

ATTACHMENT TO AGENDA ITEM

Ordinary Meeting

17 December 2019

Agenda Item 11.1	Planning Permit Application 2015-79/A - Amendment seeking permission for concrete crushing and mulching of timber in the Farming Zone	
Attachment 1	Watson Moss Growcott Acoustic Report	372



CONSULTANTS: ACOUSTICS, NOISE & VIBRATION CONTROL

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5545 MIDLAND HIGHWAY BYRNESIDE
APPLICATION TO AMEND PLANNING PERMIT TO ALLOW CHANGE IN HOURS OF
OPERATION, CONCRETE CRUSHING AND MULCHING

Assessment of Noise Emissions to Residential Premises During Trial
Crushing of Concrete/Masonry Rubble and Mulching of Green and Dry Timber

A report
prepared on behalf of:

Greater Shepparton City Council
90 Welsford St,
Shepparton VIC 3630

Ref: 12486-1ng.docx
23 September 2019



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1. INTRODUCTION

The subject site is located at 5545 Midland Highway Byrneside. An existing Planning Permit allows for the site to be used for a demolition contractor's depot including storage of demolition waste.

The hours of operation for the use under the existing Planning Permit are 7:30am to 5:00pm Monday to Friday.

An application has been made to amend the existing Planning Permit to allow:

- Extension of hours to include operation from 7:30am to 5:00pm on weekends and public holidays.
- Concrete crushing and mulching of timber waste to occur on the site.

Subsequent to the amendment application being made and before the acoustic testing which is the subject of this report, the application for extension of hours was withdrawn.

As part of the environmental approvals process for the proposal, Watson Moss Growcott Acoustics Pty Ltd (WMG) has been engaged to carry out an assessment of noise emissions from the subject site due to concrete crushing and timber mulching carried out at the site during a trial.

This report presents the results of the acoustic assessment and considers noise emissions associated with the use that is sought in accordance with the Victorian Environment Protection Authority Publication 1411 *Noise from Industry in Regional Victoria – Recommended Maximum Noise Levels from Commerce, Industry and Trade Premises in Regional Victoria* (NIRV).

The objective has been to determine if the proposed use can be added to the existing operations at the subject site while remaining in overall compliance with the NIRV Recommended Maximum Noise Levels.

2. NOISE ASSESSMENT TERMINOLOGY

Noise assessment terminology used within this report is defined within Table 1 below:

Table 1: Noise Assessment Terminology

Terminology	Definition
dB(A)	Decibels recorded on a sound level meter, which has had its frequency response modified electronically to an international standard, to quantify the average human loudness response to sounds of different character
L ₉₀	The level exceeded for 90% of the measurement period, which is representative of the typical lower levels in a varying noise environment. It is the noise measure defined by the EPA as the measure of the background noise level to use in determining noise limits.

<u>Terminology</u>	<u>Definition</u>
L_{eq}	The equivalent continuous level that would have the same total acoustic energy over the measurement period as the actual varying noise level under consideration. It is the noise measure defined by the EPA as the measure of the noise to use in assessing compliance with noise limits.
Sound power level	The amount of energy emitted from a source in the form of sound.

3. SITE AND ENVIRONS

The subject site is located at 5545 Midland Highway Byrneside, where the local area is predominantly agricultural land.

The site abuts the Midland Highway to the south, the Byrneside-Gillieston Road to the west and railway associated land on the other boundaries.

Noise emissions associated with the proposed facility will require consideration at residential receptors in the vicinity of the subject site.

The planning scheme map in Appendix One identifies the subject site and the noise sensitive receptors relevant as part of this assessment. The blue numbers on the planning scheme map are the street numbers on Byrneside-Gillieston Rd (the north-south road) and the Midland Hwy (the east-west road)

The site and all relevant residential receptors occupy Farming zoned land (FZ1). The subject site is abutted by land zoned PUZ4 and RDZ1

4. NOISE EMISSION ASSESSMENT CRITERIA

4.1 ASSESSMENT CRITERIA

When considering noise emissions associated with the proposed new use at the subject site, resultant noise levels at residential receptors are considered in accordance with the following guideline and policy:

- *Environment Protection Authority Publication 1411 Noise from Industry in Regional Victoria – Recommended Maximum Noise Levels from Commerce, Industry and Trade Premises in Regional Victoria (NIRV); and*
- *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP N-1).*

The NIRV document was introduced in 2011 to provide guidance on suitable noise emission assessment criteria for regional areas within Victoria but outside Metropolitan Melbourne.

