WILKINSON MURRAY

2 March 2015

WM Project Number: 10196-R
Our Ref: JB 020315BC ltr

Tim Ward
JBA Planning
Level 7, 77 Berry Street
North Sydney NSW 2059

Dear Sir

**Re: Horsley Park Employment Precinct Revision**
**Noise Assessment including CSR Site and Oakdale South Site**

Noise modelling for the Horsley Park Concept Plan has been conducted for Stages 3A (approved), and Stages 3B, 4 and 5 of the Jacfin site (being the deferred residual lands). This noise modelling has been conducted based on previous investigations and noise assessments conducted by Wilkinson Murray. The most recent assessment which has been submitted to the NSW Department of Planning is titled:

*Lot A Burley Road, Horsley Park Employment Precinct – Concept Project Application – Revised Noise and Vibration Impact Assessment – Report Number 10196 Version I dated August 2012.*

The deferred residual land is currently proposed to consist of 3 industrial buildings and 27 residential blocks on the Eastern and Southern boundaries of the site.

In addition assumed building envelopes and pad levels for the two most southern allotments in the proposed CSR subdivision and the Oakdale South development have been included in the noise modelling.

Included in the modelling of these buildings are:

- A noise barrier in the order of 10m in height on the southern boundary of the CSR site, which tapers to ground level on the western end, generally consistent with the noise bund depicted in the Draft Development Control Plan for 327-335 Burley Road, Horsley Park, prepared by Peter Andrews and Associates, dated August 2014.
- For the CSR site, loading docks with trucks moving and loading along with forklifts on the northern side of the western building (assumed building pad level of RL 87.5) and the western side of the eastern building (assumed building pad level of RL 89). Both buildings are assumed to be 14 meters high.
- For the Oakdale South site, loading docks with trucks moving and loading along with forklifts primarily on the western side of buildings (assumed building pad level ranged from of RL 62

to72). All the buildings are assumed to be 14 meters high. The building closest to the boundary has an assumed pad level of RL 72

## TERMINOLOGY

Most environments are affected by environmental noise which continuously varies, largely as a result of road traffic. To describe the overall noise environment, a number of noise descriptors have been developed and these involve statistical and other analysis of the varying noise over sampling periods, typically taken as 15 minutes. These descriptors are here defined.

**Maximum Noise Level ($L_{Amax}$) –** The maximum noise level over a sample period is the maximum level, measured on fast response, during the sample period.

**$L_{A1}$ –** The $L_{A1}$ level is the noise level which is exceeded for 1% of the sample period. During the sample period, the noise level is below the $L_{A1}$ level for 99% of the time.

**$L_{A90}$ –** The $L_{A90}$ level is the noise level which is exceeded for 90% of the sample period. During the sample period, the noise level is below the $L_{A90}$ level for 10% of the time. This measure is commonly referred to as the background noise level.

**$L_{Aeq}$ –** The equivalent continuous sound level ($L_{Aeq}$) is the energy average of the varying noise over the sample period and is equivalent to the level of a constant noise which contains the same energy as the varying noise environment. This measure is also a common measure of environmental noise and road traffic noise.

**ABL –** The Assessment Background Level is the single figure background level representing each assessment period (daytime, evening and night time) for each day. It is determined by calculating the $10^{th}$ percentile (lowest $10^{th}$ percent) background level ($L_{A90}$) for each period.

**RBL –** The Rating Background Level for each period is the median value of the ABL values for the period over all of the days measured. There is therefore an RBL value for each period **–** daytime, evening and night time.

## NOISE CRITERIA

Noise criteria, consistent with previous assessments, are based on the EPA's *NSW Industrial Noise Policy.*

This policy establishes intrusive and amenity noise criteria for surrounding receivers. In the case of the Jacfin site the controlling noise criterion is the intrusive noise criterion which is a based on a measured Rating Background Level plus 5 dB approach.

### Sleep Disturbance

The application notes of the INP state:

*From the research, the EPA recognised that the current sleep disturbance criterion of an $L_{A1, (1\ minute)}$ (*or $L_{Amax}$*) not exceeding the LA90, (15 minute) by more than 15 dB(A) is not ideal. Nevertheless, as there is insufficient evidence to determine what should replace it, the EPA will continue to use it as a guide to identify the likelihood of sleep disturbance. This means that where the criterion is met, sleep disturbance is not likely, but where it is not met, a more detailed analysis is required.*

Accordingly a sleep disturbance screening criterion of 47dBA, based a measured night RBL of 32 dBA at existing residences on Greenway Place and Capitol Hill Drive, has been established for assessment purposes.

