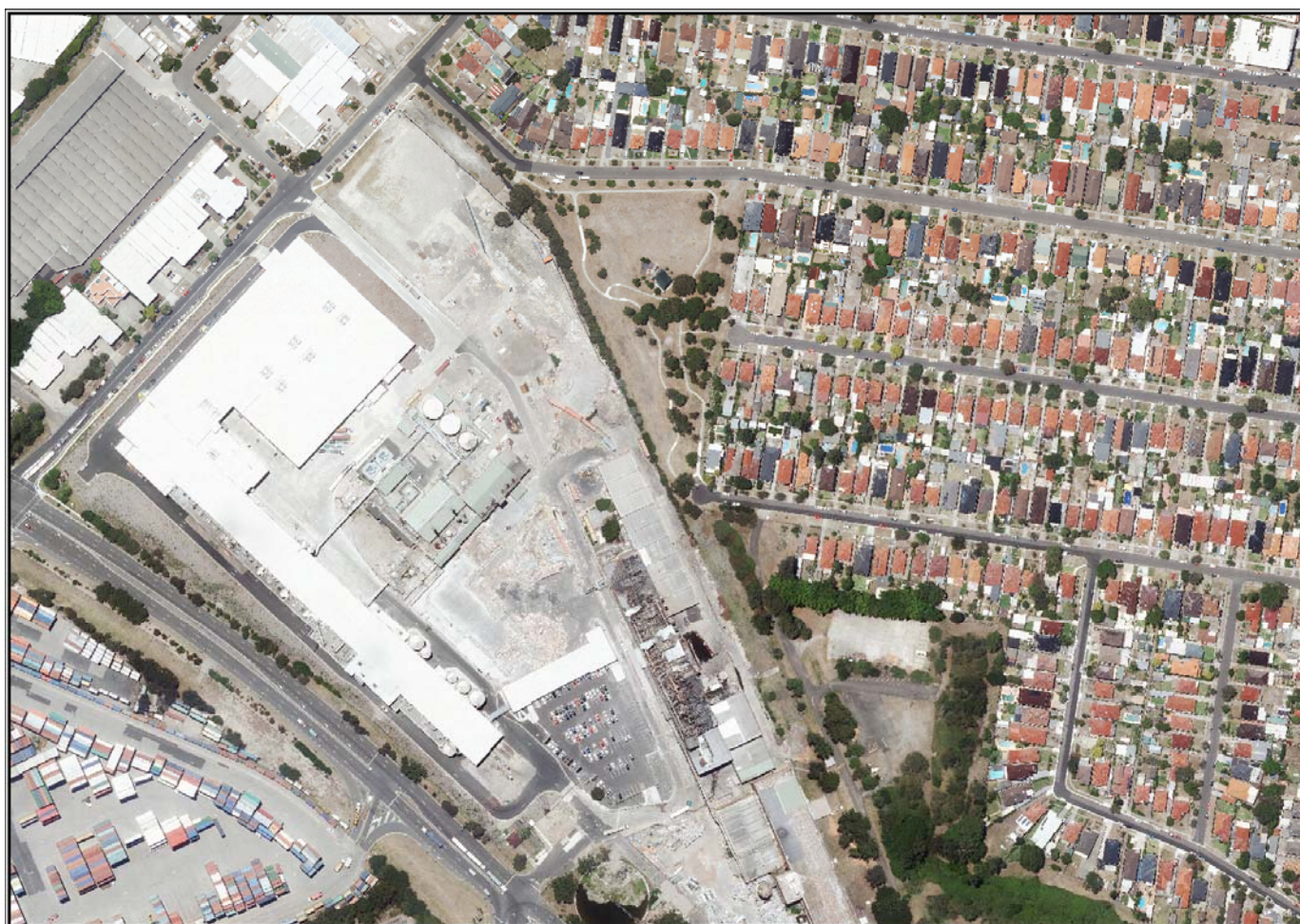


Orora Limited

Wastewater Treatment Plant Operational Noise Impact Assessment



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Orora Limited
WTP ONIA

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1. Introduction

1.1 Overview

Orora Limited (Orora) uses substantial quantities of water to process waste paper and to manufacture finished paper products. Waste water is currently treated in an on-site wastewater treatment plant (WTP) via dissolved air flotation (DAF) for reuse in the process for up to 400 cycles, prior to discharge under a Trade Waste agreement with Sydney Water.

