

SOUL FRIENDS PET CREMATATIONS

SOUL FRIENDS PET CREMATORIOUS AND WORKSHOP, ASHURST

UPDATED UPDATED ASSESSMENT OF
ENVIRONMENTAL NOISE EFFECTS REPORT
- LU5959

SEPTEMBER 2021

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Soul Friends Pet Crematorium and Workshop, Ashurst Updated Assessment of Environmental Noise Effects Report - LU5959

Soul Friends Pet Cremations

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REV	DATE	DETAILS
1	09 February 2021	Update for existing site activities
2	16 September 2021	Update for kennel and cattery closure
3	22 September 2021	Update for existing consent update

	NAME	DATE	SIGNATURE
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EXECUTIVE SUMMARY

This report provides an updated assessment of noise for the proposed activities at 94 Mulgrave Street in relation to LU5959, since the application was submitted the kennels that previously operated from the site have closed. Hence this report provides an update in respect to noise effects.

WSP has undertaken an assessment of the noise associated with the proposed relocation and extension of an existing pet crematorium and woodwork workshop, operating as Soul Friends Pet Cremations (Soul Friends). It is proposed that the existing crematoria and workshop are relocated at new location at 94 Mulgrave Street, in Ashurst. The proposal involves a new building being constructed to the north on the 94 Mulgrave Street site which will eventually house four crematoria and associated stacks (two existing and two new), along with the relocated workshop, a reception, staff areas, and non-denominational chapel.

The operation of the crematorium and workshop will generally occur between 0900 and 1700 hours Monday to Friday; however, the crematorium activities may run until 2100 hours if any crematorium chambers are non-operational due to maintenance. All staff will be offsite prior to 2200 hours.

The proposed site activities are:

- The operation of the workshop between 0900 and 1700 hours
- Two cremation chambers operating concurrently. Cremation services will not operate all day, as each burn takes approximately 2.5 hrs to undertake, with downtime between each burn for cooling, loading and unloading.

We have undertaken an assessment based on both the workshop operation in isolation, and another assessment considering the workshop and crematorium operating concurrently in a worst-case scenario. We have assessed noise from vehicles arriving and leaving the site separately as the peak staff vehicle movements will occur outside of when the crematorium or workshop operates.

While assessments have been undertaken against the relevant District Plan Standards at the property boundaries, alternative noise limits for the site have been developed. This has been undertaken based on the context of the wider site, as some adjacent properties are commercial in nature or are not noise sensitive (pastoral land, rather than residential).

For completeness we have also assessed noise against the Palmerston North City Council District Plan noise Standards which assesses noise at the boundary of rural zoned sites. Although these limits are exceeded at some adjacent sites between 1 and 12 dB, the effect is not considered to be significant.

Noise from a scenario where the workshop solely operates achieves the recommended noise limits at the boundary of the property and notional boundary of any dwelling in the rural zone at all adjacent properties.

Noise from the workshop operating concurrently with the crematorium achieves the recommended noise limits at the boundary of any residential zone and notional boundary of any dwelling in the rural zone at all properties.

Therefore, on the basis of the assessments presented within this report, noise as a result of the crematorium and workshop on the site is not considered to be a material constraint to the reasonable operation of the facility.

1 PROJECT BACKGROUND

WSP has been appointed by Soul Friends to provide acoustic consultancy services to assess the noise effects associated with the relocation and extension of the current pet crematorium and existing workshop. The existing crematorium and wood workshop is to be relocated to a single new site at 94 Mulgrave Street, in Ashurst.

Previously Tolly Farm Kennels and Cattery operated from the site, this activity has now permanently closed and will no longer be considered part of the existing environment.

Soul Friends Pet Crematoriums provides cremation services for private individuals, vet clinics, and education providers in the Manawatu-Tararua area. The relocation of the two existing chambers, and the addition of another two cremation chambers would provide a higher capacity and provide specialist services for individuals who want to witness the cremation. Relocating the workshop to the same site as the crematorium would provide a single site for all staff at Soul Friends.

This noise assessment is based on our correspondence with the applicant to date along with the following documentation:

- Operating procedure document titled *Standard operating Procedure; Cremator Operation*, numbered 09-20, prepared by Soul Friends Limited, and received by email on 26 November 2020; and,
- Site layout titled *Tolly Farm – Soul Friends; 94 Mulgrave St, Ashurst; Site Plan*, as prepared by Total Span, and received by email on 5 October 2020.

This report outlines relevant operational acoustic criteria for the relocation and extension of the crematorium and workshop and assesses the potential operational noise effects against the acoustic criteria.

2 SITE DESCRIPTION

2.1 SITE LOCATION

The area surrounding the proposed site is generally rural in nature to the north, east and west. A plant nursery is located to the east, and an abattoir is located to the west of the proposed site. Rural dwellings are located further north. To the south is undeveloped residential land, and low-density typically single-story residential dwellings. The site is located in a Rural Zone, as are the sites immediately to the east, west and north. The sites to the southeast, southwest, and south across Mulgrave Street are located in a Residential Zone.

The wider subject site includes an existing residential dwelling. Previously a kennels and cattery operated on the site, which was recently permanently closed due to COVID-19 impacts. As such, in future only the crematorium and workshop will operate on the site.

A proposed new building which is to house the crematorium, workshop, chapel and administrative spaces is to be constructed to the north of the current buildings on site, as shown in pink in

Figure 2.1 and described below. A new internal driveway will be developed between the current driveway and proposed new building. The location of the proposed development in the context of the surrounding area is shown in

Figure 2.1.

