

25 November 2019

John Roser  
Waste Operations Manager  
Griffith City Council  
Griffith NSW 2680

John.Roser@griffith.nsw.gov.au



Dear John Roser

**Re: 18-393 Tharbogang Quarry Noise Monitoring**

**INTRODUCTION**

Griffith City Council (Council) currently operates a Landfill and Quarry in Tharbogang, approximately 10 km northwest of Griffith. Access to the site is via Hillside Drive, off Kidman Way (MR80). The Department of Planning and Environment (DP&E) Conditions of Approval (CoA) for the site require a noise and vibration monitoring program to be prepared and implemented. Council has contracted NGH to monitor operational noise from the Tharbogang Quarry/Landfill.

Noise monitoring and reporting aims to compare the noise from quarry and landfill operations with its conditional limits as described in the CoA's. This will compare monitored noise levels at five sensitive receivers adjacent to the facility (Appendix A) with the noise management levels. The field consultant was denied access to Property 6, hence no monitoring was completed at this premise.

Monitoring was conducted three times at each sensitive receiver over three different time periods: morning 8 am – 10:15 am, midday 11:30 – 1:30, and afternoon 2 pm – 6 pm. The afternoon monitoring was completed on the 20<sup>th</sup> November 2019, with the morning and midday periods being recorded on the 21<sup>st</sup> November 2019. The landfill site was in operation during the time of the monitoring. The quarry was not operational throughout the survey period.

This letter details the results of the noise monitoring conducted at the five sensitive receivers.

**NOISE MONITORING**

An NGH consultant attended each sensitive receiver location to conduct noise monitoring for 15 minute intervals using a Type 1 sound level meter (Svantek/Svan 957). The sound level meter was positioned between 5 m and 30 m from an external wall of each residential building, mounted on a tripod at human ear height (1.7 m), with the microphone facing the main noise source(s), and positioned between the Landfill/Quarry Centre and the residence.

The sound level meter was field calibrated at the beginning of the day (8 am), at midday (12 pm). The sound level meter was within the service calibration period.

A variety of foreground and background noises were audible at the sensitive receiver locations. These noise sources included the sound of wind, garden birds, tractors working in orange orchards, road traffic from Slope Road and Kidman Way, dogs barking, and people talking. Line graphs showing the noise levels for each monitoring period are provided in Appendix B.

Noise monitoring datasheets for the noise monitoring program were completed for each monitoring period and are provided in Appendix C.

## WEATHER CONDITIONS

The weather in Tharbogang on the 20<sup>th</sup> and 21<sup>st</sup> November 2019 was warm and windy. Cloud cover ranged from 60 to 100%. The windy conditions on the 21<sup>st</sup> November, may have influenced the monitoring results. A summary of the weather data from the weather station at Griffith Airport is provided below.

Table 0-1 Griffith weather temperature and wind data.

Date	Time (24hr)	Temp °C	Direction	Wind	
				Average Speed m/s	Gust km/h
21.11.19	08:00	32.2	N	8.7	44.3
21.11.19	09:00	34.3	NNE	9.3	46.4
21.11.19	10:00	36.5	N	9.3	48.2
21.11.19	11:00	38.3	N	10.3	48.2
21.11.19	12:00	40	N	9.8	46.4
21.11.19	13:00	40.8	NNW	9.8	48.2
20.11.19	14:00	36.3	S	4.1	22.3
20.11.19	15:00	36.6	SSE	2.1	13
20.11.19	16:00	36.6	E	3.6	20.5
20.11.19	17:00	36.6	ESE	3.1	22.3
20.11.19	18:00	35.4	NE	3.6	16.6

## NOISE MONITORING RESULTS

The development consent (06\_0034MOD2) CoA 28 describes the impact assessment criteria as:

### Noise Impact Assessment Criteria

28. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in Table 1:

Table 1: Operational noise impact assessment criteria dB(A)

Location and Locality	Day <i>L<sub>Aeq</sub>(15 min)</i>	Evening <i>L<sub>Aeq</sub>(15 min)</i>	Night <i>L<sub>Aeq</sub>(15 min)</i>
All Surrounding Sensitive Receivers	35	35	35

The noise impact assessment criteria is 35 dB(A)*L<sub>Aeq</sub>* for all times the Quarry and Landfill is operational. A comparison between the impact assessment criteria and the monitored *L<sub>Aeq</sub> (15 min)* noise levels for each location and period is provided below (**Error! Reference source not found.**).

The monitored noise levels exceed the noise impact assessment criteria at each location for every monitoring period. However, direct observation at all sensitive receiver locations demonstrated that the landfill was not audible while operating. The dominant audible noise sources at each location varied between sites. The sources of audible noise dominating the monitoring including wind, generators, air-conditioning devices, road traffic and wildlife (birds) at the sensitive receiver locations.

Noise monitoring was undertaken 50 m from an active area of the landfill site (trucks visiting this zone) between 13:58 and 14:13 (20<sup>th</sup> November 2019) when the facility was fully operational. At 50 m from the landfill the noise level was recorded as 53.2 dB(A) *L<sub>Aeq</sub> (15 min)*. The monitored site noise of 53.2 dB(A) (at site) when attenuated for distance provides a calculated noise level of 31 dB(A) *L<sub>Aeq</sub> (15 min)* at the nearest receiver (650 m from site).

Noise monitoring datasheets are provided in Appendix C.

Table 0-2 Noise monitoring results summary

	Monitored Noise Levels dB(A) <sub>L<sub>Aeq</sub>(15min)</sub>			Distance from facility to receiver (m)
	Morning	Midday	Afternoon	
<b>Assessment Criteria</b>	35	35	35	-
<b>Sensitive receiver 1</b>	58.1	73.3	34.2	1020
<b>Sensitive receiver 2</b>	53.8	73.3	44.6	1300
<b>Sensitive receiver 3</b>	57.8	73.3	37.0	1000
<b>Sensitive receiver 4</b>	55.2	40	49.0	650
<b>Sensitive receiver 5</b>	50.8	48.3	44.0	690
<b>Sensitive receiver 6</b>	-	-	-	1250
<b>Quarry Face</b>	-	53.2	-	60

### IMPACT OF QUARRY/LANDFILL ON SENSITIVE RECEIVERS

The impact of quarry and landfill noise emission was shown to be relatively minor when attenuated for distance. The site observations at the sensitive receivers reinforce the notion that the facility noise impact is a minor contributor to ambient noise levels. While the recorded noise levels at each of the sensitive receivers ( $L_{Aeq}(15\text{ min})$ ) exceeded the assessment criteria of 35 dB(A)  $L_{Aeq}(15\text{ min})$ , this was likely due to noise sources produced from sources other than the Tharbogang Recycling Centre. In conclusion, the noise from the quarry/landfill was not the main contributor to noise at any of the five (assessed) sensitive receiver locations.

Yours sincerely,



**A Bauer**  
Environmental Consultant  
692301530  
NGH



# APPENDIX A Sensitive Receivers Map



Figure 0-1 Location of sensitive receivers (monitoring locations) from Tharbogang Quarry



# Appendix B Noise Monitoring Results

## Griffith Recycling Centre

### Midday

The sound level meter was positioned facing southeast towards the centre of the Landfill site, and to the south of the internal access road. A diagram is provided in Appendix C. The sound level meter was positioned approximately 50 m to the area where trucks were depositing and burying waste. Bird calls were a dominant noise source at this site. Other noise sources included staff conversing, dogs barking, and traffic from Kidman Way. These sources were audible but less so than the landfill activities. Four heavy vehicle movements were recorded within the monitoring period. The noise level recorded by the attended monitoring was 53.2 dB(A)  $L_{Aeq}$  (15 min), which is above the 35 dB(A) noise impact assessment criteria.

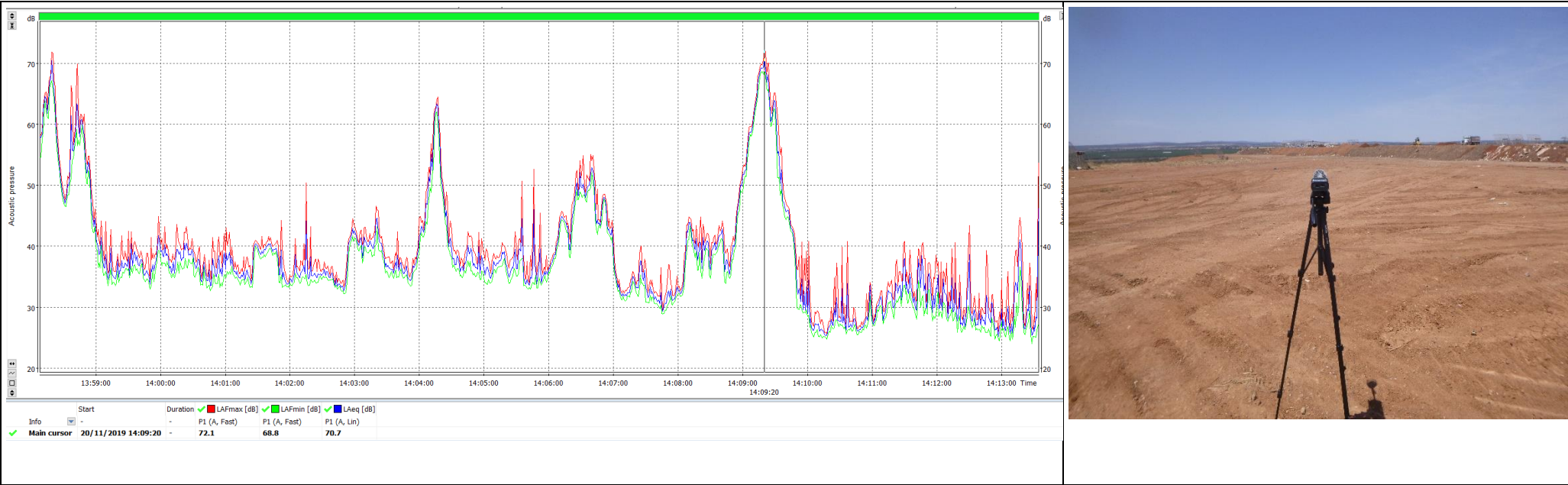


Figure 0-1 – Landfill centre Midday

Sensitive Receiver 1

This sensitive receiver was located approximately 980 m off Slopes Road and approximately 1020 m from Tharbogang Quarry/Landfill Centre. The residence was situated overlooking an orange orchard to the south. A rocky hillside was located between the house and the quarry to the southeast.

