HERRING STORER ACOUSTICS

PROPOSED SERVICES STATION

CNR FLYNN DRIVE & GREENWICH PARADE NEERABUP

ENVIRONMENTAL ACOUSTIC ASSESSMENT

NOVEMBER 2022

OUR REFERENCE: 30334-2-18107-02

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ENVIRONMENTAL ACOUSTIC ASSESSMENT

NEERABUP PROPOSED INTEGRATED SERVICES HUB

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FOR

PEREGRINE CORPORATION

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1. INTRODUCTION

Herring Storer Acoustics were commissioned by Peregrine Corporation to undertake an acoustic assessment of noise emissions associated with the proposed development to be located at Lot 1001 Greenwich Parade, Neerabup, being on the north west corner of Flynn drive and Greenwick Parade, Neerabup.

This report assesses noise emissions from the premises with regards to compliance with the requirements of the *Environmental Protection (Noise) Regulations 1997*. It is understood that the development consists of a service station, convenience store, drive-thru facility and car wash. Therefore, noise sources considered as part of this assessment include:

- Car wash and vacuum units;
- Mechanical Services;
- Voices within the drive thru facility; and
- Car and truck doors closing.

We note that from recent information received from the DWER, the bitumised area would be considered as a road, thus noise relating to the "propulsion and braking" of motor vehicles is exempt from the *Environmental Protection (Noise) Regulations 1997*. We note that these noise sources are rarely critical in the determination of compliance. For completeness, we have also provided an assessment of the noise emissions (attached in Appendix B) from the following:

- Car movements on site;
- Car and truck engine starts; and
- Truck air brakes.

For reference, the plans for the proposed development is attached in Appendix A.

2. SUMMARY

The closest neighbouring residences to this development are located to the south of the development, across Flynn Drive. As the facility (ie fuel station and carwash) would be open 24 hours per day, noise received at the neighbouring noise (highly) sensitive premises from these noise sources needs to comply with the appropriate assigned noise levels for the night period.

Noise from the carwash could operate 24 hours per day, hence noise received at the neighbouring residences need to comply with the assigned night period noise levels. Analysis of the noise from the carwash shows that compliance with the assigned L_{A10} noise levels would be achieved, with the inclusion of the following noise mitigation:

- The entry and exit doors to the car was provide a minimum reduction of 12 dB(A); and
- Either limit the number of vacuum units that can be used during the night period to 2; or they be installed with hoods orientated to protect the neighbouring residences.

Noise from the mechanical services would also comply with the assigned L_{A10} noise levels at all times.

The assessment indicates that noise emissions from car and truck doors closing have been assessed to comply with the assigned L_{AMax} noise levels at all times.

Finally, noise from the drive thru facility would also comply with the assigned L_{A10} noise levels at all times.

From the analysis undertaken, noise emissions from the proposed development has been assessed to comply with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times, provided the noise mitigation to the carwash, as outlined above is incorporated into the development.

3. CRITERIA

The allowable noise level for noise sensitive premises in the vicinity of the proposed Facility site is prescribed by the *Environmental Protection (Noise) Regulations 1997*. Regulations 7 and 8 stipulate maximum allowable external noise levels or assigned noise levels that can be received at a premise from another premises. For residential premises, this noise level is determined by the calculation of an influencing factor, which is then added to the base levels shown below. The influencing factor is calculated for the usage of land within two circles, having radii of 100m and 450m from the premises of concern. The base noise levels for residential premises and the assigned noise levels for industrial premises are listed in Table 3.1.

TABLE 3.1 - BASELINE ASSIGNED OUTDOOR NOISE LEVEL

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		L_{A10}	L_{A1}	L_{Amax}
Noise sensitive premises: highly sensitive area	0700 - 1900 hours Monday to Saturday (Day)	45 + IF	55 + IF	65 + IF
	0900 - 1900 hours Sunday and Public Holidays (Sunday / Public Holiday Day)	40 + IF	50 + IF	65 + IF
	1900 - 2200 hours all days (Evening)	40 + IF	50 + IF	55 + IF
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays (Night)	35 + IF	45 + IF	55 + IF

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.
IF is the influencing factor.

It is a requirement that received noise be free of annoying characteristics (tonality, modulation and impulsiveness), defined below as per Regulation 9.

