

ACOUSTIC ASSESSMENT – CHILDCARE CENTRE

Meek's Day Care Centre

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21 March 2018

Prepared For:

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This firm is a member of the Association of Australian Acoustical Consultants.

The work reported herein has been carried out in accordance with the terms of membership. We stress that the advice given herein is for acoustic purposes only, and that the relevant authorities should be consulted with regard to compliance with regulations governing areas other than acoustics.

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1.0 INTRODUCTION

PKA Acoustic Consulting have been commissioned by Monique Wilson on behalf of Meek's Day Care Pty Ltd to assess the acoustic interaction of the proposed child care centre at 84-90 Third Road, Berkshire Park with the surrounding environment.

The assessment will be part of the DA conditions and documents to be presented to Penrith City Council. The purpose of the assessment is to establish the noise impact of the proposed changes to the day care operation and provide recommendations if there are any exceedances above the limits.

2.0 SUMMARY

An acoustic assessment has been conducted in accordance with the acoustic requirements of Penrith City Council and the NSW EPA *Noise Policy for Industry* (2017) to assess the noise intrusion into the surrounding premises.

PKA visited the home of Monique Wilson to inspect the proposed child care site and surroundings. Noise monitoring was conducted on site to measure the ambient noise levels. Noise breakout levels were calculated to the nearest sensitive receivers. Assessments have also been carried out to consider the noise intrusion and impact on internal and external childcare spaces. The noise levels were assessed against the relevant criteria. Where exceedances occurred, recommendations were given for consideration and compliance.

Providing our recommendations detailed in Section 7.0 are implemented, the proposed changes to the day-care operation at 84-90 Third Road, Berkshire Road will comply with the acoustic requirements of Penrith City Council.

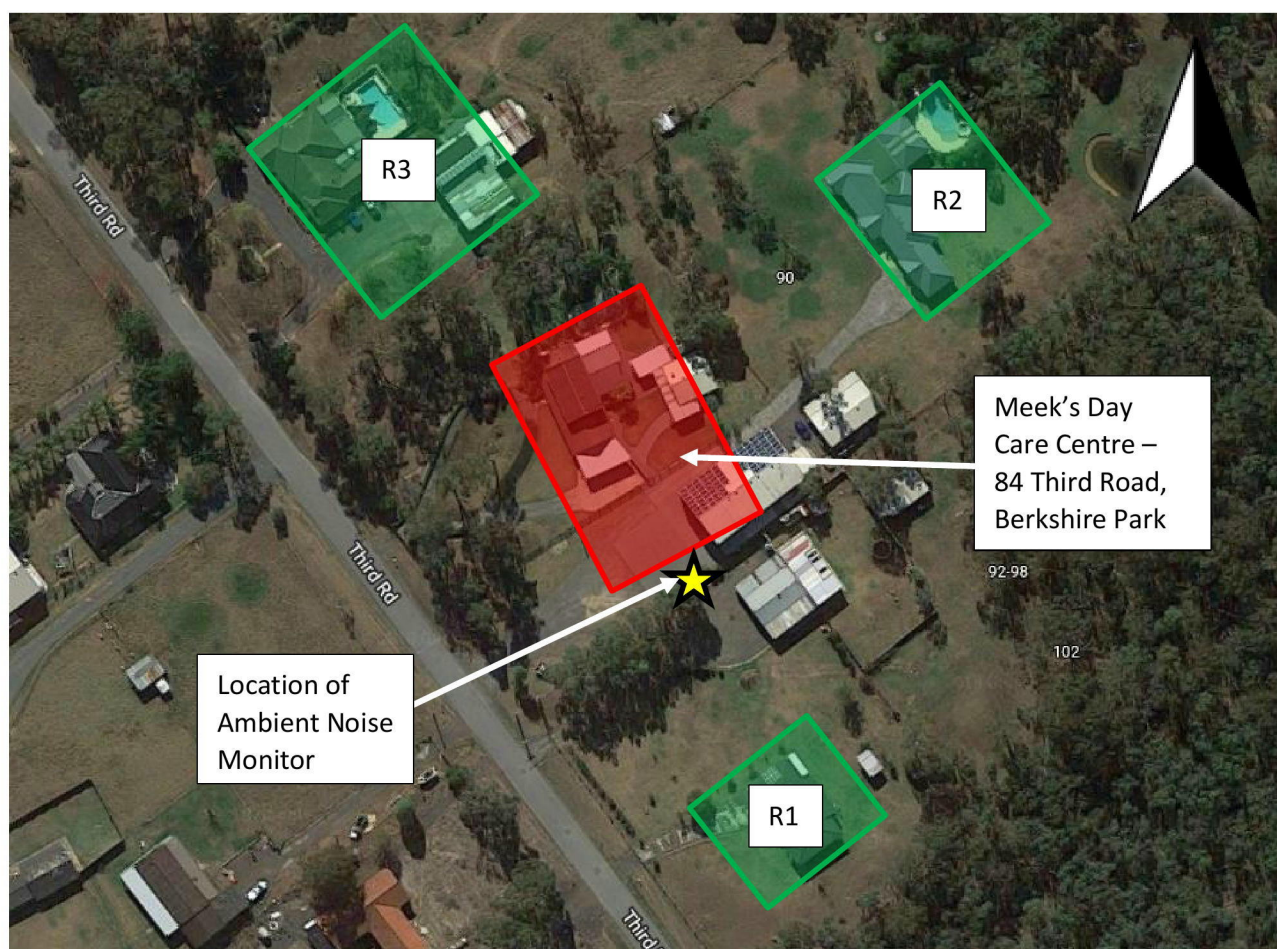
3.0 SITE DESCRIPTION

3.1 Overview

The proposed Meek's Day care centre is an existing residential property where the resident operates a family day care located at 84 - 90 Third Road, Berkshire Park. The site is bound by Third Road on the west and residential properties on the remaining sides.