SEPP N-1 is applicable within Metropolitan Melbourne, but is also a reference document for NIRV, providing noise assessment methodologies.

The NIRV document includes Recommended Maximum Noise Levels (RMNLs) which are determined based on the Planning Scheme land use zonings associated with the location/s of the commercial noise emissions and the noise sensitive residential receptors. The RMNL's described within the NIRV document are guideline values.

The recommended levels only gain a higher status than recommendations if adopted as Conditions in a Planning Permit or Operating Licence, which is common practice. In the absence of adoption of the RMNLs in a Planning Permit or Operating Licence, the EPA would apply the NIRV RMNLs if called upon to consider noise complaints.

The existing Planning Permit requires compliance with NIRV and SEPP N-1.

For residential receptors located outside major urban centres of regional Victoria like the subject site, RMNL's are based on set methodologies described within NIRV including:

- consideration of the land zoning of the 'noise-generating use' and the land zoning of the 'noise-receiving location' and
- the shortest distance of the house under consideration to the boundary of the zone in which the noise emitter is located, where the noise generator and the noise receiver are located in different zones.

In 'background relevant areas' where background levels may be higher than usual for a rural area, the background level can also influence the RMNLs. 'Background-relevant areas' are typically near major roads or the coast, locations which include ongoing sources of ambient noise.

Using NIRV methodology, RMNLs vary depending on the time of the day, evening or night, with the highest permitted values typically occurring during week daytimes, and the lowest during the night period.

The relevant EPA-defined 'day', 'evening', and 'night' assessment periods are shown below in Table 3.

Table 2: EPA Assessment Periods

<u>EPA Assessment Period</u>	<u>Relevant Days</u>	<u>Relevant Time Periods</u>
'Day'	Monday to Friday	7:00am to 6:00pm
	Saturday	7:00am to 1:00pm
'Evening'	Saturday	1:00pm to 6:00pm
	Sunday, Public Holidays	7:00am to 6:00pm
	All Days	6:00pm to 10:00pm
'Night'	All Days	10:00pm to 7:00am

The existing and proposed hours of operation are all within the defined 'day' period.

The noise-generating use and all relevant noise-receiving locations are all located within the farming zone, FZ1, which from Table 1 in NIRV gives zone levels of 46, 41 and 36 dB(A) for the 'day', 'evening' and 'night' periods as defined above.

As the only other zones located between the FZ1 zoning occupied by the noise-generating use and the FZ1 zoning occupied by the noise-receiving locations are for road/rail use, there is no distance adjustment in Step 2 of the NIRV procedure.

Step 3 of NIRV, the base noise level check is not relevant in this instance.

Step 4 relates to consideration of ambient background noise levels in 'background relevant areas'. In 'background-relevant areas', the background level is sufficiently high to elevate the RMNL.

For the 'day' period, if the background level is higher than 8dB(A) below the RMNL, then the RMNL becomes the background level plus 8 dB(A).

Ambient background monitoring was conducted at 5530 Midland Hwy and 1 Byrneside-Gillieston Rd and is discussed in section 5 of this report. The ambient background noise for the purpose of considering the RMNL must not include contributions from the source under investigation or other industrial noise sources. The only relevant background noise in this instance is due to traffic on the Midland Highway.

Only limited periods of monitoring were possible on the test day without noise contributions due to noise emission from trial of crushing and mulching. These periods were for a short duration prior to commencement of crushing operations in the morning, from approximately 12:45pm to 1:45pm during the lunch break and after operations ceased at approximately 4:10pm.

During these periods the background noise level at 5530 Midland Hwy approximately 80 m from the highway at a location representative of the setback of the house from the road varied from the low 40s dB(A) L_{90} prior to commencement to 38 dB(A) L_{90} during the lunch break and back up to 42-44 dB(A) L_{90} late in the day. This indicates a background level over the day period of typically 40 dB(A) L_{90} at this location which implies that the 'day' period RMNL would be 8 dB(A) higher at 48 dB(A).