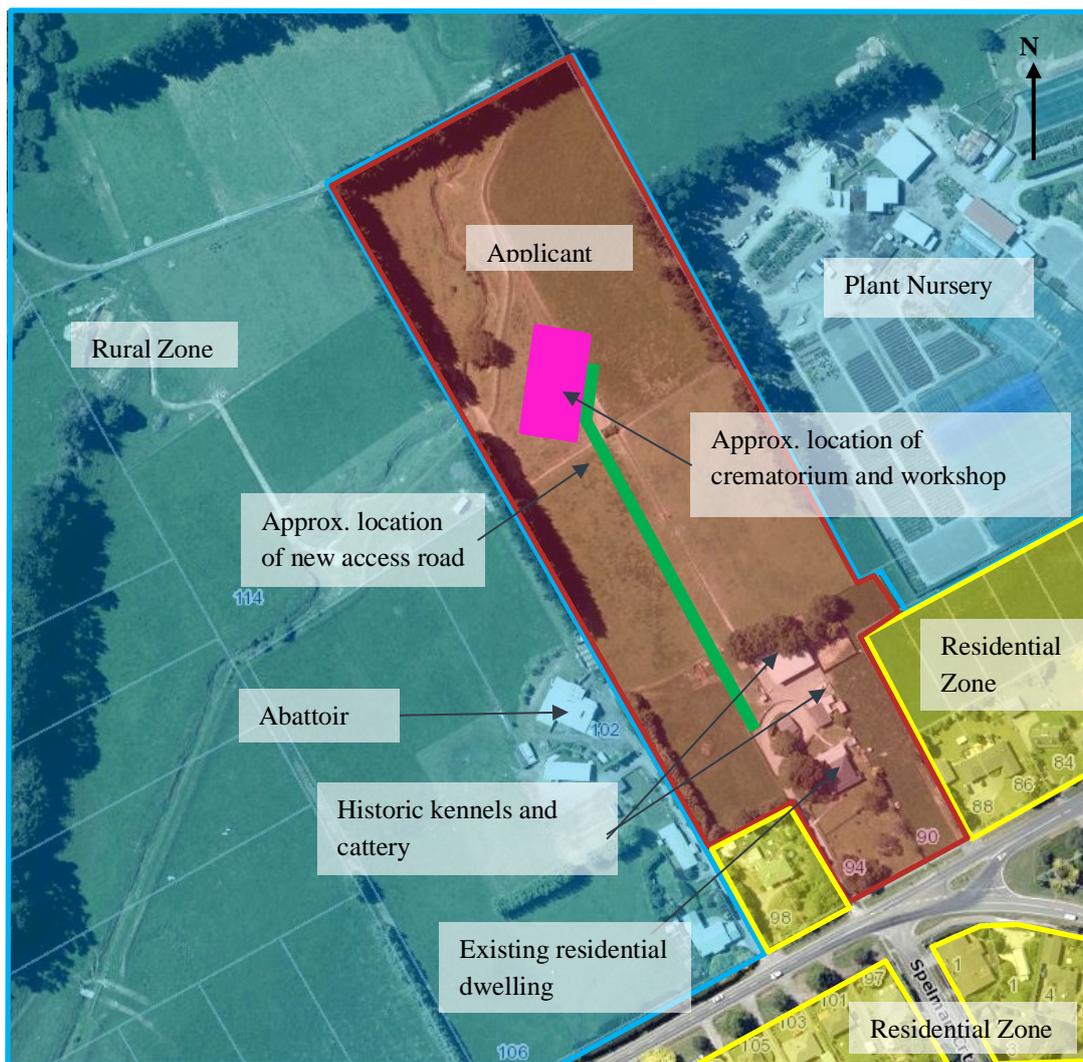


Figure 2.1 Location of the proposed building (in pink) (Palmy Local Maps accessed 02/12/2020)

2.2 NOISE SENSITIVE RECEPTORS

There are multiple existing noise sensitive receptors surrounding the site. These include:

- 102/106 Mulgrave Street (abattoir) and 83 Winchester Street (plant nursery) which are commercial in nature
- 88, 97, and 98 Mulgrave Street (residential zoned with dwellings on the land)
- 114 Mulgrave Street and 167 Wyndham Street (rural zoned land)
- 73 Winchester Street (residential zoned land with no dwelling currently on the land)

The above properties are shown in relation to the proposed site in Figure 2.2.



Figure 2.2 Location of nearby noise sensitive properties

2.3 PROPOSED ACTIVITY

The proposal is to construct a new building to the north of the 94 Mulgrave Street site, adjacent to the unnamed stream that runs through the site, with a new vehicle access leg between the current driveway and proposed building. Additionally, new parking facilities for staff and customers and an area for receiving deliveries are proposed.

The proposed building is to be constructed from profiled steel and lined internally on the walls with plywood. There will be sliding/roller doors in the façade of the building to allow for access, ventilation, and ease of movement into the workshop and crematorium. Mechanical ventilation will be provided into the workshop spaces.

The proposed building is to contain:

- The two current crematorium chambers relocated to the site and two proposed new crematorium chambers, with the stacks penetrating the roof.
- A woodwork workshop.
- Staff room and amenities.
- A reception, non-denominational chapel, and private area to watch the crematorium process.

Staff for the workshop and crematorium will generally arrive on site around 0900 hours, and on a typical day leave around 1700 hours. When a crematorium chamber is having maintenance (2 – 3 times a year), crematorium staff may depart the site later (around 2100 hours) to allow for an additional burn cycle, this would not be a common occurrence.

A total of 6 staff, consisting of 3 full time employees and 3 part-time employees are to work at the proposed building, Monday to Friday. The crematorium and workshop will operate concurrently though crematorium burn cycles. During the loading and cool-down cycles of the crematorium, the workshop will also operate. Only up to two chambers of the crematorium will operate at once.

The wider area will include a memorial garden, which is open to the public, but by invitation only. Visitor numbers will be limited, but for the purposes of this assessment it is assumed that 6 vehicle movements in a worst-case 15 minute period may occur (same as staff movements). In addition, it is unlikely that visitors will come onto site during a cremation process.