Morning

The sound level meter was positioned approximately eight metres from the eastern wall of the residence facing northeast. The dominant noise source was the strong wind gusts, which blew from the north-northeast. This wind also caused the Eucalyptus trees surrounding the house to make ‘whooshing’ sounds throughout the monitoring period. Small birds were heard calling, and scraping vegetation on the ground. The breeze caused dry leaves to make a scraping sound when blown across the sealed driveway. Additional background noise was traffic coming from Kidman Way past the orchards. Heavy vehicles or activity from the landfill were not audible. The recorded noise level for the period was 51.6 d(B(A)  $L_{Aeq}$  (15 min), which is over the 35 dB(A) noise impact assessment criteria. Traffic from Kidman Way was audible, to the southwest. The noise level recorded by the attended monitoring was 73.3 dB(A)  $L_{Aeq}$  (15 min), which is over the 35 dB(A) noise impact assessment criteria.



Figure 0-2 – Sensitive Receiver 1 Morning

Midday

The sound level meter was positioned approximately eight metres from the eastern wall of the residence facing northeast, in the same location as the morning monitoring session. The dominant noise source was the strong wind gusts, which blew from the north-northwest. This wind caused the Eucalyptus trees surrounding the house to make ‘whooshing’ sounds throughout the monitoring period. Small birds were heard calling from vegetation on the rocky hillside directly northeast of the location. Additional background noise was received in the form of traffic noise coming from Kidman Way to the south. Heavy vehicles or activity from the landfill were not audible. The noise level recorded by the attended monitoring was 73.3 dB(A)  $L_{Aeq}$  (15 min), which is over the 35 dB(A) noise impact assessment criteria.

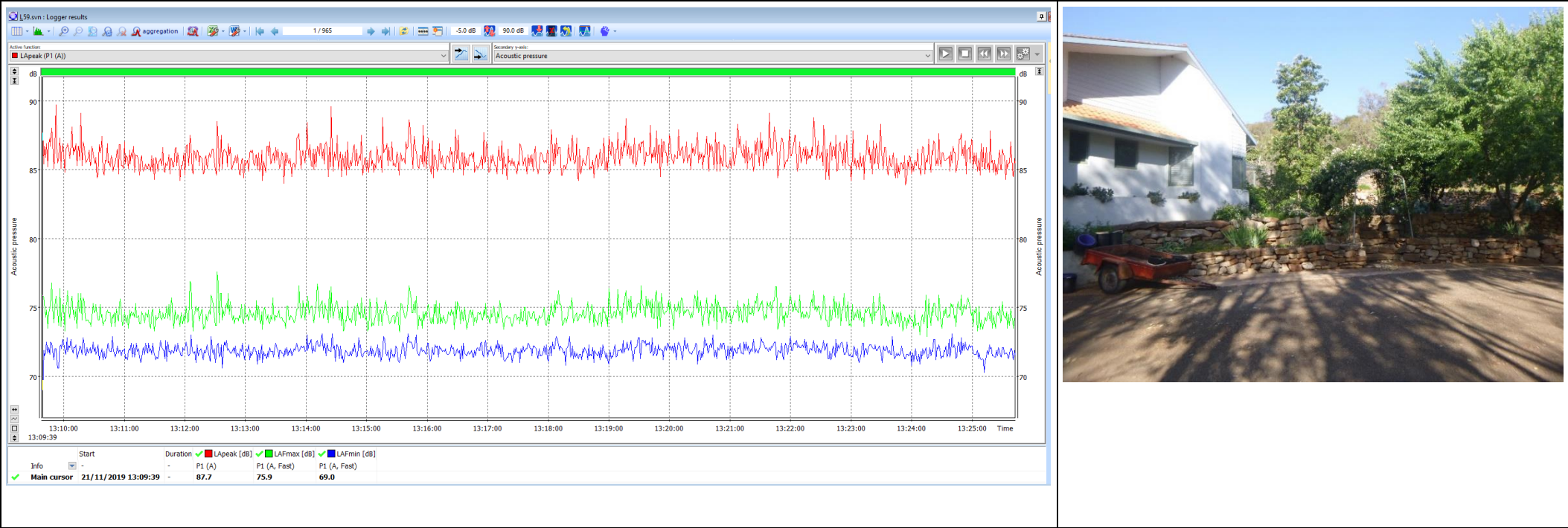


Figure 0-3 – Sensitive Receiver 1 Midday



Afternoon

The sound level meter was positioned approximately eight metres from the eastern wall of the residence facing northeast; as in the morning and midday monitoring session. The dominant noise included the breeze and the rustling of leaves from trees surrounding the residence. The recorded noise level for the period was 34.2 d(B(A) LAeq (15 min). This reading is over the 35 dB(A) noise impact assessment criteria.

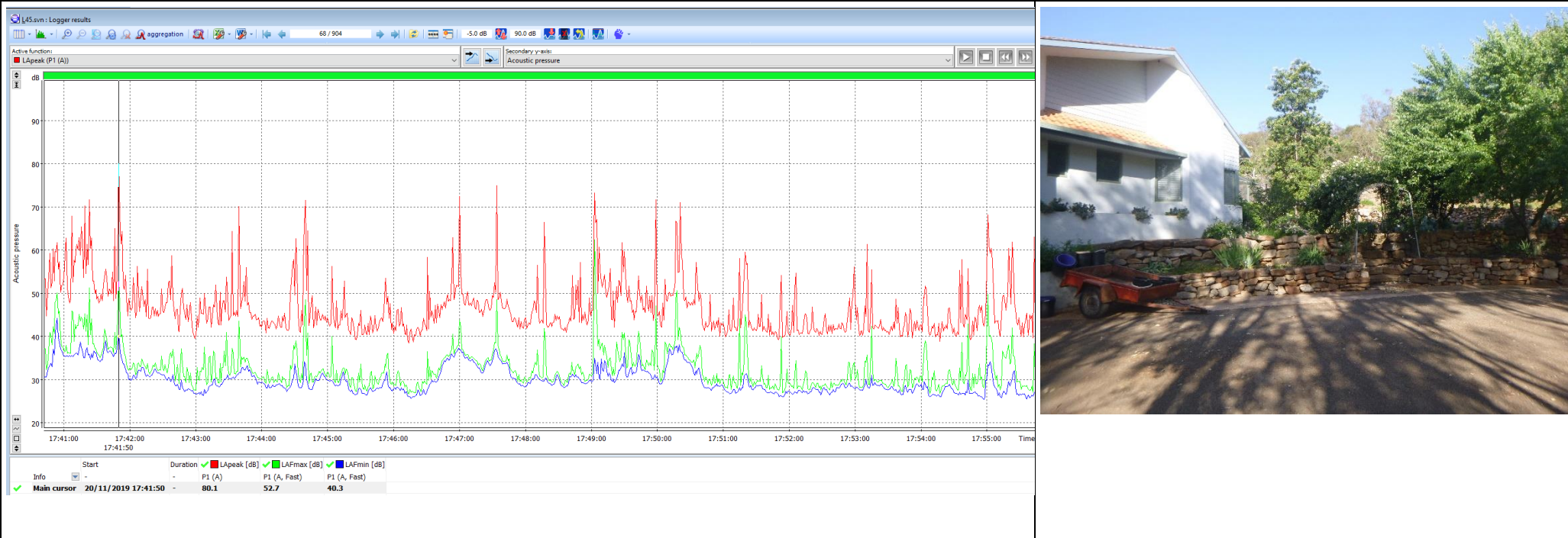


Figure 0-4 – Sensitive Receiver 1 Afternoon

Sensitive Receiver 2

This sensitive receiver was located directly off Slopes Road, approximately 1300 m from the Tharbogang Quarry/Landfill site. The residential building was surrounded by tall garden vegetation, which may offer some protection from background noise emitted from the quarry, while increasing foreground noise emissions from birds, rustling leaves and insects.

Morning

The sound level meter was set up at the base of the driveway, eight metres from the residential building, facing north east. The dominant background noise was caused by the sounds of strong wind gusts, which remained consistent throughout the monitoring period. Birds calling from around the house-yard were audible, as were faint human voices coming from a distance among the orange orchid. A tractor was used in the orange orchard to the north of the residence from 09:24 am. Heavy vehicles from the landfill were not audible. Another distinctive noise was traffic noise from the main roads to the south of the premise. The noise level recorded by the attended monitoring was 53.8 dB(A) LAeq (15 min). This recording is over the 35 dB(A) noise impact assessment criteria.

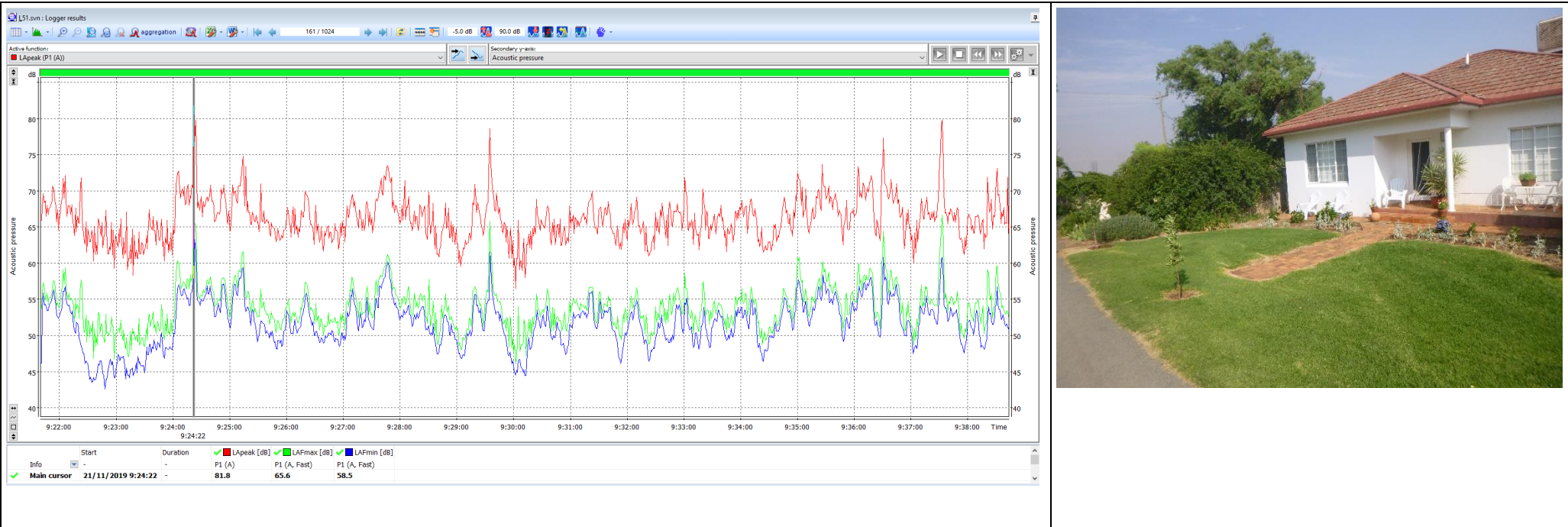


Figure 0-5 – Sensitive Receiver 2 Morning

Midday

The sound level meter was set up in the same location as for the morning session at the base of the driveway, eight metres from the residential building, facing north east. The dominant noise source was the strong wind gusts, which blew through the tall trees at this premise. Birds calling from around the house-yard were audible, as were faint noises of people driving trucks among the orange orchids, and the noises made by two large dogs moving around the yard. Another distinctive noise was the movement of a tractor along Slopes Road to the south of the premise. The noise level recorded by the attended monitoring was 73.3 dB(A)  $L_{Aeq}$  (15 min). This recording is over the 35 dB(A) noise impact assessment criteria.