In the case of relevant Council policies the following is noted.

**Penrith Council**

Clause 9 of Section C11.1(C) of Penrith Council's DCP notes.

***9. Noise and Vibration***

Any subdivision proposal is required to address the objectives and controls set out in Chapter C12 'Noise and Vibration' with particular focus on designing lots so sensitive buildings (especially dwellings) will have sufficient setbacks or noise mitigation measures to minimise noise and vibration impacts.

In relation to section "C12 Noise and Vibration - Industrial and Commercial Development" council requires the following control with respect to industrial noise:

| Objective | Controls | Comment |
|---|---|---|
| The objectives of this section are to:<br>a) Ensure that industrial development does not adversely impact on the amenity of neighbouring residential development and other sensitive land uses; and<br>**b)** Ensure that the amenity of development surrounding commercial development and licensed premises is not adversely impacted. | 1. General<br>a) Council will not grant consent to any noise generating industrial development, commercial development or licensed premises unless it can be demonstrated that:<br>(i) The development complies with the relevant State Government authority or agency standards and guidelines for noise, as well as any relevant Australian Standards;<br>(ii) The development is not intrusive (as defined in the EPA's Industrial Noise Policy);<br>(iii) Road traffic noise generated by the development complies with the provisions of Section 12.1 of this Chapter;<br>(iv) The development complies with rail noise and vibration criteria (refer Section 12.2 of this Chapter); and<br>(v) The development does not adversely impact on the amenity of the area or cause sleep disturbance.<br>Noise Impact Statements - specific requirements<br>b) All development applications where the above controls are relevant are required to provide a Noise Impact Statement prepared by a qualified acoustic consultant in accordance with the requirements set out in Appendix F3 of this DCP.<br>c) The Noise Impact Statement should demonstrate acoustic protection measures necessary to achieve an indoor environment meeting residential standards, in accordance with relevant noise criteria, as well as relevant Australian Standards. | Items i) and v) are those that are applicable to the Jacfin site whereby it is noted that these are consistent with the assessment criteria adopted for the Horsley Park Employment Precinct Concept Plan. |

**Fairfield Council**

We note that Fairfield Council does not detail any specific requirements for industrial noise in their 2013 DCP. However it has been our experience that council relies, as do many councils, on the Policies promulgated by the NSW Environmental Protection Authority. The EPA's policy that specifically addresses industrial noise is the NSW Industrial Noise Policy (INP).

## CONCEPT NOISE MODELLING

Concept noise modelling, consistent with the approach adopted in the previous referenced noise assessments, has been conducted for Stages 3A and the deferred residual lands. The modelling has been conducted using Cadna A modelling software allowing for the following:

- Site layout as detailed in Figure 1.
- The topography in the areas reserved for future residential remains unchanged.
- Building heights are generally 14m unless stated otherwise below.
- Industrial building pads as shown in the figure.
- Noise sources that were adopted in the revised assessment for Stages 3A/B to 5 have also been applied in the current noise modelling (As detailed in Table 1) being.
    1. All buildings operating 24-hours, i.e. day and night operation;
    2. 1 truck per site manoeuvring for one minute in the 15-minute assessment period;
    3. Two to three trucks per warehouse unloading depending on warehouse size;
    4. One to three forklifts operating at each warehouse depending on warehouse size;
    5. One to two reversing alarms at each warehouse operating for 10 seconds;
    6. Two to four roof top fans operating at each warehouse depending of warehouse size, and
    7. Three trucks on the central road in the 15-minute assessment period.
- The docks on the two most southern buildings on the Jacfin Site are to be on the northern side of these buildings.
- The docks on the two most eastern buildings on the Jacfin Site are to be on the western side of these buildings. These buildings are assumed to be only 12 m high.

**Table 1 Summary of Sound Power Levels Used for Plant and Mobile Equipment**

| Item | Operating Condition | Overall $L_{Aeq}$ Sound Power Level (dBA) |
|---|---|---|
| Semi - trailer | Loading/Unloading | 87 |
| Petrol Forklift | Lifting, moving | 96 |
| Exhaust Fan | Operating | 95 |
| Semi-tailer | Driving through yard | 104 |
| Exhaust Fan | Operating | 95 |
| Reverse alarm | Reversing | 112 |

Figure 1 shows indicative layout used for the noise modelling.