"impulsiveness" means a variation in the emission of a noise where the difference between L_{Apeak} and $L_{Amax(Slow)}$ is more than 15 dB when determined for a single representative event;

"modulation" means a variation in the emission of noise that –

(a) is more than 3 dB L_{AFast} or is more than 3 dB L_{AFast} in any one-third octave band;

(b) is present for more at least 10% of the representative assessment period; and

(c) is regular, cyclic and audible;

"tonality" means the presence in the noise emission of tonal characteristics where the difference between –

(a) the A-weighted sound pressure level in any one-third octave band; and

(b) the arithmetic average of the A-weighted sound pressure levels in the 2 adjacent one-third octave bands,

is greater than 3 dB when the sound pressure levels are determined as $L_{Aeq,T}$ levels where the time period T is greater than 10% of the representative assessment period, or greater than 8 dB at any time when the sound pressure levels are determined as L_{ASlow} levels.

Where the noise emission is not music, if the above characteristics exist and cannot be practicably removed, then any measured level is adjusted according to Table 3.2 below.

TABLE 3.2 - ADJUSTMENTS TO MEASURED LEVELS

Where **tonality** is present	Where **modulation** is present	Where **impulsiveness** is present
+5 dB(A)	+5 dB(A)	+10 dB(A)

Note: These adjustments are cumulative to a maximum of 15 dB.

For this development, the closest residential premises of concern are located, as shown on Figure 3.1 below.

FIGURE 3.1 – AREA AROUND PROPOSED DEVELOPMENT

The influencing factor at the nearest residential locations to the south of Flynn Drive have been determined as summarised in Table 3.3.

TABLE 3.3 – INFLUENCING FACTORS

Influencing Factor Parameter	Influencing Factor (dB)	
	Residences R1, R2, R3 & R5	Residence R4
Major Road within inner circle	-	-
Major Road within outer circle	+2	+2
Secondary Road within inner circle	-	-
Industrial Premises within the inner circle	0	0
Industrial Premises within the outer circle	+2	+3
TOTAL IF	+4	+5

Note: It should be noted that in the future, Flynn Drive would be a major road and the influencing factor for a major road in the outer circle is +2dB.

Based on the above, the assigned noise levels are as listed in Tables 3.4 and 3.5.

TABLE 3.4 - ASSIGNED OUTDOOR NOISE LEVEL FOR RESIDENCES R1, R2, R3 AND R5

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises: Highly sensitive area	0700 - 1900 hours Monday to Saturday	49	59	69
	0900 - 1900 hours Sunday and Public Holidays	44	54	69
	1900 - 2200 hours all days	44	54	59
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	39	49	59

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.

TABLE 3.5 - ASSIGNED OUTDOOR NOISE LEVEL FOR RESIDENCE R4

Premises Receiving Noise	Time of Day	Assigned Level (dB)		
		$L_{A\ 10}$	$L_{A\ 1}$	$L_{A\ max}$
Noise sensitive premises: Highly sensitive area	0700 - 1900 hours Monday to Saturday	50	60	70
	0900 - 1900 hours Sunday and Public Holidays	45	55	70
	1900 - 2200 hours all days	45	55	60
	2200 hours on any day to 0700 hours Monday to Saturday and 0900 hours Sunday and Public Holidays	40	50	60

Note: L_{A10} is the noise level exceeded for 10% of the time.
L_{A1} is the noise level exceeded for 1% of the time.
L_{Amax} is the maximum noise level.

4. MODELLING

Modelling of the noise propagation from the proposed development was carried out using an environmental noise modelling computer program, "SoundPlan". Calculations were carried out using the EPA weather conditions as stated in the Environmental Protection Authority's *"Draft Guidance for Assessment of Environmental Factors No.8 - Environmental Noise"*.

Noise emissions from the development, include:

- Carwash and vacuum units;
- Mechanical Services;
- Voice within the drive thru facility; and
- Doors closing for both cars and trucks.

Although, the noise emissions associated with car and truck activities on site would be considered exempt from the Regulations, for completeness, noise modelling and assessment were also undertaken for the following sources:

- Car movements on site;
- Car and truck engine starts; and
- Truck air brakes.

The modelling results and assessment for these items are contained in Appendix B.