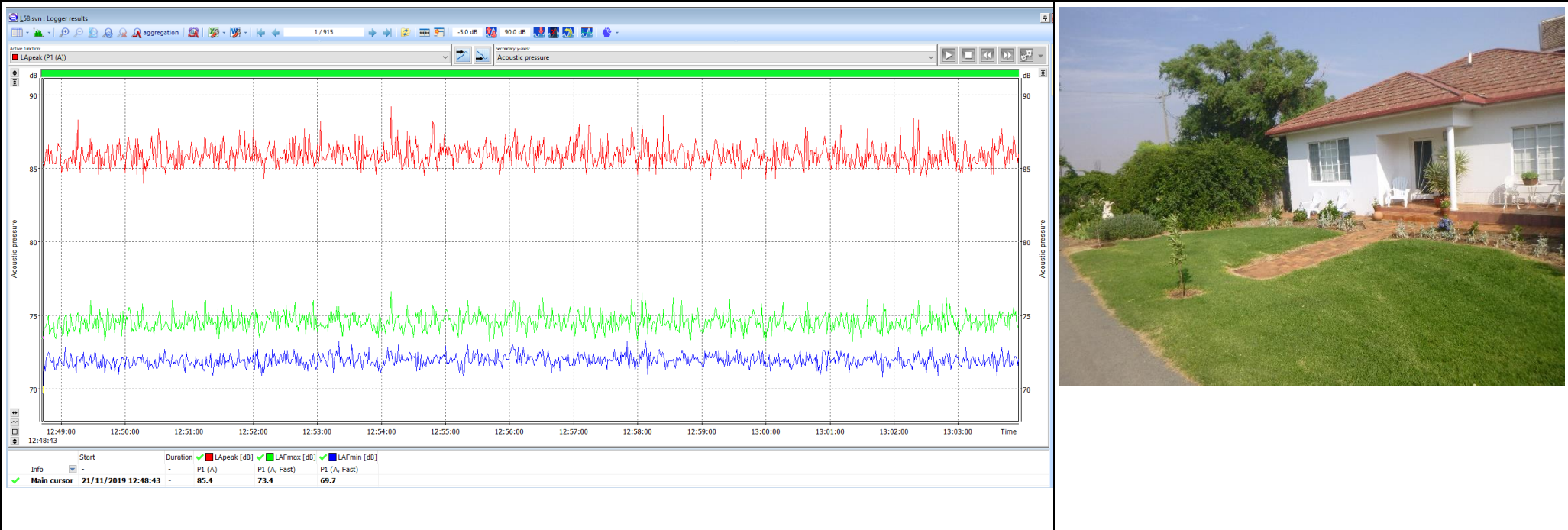


Figure 0-6 – Sensitive Receiver 2 Midday



Afternoon

The sound level meter was set up in the same location as for the morning and midday session at the base of the driveway, eight metres from the residential building, facing north east. The dominant noise was from the house air-conditioning device. Other distinctive noises included traffic noise from main roads to the southeast. The noise level recorded by the attended monitoring was 44.6 dB(A) LAeq (15 min). The reading is over the 35 dB(A) noise impact assessment criteria.

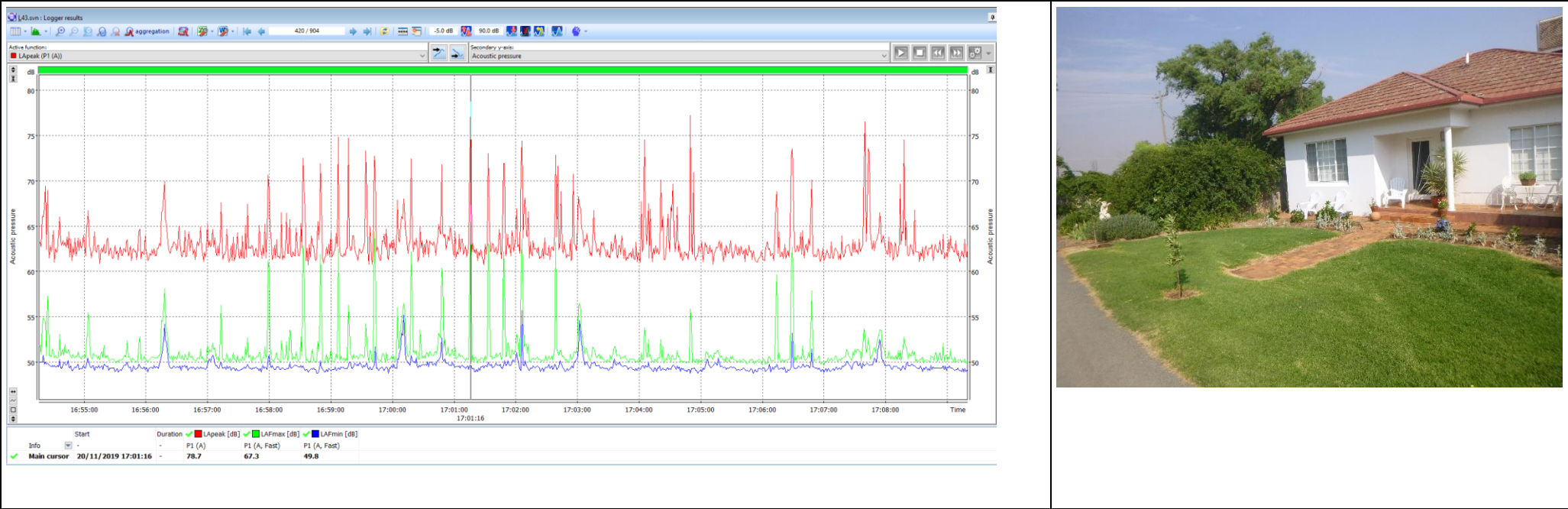


Figure 0-7 – Sensitive Receiver 2 Afternoon



Sensitive Receiver 3

This sensitive receiver was located directly off Slopes Road, approximately 1760 m from the Tharbogang Quarry/Landfill Centre. The residential building was surrounded by tall garden vegetation, which may have offered some protection from background noise emitted from the quarry/landfill, while increasing foreground noise emissions from birds, rustling leaves and the house aircon device.

Morning

The sound level meter was positioned 10 m from the north eastern wall of the residence and 20 m from the edge of Slopes Road, facing north east. The main noise source came from the strong gusts of wind at this premise. Gardens were being watered from above ground sprinklers during the monitoring period, and this contributed to the background noise. As did vehicle traffic emitted from main roads south of the residence. No noise from the quarry was audible over the monitoring period. The noise level recorded by the attended monitoring was 57.8 dB(A)  $L_{Aeq}$  (15 min), which is over the 35 dB(A) noise impact assessment criteria.



Figure 0-8 – Sensitive Receiver 3 Morning

Midday

The sound level meter was set up in the same location as for the morning session at the base of the driveway, 10 m from the north eastern wall of the residence and 20 m from the edge of Slopes Road, facing north east. The main noise source came from the strong gusts of wind at this premise, which could be heard as gusts of wind in the air, and from the rustling and ‘whooshing’ sounds in the trees around the premise. Other distinctive noise sources were from the air-conditioning device, vehicle traffic emitted from main roads south of the residence, birds calling, and dry leaves scraping across the concrete. No noise from the quarry was audible over the monitoring period. The noise level recorded by the attended monitoring was 73.3 dB(A)  $L_{Aeq}$  (15 min), which is over the 35 dB(A) noise impact assessment criteria.

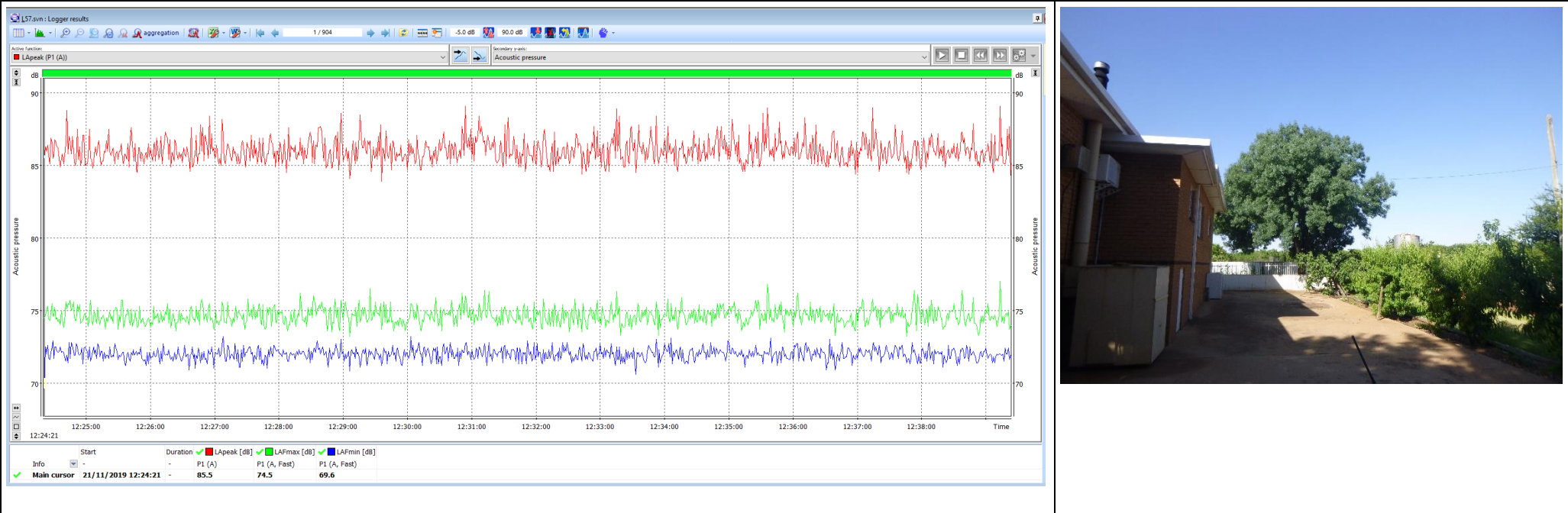


Figure 0-9 – Sensitive Receiver 3 Midday



Afternoon

The sound level meter was set up in the same location as for the morning and midday session at the base of the driveway, 10 m from the north eastern wall of the residence and 20 m from the edge of Slopes Road, facing north east. The dominant background noise source was the drone of traffic from the southwest. The dominant foreground noise source was traffic noise from Slopes Rd and Kidman Way, and the hum of the house air-conditioning. Heavy vehicles from the quarry were not audible. The noise level recorded by the attended monitoring was 37.0 dB(A) LAeq (15 min). This measurement is above the 35 dB(A) noise impact assessment criteria.