At 1 Byrnesdie-Gillieston Rd, approximately 60 m from the road, the background level did not drop to the same extent, indicating a typical 'day' period background level of 45 dB(A) L_{90} and an RMNL of 53 dB(A).

Other residential locations were more distant from the Midland Highway where noise due to highway traffic was not sufficient to change the 46 dB(A) RMNL.

Compliance with the RMNL is assessed using the L_{eq} noise measure over a 30 minute period, excluding extraneous noise and applying adjustments as required for the noise characteristics.

4.2 NOISE ALLOWANCES FOR OTHER INDUSTRY

The Recommended Maximum Noise Levels apply to the total of all industrial noise emissions affecting a noise-sensitive area. A site may need to meet lower levels when more than one industry contributes or will contribute to the total noise level affecting a noise-sensitive area.

There are no other industries in the vicinity of the subject site of significance with respect to noise emission and there appears to be little prospect of that occurring, so the proposed use can 'use up' the full noise limit.

5. AMBIENT NOISE MONITORING

Unattended noise loggers were installed at 5530 Midland Hwy and 1 Byrneside-Gillieston Rd to measure noise during the trial and the ambient background level when the trial was not in progress. Another logger was installed at the subject site to provide a reference. These loggers were installed at the locations shown in Appendix Two.

5.1 MEASUREMENT EQUIPMENT

Equipment used as part of the assessment is shown below in Table 5:

Table 3: Equipment Used as Part of Assessment

Equipment Designation	Use of Equipment
Rion NA-27 Sound Level Meter	Attended handheld measurements
Ngara Real Time Sound Acquisition System	Unattended Noise Logging Measurements

The field calibration of the measurement equipment was checked with a Bruel & Kjaer Type 4230 Sound Level Calibrator at the commencement and completion of the noise logging period and found to be within the correct calibration range.

5.2 AMBIENT NOISE MEASUREMENT RESULTS AND DISCUSSION

The ambient noise monitoring results have been displayed in graphical form in Appendix Three.

Only limited periods of monitoring were possible on the test day without noise contributions due to noise emission from the trial of crushing and mulching. These periods were for a short duration prior to commencement of crushing operations in the morning, from approximately 12:45pm to 1:45pm during the lunch break and after operations ceased at approximately 4:10pm.

During these periods the background noise level at 5530 Midland Hwy approximately 80 m from the highway at a location representative of the setback of the house from the road varied from the low 40s dB(A) L_{90} prior to commencement to 38 dB(A) L_{90} during the lunch break and back up to 42-44 dB(A) L_{90} late in the day. This indicates a background level over the day period of typically 40 dB(A) L_{90} at this location.

At 1 Byrneside-Gillieston Rd, approximately 60 m from the road, the background level did not drop to the same extent, indicating a typical 'day' period background level of 45 dB(A) L_{90} .

6. MEASURED NOISE LEVELS DURING THE TRIAL OF CRUSHING AND MULCHING

6.1 RESULTS

A trial of concrete/masonry rubble crushing and timber mulching had been set up using equipment in the possession of the occupant of the subject site. It is not known whether the same equipment is proposed for the use that is sought.

The relevant equipment used during the trial was:

- Mulch Tech Model 7000 Horizontal Wood grinder
- TESAB 10570 mobile crusher
- ZAXIS 200 excavator feeding the crusher and wood grinder, plus operating with a rock breaker
- Volvo A40E dump truck receiving crushed material.

The rock breaker is used from time to time to break pieces of concrete too large to fit into the crusher down to a size that the crusher can handle.

A light to moderate variable south westerly breeze was present throughout the testing. Measurements were frequently paused to wait for the wind to subside so that extraneous noise due to wind in the vegetation did not affect the results.

The trial commenced with crushing concrete and masonry rubble.

It was noted that during the trial that concrete and masonry rubble was being placed into the crusher in small quantities at a time and the crusher did not appear to be operating at full capacity, based on observations previously made at commercial facilities during normal operations.

While the crusher operation was occurring a sequence of noise measurements was undertaken at locations representative of residential locations, with the results set out in the table below.