The site location is shown in Figure 3-1.

Figure 3-1 Site Location



3.2 Operating Details

The proposed day-care will operate between the hours of 7:30am and 6pm between Monday and Friday. Currently, the site is used as a residence as well as operating a family day care. The proposed child care centre on site will operate during the same hours as the existing day-care operation and will have a maximum of 22 children. There is a dedicated car park for the premises which has a capacity for a maximum of 15 vehicles with no more than 7 being used at any given time.

[illegible]

The following is the summary of the sensitive residential receivers of the noise impact from the activity at the proposed function centre. The noise criteria are usually assessed at the residential boundary, however in this case, it is being considered to the residential buildings due to the nature of the layout of the developments and the area being classified as a primary production zone.

Residential Receiver 2 (R2) – 84-90 Third Road, Berkshire Park, located to the east of the day-care centre. The residential building is approximately 60 metres from the child care area and 90 metres from the car park area. Additionally, the site is shielded by the existing buildings.

Residential Receiver 3 (R3) – 76-82 Third Road, Berkshire Park, located to the north of the day-care centre. The residential building is approximately 80 metres from the child care area and 100 metres from the car park area. Additionally, the site is shielded by the existing buildings.

4.0 NOISE CRITERIA

Noise generated from commercial and industrial premises and from mechanical noise is generally assessed against the requirements of *Industrial Noise Policy (2000)*, which has been reviewed and superseded by the current *NSW EPA Noise Policy for Industry 2017* (NPfI).

The policy sets out two separate criteria to ensure environmental noise objectives are met. The first criterion considers intrusive noise to residential properties and the second is set to ensure the amenity of the land use is protected. The lower value of both criteria is considered to be the Project noise trigger level, which is the limit of the $L_{Aeq, 15min}$ noise level that must not be exceeded for the corresponding period of the day.

Amenity Criterion

To limit continuing increases in noise levels, the maximum ambient noise level within an area from commercial noise sources should not normally exceed the levels as specified in Table 2.2 of the policy for the specified time of the day. The NPfI recommends the following Amenity Noise Levels for various receiver premises.

Figure 4-1 Noise Criteria - Amenity for receiver buildings

All values in dB(A)

| Type of receiver | Time of day | Recommended Amenity Noise Level $L_{Aeq, (period)}$ |
|---------------------------|-------------|---|
| Residential (Suburban) | Day | 55 |
| | Evening | 45 |
| | Night | 40 |

To ensure that industrial noise levels (existing plus new) remain within the recommended amenity noise levels for an area, a project amenity noise level applies for each new source of industrial noise as follows:

Project amenity noise level for development = recommended amenity noise level **minus 5 dB(A)**.

To standardise the time periods for the intrusiveness and amenity noise levels, this policy assumes that the Amenity $L_{Aeq, 15min}$ will be taken to be equal to the $L_{Aeq, period} + 3 \text{ decibels (dB)}$.

Intrusiveness Criterion

The intrusiveness of a stationary noise source may be considered acceptable if the average of the maximum A-weighted levels of noise, $L_{Aeq, 15 \text{ minute}}$ from the source do not exceed by more than 5dB the Rating Background Level (RBL) measured in the absence of the source. This applies during all times of the day and night. There also exists an adjustment factor to be applied as per the character of the noise source. This includes factors such as tonal, fluctuating, low frequency, impulsive, intermittent etc. qualities of noise.

The RBL is determined in accordance with Section 2.3 of the NSW EPA NPfI. The intrusiveness criterion is $L_{Aeq, 15 \text{ minute}} < RBL + 5$.

5.0 NOISE SURVEY

Unattended noise monitoring was conducted on site between 21st February and 3rd March 2018 to record the ambient noise levels. The monitors were programmed to store the L_n percentile noise levels for each 15-minute sampling period. Measurements were made of L_{min} , L_{max} , L_{90} , and L_{eq} and were later retrieved for analysis.

The positions of noise monitors are shown in Figure 3-1. The results and summary of the noise monitoring are listed in graphical form in Appendix B of this report.

Although the monitor was on site for a period longer than 7 days, the weather from 25th February onwards was considerably bad and the data from this period could not be used. Therefore, the data from the 5 days of monitoring during the good weather period was used in this assessment. However, PKA expects the results of monitoring during this period to be representative of the existing background noise and that than any additional period of monitoring would have resulted in similar results during the weekday periods.