A new acoustic fence is to be installed along the boundary of 98 Mulgrave Street and the current driveway of the site. This acoustic fence will continue along the northern boundary of 98 Mulgrave Street, described further in Section 4.2.1.

3 ACOUSTIC CRITERIA

Section 16 of the Resource Management Act (RMA) requires occupiers of land to ensure any noise generated is of a reasonable level. A District or Resource Management Plan presents noise limits which have been developed by the Council to provide guidance as to reasonable general noise limits in certain zones.

Noise limits set in District Plans are general rules for a zone and not specific to a single site or particular land use. Specific sites may be more or less noise sensitive depending on the site use and surrounding noise environment. Therefore, it is appropriate to consider alternative criteria in such circumstances, which are relevant to the specific site and surrounding area.

Guidance as to a reasonable level of noise received at adjacent noise sensitive receivers is provided in several national and international sources, as outlined below.

3.1 PALMERSTON NORTH CITY COUNCIL DISTRICT PLAN

The noise limits for the Rural Zone are outlined in Section 9.11 *Rules: Noise*, in the Palmerston North City Council (PNCC) District Plan .

11.11.9 *Rules: Noise*

R9.11.1 *Noise*

Sound emissions from any activity in the Rural Zone when measured at or within the boundary of any land zoned for residential purposes or at or within the boundary of any land in the Rural Zone (other than land from within the noise is emitted or a road) shall not exceed the following:

<i>7.00 am – 7.00 pm</i>	<i>50 dB $L_{Aeq}(15 mins)$</i>
<i>7.00 pm to 10.00 pm</i>	<i>45 dB $L_{Aeq}(15 mins)$</i>
<i>10.00 pm – 7.00 am</i>	<i>40 dB $L_{Aeq}(15 mins)$</i>
<i>Night-time L_{max}</i>	<i>10.00 pm – 7.00 am 70 dBA L_{max}</i>

Noise between Business Zones in the PNCC District Plan are required to achieve between 60 dB $L_{Aeq}(15 min)$ to 70 dB $L_{Aeq}(15 min)$ depending on the type of Business Zone the noise receiver and source are located within. This is typical as businesses are less noise sensitive than residential or rural properties, and generally do not change in sensitivity between daytime and night-time.

As outlined in Section 6.2 of the Palmerston North City Council District Plan, noise is to be measured in accordance with NZS 6801:2008 *Acoustics – Measurement of Environmental Sound* and assessed in accordance with NZS 6802:2008 *Acoustics – Environmental Noise*.

Specific noise sources (outside of the scope of this assessment) such as construction noise, road traffic noise, and/or helicopters are to be assessed against the appropriate New Zealand Standard, rather than the fixed noise limits above.

3.2 NEW ZEALAND STANDARD NZS 6802:2008

The District Plan references NZS 6802:2008 for assessing noise emissions. New Zealand Standard NZS 6802 provides guidance daytime noise limit at the boundary of any residential zoned site or the notional boundary of any rural zone (20 metres from any habitable dwelling) of 55 dB $L_{Aeq}(15 min)$ and an evening noise limit of 50 dB L_{Aeq} which have been set “for the reasonable protection of health and amenity associated with use of land for residential purposes”.

NZS 6802 states that a 60 dB $L_{Aeq(15 \text{ min})}$ noise limit is appropriate during the day “for the protection of amenity values for the character of a mixed-use area or zone”, which could be considered adequate for commercial properties in this setting.

The use of the notional boundary for the assessment of noise is generally the area where the majority of residential living activities occur and is a more practical approach for this assessment for rural zoned land.

3.3 WORLD HEALTH ORGANISATION

The World Health Organisation (WHO) *Guidelines for Community Noise* (1995) document discusses health effects for environmental noise exposure including sleep disturbance, annoyance and speech disturbance. This document states that a 55 dB L_{Aeq} noise limit at the boundary of residential zones or the notional boundary of dwellings in a rural zone over a 16 hour daytime period will ensure that few people are seriously annoyed by an activity and a 50 dB L_{Aeq} noise limit at any noise sensitive location over a 16 hour daytime period will cause few people to be moderately annoyed.

3.4 DISCUSSION OF ACOUSTIC CRITERIA

Based on the documents discussed in sections 3.1-3.3 above, noise limits have been proposed, which provide what is considered to be a reasonable level of noise for the proposed activity from the site. These have developed based on protecting the existing amenity for residential dwellings in the rural and residential zones, with a slightly relaxed design requirement adopted for the existing properties which are commercial in nature (plant nursery and abattoir), at a level in keeping with the design requirement for commercial properties in an urbanised area.

Proposed project noise limits are provided in Table 3.1.

Table 3.1 Proposed Project Noise Limits

ZONE	TIME	NOISE LIMIT AT ADJACENT SITES
Residential Zone (noise limit applies at the boundary of the site being assessed)	0700 – 1900 hours	50 dB $L_{Aeq(15 \text{ min})}$
	1900 – 2200 hours	45 dB $L_{Aeq(15 \text{ min})}$
Rural Zone (noise limit applies at the notional boundary of dwellings within this zone)*	0700 – 1900 hours	50 dB $L_{Aeq(15 \text{ min})}$
	1900 – 2200 hours	45 dB $L_{Aeq(15 \text{ min})}$
Rural Zone (noise limit assessed at site boundary for commercial activities on rural zoned land, abattoir and nursery)*	At all times	60 dB L_{Aeq}

* We have also undertaken a separate review of noise at the site boundary of adjacent sites against the District Plan Rural Zone rules for completeness.

4 ASSESSMENT OF NOISE EFFECTS

The main noise sources associated with the operation of the relocated workshop and crematorium are expected to be:

- Break-out noise from the operation of the fans associated with the crematorium chambers.
- Noise from the stacks associated with the crematoria.
- Break-out noise from the woodwork workshop including extract systems.
- Noise generated by vehicles entering and exiting the site.