The calculations were based in the sound power levels listed in Tables 4.1 to 4.4.

TABLE 4.1 – CAR WASH SOUND POWER LEVELS

Plant Item	Sound Power Level dB(A)
Vacuum Units	89
Auto Carwash	93
Self Carwash	91

TABLE 4.2 – GENERAL SOUND POWER LEVELS

Item of Equipment	Sound Power Level, (dB(A))
Cars moving	81
Truck moving	89
Car Start	85
Car Door	87
Truck Start	94
Truck Door	95
Truck Air Brake	103

TABLE 4.3 – MECHANICAL SERVICES NOISE LEVELS

Plant Item	Sound Power Level dB(A)
Air Conditioning Condensing Units	2 at 67 dB(A)

TABLE 4.4 – VOICES SOUND POWER LEVEL

Plant Item	Sound Power Level dB(A)
Air Conditioning Condensing Units	2 at 67 dB(A)

The above noise sources need to comply with the following assigned noise levels:

L_{A10} - Carwash, Mechanical services and voices within drive thru.
L_{AMax} - Car and truck doors closing.

With regards to noise emissions, the following are noted:

1 Noise associated with the mechanical services does not take into account any diversity of operation. Such diversity would occur during the night period. Thus, this is a conservative assessment. At this stage of the project, the mechanical service has not been design. Therefore, the noise sources have been based on designs used for the same or similar tenancies.

2 It has been assumed that the mechanical services would be located on the roof.

3 Preliminary noise modelling indicated that with standard entry door to the "auto" carwash, noise received at the neighbouring residences could exceed the assigned noise level during the night period. Additionally, with all vacuum units operating, an exceed could also occur. Therefore, for the carwash to comply with the assigned noise levels, the following is recommended:

- The entry and exit doors to the car was provide a minimum reduction of 12 dB(A); and
- Either limit the number of vacuum units that can be used during the night period to 2; or they be installed with hoods orientated to protect the neighbouring residences.

5. RESULTS

Calculations were undertaken to all the residences noted on Figure 3.1. The resultant noise levels are listed in Tables 5.1 and 5.2.

NOTE: The results for those sources exempt of the regulations are attached in Appendix B.

TABLE 5.1 – WORST CASE CALCULATED NOISE LEVELS
NOISE SOURCES REQUIRING COMPLIANCE

Item	Calculated Noise Levels (dB(A))				
	R1	R2	R3	R4	R5
Carwash	34	34	33	32	27
Mechanical services	17	18	20	26	18
Voices	10	8	17	22	16
Car Door	27	28	31	36	27
Truck Door	37	38	39	43	38

6. ASSESSMENT

The following provided the acoustic assessment for the noise sources requiring compliance, as listed in Table 5.1.

For those sources that are exempt from the Regulations, the assessments are attached in Appendix B.

6.1 L_{A10} NOISE EMISSIONS – CARWASH

During operation, noise emissions from the carwash would at times occur for more than 10% of the time. Thus, noise received at the neighbouring residences needs to comply with the assigned L_{A10} noise levels.

Given the resultant noise level at the residences and likely background noise level associated noise from vehicles travelling along Flynn Drive, we believe that it is unlikely that noise received at the neighbouring residences would be tonal. However, again to be conservative, a +5 dB(A) penalty has been applied to the calculated noise level associated with the carwash. Table 6.1 lists the characteristics that should be included in the assessable noise level.

TABLE 6.1 – APPLICABLE ADJUSTMENTS AND ASSESSABLE L_{A10} NOISE LEVELS, dB(A)
CARWASH

Location	Calculated Noise Level, dB(A)	Applicable Adjustments to Measured Noise Levels, dB(A)			Assessable Noise Level, dB(A)
		Where Noise Emission is NOT music			
		Tonality	Modulation	Impulsiveness	
R1	34	+5	-	-	39
R2	34	+5	-	-	39
R3	33	+5	-	-	38
R4	32	+5	-	-	37
R5	27	+5	-	-	32

Table 6.2 shows the applicable Assigned Noise Levels, and assessable noise level emissions associated with the carwash.