5.1 Instrumentation

Noise measurements were conducted using the following equipment:

- Sound analyser Acoustic Research Laboratory, Serial number 16-207-017.
- Sound calibrator B&K 4230, Serial number 11419.

The instruments were calibrated before and after the noise measurements and there were no adverse deviations between the two.

The analysers are type 1 and comply with AS IEC 61672.2-2004. The instruments carry traceable calibration certificates.

5.2 Project Noise Criteria

Data from the noise monitors were processed to obtain the ambient noise levels and the noise goals.

Ambient Noise Measurements

The tables below present the results of the ambient noise monitor measurements.

The assessment periods are defined by the NSW NPfI are as follows:

- Daytime: 7 am to 6 pm
- Evening: 6pm to 10 pm
- Night: 10pm to 7 am

Table 5-1 NPfl Project Noise Trigger Levels

All values in dB(A)

| Receiver Type | Period | Measured RBL (L _{A90}) | Acceptable Noise Levels L _{Aeq} (period) | NSW Noise Policy for Industry Criteria | | Project Noise Trigger Levels L _{Aeq} 15min |
|-------------------------|---------|----------------------------------|---|--|--------------------------------------|---|
| | | | | Amenity L _{Aeq} 15min | Intrusiveness L _{Aeq} 15min | |
| Residential (Sub-Urban) | Day | 36 | 55 | 53 | 41 | 41 |
| | Evening | 35 | 45 | 43 | 40 | N/A |
| | Night | 30 | 40 | 38 | 35 | N/A |

The childcare centre is proposed to be used only during the daytime hours and therefore, the evening and night criteria is not applicable in this instance.

6.0 ASSESSMENT

The childcare centre or the outdoor areas are not affected by traffic noise as the premises is located away from any busy roads or corridors.

6.1 Children Play Areas

Considering the maximum capacity of 22, calculations were performed assuming all 22 children in the outdoor area.

Noise level of children at play was obtained from the AAAC (Association of Australian Acoustical Consultants) publication, Guidelines for Childcare Noise Assessment. The publications suggest the noise levels for 10 children aged 1-2 years old at play as SWL 77 dB(A), 10 Children aged 2-3 years old at play as SWL 83 dB(A), 10 Children aged 3-6 years old at play as SWL 84 dB(A).

Assuming an equal mix of the above, a sound power level of 90 dB(A) for the 22 children in the outdoor play area. (A sound power level of 92 dB(A) was considered for the 15 children in the indoor play areas. Based on the construction of the indoor areas and if the windows are closed, a reduction of 20 dB(A) is achievable. This is significantly lower and therefore, the worst-case scenario of the outdoor play area is being considered.) Therefore, the total sound power level from the child care premises will be 87 dB(A) and this is being used for the calculations. The following table presents the results of the calculations at the boundaries.

Table 6-1 Sound Pressure Levels at residential buildings assuming maximum childcare activity

| Sound Power Level at childcare centre from play areas | Sound Pressure Level at Receiver R1 | Sound Pressure Level at Receiver R2 | Sound Pressure Level at Receiver R3 | Noise Criteria L _{Aeq} | Complies? |
|---|-------------------------------------|-------------------------------------|-------------------------------------|---------------------------------|-----------|
| 90 dB(A) | 42 dB(A)* | 40 dB(A) | 38 dB(A) | 41 dB(A) | Yes* |

**Marginal exceedance but allowable as it could be a results of measurement tolerance.*

6.2 Carpark Noise Assessment

The architectural plans indicate that the site will have a total of 15 parking spaces and PKA has been advised that only 7 cars will be on site at any given time. PKA has considered a scenario where 15 cars arrive or leave in a 15-minute period (unlikely, but a stringent situation). The calculations present the values at receiver R1 as it is the most sensitive residential receiver of the carpark activity.

Typical time frames for events and their corresponding sound pressure levels were considered. The assumptions made for the event are listed below in Table 6-2 and Table 6-3. The values are based on extensive measurements conducted by PKA.

Table 6-2 Typical Time Frames and Sound Pressure Levels – Cars attending service

| Event Description | Sound Pressure Levels (10m) | Duration of each Event |
|--|-----------------------------|------------------------|
| Car Entering and driving into the car park | 61 dB(A) | 10 seconds |
| Cars stopping and parking | 55 dB(A) | 5 seconds |
| Door slams (assuming 2 per car) | 56 dB(A) | 1 second |

Table 6-3 Typical Time Frames and Sound Pressure Levels – Cars leaving service

| Event Description | Sound Pressure Levels (10m) | Duration of each Event |
|------------------------------------|-----------------------------|------------------------|
| Door slams (assuming 2 per car) | 67 dB(A) | 1 seconds |
| Cars starting – Engine Activity | 78 dB(A) | 1 seconds |
| Cars driving out of the car park | 61 dB(A) | 10 seconds |

The results of the traffic noise impact from the proposed car park activity is shown below in Table 6-4.

