

## C Technical Note – Measured noise levels – Orora quarterly monitoring

<b>Project no.</b>	16002	<b>Date</b>	19 March 2018
<b>Client</b>	Orora Pty Ltd, Matraville	<b>Project manager</b>	Jacob Chretien
<b>Project description</b>	B7 Demolition - Noise compliance		
<b>Project engineer</b>	Scott Hughes		
<b>Subject</b>	Measured noise levels – Orora quarterly monitoring		

## Summary

Orora has completed demolition of its B7 paper machine building. To offset the loss of the noise screening afforded by this building, a 140 m long, 12 m high noise wall has been installed along the most affected boundary. A review of noise monitoring data at the noise sensitive receivers most likely to be affected by the loss of the B7 building has been completed to determine whether the noise wall is effective in Orora's continuing compliance with noise limits in its Environment Protection Licence.

Analysis of monitoring data for 6 monitoring periods prior to demolition and 2 periods subsequent indicates noise levels after installation of the wall are within the typical range of measured levels and often at the lower end for the LA90 statistical parameter.

When comparing median results, noise levels following installation of the wall tend to be lower than prior to B7 demolition. Therefore, noise levels at the nearest affect receivers do not appear to have increased following installation of the noise wall.

## Introduction

In line with proposed infrastructure modifications at Orora's paper mill in Matraville, NSW, demolition of the approximately 170 metre long, B7 Paper Machine Building (B7) within the Orora site has been completed.

Prior to demolition, Orora prepared a Noise Management Strategy (NMS) to address potential impacts on the noise amenity of the closest residential properties to the B7 building, which recommended a noise barrier to be located on the eastern boundary over a distance of around 140 metres from the end of the B8 building, along the boundary adjacent to the B7 building.

The proposed noise barrier was constructed from shipping containers stacked four high, having an overall height of around 12 metres and located adjacent to the B7 building (see Figure 1).

As part of the compliance process for the demolition of the B7 building, a review of the local noise environment before and after the construction of the noise wall and subsequent demolition of B7 has been completed. This Technical Note presents a review of the results of long term quarterly noise monitoring at two locations within Partanna Avenue, both potentially affected by noise from the Orora site.