Table 4: Predicted noise levels associated with proposed facility operation

<u>Noise Sensitive Receptor</u>	<u>Measured Noise Level, dB(A)</u> <u>Leq</u>	<u>Notes</u>	<u>Indicated compliance with NIRV RMNL?</u>
80 Byrneside-Gillieston Rd	-	Too much vegetation at this location affected by wind to get reliable measurement	-
125 Byrneside-Gillieston Rd	-	Crushing audible at times, not reliably measureable under the conditions	-
25 Byrneside-Gillieston Rd	53	Crushing noise dominant feature of the environment	No
23 Byrneside-Gillieston Rd	50	Crushing noise dominant feature of the environment, birds and traffic excluded from the measurements	No
15 Byrneside-Gillieston Rd	50	Some acoustic shielding due to the shed on the subject site, crushing noise dominant, excluding birds from the measurement	No
1 Byrneside-Gillieston Rd	58	Very brief sample but crusher stopped.	Inconclusive

The measurements on which the tabulated figures were based were short samples, typically of several minutes duration. As a trial, operation was not consistent and full commercial operation would be expected to be less stop-start.

The short-term L_{eq} measurements were interpreted in the context of NIRV compliance on the basis that over a 30-minute assessment period operation would not occur for 100% of the time and an estimate of 15 minutes of noise generation per 30 minutes would indicate a duration adjustment of -3 dB(A).

The character of the noise indicated that a +2 dB(A) tonal adjustment would be applicable, indicating that the effective level under full commercial operation would be likely to be 1 dB(A) less than the short-term L_{eq} measured.

Three of the results were 50, 50 and 53 dB(A) L_{eq} respectively, well above the 46 dB(A) 'day' period NIRV RMNL.

The result at 1 Byrneside-Gillieston Rd was of such short duration prior to the crusher stopping that it was inconclusive.

An attempt was then made to conduct a trial of rock breaker noise, but its usage was so limited as not to be worth going out to the residential locations. In normal use, rock breakers produce a higher level than a crusher but typically for shorter duration.

After breaking for lunch, a trial of the wood grinder was conducted. This commenced with some green waste being fed through the grinder, but as this is not the intended usage of the mulcher at the site, measurements were not conducted at the residential premises while this exercise was carried out.

Once the proponent had agreed to feed some of the stockpile of actual timber waste through the mulcher/grinder, a further set of noise measurements at the residential premises was conducted, with the results set out in the table below.

Table 5: Measured noise levels due to mulcher/grinder operation

<u>Noise Sensitive Receptor</u>	<u>Measured Noise Level, dB(A)</u> <u>L_{eq}</u>	<u>Notes</u>	<u>Indicated compliance with NIRV RMNL?</u>
80 Byrneside-Gillieston Rd	-	Mulching audible but too affected by wind to get reliable measurement	-
125 Byrneside-Gillieston Rd	-	Mulching audible at times, not reliably measureable under the conditions	-
25 Byrneside-Gillieston Rd	50	Crushing noise clearly audible, pausing for extraneous noises	No
23 Byrneside-Gillieston Rd		Dogs barking consistently at this location, measurement not possible on this occasion	-
15 Byrneside-Gillieston Rd	51	Some acoustic shielding due to the shed on the subject site, mulching noise dominant, excluding birds from the measurement	No
1 Byrneside-Gillieston Rd		Operation again stopped while at this location.	Inconclusive

<u>Noise Sensitive Receptor</u>	<u>Measured Noise Level, dB(A)</u> <u>Leq</u>	<u>Notes</u>	<u>Indicated compliance with NIRV RMNL?</u>
5480 Midland Hwy	48	Only possible to obtain a very brief sample at this location before operation stopped for the day.	Inconclusive

Where results could be obtained, they were very similar to the crushing results, indicating exceedance of the NIRV RMNL by approximately 5 dB(A).

Analysis of the noise logging results at 5530 Midland Hwy and 1 Byrneside-Gillieston Rd was complicated by the presence of intermittent traffic noise. However, the results were so conclusive at the locations further north up Byrneside-Gillieston Rd that it is not necessary to conduct detailed analysis of the noise logging results.