Noise from people outside of the building talking (such as from people on a coffee break, sitting outside during lunch, or guests walking from the carpark to the reception) are expected to produce minimal noise emissions. We would expect the effects of these to be negligible due to the relatively low level, infrequent occurrence and distance to surrounding boundaries. Therefore, noise from these sources is not considered within this assessment.

4.1 CURRENT ACTIVITY

Currently, the crematorium and workshop operate over two different sites. On the 8th of October 2020, George van Hout from WSP visited both the current workshop site and crematorium to undertake noise measurements of the current activities which occur at both of these sites. Results from the measurements are provided below.

4.1.1 WORKSHOP

During our site visit, the current workshop was located within an independent building, on a rural property not owned or operated by the applicant. This workshop is a shared working space, used by others (joinery business). During the time on site, people not associated with Soul Friends were also using the workshop space, however; measurements were only taken of machinery that is to be relocated to the proposed new workshop.

The workshop creates hand-made wooden urns for housing the ashes of pets for owners to keep. The machinery used in the creation of these wooden urns includes bench saws, drills, routers, planes, and belt sanders. Various hand tools are also used. The main equipment is summarised in Table 4.1.

Noise measurements were undertaken close (1.5 metres away) to the equipment, along with general reverberant levels within the space when multiple pieces of equipment were in operation. All measurements were undertaken within the workshop such that the influence from ambient noise (such as noise from birds and vehicles) was negligible.

Based on our site visit, observations of the use of the equipment were:

- Two workshop staff were on site while the site visit was undertaken.
- The equipment was not used continuously, so there were periods where no equipment was used. This ranged between 30 seconds and 5 minutes, depending on the activity that was occurring.
- Equipment was used concurrently, with staff undertaking various tasks, including using the bench saw and belt sander concurrently.
- Each piece of equipment had its own dedicated dust removal system (where relevant).

The equipment, and measured sound level is given in Table 4.1 below. Where reverberant noise levels are provided, measurements were undertaken away from the operational equipment such that one source was not dominant over the other. The reverberant levels were representative of the existing workshop environment.

Noise from handheld tools such as hammers, hand sand papering, hand saw, etc. did not generate significant noise levels compared to machinery outlined in Table 4.1. The equipment measured is considered to be amongst the noisiest activities in the workshop.

Table 4.1 Measured noise level of workshop equipment

Equipment	Noise Level
Belt sander with extract fan	75 dB $L_{Aeq(30 \text{ sec})}$ at 1.5 m away
Bench router	78 dB $L_{Aeq(30 \text{ sec})}$ at 1.5 m away
Bench side drill	75 dB $L_{Aeq(20 \text{ sec})}$ at 1.5 m away
Bench planer	89 dB $L_{Aeq(20 \text{ sec})}$ at 2 m away
Table plane/square edge	80 dB $L_{Aeq(20 \text{ sec})}$ at 1.5 m away
Table saw	88 dB $L_{Aeq(30 \text{ sec})}$ at 1.5 m away
Reverberant level with belt sander, extract fan and bench router	73 $L_{Aeq(30 \text{ sec})}$ SPL _{rev}
Reverberant level with table plane/square edge and belt sander	73 dB $L_{Aeq(30 \text{ sec})}$ SPL _{rev}
Reverberant level with table saw and belt sander operating	80 dB $L_{Aeq(30 \text{ sec})}$ SPL _{rev}

Noise measurements were only undertaken while the equipment was operational. No long-term (15 minute) measurements were undertaken as the workshop was used by others and would not be representative of the new facility.

4.1.2 CREMATORIUM

The existing crematorium is located in a commercial precinct in Fitzherbert, in Palmerston North. The current building contains two large crematorium chambers and associated supply fans (for gas and air), with the two stacks penetrating through the roof to approximately 10 metres high.

Based on site observations, discussions with the client, and the Cremation Procedure document, once the cremator is loaded and shut, the following procedure is followed:

- The hearth fan is turned on to remove any fumes which may ignite. This runs for approximately 5 minutes.
- The after burner in the secondary chamber then turns on to heat the chamber and stacks. This runs for approximately 20 minutes.
- Both burners in the primary chamber then ignite, heating the chamber to approximately 800 degrees Celsius.
- The primary burners cycle on and off based on the temperature of the chamber to keep it at approximately 800 degrees Celsius.

The total time of each cremation depends on the weight which is loaded into the chamber. Typically, a 150 kg load (made up of multiple animals) is used, which takes between 2 and 2.5 hours to complete a single cycle.

WSP undertook measurements of the crematorium at the following locations:

- Within the room which houses the crematorium chambers as a reverberant noise level.
- 10 metres from the partial open door to the room which contains the crematorium chambers.
- Locations around the building where noise from the two stacks are dominant.

Outside the crematorium room, other noise sources were also audible during the measurement period, including vehicles on Tennent Drive, birdsong, and noise from other tenancies in the general area.

Noise measurements were made during the first three stages of the cremation process above. During our site visit, a cowl was installed on top of both towers to reduce rain from entering the stacks while the kiln dried. This made audible noise

due to the air movement around the cowls. Once the cowls are removed, the less turbulent air is expected to result in lower noise levels; however, we have considered this worst-case level only with the cowl on for the purposes of this assessment.

The noise levels measured during our site visit of the crematorium operating are outlined in Table 4.2.