Table 6-4 Traffic Noise Impact from Car Park Operation at Receiver R1

| Calculated noise at sensitive receivers | Period | NPfI Project Trigger Levels – Noise Criteria ($L_{eq\ 15min}$) | Complies? |
|---|------------------------------|---|-------------------|
| Vehicles arriving $L_{eq\ 15min}$: 38 dB(A) | Daytime operation of carpark | 41 dB(A) | Yes |
| Vehicles leaving $L_{eq\ 15min}$: 41 dB(A) | | | Yes (Marginal) |

Based on the information provided and the assumptions made on measurements performed by PKA, the proposed car park activity complies with the acoustic criteria. Please refer to Section 7.0 of this report for recommendations that need to be carried out to ensure that acoustic compliance is achieved during operation and maintained.

7.0 RECOMMENDATIONS

The following recommendations need to be employed to ensure that acoustic compliance is achieved and maintained during operation. The recommendations have been based on data provided to PKA for the preparation of this report and assumptions made in calculations.

Car Park Activity

1. The number of car movements must be limited to 15 within a 15-minute period.
2. The car park drive in area and parking should be limited to 10km/hr to keep noise emissions low.
3. Signage must be displayed clearly to ensure patrons in the carpark are aware of potential noise generation activity and to remain as quiet as possible during the night-time hours.

Outdoor Plant and equipment

4. The selection of any future outdoor mechanical and plant equipment must be checked so that the rated sound power/pressure levels will comply at the boundary of the sensitive residences (existing and proposed) with the criteria listed in Section 5.2

APPENDIX A DRAWINGS USED TO PREPARE REPORT

This report was prepared using drawings provided by Havanah Building Design for Lot 107, DP975322.

| No. | Rev. | Title | Date |
|--------|------|---|------------|
| 102/18 | - | Sheet 1 of 3: Site Plan | 01-03-2018 |
| 102/18 | - | Sheet 2 of 3: Floor Plan and Part Site Plan | 01-03-2018 |
| 102/18 | - | Sheet 3 of 3: Elevations & Section | 01-03-2018 |

APPENDIX B NOISE MEASUREMENTS (GRAPHICAL)

11164 Meek's Day Care Centre

Project Address: 84 - 90 Third Road, Berkshire Park

Logger Location: At the residential boundary of 84 and 82 Third Road, Berkshire Park