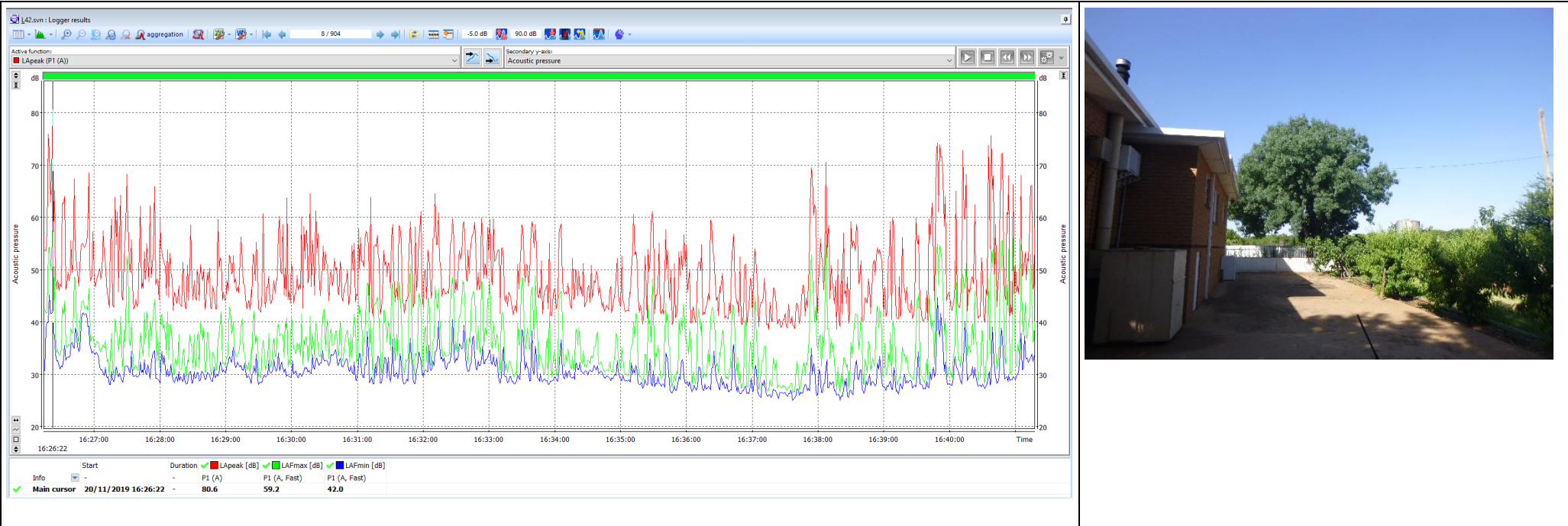


Figure 0-10 – Sensitive Receiver 3 Afternoon

Sensitive Receiver 4

This sensitive receiver was located approximately 280 m off Slopes Road and approximately 1757 m from the Tharbogang Quarry/Landfill Centre. The dwelling was embedded within orange orchards.

Morning

The sound level meter was positioned 28 m from the eastern wall of the residence, facing northeast. A map of the location is provided in noise monitoring datasheets (Appendix C). The strong wind gusts at sensitive receiver five provided the most dominant noise source throughout the monitoring period. Occupant activities occurred at the residence between 9:29 am and 8:44 am, which included the opening and closing of house doors, and the house car leaving from the garage. The drone of traffic from main roads south of the location were audible, as was truck activity within the orange orchids adjacent to the premise. Heavy vehicles from the quarry/landfill could not be heard during this monitoring period. The noise level recorded by the attended monitoring was 55.2 dB(A)  $L_{Aeq}$  (15 min). A reading over the 35 dB(A) noise impact assessment criteria.

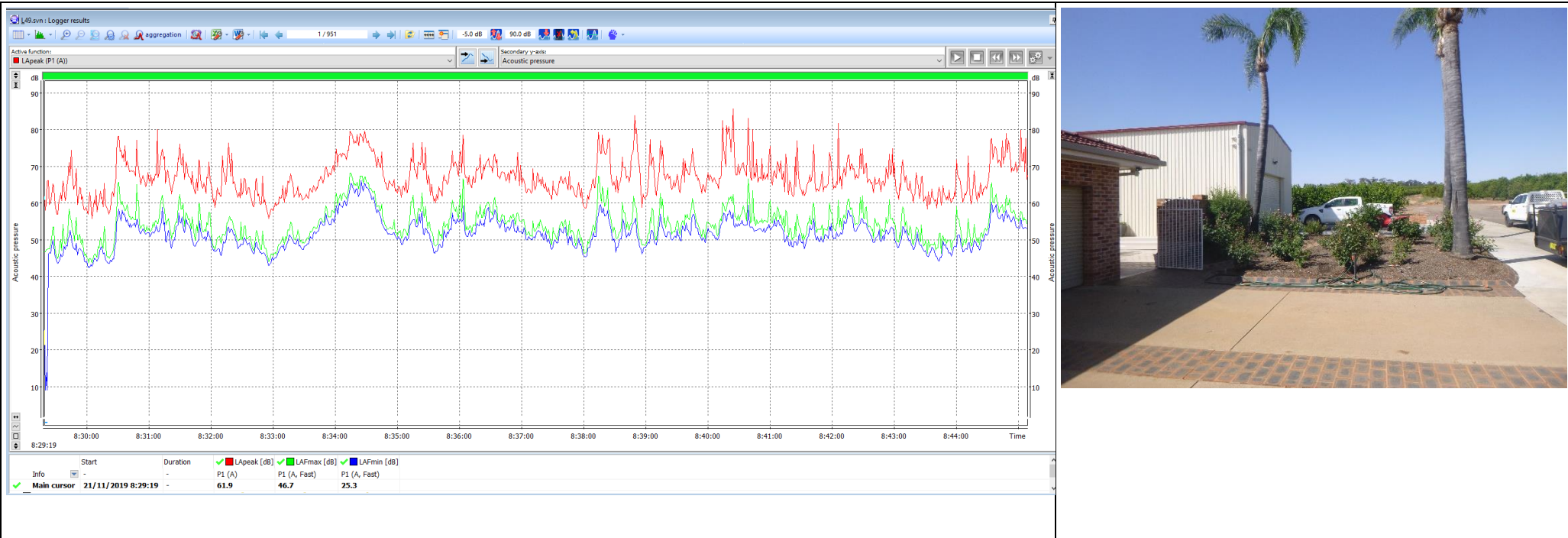


Figure 0-11 – Sensitive Receiver 4 Morning

Midday

The sound level meter was positioned 28 m from the eastern wall of the residence, facing northeast, and in the same location as the morning session. The dominant source of noise during the monitoring period was the strong wind gusts blowing from the north. The drone of traffic from main roads south of the location was audible, as was the sound of birds calling from the orange trees and within the residential house garden. The noise level recorded by the attended monitoring was 40.0 dB(A)  $L_{Aeq}$  (15 min), which is over the 35 dB(A) noise impact assessment criteria.



Figure 0-12 – Sensitive Receiver 4 Midday



Afternoon

The sound level meter was positioned 28 m from the eastern wall of the residence, facing northeast, and in the same location as the morning and midday sessions. The dominant background noise source was wind and vehicles on the Kidman Way and Slopes Road. The foreground was generally quiet with birds chattering throughout the monitoring period. The noise level recorded by the attended monitoring was 49.0 dB(A)  $L_{Aeq}$  (15 min). This is over the 35 dB(A) noise impact assessment criteria.

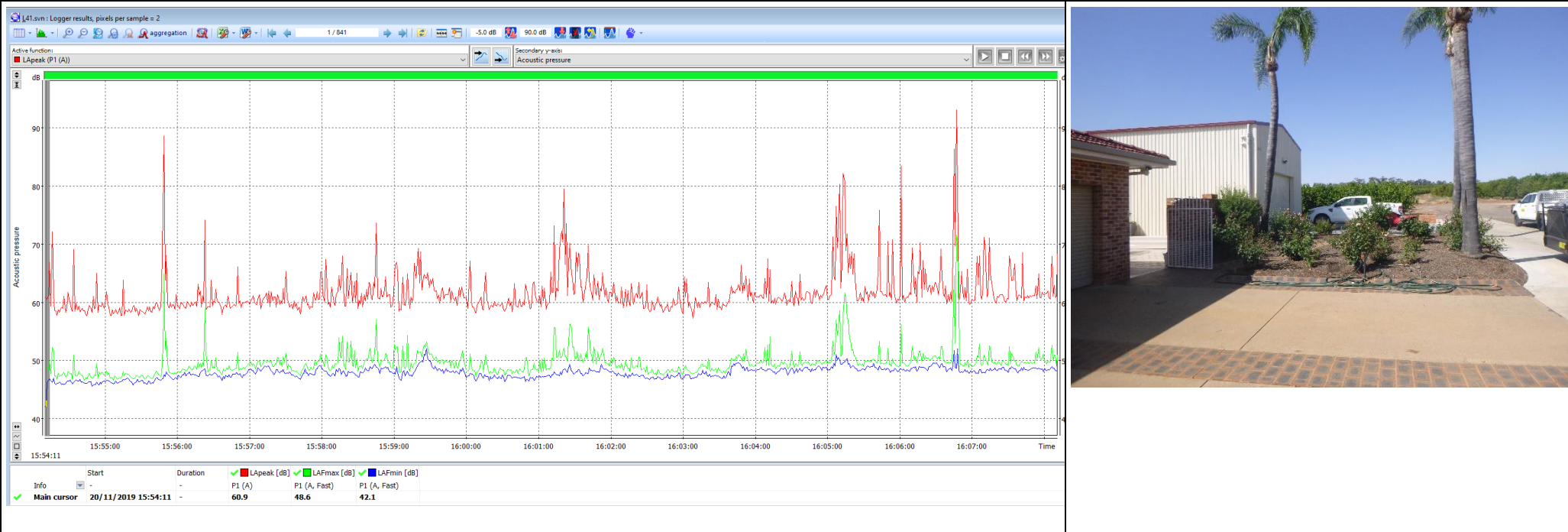


Figure 0-13 – Sensitive Receiver 4 Afternoon

Sensitive Receiver 5

This sensitive receiver was located within an orange orchard, approximately 350 m off Slopes Road and approximately 1020 m from Griffith Recycling Centre. The residential building is also within the same compound as two large sheds and a generator, which was operational and emitting an audible ‘hum’ throughout the day.

Morning

The sound level meter was positioned 30 m off the residence, facing northeast. The constant hum of the generator in the packing shed was audible in the foreground, as were the sounds of small birds calling, the wind, vehicle movements on the property, and the tin sheds rustling in the breeze. The generator was the most dominant and constant noise source. The drone of traffic from main roads south of the location were also audible. The quarry/landfill was not audible during the time of this monitoring. The noise level recorded by the attended monitoring was 50.8 dB(A) LAeq (15 min), which is above the 35 dB(A) noise impact assessment criteria.