**Figure 1 View of container noise wall – B7 demolition**

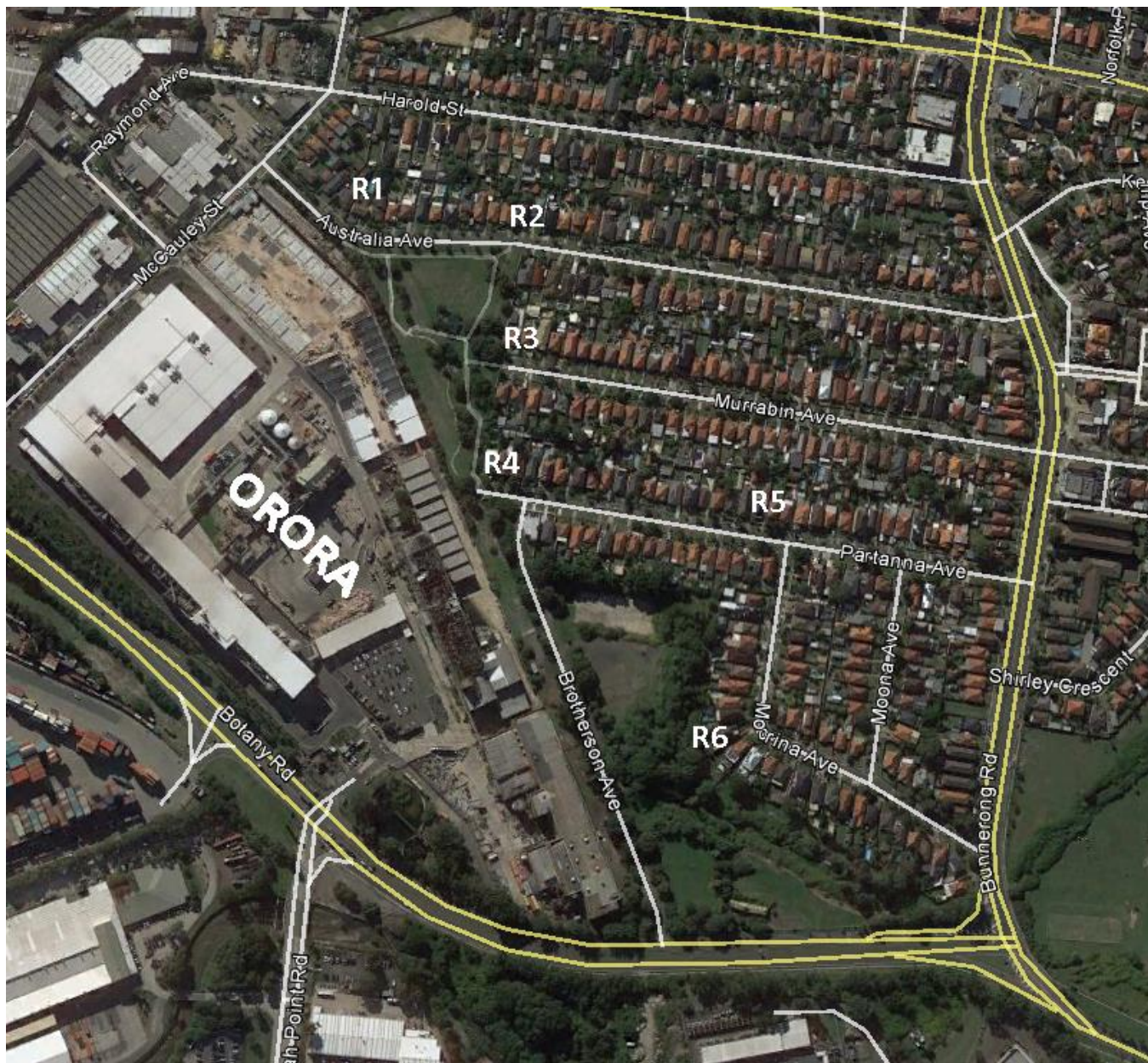
## Monitoring locations

As part of Orora's Environment Protection Licence (EPL) No. 1594, there is a requirement to undertake quarterly monitoring at receivers surrounding the site to show compliance with set noise limits. The receiver locations identified for monitoring are identified in condition L4.1 of the EPL and Condition 10 of the MCoA. The monitoring locations are the subject of quarterly noise surveys, which provide a long term profile of noise levels surrounding the site. The monitoring locations and references are presented in Table 1 and shown on an aerial photograph in Figure 2.

**Table 1 Orora EPL noise monitoring locations**

ID	Location
R1	Corner of McCauley Street and Australia Avenue
R2	Australia Avenue
R3	Murrabin Avenue
R4	Partanna Avenue
R5	Corner of Partanna Avenue and Moorina Avenue
R6	Moorina Avenue





**Figure 2 Site location and compliance monitoring locations (Source: Google Maps 2016)**

Receivers in Partanna Avenue, likely to be most affected by the demolition of the B7 building, are located at R4 and R5. While close to the container barrier, the monitoring location for receiver R6 has not been included in this review. This location benefits from shielding offered by the existing B8 Building from Orora's activities and is more significantly influenced by noise sources south of the site such as Port Botany as well as traffic noise from Botany and Bunnerong Roads.

## Results

The quarterly monitoring history dating back to July 2016, prior to the demolition works, has been compared to the two most recent noise monitoring surveys at these receivers being the November 2017 and February 2018 periods which were completed once the demolition works were underway.

Monitoring conducted in November 2017 represents the noise environment when the container wall was initially installed, and demolition work had commenced. Monitoring conducted in February 2018 represents the noise environment at the completion of demolition of the B7 building and therefore the worst-case scenario, i.e. no shielding of Orora or other noise sources to the south by the B7 building.

The measurements presented in the following tables summarise the minimum and maximum noise level ranges for the night time survey periods for each of the quarterly survey periods. The night time periods have been selected to best represent the influence of the Orora site on the noise environment, which will be more accurately reported when extraneous noise influences are minimal.

The range of minimum and maximum noise levels for each of the parameters has been used to better describe the noise environment during each survey. The measurements include the  $L_{A90}$  and the  $L_{Aeq}$  noise levels, with the  $L_{A90}$  levels better representing steady state noise influences expected from the Orora site.

Results for the November 2017 and February 2018 periods when the container barrier is in place are shown in bold. Graphs of the results have been included in Appendix A.