Orora is currently seeking to establish additional WTP facilities to improve the quality and reduce the quantity of discharged wastewater, improving environmental outcomes, increasing process efficiency and reducing discharge fees.

The upgraded WTP would be located in a central area of the site, adjacent to existing WTP facilities. The upgraded WTP would be approximately 2500 m² in area and 160m from the nearest residences located on Partanna Avenue.

The noise limits for the B9 Paper machine and associated operations were determined as part of the project approval in July 2007. The site noise emission limits are detailed in Condition 10 of the Orora B9 MCoA and are reflected in Condition L4 of EPL 1594. The design and operation of the WTP is required to comply with the limits identified in EPL 1594.

This Operational Noise Impact Assessment (ONIA) has been prepared to quantify the likely impacts and recommend appropriate mitigation measures to ensure compliance with the Orora environmental licence conditions.

1.2 Planned works

Orora would engage a specialist WTP supplier to design and construct the new WTP which is anticipated to be supplied as a package system. The WTP would be a high rate anaerobic treatment facility employing expanded granular sludge bed (EGSB) technology. This type of system has the following functional components:

- A primary clarifier for the removal of non biodegradable suspended solids from the waste stream (influent).
- Biological reactors as a secondary treatment stage for the removal of biodegradable organic compounds that are converted to methane and reusable sludge products.
- A secondary clarifier to further treat the wastewater before discharge
- Sludge dewatering and removal as solid waste.

These systems are characterised by minimal moving components relying primarily on the pumping between stages to agitate and move fluids through the process. As such, the bulk of noise generating equipment is confined to the motors and pumps necessary to transfer the waste water between tanks and return it to the process stream.

Additional equipment required for the treatment process such as the blowers for the aeration tank and the centrifuge/decanter for dewatering, provide the primary sources of noise generation associated with the WTP. Typically this equipment is supplied in purpose built enclosures or equipment sheds to minimise noise impacts where necessary.

A summary of the noise generating equipment expected to be used for the project is presented in **Error! Reference source not found.** The anticipated sound power levels, and duty cycle from each item is also presented in the table. An illustration of the approximate location of the equipment is shown in Figure 1-1.

