposed	Change	Existing	Proposed	Change	Existing	Proposed	Change	
33	14.2	13	-1.2	8.9	9.2	0.3	11.5	13.7	2.2	35
34	14.4	13.3	-1.1	9.6	9.9	0.3	11.6	13.2	1.6	35
35	13.4	12.4	-1	6.6	7	0.4	17.1	18.7	1.6	35
36	12.4	11.5	-0.9	7.4	7.7	0.3	10.5	12.3	1.8	35
37	12.7	11.8	-0.9	7.9	8.1	0.2	10.8	12.6	1.8	35
38	13	12	-1	8.1	8.4	0.3	11	12.8	1.8	35
39	14	12.8	-1.2	9.1	9.4	0.3	11.5	13.3	1.8	35
40	21.5	20.8	-0.7	14.5	15	0.5	15.3	17.2	1.9	35
41	19.1	18.9	-0.2	12.4	13.2	0.8	14.5	16.7	2.2	35
42	17.5	18.4	0.9	11.2	12.3	1.1	13.6	16	2.4	35
43	30.9	30	-0.9	22.5	22.8	0.3	21.7	22.8	1.1	35
44	31.4	30.2	-1.2	21.5	22	0.5	25.6	26.9	1.3	35
45	15.4	15.7	0.3	9.3	10.1	0.8	12.4	14.8	2.4	35
46	15.7	15.7	0	9.7	10.4	0.7	12.6	14.8	2.2	35
47	8.1	8.2	0.1	2.3	3.1	0.8	9.7	12.1	2.4	35
48	8.2	9.3	1.1	2.4	3.9	1.5	9	11.5	2.5	35
49	13.4	15.5	2.1	7.1	9.1	2	11.6	15.2	3.6	35
50	13.6	15.9	2.3	7.3	9.4	2.1	11.7	14.6	2.9	35
51	15.4	18.5	3.1	8.7	12	3.3	12.4	15.5	3.1	35
52	17.4	22.6	5.2	9.9	13.4	3.5	16.4	21.3	4.9	35
53	18.3	23.2	4.9	11	14.6	3.6	17.9	19.5	1.6	35
54	19.1	23.9	4.8	11.8	14.5	2.7	18.2	20.7	2.5	35
55	20.2	23.9	3.7	12.1	15.5	3.4	18.7	21.2	2.5	35
56	17.6	20.8	3.2	9.9	13.5	3.6	13.6	17	3.4	35
57	24	25.4	1.4	14.9	19	4.1	21.1	22.6	1.5	35
58	21.1	24	2.9	12.8	16.5	3.7	15.4	20.7	5.3	35
59	21.5	24.3	2.8	13.1	16.9	3.8	15.6	20.8	5.2	35
60	21.1	23.7	2.6	12.7	16.2	3.5	15.4	19.9	4.5	35

Table A2: Predicted L_{Aeq} Results – Event Hours (dB(A))

Receptor Number	Patrons			Vehicles			Light Towers			Generators			Criteria
	Existing	Proposed	Change	Existing	Proposed	Change	Existing	Proposed	Change	Existing	Proposed	Change	
Max	34.4	37.7		23.5	30.1		26.6	31.1		33.6	38.1		45
1	13.6	12.4	-1.2	9	9.2	0.2	11.3	12.9	1.6	18.3	19.9	1.6	45
2	14.2	13.2	-1	9.5	9.8	0.3	11.5	13.2	1.7	18.5	20.2	1.7	45
3	12.7	11.2	-1.5	7.7	8	0.3	10.9	12.6	1.7	17.9	19.6	1.7	45
4	17.6	16.2	-1.4	12.9	13.1	0.2	13.4	15.1	1.7	20.4	22.1	1.7	45
5	26.2	25	-1.2	23.5	23.6	0.1	18.3	19.7	1.4	25.3	26.7	1.4	45
6	16	16.2	0.2	9.9	10.7	0.8	12.8	15	2.2	19.8	22	2.2	45
7	18.8	18.8	0	12.1	13.1	1	14.5	16.7	2.2	21.5	23.7	2.2	45
8	19	20.8	1.8	12	13.5	1.5	14.6	17.1	2.5	21.6	24.1	2.5	45
9	16.7	22.9	6.2	11.5	15.2	3.7	15.1	18.4	3.3	22.1	25.4	3.3	45
10	24.8	30.5	5.7	17.8	22.7	4.9	17.7	25.9	8.2	24.7	32.9	8.2	45
11	31.2	37.4	6.2	23.5	30.1	6.6	26.6	31.1	4.5	33.6	38.1	4.5	45
12	25.8	25.2	-0.6	17.5	18.2	0.7	19.9	21.1	1.2	26.9	28.1	1.2	45
13	34.4	34	-0.4	23.1	23.3	0.2	24.8	26	1.2	31.8	33	1.2	45
14	12.3	11.4	-0.9	5.2	5.8	0.6	10.4	12.1	1.7	17.4	19.1	1.7	45
15	12.8	12.1	-0.7	6.3	6.7	0.4	10.7	12.9	2.2	17.7	19.9	2.2	45
16	5.9	4.9	-1	0.8	1.3	0.5	7.7	9.4	1.7	14.7	16.4	1.7	45
17	22.7	21.7	-1	17.1	17.4	0.3	16.1	18	1.9	23.1	25	1.9	45
18	24.4	24.1	-0.3	18	18.8	0.8	17.8	20	2.2	24.8	27	2.2	45
19	14.7	13.9	-0.8	9.9	10.1	0.2	11.9	13.6	1.7	18.9	20.6	1.7	45
20	-1.3	-2.3	-1	-4.5	-3.9	0.6	4.9	6.9	2	11.9	13.9	2	45
21	-13.5	-14	-0.5	-12.8	-11.8	1	0.3	2.4	2.1	7.3	9.4	2.1	45
22	-8.9	-8.8	0.1	-10.2	-9.2	1	2.2	4.4	2.2	9.2	11.4	2.2	45
23	6.4	6.5	0.1	1.8	2.8	1	8.4	10.7	2.3	15.4	17.7	2.3	45
24	11.4	14.4	3	5.3	7.2	1.9	10.6	14.2	3.6	17.6	21.2	3.6	45
25	30	37.7	7.7	22.4	29.5	7.1	25.8	31	5.2	32.8	38	5.2	45
26	21.4	23.8	2.4	12	14.9	2.9	19.3	21.6	2.3	26.3	28.6	2.3	45
27	12.1	11.1	-1	7.1	7.4	0.3	10.5	12.3	1.8	17.5	19.3	1.8	45
28	11.9	10.6	-1.3	7.1	7.4	0.3	10.5	12.3	1.8	17.5	19.3	1.8	45
29	5.1	3.9	-1.2	0.2	0.6	0.4	7.4	9.2	1.8	14.4	16.2	1.8	45
30	15.5	14.5	-1	8.4	8.8	0.4	12	13.6	1.6	19	20.6	1.6	45
31	2.7	1.7	-1	-1.6	-1.1	0.5	6.4	8.2	1.8	13.4	15.2	1.8	45
32	18.3	17.1	-1.2	14.1	14.3	0.2	13.8	15.3	1.5	20.8	22.3	1.5	45
33	14.2	13	-1.2	8.9	9.2	0.3	11.5	13.7	2.2	18.5	20.7	2.2	45
34	14.4	13.3	-1.1	9.6	9.9	0.3	11.6	13.2	1.6	18.6	20.2	1.6	45
35	13.4	12.4	-1	6.6	7	0.4	17.1	18.7	1.6	24.1	25.7	1.6	45