TABLE 6.2 – ASSESSMENT OF L_{A10} NOISE LEVEL EMISSIONS
CARWASH

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L_{A10} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	39	Night Period	39	Complies
R2	39	Night Period	39	Complies
R3	38	Night Period	39	Complies
R4	37	Night Period	40	Complies
R5	32	Night Period	39	Complies

6.2 L_{A10} NOISE EMISSIONS – MECHANICAL SERVICES

Noise emissions from the mechanical services would be steady state and would operate for the majority of time. Hence noise received from the mechanical services needs to comply with the assigned L_{A10} noise level.

Given the resultant noise level at the residences and likely background noise level associated noise from vehicles travelling along Flynn drive, we believe that it is unlikely that

noise received at the neighbouring residences would be tonal. However, again to be conservative, a +5 dB(A) penalty has been applied to the calculated noise level associated with the mechanical services. Table 6.3 lists the characteristics that should be included in the assessable noise level.

TABLE 6.3 – APPLICABLE ADJUSTMENTS AND ASSESSABLE L_{A10} NOISE LEVELS, dB(A)
MECHANICAL SERVICES

Location	Calculated Noise Level, dB(A)	Applicable Adjustments to Measured Noise Levels, dB(A)			Assessable Noise Level, dB(A)
		Where Noise Emission is NOT music			
		Tonality	Modulation	Impulsiveness	
R1	17	+5	-	-	22
R2	18	+5	-	-	23
R3	20	+5	-	-	25
R4	26	+5	-	-	31
R5	18	+5	-	-	23

Table 6.4 shows the applicable Assigned Noise Levels, and assessable noise level emissions associated for the scenarios associated with the mechanical services.

TABLE 6.4 – ASSESSMENT OF L_{A10} NOISE LEVEL EMISSIONS
MECHANICAL SERVICES

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L_{A10} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	22	Night Period	39	Complies
R2	23	Night Period	39	Complies
R3	25	Night Period	39	Complies
R4	31	Night Period	40	Complies
R5	23	Night Period	39	Complies

6.3 L_{A10} NOISE EMISSIONS – VOICES AT DRIVE THRU

During operation, noise emissions from voices within the drive thru would at times occur for more than 10% of the time. Thus, noise received at the neighbouring residences needs to comply with the assigned L_{A10} noise levels.

Noise emission from voices does not contain any annoying characteristics. Thus, the assessable noise levels are as listed in Table 5.1. Thus, Table 6.5 shows the applicable Assigned Noise Levels, and assessable noise level emissions associated with the carwash.

TABLE 6.5 – ASSESSMENT OF L_{A10} NOISE LEVEL EMISSIONS
VOICES WITHIN DRIVE THRU

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L_{A10} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	10	Night Period	39	Complies
R2	8	Night Period	39	Complies
R3	17	Night Period	39	Complies
R4	22	Night Period	40	Complies
R5	16	Night Period	39	Complies

6.4 L_{AMAX} NOISE EMISSION – CAR DOOR

Noise emissions from a car door closing on site need to comply with the assigned L_{AMax} noise level. As the critical period for compliance for this source is the night period, this scenario includes noise emissions from the sources associated with L_{AMax} noise levels. However, under the Regulations, each of these sources needs to be considered individually, it is the highest calculated noise levels used for assessment, rather than the cumulative overall noise levels.

Noise associated with the closing of a car door could be impulsive and to be conservative, a +10 dB(A) penalty for impulsiveness would be applied.

Table 6.6 list the characteristics that should be included and the assessable noise levels and the assessable noise level for car doors closing.

TABLE 6.6 – APPLICABLE ADJUSTMENTS AND ASSESSABLE L_{AMAX} NOISE LEVELS, dB(A)
CAR DOOR

Locations	Calculated Noise Level, dB(A)	Applicable Adjustments to Measured Noise Levels, dB(A)			Assessable Noise Level, dB(A)
		Where Noise Emission is NOT music			
		Tonality	Modulation	Impulsiveness	
R1	27	-	-	+10	37
R2	28	-	-	+10	38
R3	31	-	-	+10	41
R4	36	-	-	+10	46
R5	27	-	-	+10	37

Table 6.7 shows the applicable Assigned Noise Levels, and assessable noise level emissions associated for the scenarios associated with the car doors closing.