**Table 2 Quarterly monitoring data - Location R4**

Quarterly Monitoring survey period		Container noise barrier status	Noise level Range $L_{A90}$ dB(A)		Noise level Range $L_{Aeq}$ dB(A)		Arithmetic average	
Year	Month		Min	Max	Min	Max	$L_{A90}$	$L_{Aeq}$
2016	January	Not installed	36.3	47.9	45.5	52.9	41	48
2016	April	Not installed	37.2	42.6	42.4	50	39	44
2016	July	Not installed	44.6	48.4	47.3	52.2	46	50
2016	September	Not installed	39.4	47.5	44.8	57.6	43	54
2017	February	Not installed	n/a	n/a	n/a	n/a	n/a	n/a
2017	August	Not installed	45.3	48.7	47.5	51.3	48	50
<b>2017</b>	<b>November</b>	<b>Installed</b>	<b>37.6</b>	<b>46.7</b>	<b>49.1</b>	<b>58.7</b>	<b>41</b>	<b>53</b>
<b>2018</b>	<b>February</b>	<b>Installed</b>	<b>39.6</b>	<b>46.8</b>	<b>43.3</b>	<b>52.3</b>	<b>43</b>	<b>48</b>

**Table 3 Quarterly monitoring data - Location R5**

Quarterly Monitoring survey period		Container noise barrier status	Noise level Range LA90 dB(A)		Noise level Range LAeq dB(A)		Arithmetic average	
Year	Month		Min	Max	Min	Max	LA90	LAeq
2016	January	Not installed	n/a	n/a	n/a	n/a	n/a	n/a
2016	April	Not installed	31.6	37.4	38.9	48.1	34	42
2016	July	Not installed	43.1	48	46.1	53.1	46	50
2016	September	Not installed	40.5	44.5	47.2	53.2	43	49
2017	February	Not installed	29.4	42	39.9	49.4	38	46
2017	August	Not installed	44.7	50.8	46.5	53.6	48	51
<b>2017</b>	<b>November</b>	<b>Installed</b>	<b>33.4</b>	<b>43.4</b>	<b>44.2</b>	<b>49.6</b>	<b>37</b>	<b>47</b>
<b>2018</b>	<b>February</b>	<b>Installed</b>	<b>34.9</b>	<b>43.8</b>	<b>43</b>	<b>53.6</b>	<b>39</b>	<b>46</b>

The results for each of the receiver locations indicate that noise levels after installation of the container wall are within the typical range of measured levels and often at the lower end for the LA90 statistical parameter.

Further analysis of these receiver locations has been undertaken to compare the median values for noise levels without a container wall versus those with the container wall in place.