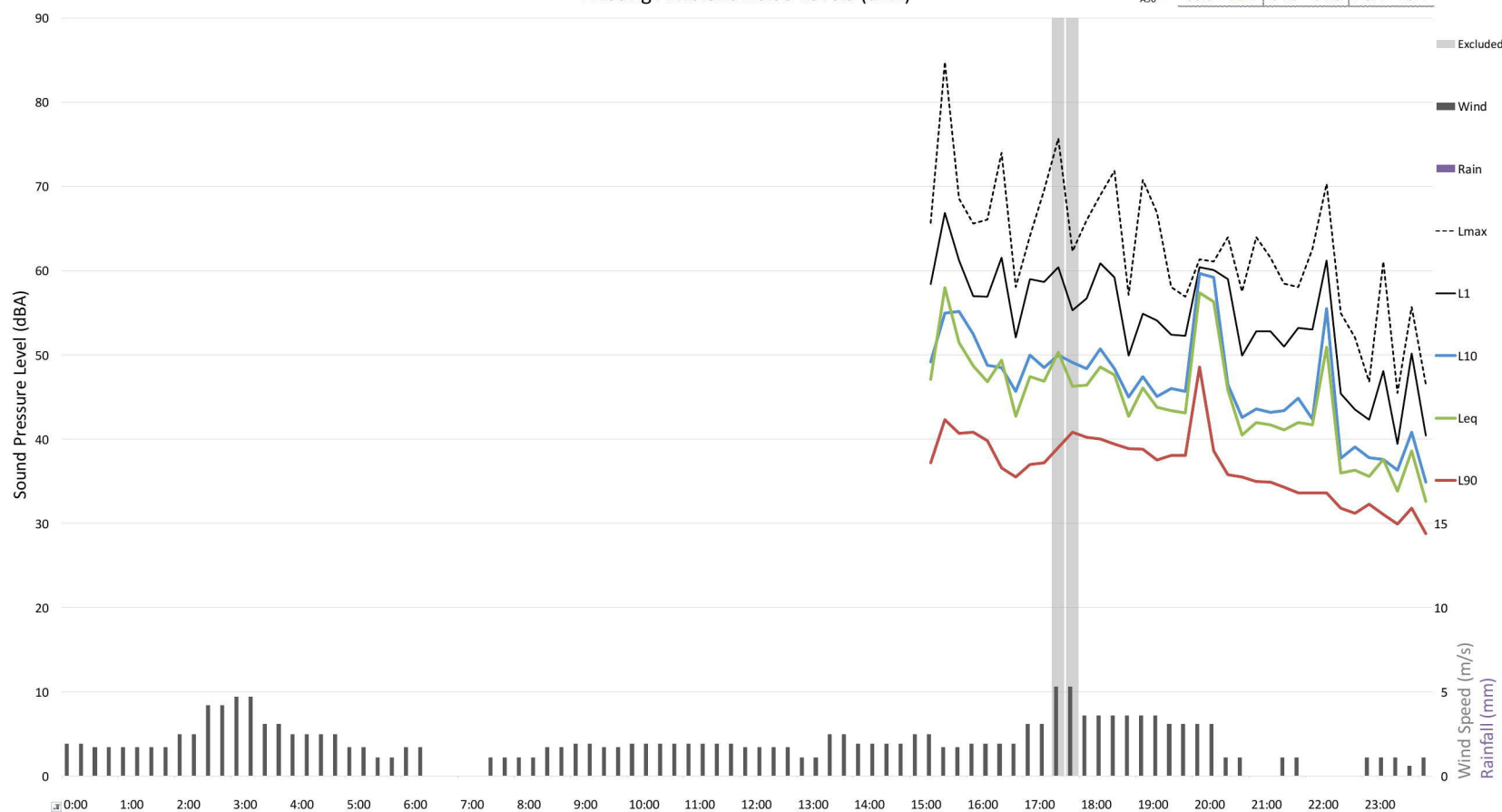
BOM weather data: Penrith IDN60901

PKA Acoustic Consulting

21-02-2018 Wednesday

Existing Ambient Noise Levels (dBA)

| | Daytime 07:00 - 18:00 | | Evening 18:00 - 22:00 | | Nighttime 22:00 - 07:00 | |
|---------------------|--------------------------|-------------------|--------------------------|-------------------|----------------------------|-------------------|
| | Measured | Weather Corrected | Measured | Weather Corrected | Measured | Weather Corrected |
| L _{Aeq} dB | 0.0 | 0.0 | 49.4 | 49.4 | 44.0 | 44.0 |
| L _{A90} dB | 36.6 | 36.4 | 34.6 | 34.6 | 28.4 | 28.4 |



11164 Meek's Day Care Centre

Project Address: 84 - 90 Third Road, Berkshire Park

Logger Location: At the residential boundary of 84 and 82 Third Road, Berkshire Park

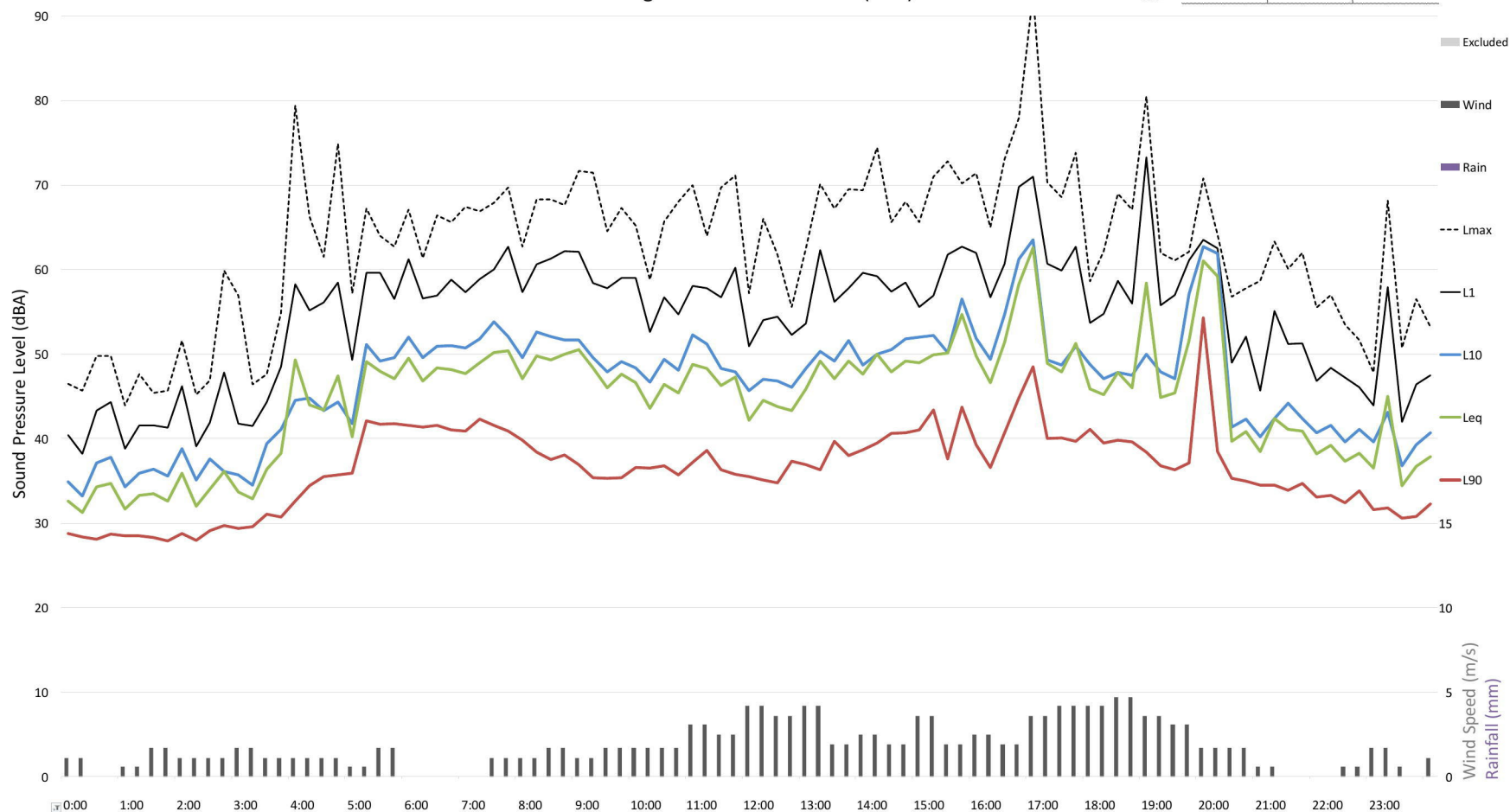
BOM weather data: Penrith IDN60901

PKA Acoustic Consulting

22-02-2018 Thursday

Existing Ambient Noise Levels (dBA)