TABLE 6.7 – ASSESSMENT OF L_{AMAX} NOISE LEVEL EMISSIONS
CAR DOOR

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L_{AMax} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	37	Night Period	59	Complies
R2	38	Night Period	59	Complies
R3	41	Night Period	59	Complies
R4	46	Night Period	60	Complies
R5	37	Night Period	59	Complies

6.5 L_{AMAX} NOISE EMISSION – TRUCK DOOR

Noise emissions from a truck door closing on site need to comply with the assigned L_{AMax} noise level. As the critical period for compliance for this source is the night period, this scenario includes noise emissions from the sources associated with L_{AMax} noise levels. However, under the Regulations, each of these sources needs to be considered individually, it is the highest calculated noise levels used for assessment, rather than the cumulative overall noise levels.

Noise associated with the closing of a truck door could be impulsive and to be conservative, a +10 dB(A) penalty for impulsiveness would be applied.

Table 6.8 list the characteristics that should be included and the assessable noise levels and the assessable noise level for truck doors closing.

TABLE 6.8 – APPLICABLE ADJUSTMENTS AND ASSESSABLE L_{AMAX} NOISE LEVELS, dB(A)
TRUCK DOOR

Locations	Calculated Noise Level, dB(A)	Applicable Adjustments to Measured Noise Levels, dB(A)			Assessable Noise Level, dB(A)
		Where Noise Emission is NOT music			
		Tonality	Modulation	Impulsiveness	
R1	37	-	-	+10	47
R2	38	-	-	+10	48
R3	39	-	-	+10	49
R4	43	-	-	+10	53
R5	38	-	-	+10	48

Table 6.9 shows the applicable Assigned Noise Levels, and assessable noise level emissions associated for the scenarios associated with the truck doors closing.

TABLE 6.9 – ASSESSMENT OF L_{AMAX} NOISE LEVEL EMISSIONS
TRUCK DOOR

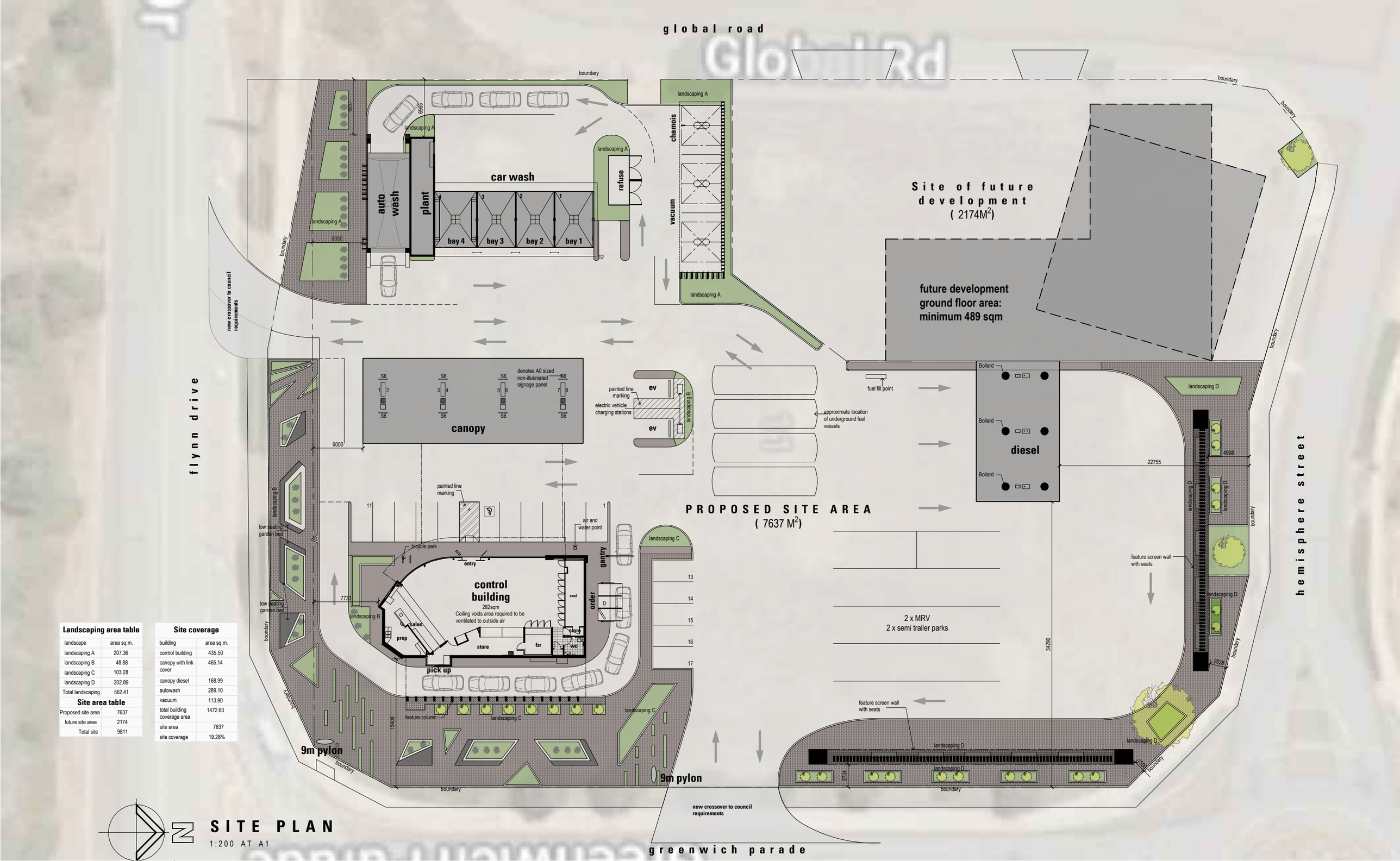
Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L_{AMax} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	47	Night Period	59	Complies
R2	48	Night Period	59	Complies
R3	49	Night Period	59	Complies
R4	53	Night Period	60	Complies
R5	48	Night Period	59	Complies