Table 4.2 Measured noise level of two cremators operating

Activity	Noise Level	Notes
Hearth fans operating only	81 dB $L_{Aeq(20\text{ sec})}$ SPL_{rev}	Measured inside the room (reverberant level) when hearth fans were only operating.
Noise from the stacks with hearth fans only	54 dB $L_{Aeq(20\text{ sec})}$ at 15 metres*	Measured behind building, away from traffic noise. Other noise was audible during measurements
Second fans and hearth fans operating only	83 dB $L_{Aeq(20\text{ sec})}$ SPL_{rev}	Measured inside the room (reverberant level) when hearth fans and secondary fans were operating.
Noise from the stacks with hearth fans and secondary fans	61 dB $L_{Aeq(20\text{ sec})}$ at 15 metres*	Measured behind building, away from traffic noise. Other noise was audible during measurements
Primary, secondary and heath fans all operating	84 dB $L_{Aeq(20\text{ sec})}$ SPL_{rev}	Measured inside the room (reverberant level) when all three sets of fans were operating.
Noise from the stacks with primary, secondary, and hearth fans operating	64 dB $L_{Aeq(20\text{ sec})}$ at 15 metres*	Measured behind building, away from traffic noise. Other noise was audible during measurements

*Noise was measured at a location 13 metres horizontally to the stacks, with the stacks approximately 8 metres above the measurement location.

The highest noise generating operation associated with the crematorium is when all six fans (two hearth fans, two primary fans, and two secondary fans) are operating concurrently.

During the initial stages when the hearth fans are operating only, noise levels from the stacks are 10 dB lower overall. During the warming of the stacks when the secondary fans operate concurrently with the hearth fans, noise levels from the stacks are 7 dB lower. Therefore, noise levels on site will be lower than predicted within this report during other stages of crematorium use.

4.2 PREDICTED NOISE LEVELS

SoundPLAN Version 8.1 3D computational noise modelling software has been used to predict the transmission of noise from the proposal to adjacent noise sensitive receptors, based on the methodology contained within ISO 9613-2. The assessment takes into account attenuation due to distance and terrain as well as absorption by the atmosphere and ground. Our assessment assumes worst-case downwind conditions in all directions from the source which provides a conservative approach for assessment.

Under NZS 6802:2008, where an activity produces a Special Audible Characteristic (SAC) a 5 dB penalty shall be applied. While the measured noise spectrum from each equipment does not show overly tonal levels (when assessed in line with NZS 6802:2008), this equipment can be intrusive, impulsive, and includes high speed cutting. Therefore, we have included a 5 dB penalty for Special Audible Characteristics from the workshop.

For activities on site that occur for a limited duration, or that occur during the daytime period, but at a reduced rate to the peak period assessed, a -5 dB duration adjustment can be applied under NZS 6802:2008. We have allowed a -5 dB

duration adjustment for vehicles entering and exiting the site only, as during the majority of the day (non-peak periods), vehicles movements will be considerably less than the peak periods for staff arriving and departing at the beginning and end of the day.

4.2.1 MITIGATION

An acoustic fence is proposed along the boundary of the site and 98 Mulgrave Street, as shown in Figure 4.1. The acoustic fence shall comply with the following minimum specifications:

- Height: 1.8 metres (min.)
- Surface mass: 10 kg/m² (min.)
- The fence shall be constructed and maintained such that there are no gaps or cracks in the fence. Where timber is used, the paling shall be overlapped by a minimum of 25 mm or a board and batten system implemented. A sleeper rail will be required sealing the bottom of the fence to the ground.
- If timber is used, this would be constructed of 25 mm pine (or equivalent) to resist warping.



Figure 4.1 Location of acoustic fencing

4.2.2 NOISE FROM THE WORKSHOP ONLY

We have assessed noise emissions from the workshop space within the proposed building. The workshop takes up approximately a quarter of the building, in the southwest corner. There are five roller/sliding doors proposed in the façade of the building. We have assumed for this analysis that all roller doors would be open, reflecting a worst case scenario for noise break out.

The workshop is to be a similar size, scale, and have a similar acoustic environment (all hard surfaces) as the current workshop where the source noise level were measured. Based on our existing site noise measurements, we have calculated that a reverberant internal noise level of 90 dB L_{Aeq} within the workshop area may occur during the worst-case operation of the workshop, which includes a 5 dB correction for SAC. We have assumed that this level would be approximately constant over a 15-minute period. This in reality may not occur as equipment is turned on when in use, and off to inspect progress, or as hand tools (hand sanding, light drilling, hammering pins) are used which have a significantly lower noise level. Therefore, this assessment is expected to be conservative.

Based on the above, and accounting for the acoustic fence installed in the location outlined in Figure 4.1, the predicted noise emissions from the workshop are provided in Table 4.3.

Table 4.3 Predicted operational noise levels from the workshop only

Property Address	Distance to assessment location, m	Predicted noise Level (dB L _{Aeq}) inclusive of SAC	Property type	Noise Limit (dB L _{Aeq})	Compliant?
106 Mulgrave Street	176	43	Rural	50	Yes
167 Wyndham Street	268	< 30	Rural	50	Yes
88 Mulgrave Street	200	43	Residential	50	Yes
97 Mulgrave Street	266	36	Residential	50	Yes
98 Mulgrave Street	180	43	Residential	50	Yes
73 Winchester Street	160	44	Residential	50	Yes
83 Winchester Street	75	52	Rural Commercial	60	Yes
102 Mulgrave Street	45	52	Rural Commercial	60	Yes

A noise contour map showing the noise emissions from this activity is provided in Appendix A.

Table 4.1 demonstrates that noise levels are predicted to achieve the noise limits at the site boundary of all residential zones, the notional boundary of all dwellings in the rural zone, and the site boundary of rural zoned sites which are commercial in nature. Therefore, effects from the workshop operating concurrently are predicted to be reasonable.

4.2.3 NOISE FROM THE CREMATORIUM AND WORKSHOP OPERATING CONCURRENTLY

We have assessed the noise emissions from the proposed building when activities in the workshop occur concurrently with the operation of the crematorium. The crematorium takes up one-half of the proposed building across the length of the building. The stacks penetrate the roof of the proposed building and will stand approximately 10 metres high. The roller/sliding doors in the façade are required to be open to allow for ventilation to the crematorium chambers, and so assessed all roller doors being open.