| | Daytime | | Evening | | Nighttime | |
|---------------------|---------------|-------------------|---------------|-------------------|---------------|-------------------|
| | 07:00 - 18:00 | | 18:00 - 22:00 | | 22:00 - 07:00 | |
| | Measured | Weather Corrected | Measured | Weather Corrected | Measured | Weather Corrected |
| L _{Aeq} dB | 51.1 | 51.1 | 53.1 | 53.1 | 44.7 | 44.7 |
| L _{A90} dB | 35.4 | 35.4 | 34.5 | 34.5 | 30.0 | 30.0 |



11164 Meek's Day Care Centre

Project Address: 84 - 90 Third Road, Berkshire Park

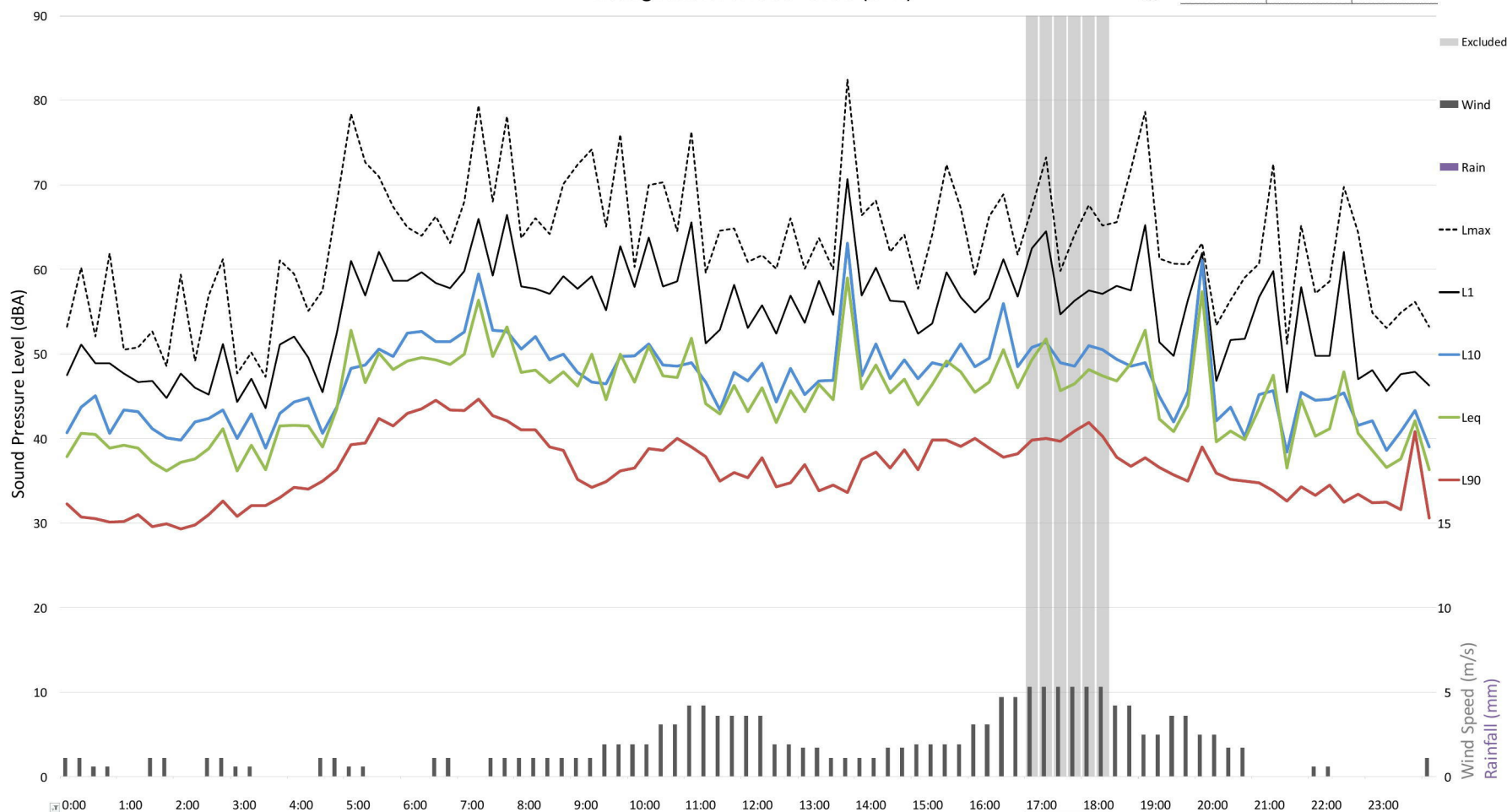
Logger Location: At the resindital boundary of 84 and 82 Third Road, Berkshire Park