6.2 DISCUSSION

Noise due to both the concrete/masonry rubble and wood mulching/grinding operations was clearly audible and measurable at several of the residential premises heading north up Byrneside-Gillieston Rd, with resultant noise levels approximately 5 dB(A) above the NIRV 'day' period RMNL of 46 dB(A).

Two factors indicate that, if anything, the resultant noise levels could be higher at the critical identified residential premises, 15, 23 and 25 Byrneside-Gillieston Rd, if full operation were to proceed than was identified during the trial:

- It was apparent that the focus of the operators during the trial was to minimise noise generation by the selection of material and the rate of processing. In commercial operation the focus would be achieving throughput and as the Leq noise level is a result of both level and duration, the results would be expected to be higher.
- The measurements at residential locations north west of the subject site were conducted in the presence of a south westerly breeze, which would have opposed propagation to those measurement locations to an extent. Under calm conditions higher noise levels would occur at the measurement points.

Overall, the results of the assessment have indicated that operation of the crushing and mulching/grinding uses that are sought for the site by the proponent would not comply with the recommended maximum noise levels under NIRV.



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7. CONCLUSIONS

Watson Moss Growcott Acoustics (WMG) has carried out an assessment of noise emission from the crushing and mulching/grinding operations sought by the proponent in the Planning Permit amendment application.

Noise emissions associated with the proposed use have been considered in accordance with methodologies described in the following guidelines and policies:

- *Environment Protection Authority Publication 1411 Noise from Industry in Regional Victoria – Recommended Maximum Noise Levels from Commerce, Industry and Trade Premises in Regional Victoria (NIRV); and*
- *State Environment Protection Policy (Control of Noise from Commerce, Industry and Trade) No. N-1 (SEPP N-1).*

Based on the assessment, it has been concluded that operation of the proposed additional uses at the subject site would not comply with the NIRV recommended maximum noise levels.

A handwritten signature in black ink that reads "Neville Goddard".