When all four crematoria are installed at the site, only two crematoriums chambers will operate concurrently. We have based our analysis on the noise measurements undertaken on site, with a calculated reverberant level within the building of 83 dB L_{Aeq} for two crematorium chambers operating, and noise out of the stack being 61 dB L_{Aeq} at 15 metres for one stack, both of which are assumed to be steady over a 15 minute period. The directivity of the stack for the measurements is generally representative of the directivity at receptor locations. The stack noise level is a worst-case scenario when the heath fan, after burner, and primary chamber burners all operate concurrently on both crematorium chambers. This would only occur after the first 25 minutes (the first 25 minutes is the hearth fan and secondary fan operating only) to heat the chamber up to 800 degrees Celsius. Once the chamber is at 800 degrees Celsius, the two primary burners will cycle on and off to keep temperature. Therefore, this noise assessment predicts the worst-case noise emissions generated. This

level of noise would not occur for the entire operating period, as the cremators run for approximately 2.5 hours for a typical burn period, with a down period for cooling, unloading, and loading.

For the combined assessment it has been assumed that the workshop operation is the same as that outlined in Section 4.1.1.

Based on the above, and accounting for the acoustic fence installed in the location outlined in Figure 4.1, the predicted noise emissions from the workshop and crematoriums operating concurrently are provided in Table 4.4.

Table 4.4 Predicted operational noise levels from the workshop and crematorium operating concurrently

Property Address	Distance to assessment location, m	Predicted Noise Level (dB L _{Aeq}) inclusive of SAC	Property type	Noise Limit (dB L _{Aeq})	Compliant?
106 Mulgrave Street	176	45	Rural	Daytime 50	Yes
				Evening 45*	Yes
167 Wyndham Street	268	40	Rural	Daytime 50	Yes
				Evening 45*	Yes
88 Mulgrave Street	200	44	Residential	Daytime 50	Yes
				Evening 45*	Yes
97 Mulgrave Street	266	42	Residential	Daytime 50	Yes
				Evening 45*	Yes
98 Mulgrave Street	180	45	Residential	Daytime 50	Yes
				Evening 45*	Yes
73 Winchester Street	160	45	Residential	Daytime 50	Yes
				Evening 45*	Yes
83 Winchester Street	75	54	Rural Commercial	60	Yes
102 Mulgrave Street	45	52	Rural Commercial	60	Yes

*Lower noise limit as the cremators may operate until 2200 hours for maintenance purposes, where the workshop will only operate until 1700 hours.

A noise contour map showing the noise emissions from this activity is provided in Appendix B.

Table 4.1 demonstrates that noise emissions are predicted to achieve the proposed noise limits at the site boundary of all residential zones, the notional boundary of all dwellings in the rural zone. Therefore, effects from the workshop operating concurrently with the crematorium are predicted to be reasonable.

We have also assessed noise at the boundary of the rural zoned sites. Noise emissions are predicted to achieve the District Plan noise Standards at the site boundary of the majority of rural zoned sites. Further description of these properties is provided below.

4.2.4 NOISE LEVELS AT RURAL SITE BOUNDARIES

Predicted noise at the boundary of adjacent rural zoned sites has been assessed against the PNCC District Plan standards.

Regarding noise from the workshop operating solely, our predictions show that the noise level at the site boundary of all adjacent rural zoned sites achieve the District Plan noise standards. This is except for 83 Winchester Street and 102 Mulgrave Street, which are 2 dB higher than the general Rural Zone noise standards outlined in the District Plan. We have the following comments on this:

- A 2 dB increase is subjectively and imperceptible increase in loudness.
- These two properties are commercial in nature and so are less noise sensitive than residential rural type properties.
- The effects associated with the slight exceedances of the District Plan noise limits are negligible.
- The analysis assumes that workshop equipment will operate concurrently for an entire 15-minute period. This is unlikely to actually occur for any extended period of time, and therefore noise levels will be lower.

With regard to noise at the boundary of rural zoned sites when the workshop operates concurrently with the crematorium:

- The predicted noise levels exceed the general Rural Zone noise standards outlined in the PNCC District Plan at the boundary of the adjacent site, as shown in Table 4.5. We do not expect that these exceedances are significant, due to the following:
 - The predicted noise levels are from the worst-case operation of the crematorium activity when it occurs during worst-case operation of the workshop. The crematorium will not operate over the entire daytime period (only for 2.5 hrs at a time, with a respite time for cooling, loading and unloading). In addition, when operating, noise is expected to be lower as all fans are not operating concurrently and at full all of the time.
 - Operation of the crematorium after 1700 hours is expected to occur up to three times per year when other chambers cannot operate for maintenance purposes. For completeness Table 4.5 provides the difference in noise level to the evening noise standards.
 - 83 Winchester Street and 102 Mulgrave Street are currently commercial in nature, as they are a plant nursery and abattoir (consecutively). These sites therefore are significantly less noise sensitive than residential activities and would generate their own noise. They would also not be noise sensitive outside of operating hours. Therefore, the Rural Zoned noise standards are not a good indication of effects at these properties.
 - The area which experiences elevated levels of noise above the Rural Zone noise limits at 167 Wyndham Street, 102 Mulgrave Street, and 114 Mulgrave Street are not near any residential dwellings with the land currently used as pasture for stock.
 - A dwelling could only be built as a permitted activity in the northwest and southeast corners of 114 Mulgrave Street due to the unnamed stream and flood prone areas throughout this lot.
 - If a dwelling was to be constructed in the southeast corner (which is the closest site where a dwelling could be built near the boundary of the Soul Friends site) it would likely be cost prohibitive as the vehicle access leg to the area would need to cross the unnamed stream twice and require discretionary consent from the regional council as well as there being restrictions for habitable buildings in this area. Nevertheless, hypothetically any dwelling in this area may receive levels between 50 – 57 dB $L_{Aeq(15\ min)}$.
 - If a dwelling was to be constructed in the northwest corner it would be further from the Soul Friends site and it would also require consent from the regional council due to the access having to cross the unnamed stream. Any dwelling constructed in this area would receive levels of 43 – 48 dB $L_{Aeq(15\ min)}$.
- When considering the limited times per year that activities between 1900 and 2200 hours would actually occur, along with not occurring for the entire period (as staff will leave by 2100 hours), the exceedances are considered reasonable.
- Due to the above, we therefore expect any noise effects with these exceedances are negligible.