**Figure 1 Concept Plan Stage 3A and the Residual Lands.**

## PREDICTED OPERATIONAL NOISE LEVELS AT RESIDENCES

Table 2 presents predicted continuous noise levels at existing surrounding individual residences.

**Table 2 Predicted $L_{Aeq\ (15\ minutes)}$ noise levels at Existing Residences.**

| Receiver Name | Predicted Noise dBA | Intrusive Noise Goals dBA | | Compliance |
|---|---|---|---|---|
| | | Day | Night | Day / Night |
| 14 Capitol Hill Drive | 30 | 42 | 37 | Yes / Yes |
| 1 Greenway Place | 29 | 42 | 37 | Yes / Yes |
| 10-13 Greenway Place | 29 | 42 | 37 | Yes / Yes |
| 14-20 Greenway Place | 33 | 42 | 37 | Yes / Yes |
| 21-28 Greenway Place | 33 | 42 | 37 | Yes / Yes |
| 29 Greenway Place | 33 | 38 | 37 | Yes / Yes |
| 30-32 Greenway Place | 34 | 38 | 37 | Yes / Yes |
| 33-37 Greenway Place | 37 | 38 | 37 | Yes / Yes |
| 38 Greenway Place | 37 | 38 | 37 | Yes / Yes |
| 41-43 Greenway Place | 37 | 38 | 37 | Yes / Yes |

A review of the noise predictions indicates that compliance with established intrusive noise criteria is indicated at all residences during the day and night periods. It is also noted that compliance with the intrusive noise criteria means that compliance with amenity criteria will be achieved.

Predicted noise levels on the site are shown at the end of this report.