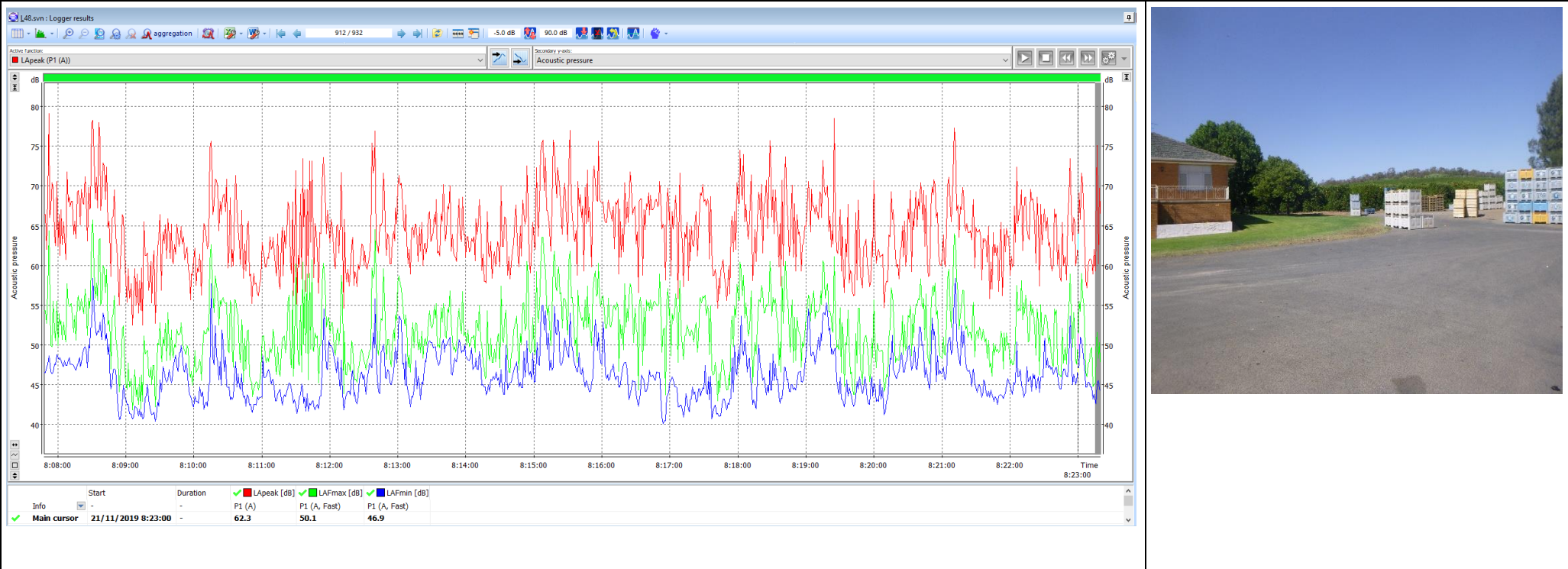


Figure 0-14 Sensitive Receiver 5 Morning

Midday

The sound level meter was positioned 30 m of the residence, facing northeast, and in the same location as the morning session. The dominant source of noise during the monitoring period was the strong wind gusts. The wind was audible as gusts through the air and also as it blew amongst the orange trees. Other distinctive noise sources were house-yard birds calling throughout the monitoring period, the sound of a radio playing from a stationary vehicle amongst the orange trees adjacent to the house, and the creaking sounds of shed doors in the breeze. The quarry/landfill was not audible during the time of this monitoring. The noise level recorded by the attended monitoring was 48.3 dB(A)  $L_{Aeq}$  (15 min), which is above the 35 dB(A) noise impact assessment criteria.

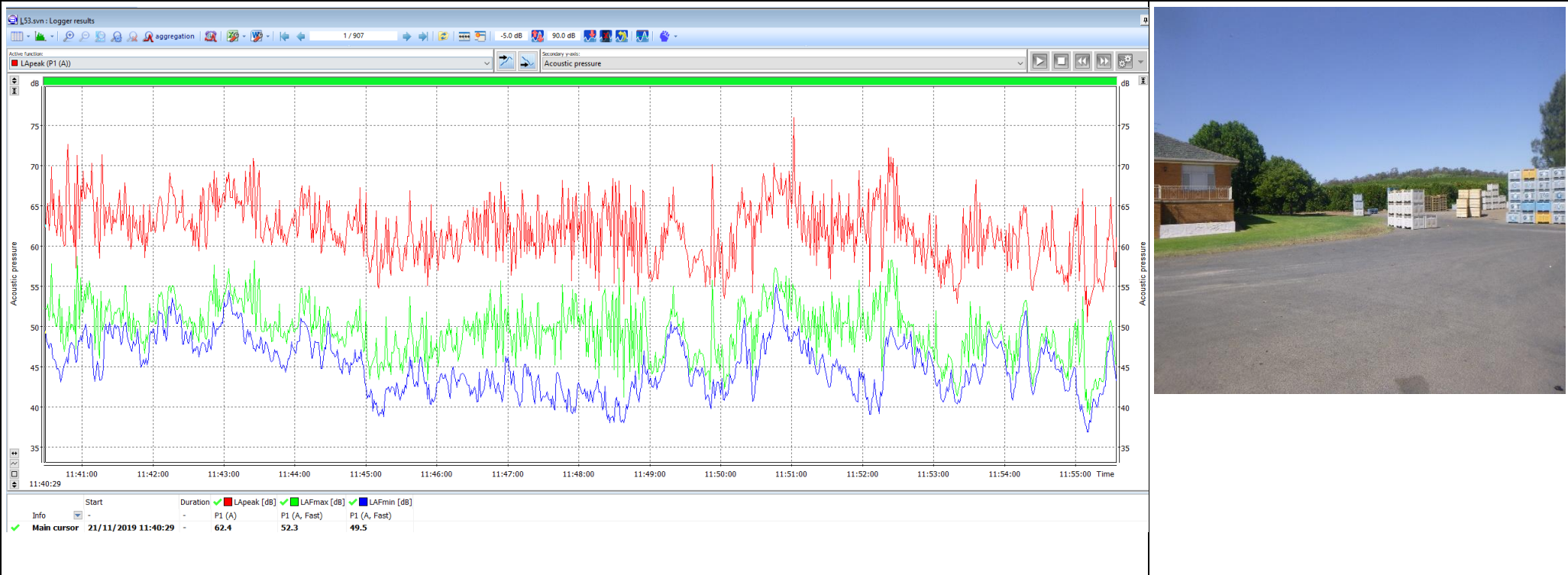


Figure 0-15 – Sensitive Receiver 5 Midday

Afternoon

The sound level meter was positioned 30 m of the residence, facing northeast, and in the same location as the morning and midday sessions. The dominant background noise was the generator in the orange sheds. Other distinctive noises were birds around the house and traffic noises from the Kidman Way. The noise level recorded by the attended monitoring was 44 dB(A) LAeq (15 min). This is over the 35 dB(A) noise impact assessment criteria.

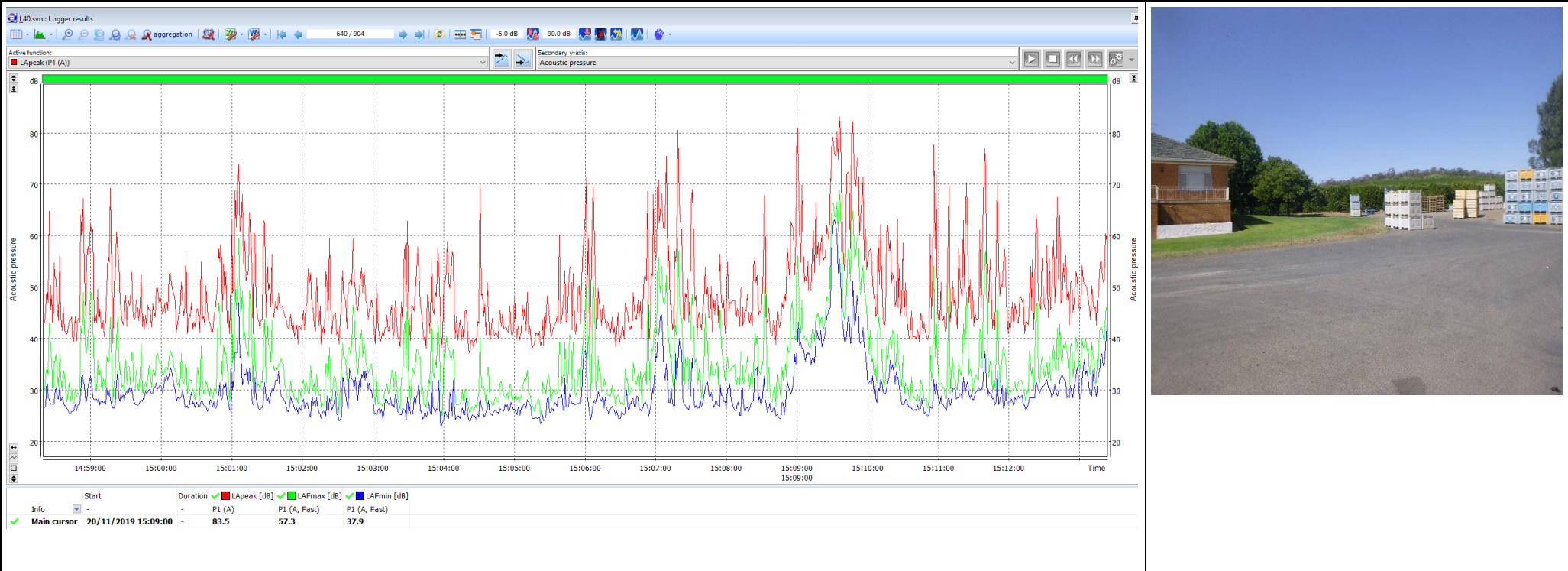


Figure 0-16 – Sensitive Receiver 5 Afternoon

Sensitive Receiver 6

Noise logging at sensitive Receiver Six, located on the corner of Slopes Road and Hillside Drive was not completed, as the field consultant was told to leave the property by the resident on the 20.11.19.