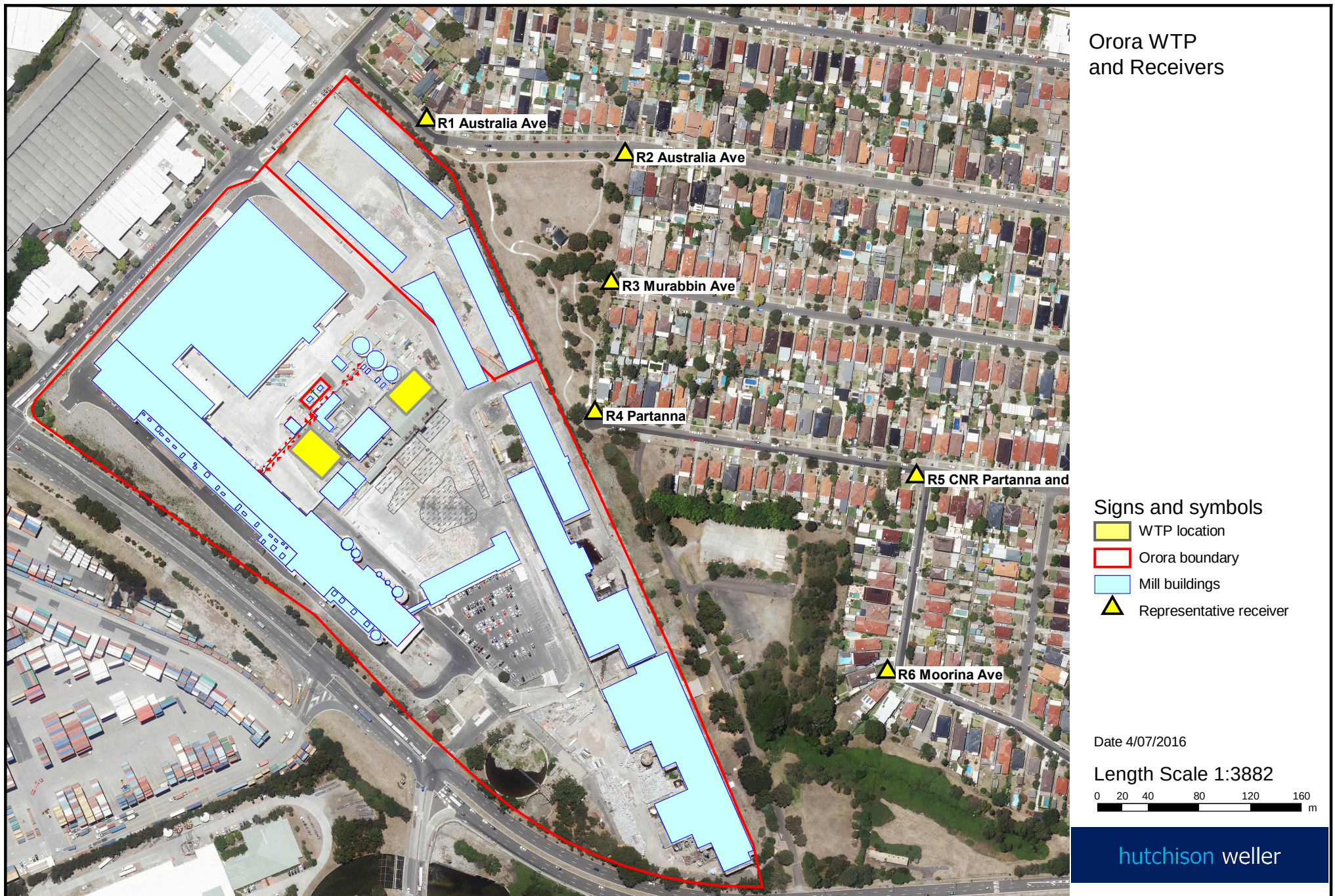


Figure 1 - 1 Overview of proposed works and nearest sensitive receivers

2. Existing environment and assessment criteria

2.1 Existing environment and Assessment criteria

The existing noise environment in the Port Botany area is generally dominated by emissions from road traffic on Botany Road and McCauley Street, port operations and industrial premises, with intermittent domestic aircraft movements from Sydney Airport.

The existing noise environment has been reviewed in detail as part of the quarterly monitoring of operational noise levels undertaken by Orora since the operations of the B9 paper mill commenced. These studies have indicated that the noise levels in the area are not dominated by a specific site or activity but are the combination of the surrounding noise influences.

The measured noise levels from monitoring surveys indicate that exceedances of the project specific criteria can occur at the L_{A90} background noise level for the situation where the plant is either operational or shutdown while undergoing maintenance. The monitoring studies also indicate that the existing noise environment is influenced by several sources and these influences are separately affected by the wind direction during the survey period for each of the receiver locations.

Figure 2-1 and Figure 2-2 present an historical overview of the background noise levels measured at the EPL receiver locations for periods when the site was under a shut down as well as operational. The noise levels are presented with the site specific L_{Aeq} 15 minute criteria for each location.