Table 4.5 Technical non-compliance

Property	Technical non-compliance at property boundary	
	0700 – 1900 Hours (50 dB L _{Aeq} limit)	1900 – 2200 Hours (45 dB L _{Aeq} limit)*
83 Winchester Street	4 dB	9 dB
102 Mulgrave Street	2 dB	7 dB
114 Mulgrave Street	7 dB	12 dB
106 Mulgrave Street	-	1 dB

*Will only occur up to four times per year.

4.2.5 NOISE FROM VEHICLES ENTERING AND EXITING THE SITE

Vehicles will enter and exit the site as staff arrive and depart, when visitors come to the site, and for deliveries to the workshop and crematorium. The proposal is for carparks to the northwest and southeast of the proposed building, with the sole entry and exit onto Mulgrave Street, utilising the existing entry/exit.

Based on advice from the operator of the crematorium and workshop, up to 6 staff vehicle movements will arrive prior to 0900 hours and generally depart at 1700 hours, Monday to Friday. While workshop staff will always depart at 1700 hours, crematorium staff may depart later (prior to 2200 hours) if additional usage is required when a crematorium chamber is down for maintenance (up to three times per year). We have assumed that all staff would arrive or depart in a worst-case 15 minute period (6 vehicle movements).

The occasional visitor or light delivery vehicle will occur during the day. All vehicle activities occur within the “daytime” period outlined in the PNCC District Plan. Visitor numbers will be controlled by an invitation only process. However, as a worst-case scenario we have assumed that 6 vehicle movements may occur in a worst-case 15 minute period, the same as staff movements.

It is proposed that the acoustic fence described in Section 4.2.1 will be installed along the boundary of the site shown in Figure 4.1. Staff would arrive and/or depart outside of when other activities occur in the proposed new building, and therefore we have assessed these scenarios in isolation.

We have undertaken calculations of light vehicles moving through the site based on a sound level of a vehicle drive-by having an SEL of 71 dB L_{AE} at 10 metres. The predicted noise from traffic is provided in Table 4.6.

Table 4.6 Predicted noise emissions from vehicles

Property Address	Distance to Boundary, m	Predicted Noise Level (dB L _{Aeq})	Property type	Project Noise Limit (dB L _{Aeq})	Compliant?
106 Mulgrave Street	42	34	Rural	50	Yes
167 Wyndham Street	120	30	Rural	50	Yes
88 Mulgrave Street	55	33	Residential	45	Yes
97 Mulgrave Street	26	36	Residential	45	Yes
98 Mulgrave Street	4	39	Residential	45	Yes
73 Winchester Street	55	33	Residential	45	Yes
83 Winchester Street	72	32	Rural Commercial	60	Yes
102 Mulgrave Street	42	34	Rural Commercial	60	Yes

As shown above, noise from traffic is predicted to be within the noise limits at the site boundary of adjacent residential zones, or at the notional boundary of any dwellings within the rural zone. Therefore, effects from noise associated with traffic are reasonable.

Noise from traffic are also predicted to be below the District Plan noise limit at the boundary of adjacent rural zone sites.

5 CONCLUSIONS

WSP has undertaken an assessment of the noise associated with the relocation and extension of the existing pet crematorium and workshop. The proposal is to relocate the activities to a new site at 94 Mulgrave Street, in Ashhurst. The proposal is for a new building in the north of the site which will house four crematorium chambers and associated stacks (two existing and two new), along with the relocated woodwork workshop, a reception, staff areas, and denominational chapel.

The activity at the site will generally occur between 0900 and 1700 hours Monday to Friday; however, the crematorium may run until 2100 hours on occasion if crematorium chambers required additional maintenance (up to three times per year). All staff will be offsite prior to 2200 hours and maintenance after hours is expected to be relatively infrequent.

Only two cremators will operate concurrently, along with the workshop. Cremation services will not operate all day, as each burn takes approximately 2.5 hrs to undertaken, with downtime between each burn for cooling, loading and unloading. The workshop will operate throughout the 0900 to 1700 hours period.

We have undertaken our assessment based on both the workshop operation in isolation, and separately based on the workshop and crematorium operating concurrently in a worst-case scenario. We have assessed noise from vehicles individually as staff will arrive or depart outside of when the crematorium or workshop operates.

Noise from the workshop operating only achieves the recommended project noise limits at the boundary of any residential zone and notional boundary of any dwelling in the rural zone at all properties.

Noise from the workshop operating concurrently with the crematorium achieves the recommended project noise limits at the boundary of any residential zone and notional boundary of any dwelling in the rural zone at all properties.