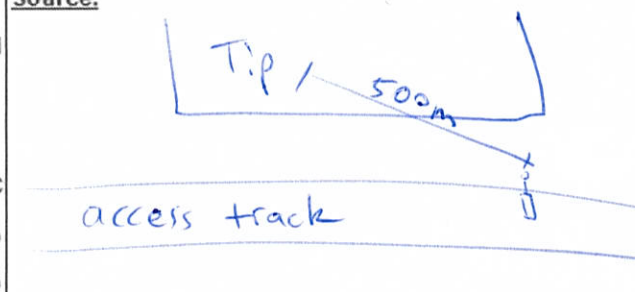


## Appendix C Noise Monitoring Datasheet

Project No: <u>18-393</u>		Date: <u>20.11.19</u>
Project Name: <u>Tharbogang Quarry Landfill</u>		Page <u>1</u> of <u>19</u>
Client: <u>Griffith City Council</u>		Performed by: <u>Alice Bauer</u>
Site: <u>Landfill site</u>		Monitoring Position: <u>SE</u>
Sound level Meter Make and Model: <u>SVANTEK 957</u>		

1. Monitoring Interval: <u>15 min</u>	mins ( 10 to 15 minutes standard)
2. Start Time: <u>13.58</u>	Finish Time: <u>14.13</u>
3. Calibration performed before monitoring	<input checked="" type="checkbox"/> Y/N factor = <u>108</u> dBA
4. Calibration performed before monitoring	Y/N factor = _____ dBA

$L_{eq}$ = <u>53.2</u>	$L_1$ = _____	$L_{peak}$ = <u>85.5</u>
$L_{10}$ = _____	$L_{max}$ = <u>72.1</u>	$L_{90}$ = _____
$L_{min}$ = <u>24.5</u>	Height of meter: <u>170 cm</u>	(1.2m minimum)

Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>4.1</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>S</u> Ambient Temperature = <u>36°C</u> Relative Humidity <u>13%</u> Cloud Cover <u>1%</u> Inversion Layer <input checked="" type="checkbox"/> Y/N Others ( fog, drizzle) _____	 <p>The sketch shows a rectangular area representing the landfill tip, labeled 'T.P.' with a distance of '500m' to a horizontal line labeled 'access track'. A small square on the track indicates the monitoring location.</p>

<b>DISTINCTIVE NOISE SOURCES</b> • heavy vehicles • Australian Raven calls • fliers • small birds & whistling kite calls • trucks from centre of landfill. • traffic noises from Kidman Way • light vehicles along access track • workers voices • dogs barking wind.	Dominant noise source: <u>bird calls</u>
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**NOISE CHARACTER** ( broad band , impulsive, tonal)

**METER SETTINGS** (Linear, exponential; weightings: a, b, c; fast, slow, impulsive)



NGH

Project No: 18-393

Date 21.11.19

Project Name: Tharbagany Quarry Landfill

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Client: Griffith City Council

Performed by Alice Bauer

Site: Property 1

Monitoring Position NE

Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval 15 min

mins (10 to 15 minutes standard)

2. Start Time 9.57

Finish Time 10.12

3. Calibration performed before monitoring

Y/N factor= dBA

4. Calibration performed before monitoring

Y/N factor= dBA

Leq= 58.1

L1=

Lpeak= 83.4

L10=

Lmax= 70.3

L90=

Lmin= 44.2

Height of meter 170cm

(1.2m minimum)

**Weather Conditions at time of Monitoring**

Wind Speed 9.3

m/second

(note: max allowable = 5m/sec)

Approximate Direction = N

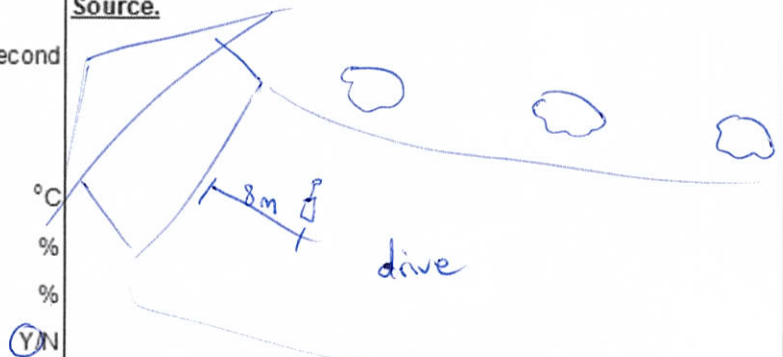
Ambient Temperature = 36.5

Relative Humidity 17

Cloud Cover 90%

Inversion Layer

Others (fog, drizzle)

**Sketch of Monitoring Location and Distance to Noise Source.****DISTINCTIVE NOISE SOURCES**

Dominant noise source : wind

- Strong wind in trees
- blade calling
- garden bird scratching litter
- dry leaves on driveway (in breeze)

**NOISE CHARACTER (broad band, impulsive, tonal)****METER SETTINGS (Linear, exponential; weightings: a, b, c; fast, slow, impulsive)****WAGGA WAGGA**

Suite 1, 39 Fitzmaurice Street (PO Box 5464) Wagga Wagga NSW 2650

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ABN 31 124 444 622 ACN 124 444 622





**NGH**

Project No: 18-393 Date 21.11.19

Project Name: Tharabogang City Council Page 14 of 19

Client: Property 4 Performed by Alice Bauer

Site: Griffith City Council Monitoring Position NE

Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval 15 min mins ( 10 to 15 minutes standard)

2. Start Time 12.05 Finish Time 12.15

3. Calibration performed before monitoring Y/N factor= 64 dBA

4. Calibration performed before monitoring Y/N factor= 108 dBA

$L_{eq}$  = 40.0  $L_1$  =             $L_{peak}$  = 77.7

$L_{10}$  =             $L_{max}$  = 51.5  $L_{90}$  =           

$L_{min}$  = 40.0 Height of meter 170 cm (1.2m minimum)

Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>9.8</u> m/second	
(note: max allowable = 5m/sec)	
Approximate Direction = <u>N</u>	
Ambient Temperature = <u>40</u> °C	
Relative Humidity <u>13</u> %	
Cloud Cover <u>70%</u> %	
Inversion Layer <u>Y/N</u>	
Others ( fog, drizzle)	

**DISTINCTIVE NOISE SOURCES** Dominant noise source: wind

• birds

• wind (strong wind in trees / bushes around house .

• traffic noise from kidman way .

**NOISE CHARACTER** ( broad band , impulsive, tonal)

**METER SETTINGS** (Linear, exponential; weightings: a, b, c; fast, slow, impulsive)

**WAGGA WAGGA**

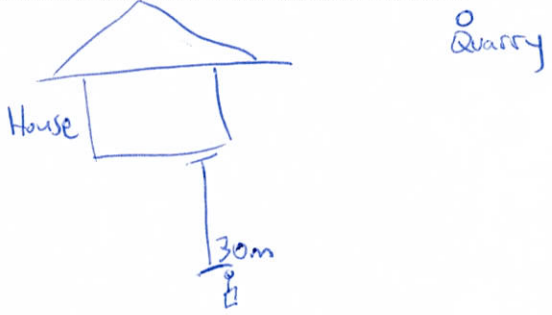
Suite 1, 39 Fitzmaurice Street (PO Box 5464) Wagga Wagga NSW 2650

T. (02) 6971 9696 E. [ng@nghconsulting.com.au](mailto:ng@nghconsulting.com.au) W. [www.nghconsulting.com.au](http://www.nghconsulting.com.au)**BEGA • BRISBANE • CANBERRA • GOLD COAST • NEWCASTLE • SYDNEY • WAGGA WAGGA**

ABN 31 124 444 622 ACN 124 444 622

Project No: 18-393 Date 20.11.19  
 Project Name: Tharbogang Quarry Landfill Page 3 of 19  
 Client: Griffith City Council Performed by Alice Bauer  
 Site: Property 5 Monitoring Position NE  
 Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval 15min mins ( 10 to 15 minutes standard)  
 2. Start Time 14.59 Finish Time 15.14  
 3. Calibration performed before monitoring Y/N factor= dB  
 4. Calibration performed before monitoring Y/N factor= dB  
 Leq= 44.0 L1= 68.8 Lpeak= 83.5  
 L10= 22.9 Lmax= 68.8 L90=  
 Lmin= 22.9 Height of meter 170cm (1.2m minimum)

Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>2.1</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>SSE</u> Ambient Temperature = <u>36°C</u> °C Relative Humidity <u>12%</u> % Cloud Cover <u>0%</u> % Inversion Layer <u>(Y/N)</u> Others ( fog, drizzle)	

#### DISTINCTIVE NOISE SOURCES

Dominant noise source: Generators

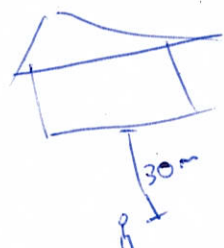
- Sparrows
- soft sound of wind
- Generator in orange packing shed.
- Road traffic along Kidman Way.
- Trucks braking along Kidman Way.
- house door open & close
- leaves rustling along far road in light wind gust
- flies
- car door & alarm, car leaving house & premise.
- shed doors in wind (creeking - loud).

NOISE CHARACTER ( broad band , impulsive, tonal)

METER SETTINGS (Linear, exponential; weightings: a, b, c; fast, slow, impulsive)

Project No: 18-393 Date 21.11.19  
 Project Name: Tharbogang Quarry Landfill Page 15 of 19  
 Client: Griffith City Council Performed by Alice Bauer  
 Site: Property 5 Monitoring Position NE  
 Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval 15 min mins ( 10 to 15 minutes standard)  
 2. Start Time 11.40 Finish Time 11.55  
 3. Calibration performed before monitoring Y/N factor= dB  
 4. Calibration performed before monitoring Y/N factor= dB  
 L<sub>eq</sub> = 48.3 L<sub>1</sub> =            L<sub>peak</sub> = 76.0  
 L<sub>10</sub> =            L<sub>max</sub> = 58.7 L<sub>90</sub> =             
 L<sub>min</sub> = 36.9 Height of meter 170cm (1.2m minimum)

Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>9.8</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>N</u> Ambient Temperature = <u>40</u> °C Relative Humidity <u>13</u> % Cloud Cover <u>80%</u> % Inversion Layer <u>Y/N</u> Others ( fog, drizzle) <u>          </u>	 <u>Quarry</u>

DISTINCTIVE NOISE SOURCES Dominant noise source: wind  
 • wind in orange trees  
 • house yard birds  
 • dry leaves blown across pavement  
 • sheds rattling  
 • garbage bag blowing in the wind  
 • radio playing in car among orange trees

NOISE CHARACTER ( broad band , impulsive, tonal)  
 METER SETTINGS (Linear, exponential, weightings; a, b, c; fast, slow, impulsive)

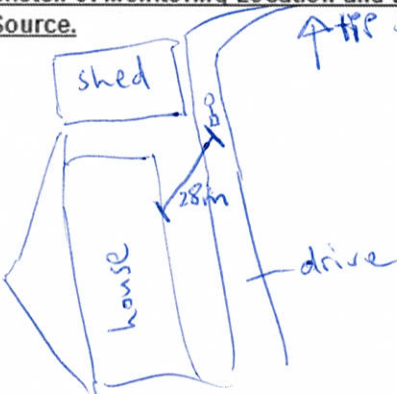




Project No: <u>18-393</u>	Date <u>20.11.19</u>
Project Name: <u>Tharbogang Quarry Landfill</u>	Page <u>4</u> of <u>19</u>
Client: <u>Griffith City Council</u>	Performed by <u>Alice Bauer</u>
Site: <u>Property 4</u>	Monitoring Position <u>NE</u>
Sound level Meter Make and Model <u>SVANTEK 957</u>	

1. Monitoring Interval <u>15 min</u>	mins ( 10 to 15 minutes standard)
2. Start Time <u>15.54</u>	Finish Time <u>16.09</u>
3. Calibration performed before monitoring	<input checked="" type="checkbox"/> Y/N factor= <u>108.16 dBA</u>
4. Calibration performed before monitoring	Y/N factor= <u>dBA</u>

Leq= <u>49.0</u>	L1= _____	Lpeak= <u>93.1</u>
L10= _____	Lmax= <u>71.6</u>	L90= _____
Lmin= <u>42.1</u>	Height of meter <u>170cm</u>	(1.2m minimum)

Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>3.6</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>E</u> Ambient Temperature = <u>37°C</u> Relative Humidity <u>11%</u> Cloud Cover <u>0%</u> Inversion Layer <input type="checkbox"/> Others ( fog, drizzle) _____	

DISTINCTIVE NOISE SOURCES	Dominant noise source : <u>wind, &amp; traffic noises.</u>
---------------------------	--

- Birds amongst orange trees (small birds)
- Trucks & traffic along Kidman Way
- Flies
- Hum of next door's generator
- Soft wind in pine trees near house
- house door opening/closing
- person at bins, tin bin noises.