From the above assessments, it can be seen that noise received at the neighbouring residences, even using a conservative analysis, complies with the requirements of the *Environmental Protection (Noise) Regulations 1997* at all times, with the following noise mitigation applied to the carwash:

- The entry and exit doors to the car was provide a minimum reduction of 12 dB(A); and
- Either limit the number of vacuum units that can be used during the night period to 2; or they be installed with hoods orientated to protect the neighbouring residences.

APPENDIX A

PLANS



Landscaping area table	
landscape	area sq.m.
landscaping A	207.36
landscaping B	48.88
landscaping C	103.28
landscaping D	202.89
Total landscaping	562.41

Site area table	
Proposed site area	7637
future site area	2174
Total site	9811

Site coverage	
building	area sq.m.
control building	435.50
canopy with link cover	465.14
canopy diesel	168.99
autowash	289.10
vacuum	113.90
total building coverage area	1472.63
site area	7637
site coverage	19.28%

N

SITE PLAN

1:200 AT A1

NEW SERVICE STATION COMPLEX

11 GREENWICH PARADE, NEERABUP WA

0 1 2 5 10m

Scale 1:100 at A1

12.10.22

Neerabup sk00d

design

APPENDIX B

ASSESSMENT OF SOURCES NOT REQUIRED TO ACHIEVE COMPLIANCE WITH THE REGULATIONS

Table B1 lists the resultant noise levels received at the residence located around the development from those sources that are exempt from the Regulations.

TABLE B.1 – WORST CASE CALCULATED NOISE LEVELS FOR NOISE SOURCE EXEMPT FROM REGULATIONS

Location	Item / Calculated Noise Levels (dB(A))				
	Car Movements	Truck Movements	Car Start	Truck Start	Truck Air Brake
R1	23	28	26	33	40
R2	25	29	28	35	41
R3	27	33	30	35	43
R4	31	36	36	39	48
R5	22	33	26	33	41

We note that with regards to vehicles accessing the site, that as anyone can access the site and the operators of the premises have no control on who can enter the car park, these areas would be designated as public places. Regulation 6 of the *Environmental Protection (Noise) Regulations 1997* relates to noise emissions from public places and under this Regulation, "*the person who is causing or permitting that noise to be emitted is to be treated as the occupier...*". Therefore, noise emissions from each individual vehicle using the car park needs to comply with the assigned noise levels.

The following provides an assessment for those noise sources that are exempt from the Regulations and do not need to achieve compliance.