NEVILLE GODDARD
WATSON MOSS GROWCOTT
Acoustics Pty Ltd

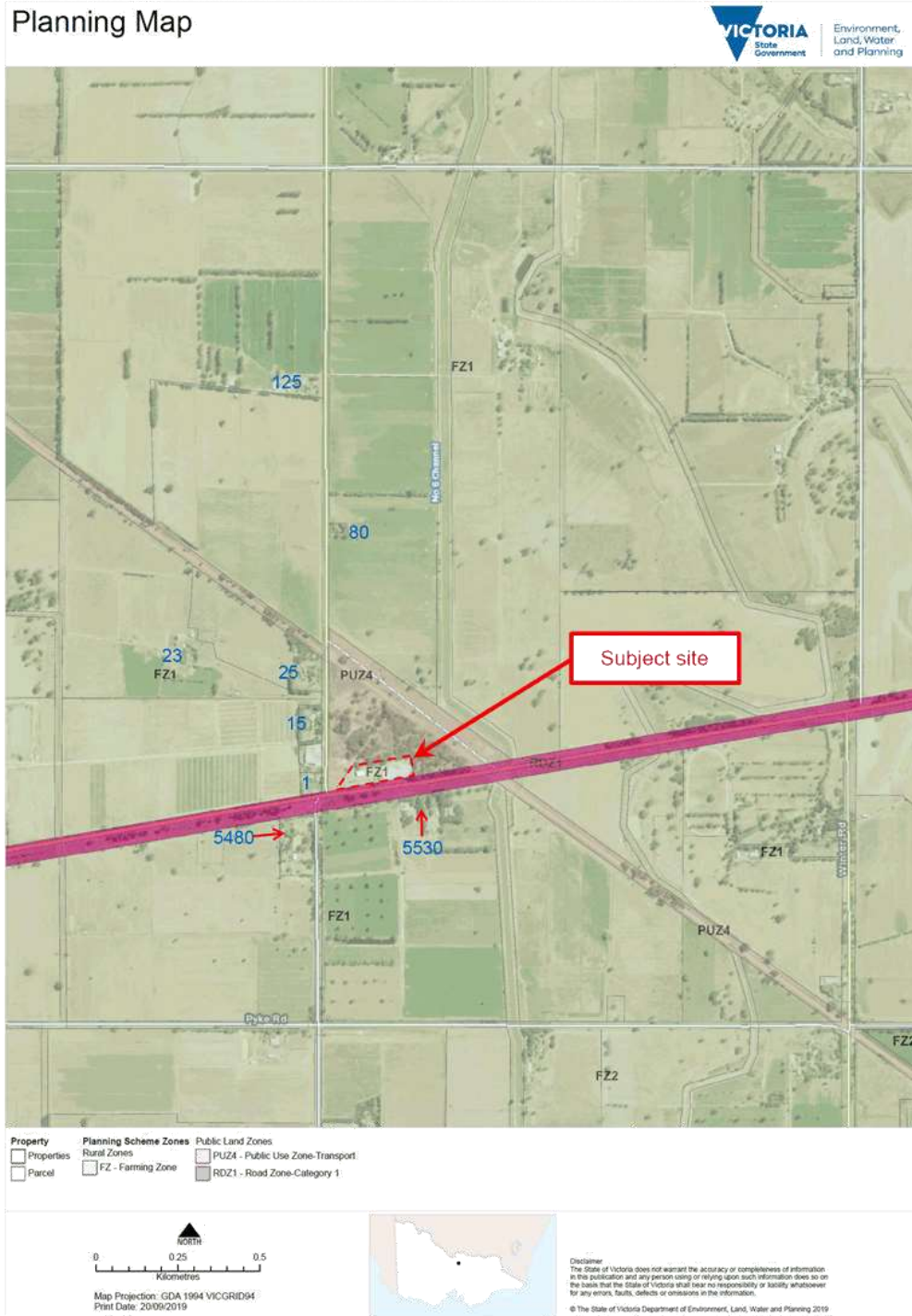


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APPENDIX ONE: PLANNING SCHEME ZONING MAP AND LOCALITY PLAN

Planning Map





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APPENDIX TWO: NOISE LOGGER LOCATIONS