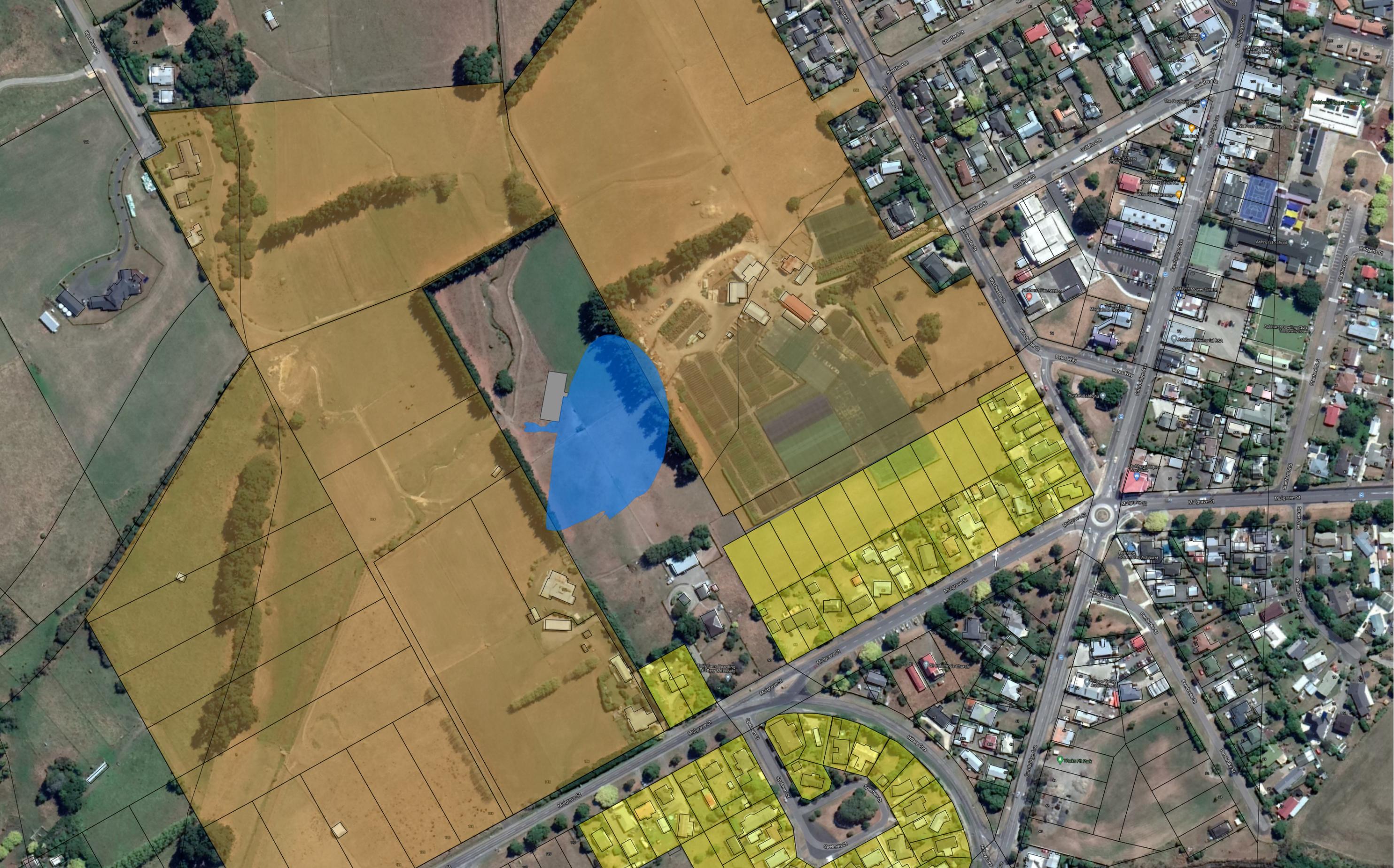
For completeness we have also assessed noise against the PNCC District Plan noise standards. Although these standards are exceeded in some areas at the property boundary. The technical exceedances are over areas of land that are used for pasture/grazing of animals and a stream runs through a portion of this land. No residential dwellings are currently in this area and cannot be built in the area potentially most affected as of right. In addition, the 83 Winchester Street is used for a plant nursery and 102 Mulgrave Street is used for an abattoir, which are commercial activities, and so are not considered to be noise sensitive.

Therefore, on the basis of the assessments presented within this report, noise as a result of the crematorium and workshop on the site is not considered to be a material constraint to the reasonable operation of the facility and adverse effects are not significant.

APPENDIX A

NOISE CONTOUR FOR SCENARIO
WHERE WORKSHOP OPERATES ONLY





Map: 201210-5-P1403-GvH-MAP1	Author: GvH			Legend ■ Workshop Operating Only - 50 dB LAeq Contour ■ Proposed Building ■ Rural Zone ■ Residential Zone	Soul Friends Pet Crematorium and Workshop, Ashurst Noise Contour of workshop operating only	
Date: 10/12/2020	Approved by: CB					1:2500 at A3
To be read in conjunction with WSP document:		<REPORT_ID>	<div style="display: flex; justify-content: space-between; align-items: center;"> <div data-bbox="0 2016 742 2058" style="font-size: 8px;"> <small>© WSP New Zealand Ltd ("WSP") Copyright in the drawings, information and data recorded ("the information") is the property of WSP. This document and the information are solely for the use of the authorised recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that which it was supplied by WSP. WSP makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or the information. NCSI Certified Quality System to ISO 9001. © APPROVED FOR AND ON BEHALF OF WSP New Zealand Limited.</small> </div> <div data-bbox="2671 1963 2849 2047" style="font-size: 24px; font-weight: bold; color: red;"> wsp </div> <div data-bbox="2700 2058 2849 2089" style="font-size: 10px;"> www.wsp.com </div> </div>			

APPENDIX B

NOISE CONTOUR FOR SCENARIO
WHERE 2 CREMATORIUM STACKS ARE
OPERATING ONLY





Map: 201210-5-P1403-GvH-MAP2 Date: 10/12/2020	Author: GvH Approved by: CB	 N	 1:2500 at A3	Legend <ul style="list-style-type: none"> Two Cremators and Workshop Operating Concurrently - 50 dB LAeq Contour Two Cremators and Workshop Operating Concurrently - 45 dB LAeq Contour Proposed Building Rural Zone Residential Zone 	Soul Friends Pet Crematorium and Workshop, Ashurst Noise Contour of workshop and two cremators operating concurrently
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To be read in conjunction with WSP document: <REPORT_ID>
 Map Source: Google Maps
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