A1 L_{A1} NOISE EMISSIONS – CAR AND TRUCK MOVEMENTS

Noise emissions from car and truck movements on site would be compared with the assigned L_{A1} noise level. As the critical period for compliance for this source is the night period, this scenario includes noise emissions from the sources associated with L_{A1} noise levels. However, under the Regulations, each of these sources needs to be considered individually, it is the highest calculated noise levels used for assessment, rather than the cumulative overall noise levels.

Noise emissions from car and truck movements, needing to comply with the assigned L_{A1} noise levels, would under the Regulations not be considered tonal. Thus, the assessable noise levels would be as listed in Table B.1.

Tables B.2 and B.3 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

TABLE B.2 – ASSESSMENT OF L_{A1} NOISE LEVEL EMISSIONS FROM CAR MOVEMENTS

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L_{A1} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	23	Night Period	49	Complies
R2	25	Night Period	49	Complies
R3	27	Night Period	49	Complies
R4	31	Night Period	50	Complies
R5	22	Night Period	49	Complies

TABLE B.3 – ASSESSMENT OF L_{A1} NOISE LEVEL EMISSIONS FROM TRUCK MOVEMENTS

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L_{A1} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	28	Night Period	49	Complies
R2	29	Night Period	49	Complies
R3	33	Night Period	49	Complies
R4	36	Night Period	50	Complies
R5	33	Night Period	49	Complies

6.6 L_{AMAX} NOISE EMISSIONS

Noise emissions from car and truck engine starts on site would be compared with the assigned L_{AMax} noise level. Additionally, noise emission from trucks air brakes also would be compared with the assigned L_{AMax} noise level. As the critical period for compliance for this source is the night period, this scenario includes noise emissions from the sources associated with L_{AMax} noise levels. However, under the Regulations, each of these sources needs to be considered individually, it is the highest calculated noise levels used for assessment, rather than the cumulative overall noise levels.

Noise emissions from a car and truck starting, needing to comply with the assigned L_{AMax} noise levels, would under the Regulations not be considered tonal. Thus, the assessable noise levels would be as listed in Table B.1.

Noise emissions from truck air brakes, when received at the neighbouring residence could be impulsive and to be conservative, a +10dB for impulsive characteristics would be applied.

Table B.4 list the characteristics that should be included and the assessable noise levels and the assessable noise level for air brakes.

TABLE B.4 – APPLICABLE ADJUSTMENTS AND ASSESSABLE L_{AMAX} NOISE LEVELS TRUCK AIR BRAKE

Item	Calculated Noise Level, dB(A)	Applicable Adjustments to Measured Noise Levels, dB(A)			Assessable Noise Level, dB(A)
		Where Noise Emission is NOT music			
		Tonality	Modulation	Impulsiveness	
R1	40	-	-	+10	50
R2	41	-	-	+10	51
R3	43	-	-	+10	53
R4	48	-	-	+10	58
R5	41	-	-	+10	51

Tables B.5 to B.7 summarise the applicable Assigned Noise Levels, and assessable noise level emissions for each identified noise.

TABLE B.5 – ASSESSMENT OF L_{AMAX} NOISE LEVEL EMISSIONS FROM CAR STARTS

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L_{AMax} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	26	Night Period	59	Complies
R2	28	Night Period	59	Complies
R3	30	Night Period	59	Complies
R4	36	Night Period	60	Complies
R5	26	Night Period	59	Complies

TABLE B.6 – ASSESSMENT OF L_{AMAX} NOISE LEVEL EMISSIONS FROM TRUCK STARTS

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L_{AMax} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	33	Night Period	59	Complies
R2	35	Night Period	59	Complies
R3	35	Night Period	59	Complies
R4	39	Night Period	60	Complies
R5	33	Night Period	59	Complies

TABLE B.7 – ASSESSMENT OF L_{AMAX} NOISE LEVEL EMISSIONS FROM TRUCK AIR BRAKE

Location	Assessable Noise Level, dB(A)	Applicable Times of Day	Applicable Assigned L_{AMax} Noise Level (dB)	Exceedance to Assigned Noise Level (dB)
R1	50	Night Period	59	Complies
R2	51	Night Period	59	Complies
R3	53	Night Period	59	Complies
R4	58	Night Period	60	Complies
R5	51	Night Period	59	Complies