NOISE CHARACTER ( broad band , impulsive, tonal)

METER SETTINGS (Linear, exponential; weightings: a, b, c; fast, slow, impulsive)



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Project No: 18-393 Date 21-11-19  
 Project Name: Tharbogang Quarry Landfill Page 16 of 19  
 Client: Griffith City Council Performed by Alice Bauer  
 Site: Property 3 Monitoring Position NE  
 Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval 15 min mins ( 10 to 15 minutes standard)  
 2. Start Time 12.24 Finish Time 12.30  
 3. Calibration performed before monitoring Y/N factor= 0 dBA  
 4. Calibration performed before monitoring Y/N factor= 0 dBA  
 L<sub>eq</sub>= 73.3 L<sub>1</sub>= L<sub>peak</sub>= 89.1  
 L<sub>10</sub>= L<sub>max</sub>= 77.0 L<sub>90</sub>=  
 L<sub>min</sub>= 69.6 Height of meter 170cm (1.2m minimum)

Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>9.8</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>N</u> Ambient Temperature = <u>40</u> °C Relative Humidity <u>13</u> % Cloud Cover <u>90%</u> % Inversion Layer <u>(Y/N)</u> Others ( fog, drizzle)	<p>A hand-drawn sketch showing a rectangular box labeled 'house'. To the right of the house is a horizontal line labeled '10m' leading to a vertical line representing a noise source. Below the house is a line labeled 'drive'.</p>

**DISTINCTIVE NOISE SOURCES** Dominant noise source = wind  
 • wind in trees  
 • birds  
 • creeking of shed next door  
 • leaves scraping along concrete in wind.  
 • aircon  
 • cats jumping fence.

**NOISE CHARACTER** ( broad band , impulsive, tonal)  
**METER SETTINGS** (Linear, exponential; weightings: a, b, c; fast, slow, impulsive)

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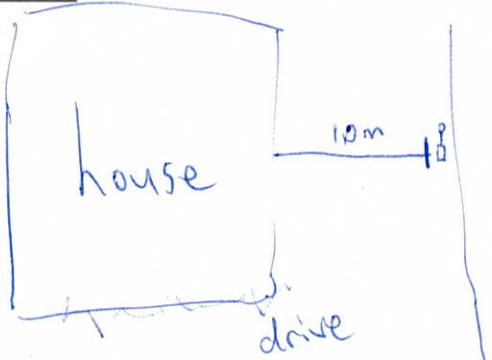
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Project No: <u>18-393</u>		Date <u>20.11.19</u>
Project Name: <u>Tharbogang Quarry Landfill</u>		Page <u>5</u> of <u>19</u>
Client: <u>Griffith City Council</u>		Performed by <u>Alice Bauer</u>
Site: <u>Property 3</u>		Monitoring Position <u>NE</u>
Sound level Meter Make and Model <u>SVANTEK 957</u>		
1. Monitoring Interval <u>15 min</u>	mins ( 10 to 15 minutes standard)	
2. Start Time <u>16.26</u>	Finish Time <u>16.41</u>	
3. Calibration performed before monitoring	Y/N factor= <u>  </u> dBA	
4. Calibration performed before monitoring	Y/N factor= <u>  </u> dBA	
$L_{eq}$ = <u>37.0</u>	$L1$ = <u>  </u>	$L_{peak}$ = <u>80.6</u>
$L_{10}$ = <u>  </u>	$L_{max}$ = <u>59.2</u>	$L_{90}$ = <u>  </u>
$L_{min}$ = <u>25.0</u>	Height of meter <u>170cm</u>	(1.2m minimum)

Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>3.6</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>E</u> Ambient Temperature = <u>37</u> °C Relative Humidity <u>11</u> % Cloud Cover <u>0</u> % Inversion Layer <u>  </u> Others ( fog, drizzle) <u>  </u>	

DISTINCTIVE NOISE SOURCES	Dominant noise source: <u>aircon + traffic noise</u>
<ul style="list-style-type: none"> <li>• blowfly / flies</li> <li>• small garden birds</li> <li>• <del>generator</del> house aircon.</li> <li>• cat walking nearby</li> <li>• traffic on Kidman Way</li> <li>• trucks on Kidman Way!</li> </ul>	

**NOISE CHARACTER** ( broad band , impulsive, tonal)

**METER SETTINGS** (Linear, exponential; weightings: a, b, c; fast, slow, impulsive)



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Project No: 18-393

Date 21.11.19

Project Name: Tharbagang Quarry Landfill

Page 17 of 19

Client: Griffith City Council

Performed by Alice Bauer

Site: Property 2

Monitoring Position NE

Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval 15 min

mins ( 10 to 15 minutes standard)

2. Start Time 12.24 12.48

Finish Time 12.39 13.03

3. Calibration performed before monitoring

Y/N factor= dBA

4. Calibration performed before monitoring

Y/N factor= dBA

Leq= 73.3

L1=

Lpeak= 89.2

L10=

Lmax= 76.6

L90=

Lmin= 69.7

Height of meter 170cm

(1.2m minimum)

**Weather Conditions at time of Monitoring**

Wind Speed 9.8

m/second

(note: max allowable = 5m/sec)

Approximate Direction = NNW

Ambient Temperature = 40.8

°C

Relative Humidity 11

%

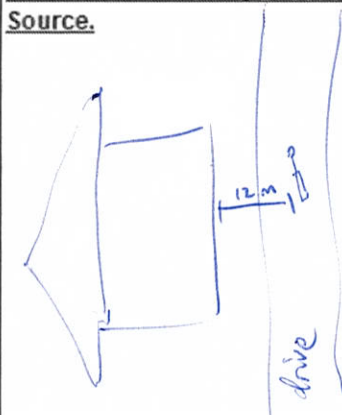
Cloud Cover 90%

%

Inversion Layer

(Y/N)

Others ( fog, drizzle)

**Sketch of Monitoring Location and Distance to Noise Source.****DISTINCTIVE NOISE SOURCES**

Dominant noise source: wind.

• Tractor along road out front

• wind in trees

• birds

• dogs barking around yard

• ppl driving trucks among orange orchid.

**NOISE CHARACTER ( broad band , impulsive, tonal)****METER SETTINGS (Linear, exponential; weightings: a, b, c; fast, slow, impulsive)****WAGGA WAGGA**

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Project No: 18-393 Date 20.11.19

Project Name: Tharbogang Quarry Landfill Page 6 of 19

Client: Griffith City Council Performed by Alice Bauer

Site: Property 2 Monitoring Position NE

Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval 15 min mins ( 10 to 15 minutes standard)

2. Start Time 16.54 Finish Time 17.09

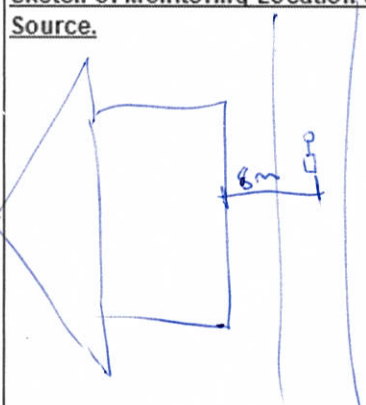
3. Calibration performed before monitoring Y/N factor= dB(A)

4. Calibration performed before monitoring Y/N factor= dB(A)

$L_{eq}$  = 44.6  $L_1$  =             $L_{peak}$  = 78.9

$L_{10}$  =             $L_{max}$  = 56.0  $L_{90}$  =           

$L_{min}$  = 41.9 Height of meter 170cm (1.2m minimum)

Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>3.6</u> m/second (note: max allowable = 5m/sec) Approximate Direction <u>ESE</u> Ambient Temperature = <u>37</u> Relative Humidity <u>11</u> Cloud Cover <u>0%</u> Inversion Layer <u>          </u> Others ( fog, drizzle) <u>          </u>	

#### DISTINCTIVE NOISE SOURCES

Dominant noise source : aircon

- house aircon
- garden birds & birds in distance
- flies & blowflies
- human voices from house
- aeroplane
- trucks Kidman Way

NOISE CHARACTER ( broad band , impulsive, tonal)

METER SETTINGS (Linear, exponential; weightings: a, b, c; fast, slow, impulsive)





NGH

Project No: 18-393

Date 21.11.19

Project Name: Tharbogang Quarry Landfill

Page 18 of 19

Client: Griffith City Council

Performed by Alice Bauer

Site: Property 1

Monitoring Position NE

Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval 15 min

mins (10 to 15 minutes standard)

2. Start Time 13.09

Finish Time 13.24

3. Calibration performed before monitoring

Y/N factor= dBA

4. Calibration performed before monitoring

Y/N factor= dBA

Leq= 73.3

L1=

Lpeak= 89.7

L10=

Lmax= 77.6

L90=

Lmin= 69.0

Height of meter 170 cm

(1.2m minimum)

**Weather Conditions at time of Monitoring**

Wind Speed 9.8

m/second

(note: max allowable = 5m/sec)

Approximate Direction = NNW

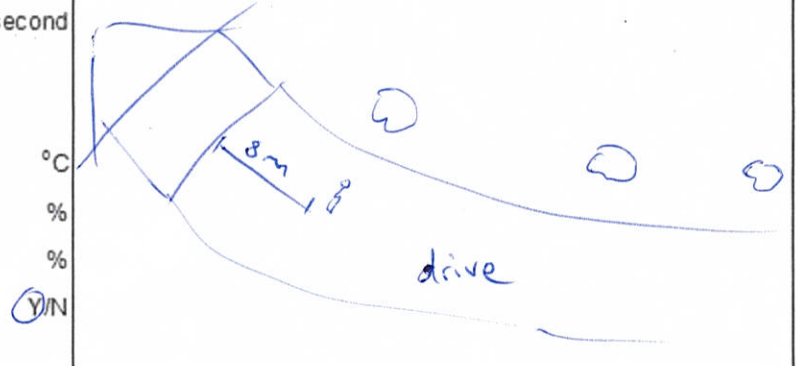
Ambient Temperature = 40.8

Relative Humidity 11

Cloud Cover 50%

Inversion Layer

Others (fog, drizzle)

**Sketch of Monitoring Location and Distance to Noise Source.****DISTINCTIVE NOISE SOURCES**

Dominant noise source : wind.