BOM weather data: Penrith IDN60901

23-02-2018 Friday

Existing Ambient Noise Levels (dBA)

| | Daytime 07:00 - 18:00 | | Evening 18:00 - 22:00 | | Nighttime 22:00 - 07:00 | |
|---------------------|--------------------------|-------------------|--------------------------|-------------------|----------------------------|-------------------|
| | Measured | Weather Corrected | Measured | Weather Corrected | Measured | Weather Corrected |
| L _{Aeq} dB | 49.4 | 49.4 | 48.7 | 48.8 | 42.0 | 42.0 |
| L _{A90} dB | 34.6 | 34.5 | 34.1 | 34.0 | 30.5 | 30.5 |



11164 Meek's Day Care Centre

Project Address: 84 - 90 Third Road, Berkshire Park

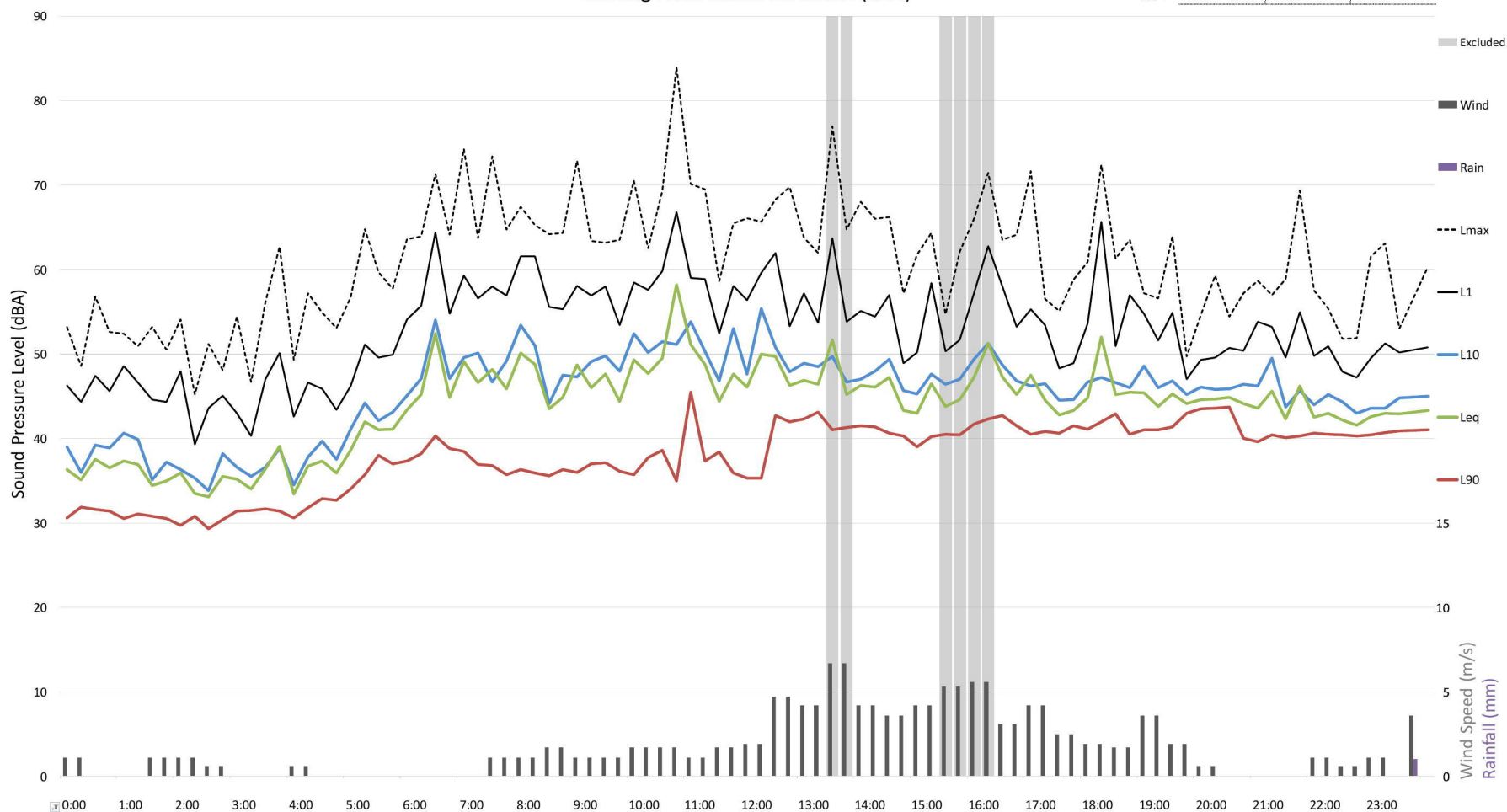
Logger Location: At the residential boundary of 84 and 82 Third Road, Berkshire Park