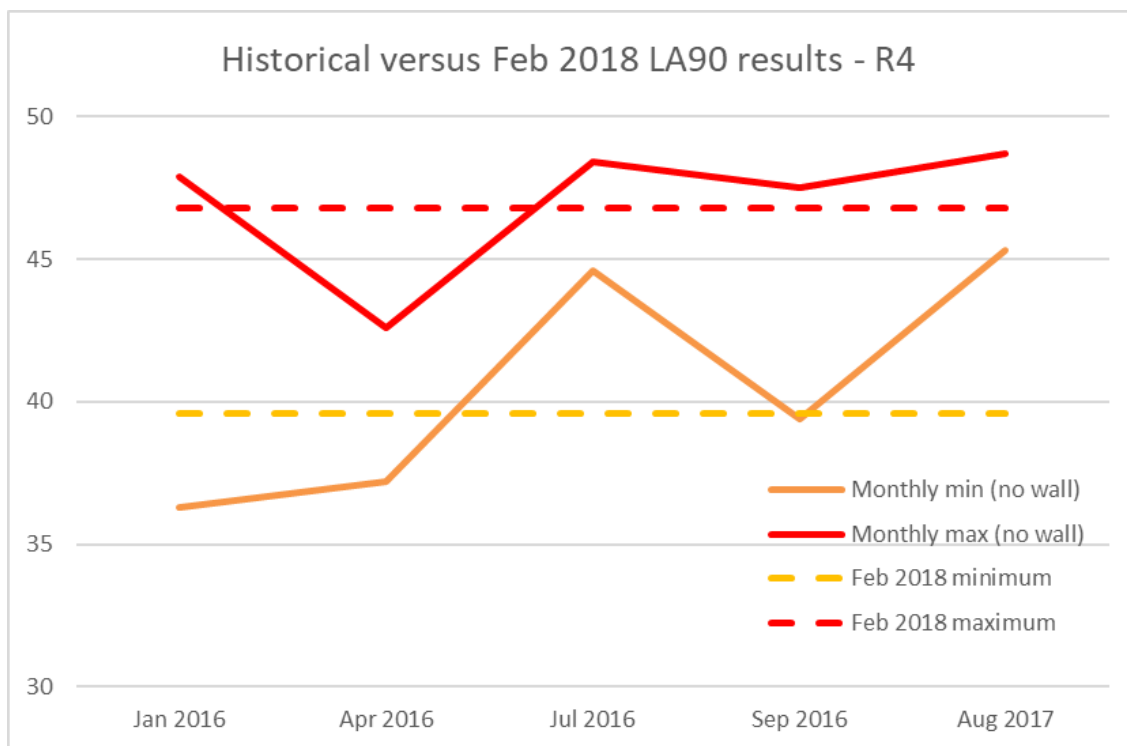
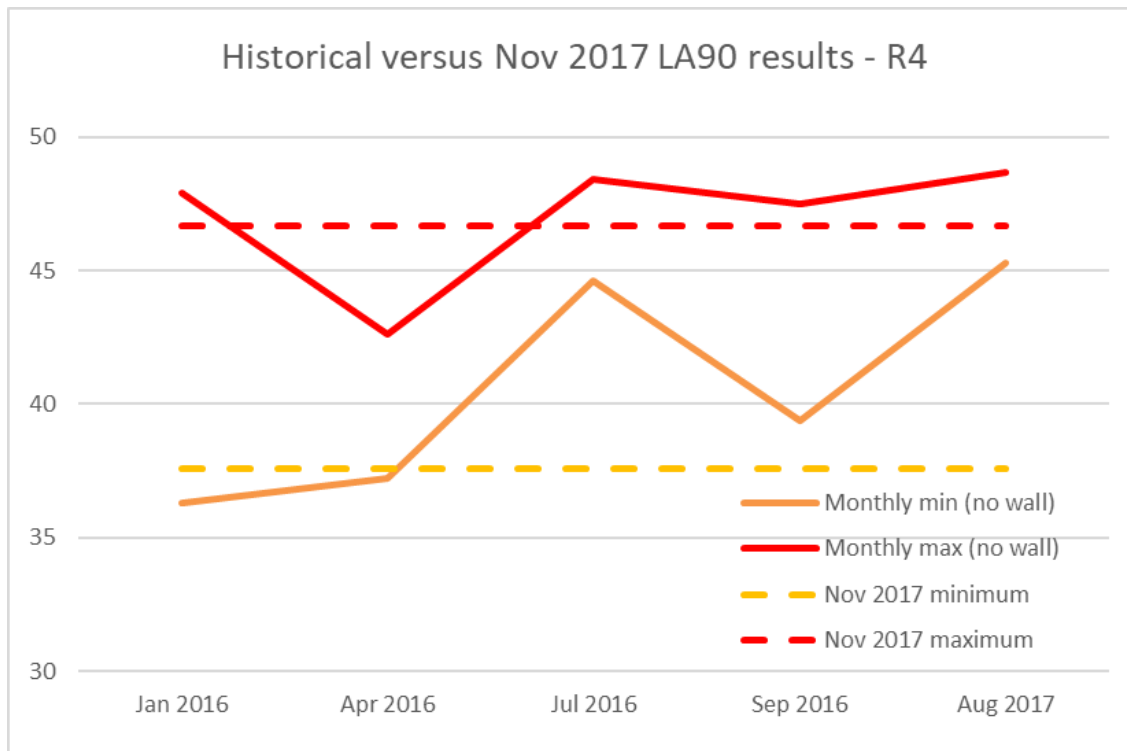
Table 4 represents the maximum and minimum noise levels as median values for each of the monthly monitoring ranges. The parameters which are lower for monitoring periods where the container barrier is installed are indicated in red with brackets.

**Table 4 Median values for quarterly monitoring – location R4 and R5**

Location	Container noise barrier status	Median Values					
		Noise level Range LA90 dB(A)		Noise level Range LAeq dB(A)		Arithmetic average	
		Min	Max	Min	Max	LA90	LAeq
R4	Not installed	39.4	47.9	45.5	52.2	43.1	49.6
	<b>Installed</b>	<b>(38.6)</b>	<b>(46.8)</b>	<b>46.2</b>	<b>55.5</b>	<b>(42.3)</b>	<b>50.7</b>
R5	Not installed	40.5	44.5	46.1	53.1	42.8	48.7
	<b>Installed</b>	<b>(34.2)</b>	<b>(43.6)</b>	<b>(43.6)</b>	<b>(51.6)</b>	<b>(38.2)</b>	<b>(46.4)</b>

For the most affected receivers, background noise levels tend to be lower after the container wall was installed when median noise levels are compared. More generally the measured noise levels after the installation of the container wall and the subsequent demolition of the B7 building indicate that current measured noise levels have not materially changed as a result of the work.

## Appendix A1 Receiver R4 results





## Appendix A2 Receiver R5 results