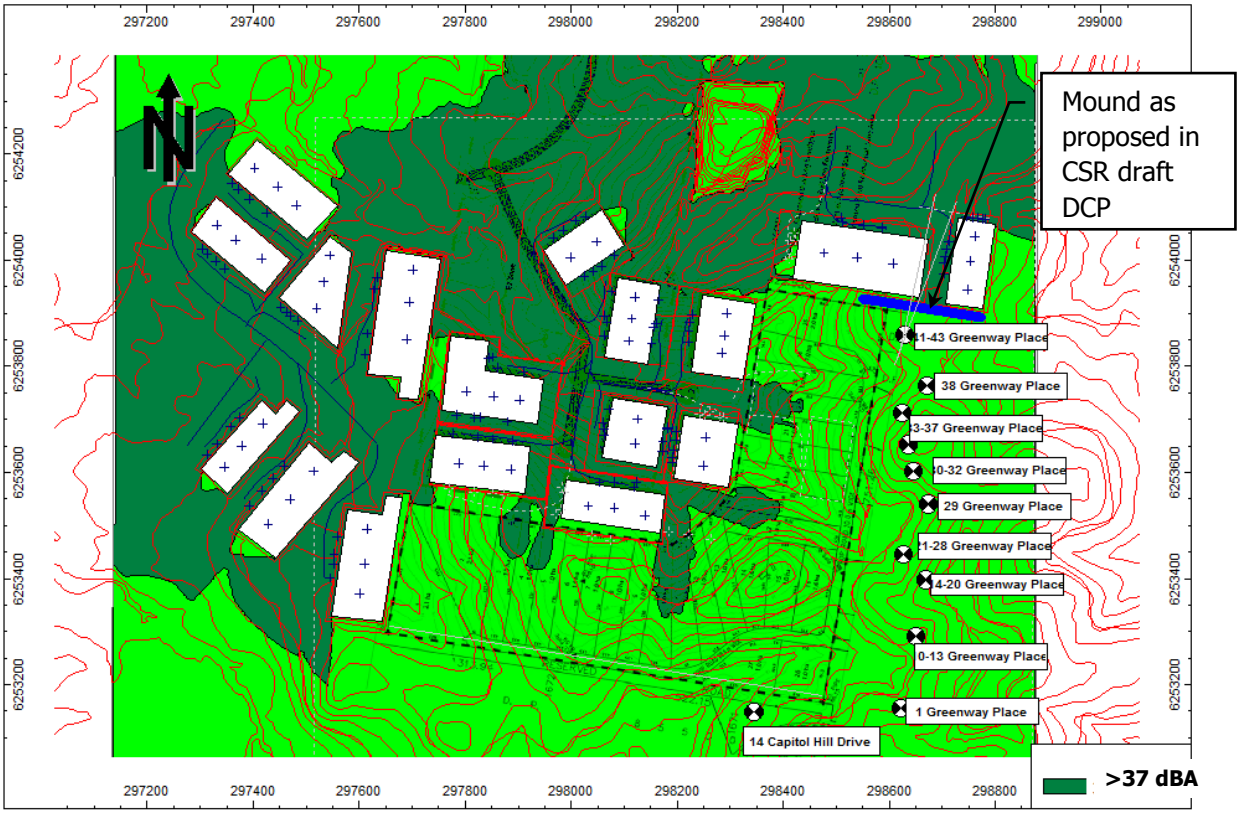
### Future Residential Receivers

Future residential land is proposed on the southern and eastern side of the site. The intent of the concept is that any future land owners can construct a dwelling on this land and enjoy an acceptable level of acoustic amenity.

Therefore should predicted noise levels comply with the 37 dBA night time noise criterion which was established for residences on Greenway Drive then no noise treatment for noise control will be required.

To show where compliance with the night criterion is achieved the following figure 3 has been produced. The area that is light green indicates compliance. Areas that are dark green indicate non-compliance with night criterion.

**Figure 3 Areas of Compliance with $L_{Aeq(15\ minute)}$ Night Criterion (Light Green)**




A review of the above noise contours indicates that basically all the proposed residential land will be subject to noise levels below the most stringent night time noise criterion.

## SLEEP DISTURBANCE

In the case of noise from events such as reversing alarms, there is the potential for sleep disturbance from areas that potentially operate in the night period. The $L_{Amax}$ noise levels due to reversing alarms have been predicted at surrounding residences. Each predicted noise level is based on an alarm operating on the site closest to each assessed residence thereby representing a "worst case" scenario.

Predicted $L_{Amax}$ noise levels are presented in Table 3.

**Table 3 Predicted Truck Reversing Alarm Noise Levels at Residences – $L_{Amax}$ dBA**

| Receiver Name | Predicted $L_{Amax}$ Noise Level (dBA) | Sleep Disturbance Screening Criterion (dBA) | Compliance with Screening Criterion |
|---|---|---|---|
| 14 Capitol Hill Drive | 35 | 47 | Yes |
| 1 Greenway Place | 34 | 47 | Yes |
| 10-13 Greenway Place | 33 | 47 | Yes |
| 14-20 Greenway Place | 38 | 47 | Yes |
| 21-28 Greenway Place | 40 | 47 | Yes |
| 29 Greenway Place | 40 | 47 | Yes |