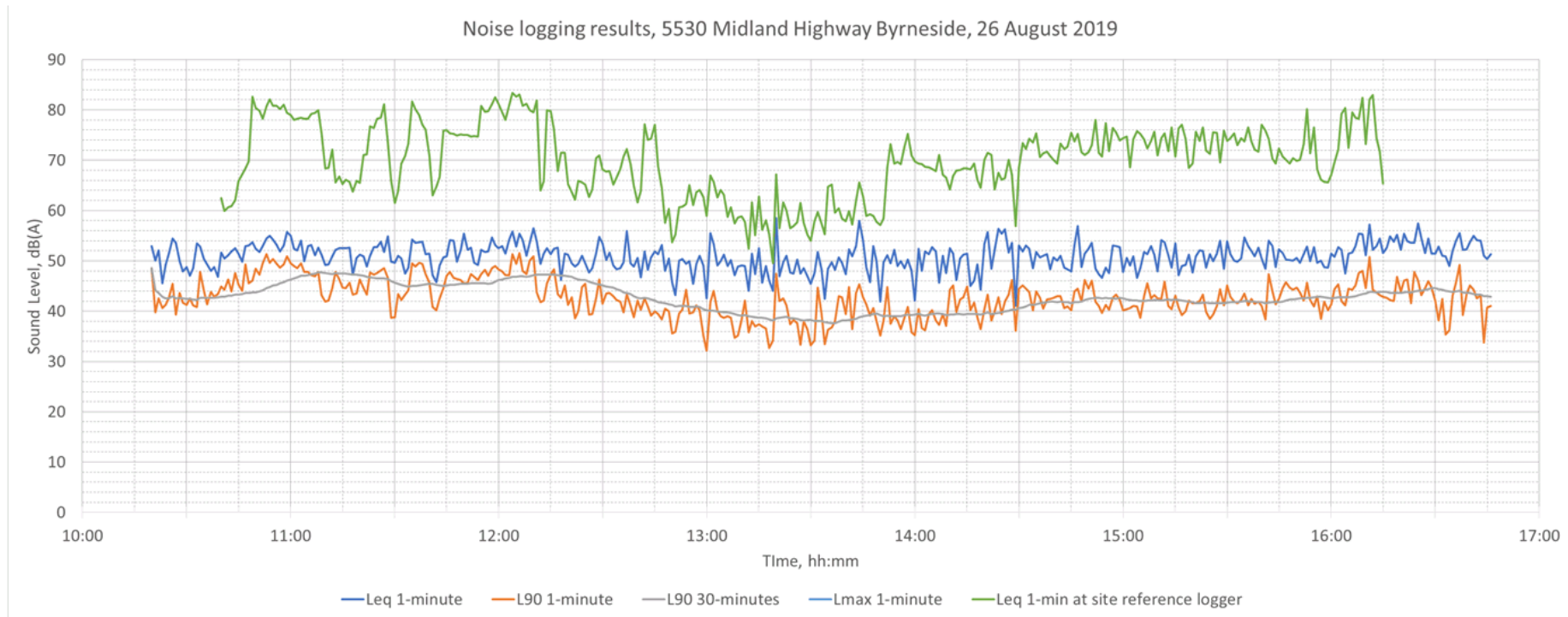




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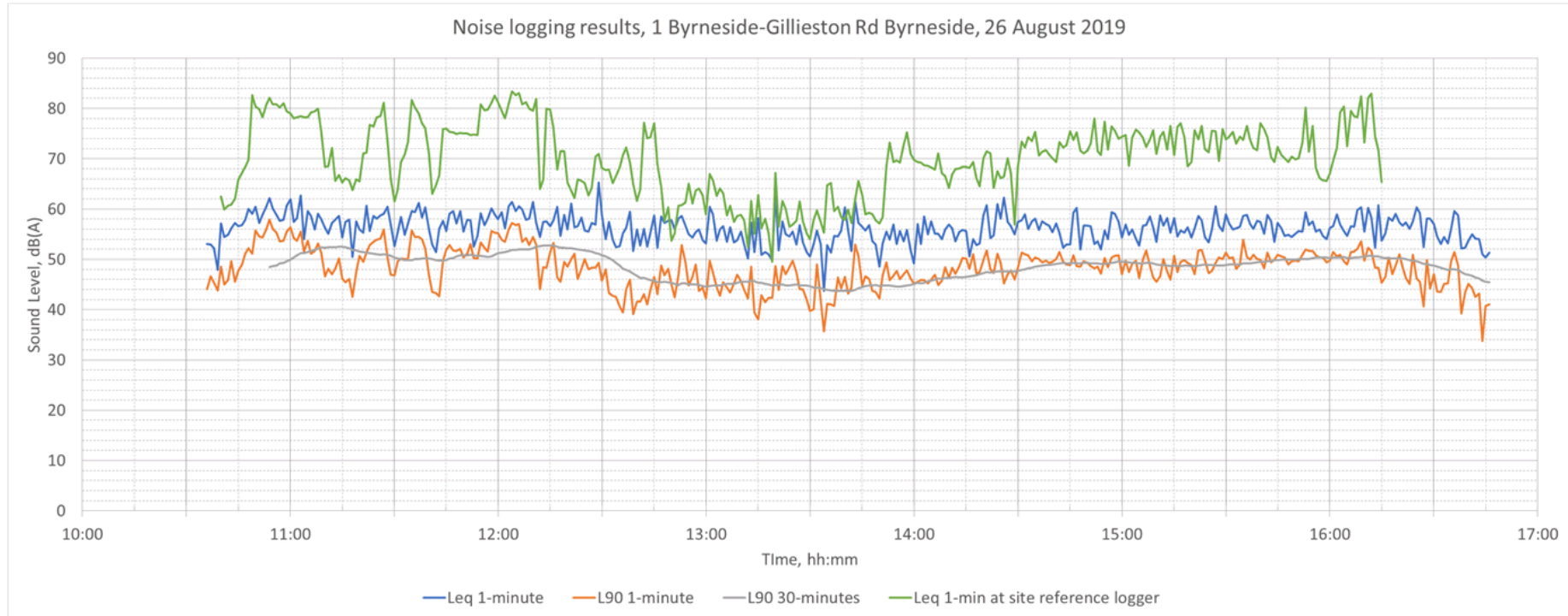
APPENDIX THREE: AMBIENT NOISE MONITORING RESULTS