- wind in leaves (strong gusts)
- small birds
- vehicles on Kidman way

**NOISE CHARACTER (broad band, impulsive, tonal)****METER SETTINGS (Linear, exponential, weightings; a, b, c; fast, slow, impulsive)****WAGGA WAGGA**

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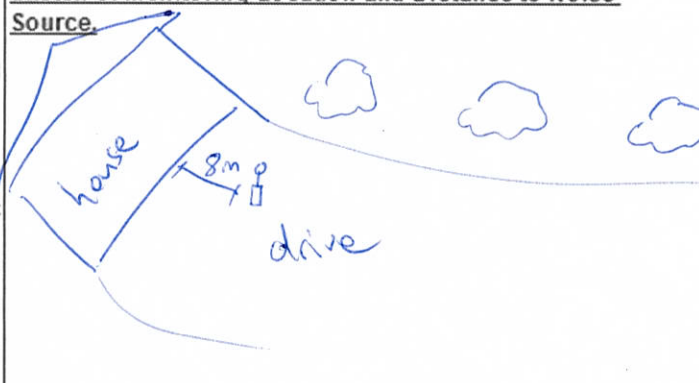
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ABN 31 124 444 622 ACN 124 444 622

Project No: 18-393 Date: 20.11.19  
 Project Name: Tharbogang Quarry Landfill Page 7 of 19  
 Client: Griffith City Council Performed by Alice Bauer  
 Site: Property 1 Monitoring Position NE  
 Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval <u>15 min</u>	mins ( 10 to 15 minutes standard)	
2. Start Time <u>17.40</u>	Finish Time <u>17.55</u>	
3. Calibration performed before monitoring	Y/N factor=	dBA
4. Calibration performed before monitoring	Y/N factor=	dBA
$L_{eq} =$ <u>34.2</u>	$L1 =$	$L_{peak} =$ <u>80.1</u>
$L_{10} =$	$L_{max} =$ <u>62.4</u>	$L_{90} =$
$L_{min} =$ <u>25.4</u>	Height of meter	(1.2m minimum)

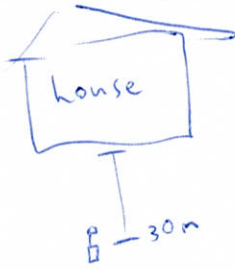
Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>3.6</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>ESE</u> Ambient Temperature = <u>35.4</u> °C Relative Humidity <u>13</u> % Cloud Cover <u>0/-</u> % Inversion Layer Others ( fog, drizzle)	

**DISTINCTIVE NOISE SOURCES** Dominant noise source : breeze & trees rustling  
• trees rustling  
• breeze  
• flies  
• birds  
• some light noises - movement from in the house.

**NOISE CHARACTER** ( broad band , impulsive, tonal)

**METER SETTINGS** (Linear, exponential, weightings: a, b, c, fast, slow, impulsive)

Project No: 18-393 Date 21/11/19  
 Project Name: Tharbogang Quarry Landfill Page 8 of 19  
 Client: Griffith City Council Performed by Alice Bauer  
 Site: Property 5 Monitoring Position NE  
 Sound level Meter Make and Model SVANTEK 957  
 1. Monitoring Interval 15min mins ( 10 to 15 minutes standard)  
 2. Start Time ~~7.57~~ 8.08 Finish Time ~~8.12~~ 8.23  
 3. Calibration performed before monitoring Y/N factor= 108 dBA  
 4. Calibration performed before monitoring Y/N factor=      dBA  
 Leq= 50.8 L1=      Lpeak= 79.1  
 L10=      Lmax= 65.7 L90=       
 Lmin= 40.1 Height of meter 170cm (1.2m minimum)

Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>8.7</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>N</u> Ambient Temperature = <u>32.2</u> °C Relative Humidity <u>21</u> % Cloud Cover <u>80%</u> % Inversion Layer <u>Y/N</u> Others ( fog, drizzle)	

**DISTINCTIVE NOISE SOURCES** Dominant noise source : Generator

- Generator
- Wind
- Sheds rustling in wind
- house sparrows & other small birds
- cars on Kidman way
- car door open/close near sheds.
- startling calls from ground.
- truck arriving at property

**NOISE CHARACTER** ( broad band , impulsive, tonal)

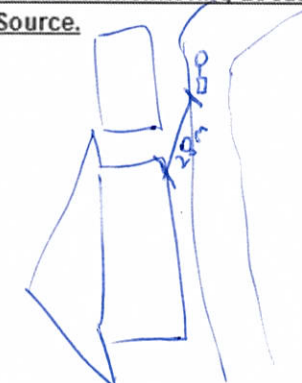
**METER SETTINGS** (Linear, exponential, weightings: a, b, c; fast, slow, impulsive)



Project No: 18-393 Date 21.11.19  
 Project Name: Tharbogang Quarry Landfill Page 9 of 19  
 Client: Griffith City Council Performed by Alice Bauer  
 Site: Property 4 Monitoring Position NE  
 Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval <u>15m</u>	mins ( 10 to 15 minutes standard)
2. Start Time <u>8.29</u>	Finish Time <u>8.44</u>
3. Calibration performed before monitoring	Y(N) factor= <u>    </u> dBA
4. Calibration performed before monitoring	Y/N factor= <u>    </u> dBA

$L_{eq}$ = <u>55.2</u>	$L_1$ = <u>    </u>	$L_{peak}$ = <u>85.7</u>
$L_{10}$ = <u>    </u>	$L_{max}$ = <u>68.1</u>	$L_{90}$ = <u>    </u>
$L_{min}$ = <u>9.0</u>	Height of meter <u>170cm</u>	(1.2m minimum)

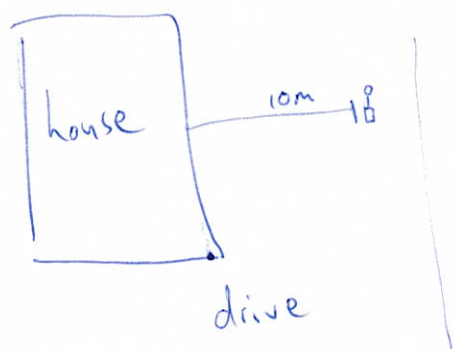
Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>8.7</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>N</u> Ambient Temperature = <u>32.2</u> °C Relative Humidity <u>21</u> % Cloud Cover <u>90%</u> % Inversion Layer <u>    </u> % Others ( fog, drizzle) <u>    </u> (Y/N)	

**DISTINCTIVE NOISE SOURCES** Dominant noise source: wind  
 • wind in palms & orange trees  
 • slight bird calls in distance  
 • activity at the house - doors opening/closing phone call.  
 • quad bike arriving at property  
 • traffic along Kidman Way  
 • house yard gate in breeze.  
 • dry leaves on concrete.  
 • truck activity around orange trees - coming & going from house twice. • house car leaving from garage  
**NOISE CHARACTER** ( broad band , impulsive, tonal)  
**METER SETTINGS** (Linear, exponential, weightings: a, b, c, fast, slow, impulsive)



Project No: 18-393 Date 21.11.19  
 Project Name: Tharbogang Quarry Landfill Page 10 of 19  
 Client: Griffith City Council Performed by Alice Bauer  
 Site: Property 3 Monitoring Position NE  
 Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval 15 min mins ( 10 to 15 minutes standard)  
 2. Start Time 8:57 Finish Time 9:12  
 3. Calibration performed before monitoring Y/N factor=    dBA  
 4. Calibration performed before monitoring Y/N factor=    dBA  
 Leq= 57.8 L1=    Lpeak= 85.3  
 L10=    Lmax= 70.8 L90=     
 Lmin= 51.4 Height of meter 170cm (1.2m minimum)

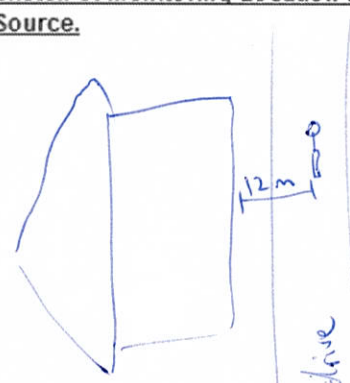
Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>9.3</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>NNE</u> Ambient Temperature = <u>34.3</u> °C Relative Humidity <u>19</u> % Cloud Cover <u>80%</u> % Inversion Layer <u>  </u> Y/N Others ( fog, drizzle) <u>  </u>	

**DISTINCTIVE NOISE SOURCES** Dominant noise source: wind  
 • trucks along road out front of house  
 • vehicles along Kidman Way  
 • sprinklers in garden  
 • wind in trees (strong gusts)  
 • shed doors in breeze  
 • dry leaves along ground.

**NOISE CHARACTER** ( broad band , impulsive, tonal)  
**METER SETTINGS** (Linear, exponential, weightings: a, b, c,; fast, slow, impulsive)

Project No: 18-393 Date 21.11.19  
 Project Name: Tharbagang Quarry Landfill Page 11 of 19  
 Client: Griffith City Council Performed by Alice Bauer  
 Site: Property 2 Monitoring Position NE  
 Sound level Meter Make and Model SVANTEK 957

1. Monitoring Interval 15 min mins ( 10 to 15 minutes standard)  
 2. Start Time 9.21 Finish Time 9.36  
 3. Calibration performed before monitoring Y/N factor= dBA  
 4. Calibration performed before monitoring Y/N factor= dBA  
 Leq= 53.8 L1= Lpeak= 81.8  
 L10= Lmax= 65.8 L90=  
 Lmin= 42.6 Height of meter 170 cm (1.2m minimum)

Weather Conditions at time of Monitoring	Sketch of Monitoring Location and Distance to Noise Source.
Wind Speed <u>9.3</u> m/second (note: max allowable = 5m/sec) Approximate Direction = <u>NNE</u> Ambient Temperature = <u>34.3</u> °C Relative Humidity <u>19</u> % Cloud Cover <u>100%</u> % Inversion Layer Y/N Others ( fog, drizzle)	

#### DISTINCTIVE NOISE SOURCES

Dominant noise source : wind

- birds around house
- wind in trees
- traffic along Kidman Way
- truck in orange trees
- human voices.

#### NOISE CHARACTER ( broad band , impulsive, tonal)

#### METER SETTINGS (Linear, exponential; weightings; a, b, c; fast, slow, impulsive)