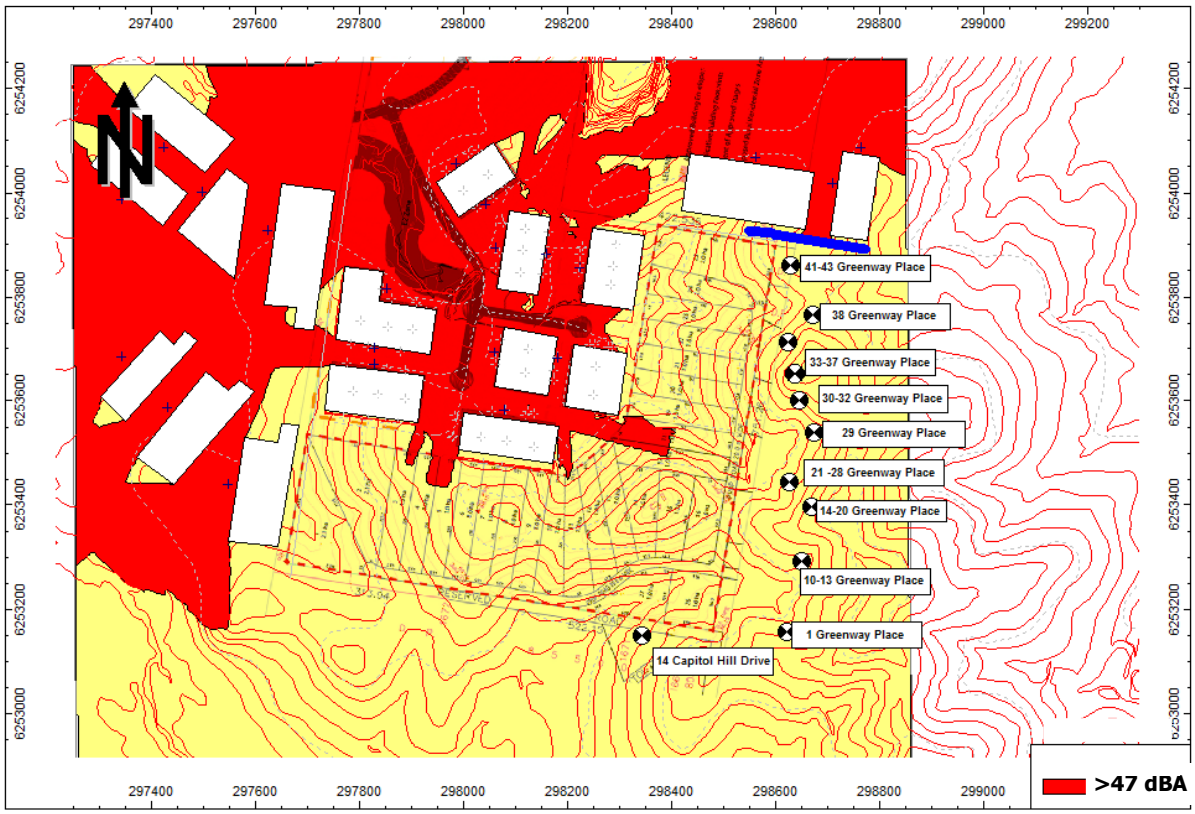
| Receiver Name | Predicted $L_{Amax}$ Noise Level (dBA) | Sleep Disturbance Screening Criterion (dBA) | Compliance with Screening Criterion |
|---|---|---|---|
| 30-32 Greenway Place | 43 | 47 | Yes |
| 33-37 Greenway Place | 43 | 47 | Yes |
| 38 Greenway Place | 44 | 47 | Yes |
| 41-43 Greenway Place | 43 | 47 | Yes |

A review of results indicates compliance with Sleep Disturbance screening noise objectives at all existing the residences surrounding the site.

**Future Residential Receivers**

Should predicted noise levels comply with the 47 dBA sleep disturbance screening noise criterion which was established for residences on Greenway Drive then noise treatment for noise control will not be required. The following figure 4 shows the areas where a noise level of 47 dBA or less is predicted being the area that is yellow.

**Figure 4 Areas of Compliance with $L_{Amax}$ Sleep Disturbance Night Criterion (Yellow).**




A review of the above figure indicates that essentially all the proposed residential land will be subject to noise levels below the sleep disturbance screening noise criterion.

**DISCUSSION CONCLUSION**

Noise modelling and assessment based on the concept design for the deferred residual land at Jacfin's Horsley Park site, the southern buildings at the CSR site and the Oakdale South site has been conducted based on the same methodology and site specific noise criteria as previous applications referenced in this assessment.

It has been determined that continuous noise emissions from the development will comply with established site specific noise criteria for 24 hour operation at existing residences and proposed residential land to the east and south of the proposed industrial dwellings.

The noise assessment of the Jacfin deferred residual lands, the CSR site and the Oakdale South site has been based on the concept design whereby an assumed worst case scenario has been assessed. When the actual use of each facility on the site is known a separate development application, accompanied by a site specific acoustic assessment, will be required addressing the specific use and associated noise emissions likely to be emitted from the facility.

It is noted that the design and location of loading docks on the CSR site will need to be managed to ensure that the acoustic amenity of existing residences on Greenway Place are adequately protected. Based on the noise modelling no additional controls or measures would be required to achieve acceptable levels at the proposed Jacfin residual land subdivision.

In the case of sleep disturbance, a review with respect to EPA recommendations has determined that intermittent night time noise at existing residences and possible future Jacfin Residential lots will be well below internal sleep disturbance objectives.