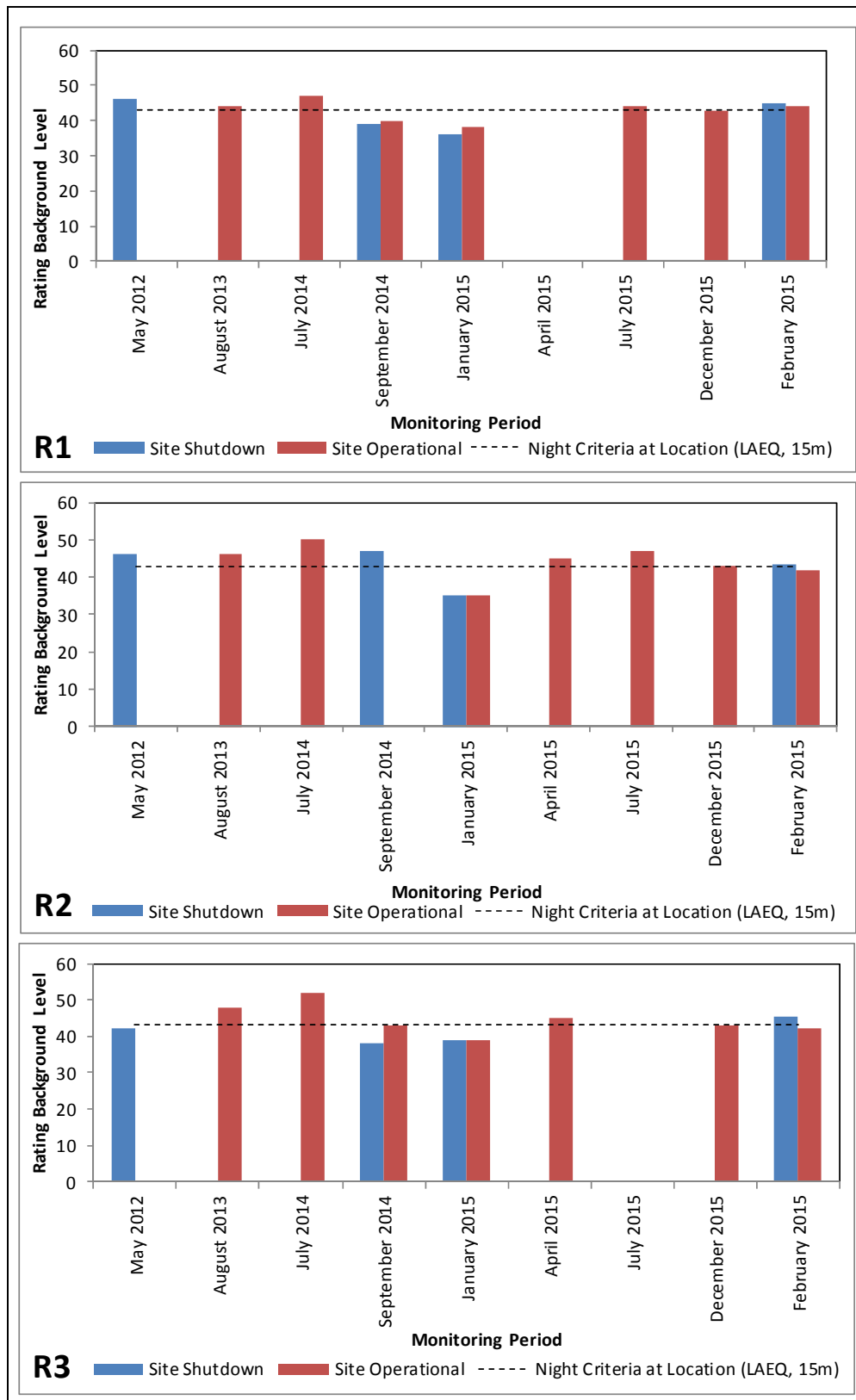


Figure 2-1 Background noise levels at EPL location 1 to 3

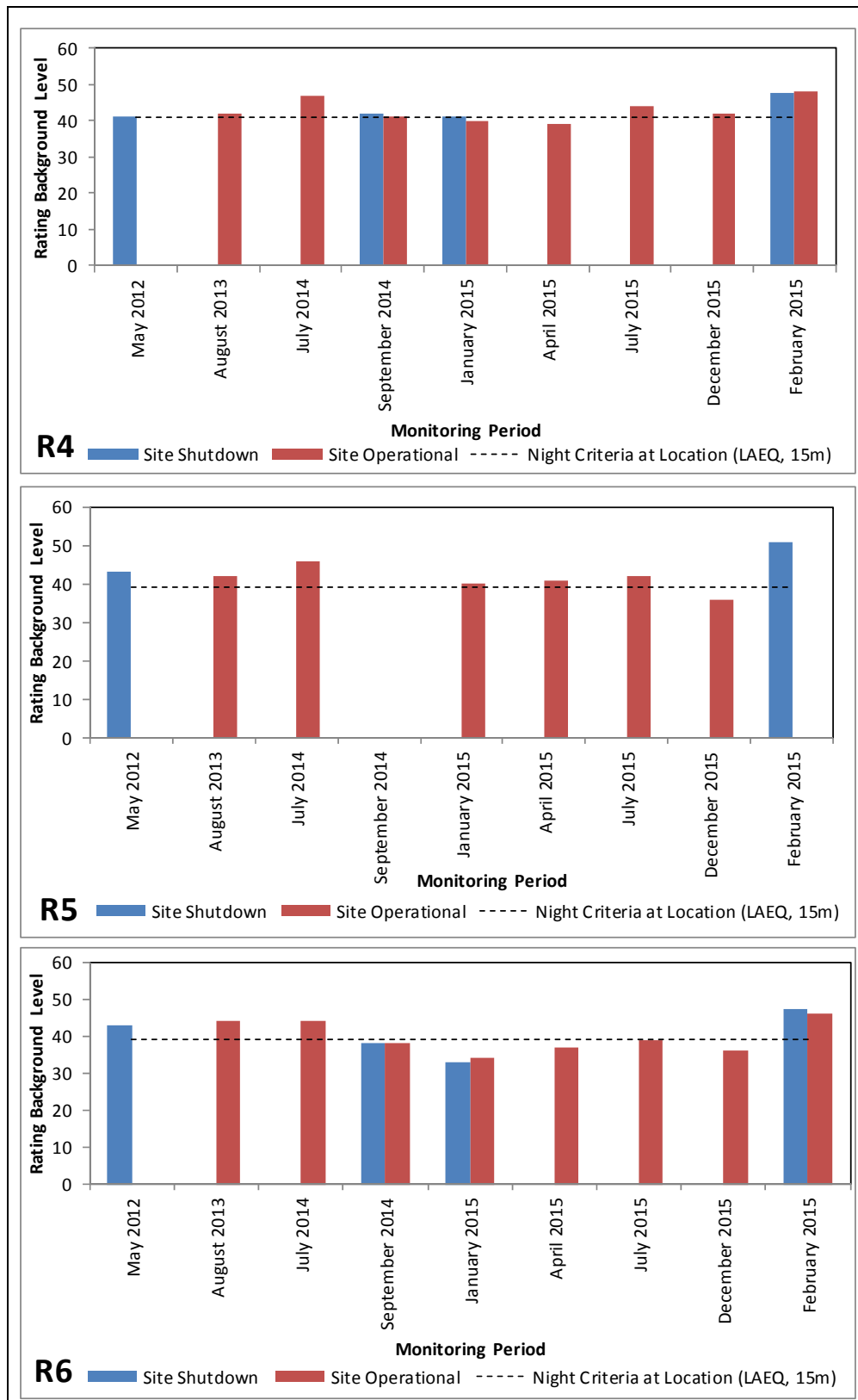


Figure 2-2 Background noise levels at EPL location 4 to 6

2.2 Operational noise limits

Operational noise limits for the new Orora Paper Mill are detailed in condition L4.1 of EPL 1594 and Condition 10 of the MCoA. Condition L4.1 in the EPL relating to noise emissions from the Orora premises states that prescribed noise limits at representative receiver locations identified in Table 2-1 must not be exceeded.

Table 2-1 Operational noise limits

Reference	Location	Day $L_{Aeq,15min}$, dB(A)	Evening $L_{Aeq,15min}$, dB(A)	Night $L_{Aeq,15min}$, dB(A)	Night L_{Amax} , dB(A)
R1	Cnr. McCauley Street and Australia Avenue	46	45	43	55
R2	Australia Avenue	45	45	43	55
R3	Murrabin Avenue	46	45	43	55
R4	Partanna Avenue	42	41	41	55
R5	Cnr. Partanna and Moorina Avenues	42	42	39	55
R6	Moorina Avenue	43	43	39	55

Typically the L_{Aeq} 15 minute night time noise levels for the most stringent criteria and these values have been used to assess the operations of the WTP for this proposal.

3. Impact assessment

3.1 Operational parameters

The WTP would be in use over a 24 hour period with individual processes operating continuously or cyclically depending on the duty requirements. The operations must therefore comply with the most stringent of the noise limits outlined in the Orora EPL for the noise night time period.