BOM weather data: Penrith IDN60901

24-02-2018 Saturday

Existing Ambient Noise Levels (dBA)

| | Daytime 07:00 - 18:00 | | Evening 18:00 - 22:00 | | Nighttime 22:00 - 07:00 | |
|---------------------|--------------------------|-------------------|--------------------------|-------------------|----------------------------|-------------------|
| | Measured | Weather Corrected | Measured | Weather Corrected | Measured | Weather Corrected |
| L _{Aeq} dB | 48.4 | 48.4 | 45.8 | 45.8 | 41.2 | 41.2 |
| L _{A90} dB | 35.7 | 35.7 | 40.1 | 40.1 | 34.1 | 34.1 |



11164 Meek's Day Care Centre

Project Address: 84 - 90 Third Road, Berkshire Park

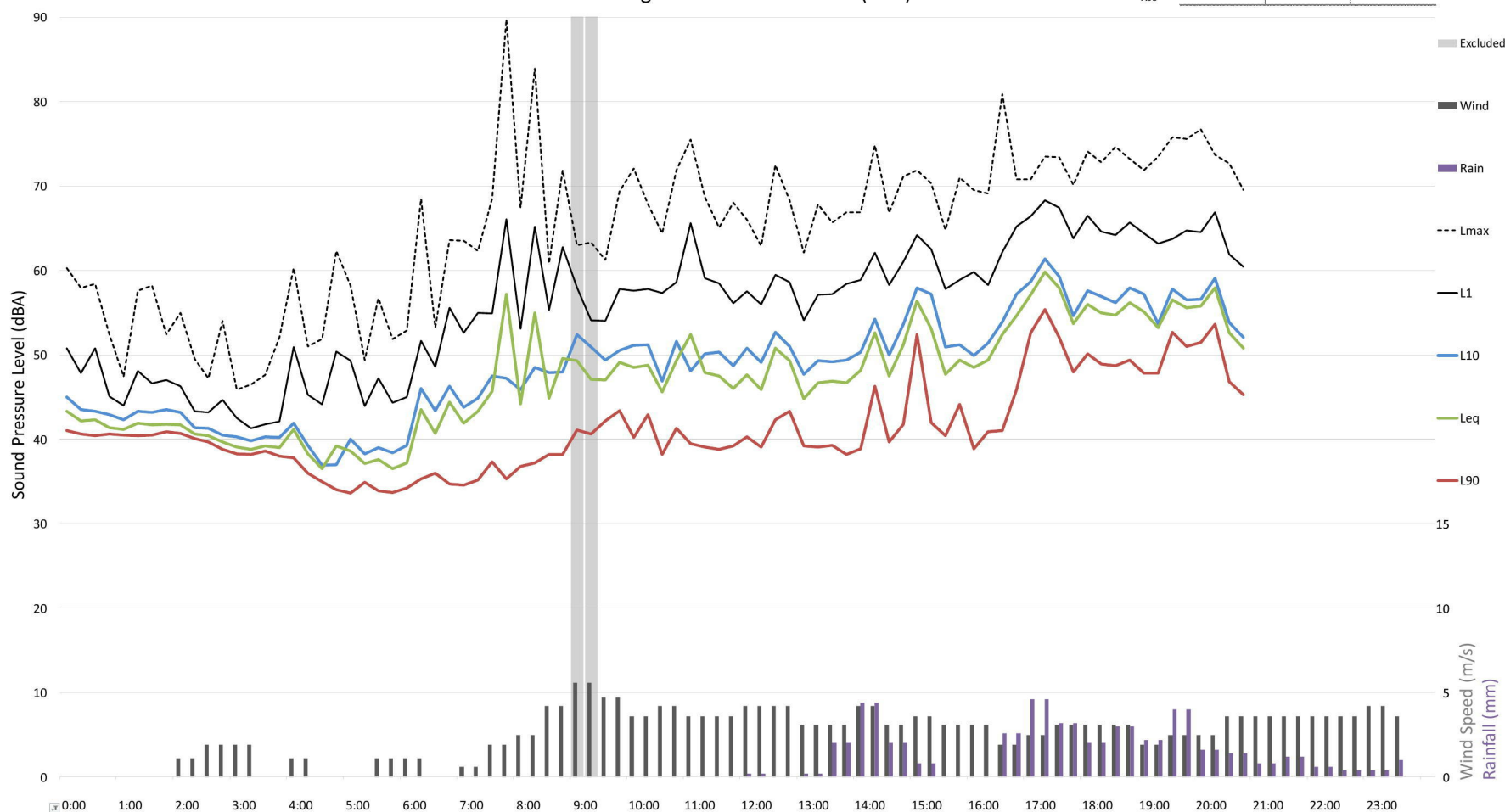
Logger Location: At the residential boundary of 84 and 82 Third Road, Berkshire Park

BOM weather data: Penrith IDN60901

25-02-2018 Sunday

Existing Ambient Noise Levels (dBA)

| | Daytime 08:00 - 18:00 | | Evening 18:00 - 22:00 | | Nighttime 22:00 - 08:00 | |
|---------------------|--------------------------|-------------------|--------------------------|-------------------|----------------------------|-------------------|
| | Measured | Weather Corrected | Measured | Weather Corrected | Measured | Weather Corrected |
| L _{Aeq} dB | 51.7 | 51.9 | 0.0 | 0.0 | 0.0 | 0.0 |
| L _{A90} dB | 38.2 | 38.2 | 46.9 | 46.9 | | |



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