The above findings are based on the following operating conditions:

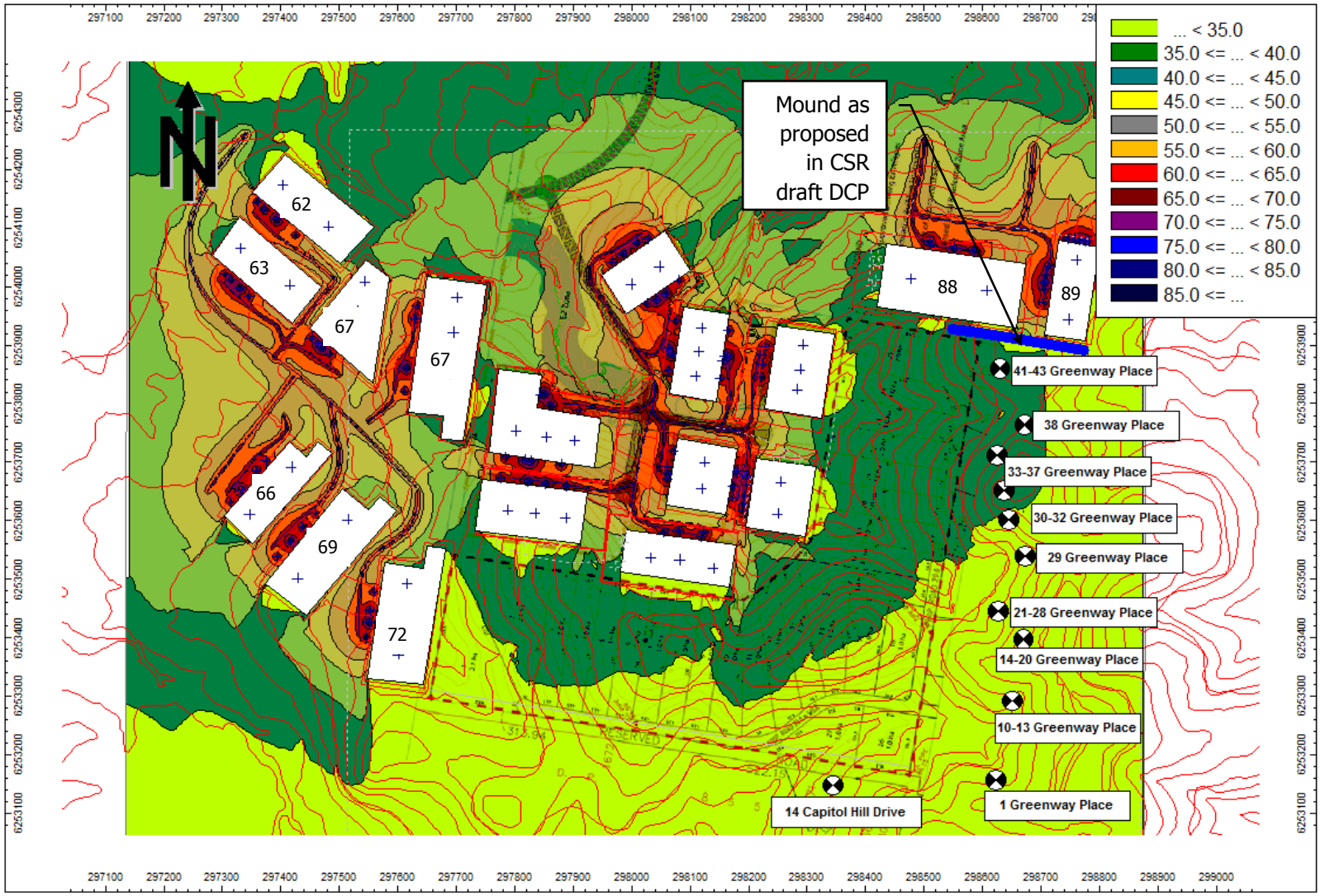
- The loading docks on the two most southern industrial buildings on the Jacfin Site are to be on the northern side of these buildings.
- The loading docks on the two most eastern industrial buildings on the Jacfin Site are to be on the western side of these buildings.
- The loading docks on the two CSR buildings are on the northern and western sides of the western and eastern buildings, respectively.
- The loading docks on the Oakdale site buildings are primarily on the western sides of the buildings.

I trust this information is sufficient. Please contact us if you have any further queries.

Yours faithfully
**WILKINSON MURRAY**

**Brian Clarke**
Senior Associate

**Figure A1** **Noise Emissions from the Deferred Residual Lands for the Jacfin Stages 3A, the CSR site and the Oakdale South Site – $L_{Aeq(15\ minutes)}$**




Note: Assumed Pad heights of buildings modelled outside the Jacfin site are shown.