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APPENDIX FOUR: PHOTOS OF CRUSHING AND MULCHING TRIAL



Photo taken during crushing trial





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Photo taken during rock breaker trial





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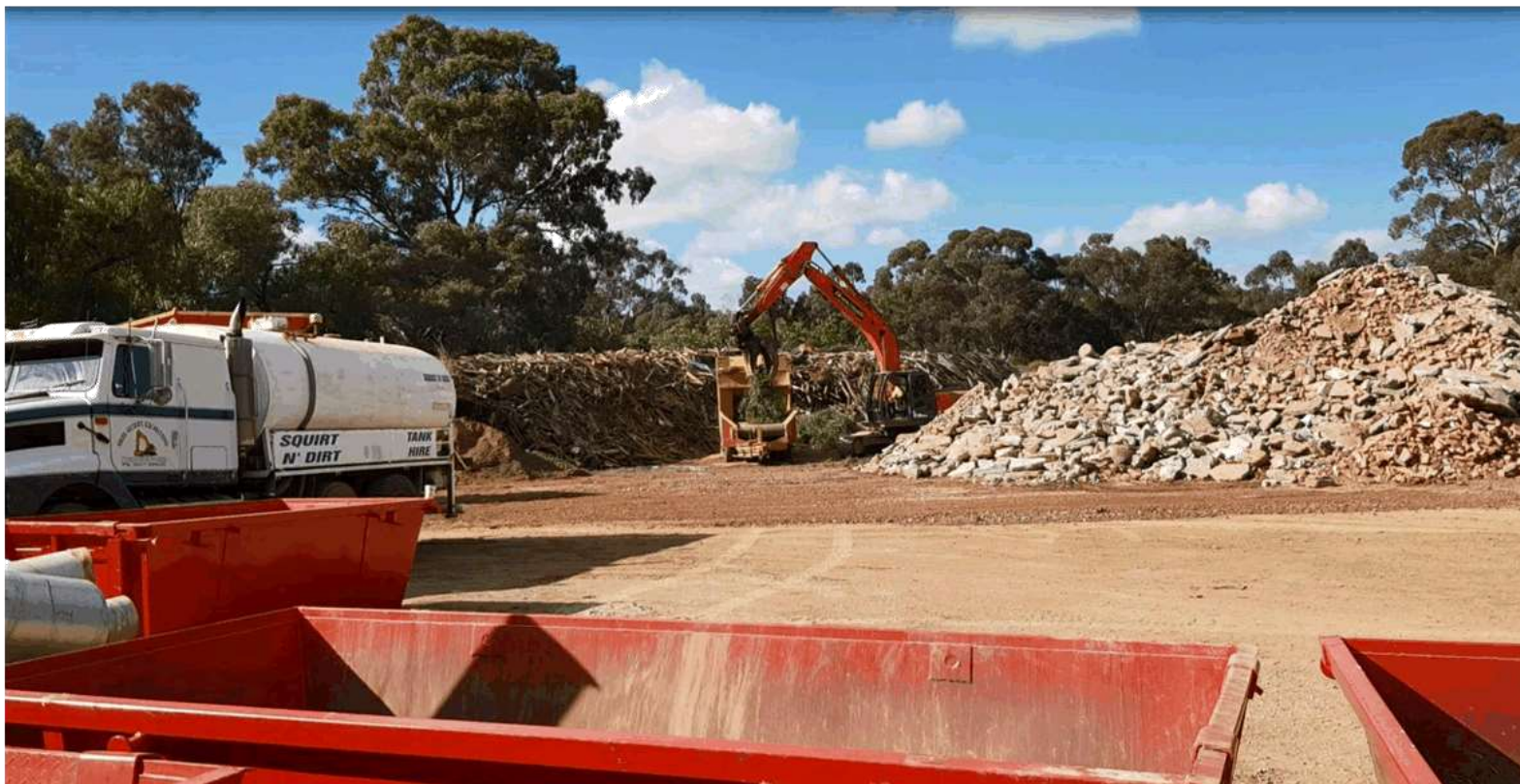


Photo taken during mulching trial, mulching a small quantity of green waste prior to mulching some of the stored dry timber waste