Receptor Number	Patrons			Vehicles			Light Towers			Generators			Criteria
	Existing	Proposed	Change	Existing	Proposed	Change	Existing	Proposed	Change	Existing	Proposed	Change	
36	12.4	11.5	-0.9	7.4	7.7	0.3	10.5	12.3	1.8	17.5	19.3	1.8	45
37	12.7	11.8	-0.9	7.9	8.1	0.2	10.8	12.6	1.8	17.8	19.6	1.8	45
38	13	12	-1	8.1	8.4	0.3	11	12.8	1.8	18	19.8	1.8	45
39	14	12.8	-1.2	9.1	9.4	0.3	11.5	13.3	1.8	18.5	20.3	1.8	45
40	21.5	20.8	-0.7	14.5	15	0.5	15.3	17.2	1.9	22.3	24.2	1.9	45
41	19.1	18.9	-0.2	12.4	13.2	0.8	14.5	16.7	2.2	21.5	23.7	2.2	45
42	17.5	18.4	0.9	11.2	12.3	1.1	13.6	16	2.4	20.6	23	2.4	45
43	30.9	30	-0.9	22.5	22.8	0.3	21.7	22.8	1.1	28.7	29.8	1.1	45
44	31.4	30.2	-1.2	21.5	22	0.5	25.6	26.9	1.3	32.6	33.9	1.3	45
45	15.4	15.7	0.3	9.3	10.1	0.8	12.4	14.8	2.4	19.4	21.8	2.4	45
46	15.7	15.7	0	9.7	10.4	0.7	12.6	14.8	2.2	19.6	21.8	2.2	45
47	8.1	8.2	0.1	2.3	3.1	0.8	9.7	12.1	2.4	16.7	19.1	2.4	45
48	8.2	9.3	1.1	2.4	3.9	1.5	9	11.5	2.5	16	18.5	2.5	45
49	13.4	15.5	2.1	7.1	9.1	2	11.6	15.2	3.6	18.6	22.2	3.6	45
50	13.6	15.9	2.3	7.3	9.4	2.1	11.7	14.6	2.9	18.7	21.6	2.9	45
51	15.4	18.5	3.1	8.7	12	3.3	12.4	15.5	3.1	19.4	22.5	3.1	45
52	17.4	22.6	5.2	9.9	13.4	3.5	16.4	21.3	4.9	23.4	28.3	4.9	45
53	18.3	23.2	4.9	11	14.6	3.6	17.9	19.5	1.6	24.9	26.5	1.6	45
54	19.1	23.9	4.8	11.8	14.5	2.7	18.2	20.7	2.5	25.2	27.7	2.5	45
55	20.2	23.9	3.7	12.1	15.5	3.4	18.7	21.2	2.5	25.7	28.2	2.5	45
56	17.6	20.8	3.2	9.9	13.5	3.6	13.6	17	3.4	20.6	24	3.4	45
57	24	25.4	1.4	14.9	19	4.1	21.1	22.6	1.5	28.1	29.6	1.5	45
58	21.1	24	2.9	12.8	16.5	3.7	15.4	20.7	5.3	22.4	27.7	5.3	45
59	21.5	24.3	2.8	13.1	16.9	3.8	15.6	20.8	5.2	22.6	27.8	5.2	45
60	21.1	23.7	2.6	12.7	16.2	3.5	15.4	19.9	4.5	22.4	26.9	4.5	45