3.1.1 Source noise levels

An equipment list for the WTP has been supplied by Orora together with estimated duty cycle for each item. These sound power levels and the resulting noise level predictions are based on un-attenuated equipment, with the exception of the blowers and the dewatering centrifuges which would be housed in purpose built enclosures. It is recommended that the outcomes of this assessment are reviewed once the equipment supplier and the design layout of the WTP has been finalised.

The list of equipment expected to be required for the WTP is presented in Table 3-1 and includes the assumed sound power levels based on the equipment power rating.

Table 3-1 Summary of project-specific equipment and noise levels

Equipment/Area	Unit sizing	Sound Power level dB(A) (un-attenuated)	Operational frequency
Chemical dosing pumps (x6 total)	~0.2kW	75	Continuous operation
Scrubber	1.5 kW	75	Continuous operation
Flare	1 kW	70	Very Intermittent operation (flare height 6m)
EGSB transfer and reactor pumps	37kW	89.5	Continuous operation
Condition tank mixing pump	3 kW	81	Continuous operation
Biomass Pump	37kW	89.5	Operates 2 hours/month
Blowers	160kW	105	Continuous operation (enclosure to achieve 85db(A))
Clarifiers/Return Tank pumps	37kW	89.5	Continuous operation
Sludge recirculation pumps	18.5kW	87	Continuous operation
Centrifuge/ decanter feed pumps	3 kW	81	Continuous operation
Centrifuge/ decanter	110kW	96.2	Continuous operation (to be located inside enclosure)

Additional vehicle movements associated with the WTP would be required for delivery of dosing chemicals for the process and removal of the dewatered sludge via skip bins. The Chemical deliveries would occur every 1 to 2 days and the sludge unloading would occur up to four times a day. The additional movements have been added to the overall site vehicle movements during the operating period.

3.2 Modelling

A SoundPLAN noise model has been developed for the Orora site has been updated with the latest developments both within the site and externally. The model updates include the removal of Building B5 where the WTP would be located, and the addition of the light industrial development in the MacCauley Street precinct to the north of the Orora site. The development is primarily constructed of 10+m high prefabricated concrete panels and provides an effective new noise barrier between the B9 paper mill and residential areas to the north on Australia Avenue.

The updated noise model was used to predict the potential noise impacts from the operation of a WTP alone and the overall cumulative noise impact for the combined operations of the B9 paper mill.

The noise modelling software was used to calculate noise impacts in accordance with the ISO9613 prediction method, at the compliance locations identified in EPL 1594. The following components were incorporated in the model:

- Topography – Based on LPI topographical data for the area.
- Individual sensitive receivers – Nine receiver locations have been selected to represent the areas that may be impacted by the works. These receiver locations are illustrated in Figure 1-1.
- Meteorology –worst-case meteorological conditions (gentle breeze from source to receiver and stable conditions).
- Residential building structures are included in the model, meaning screening provided by neighboring houses is considered. In addition, buildings located on the Orora site and a new development on McCauley Street have been included in the model.

The modelled scenario includes the combined operations of the activities within the Orora site but does not consider external noise influences from other noise generating sources.

3.3 Predicted noise levels

Estimated noise levels for the WTP at nearby receivers have been assessed against the EPL criteria and are summarised in Table 2-1.

Table 3-2 Predicted noise levels from proposed works

ID	Name	Predicted $L_{Aeq, 15 \text{ minute}}$ noise level at sensitive receiver dB(A)				
		EPL Criteria	B9 only	WWTP only	B9 and WWTP*	Complies with EPL
R1	Australia Avenue	43	43	30	43	Yes
R2	Australia Avenue	43	40	31	41	Yes
R3	Murabbin Avenue	43	41	34	42	Yes
R4	Partanna Avenue	41	38	29	39	Yes
R5	Corner Partanna and Moorina Avenues	39	35	25	35	Yes
R6	Moorina Avenue	39	32	23	33	Yes

*Predicted noise levels rounded to nearest dB(A)

The predicted noise levels indicate noise levels for the operations of the WTP are expected to be below the existing background levels and indicate an increase of less than 1 dB(A) to the overall noise levels from the site.

Based on the updated noise model, compliance with the noise goals is achieved at all receiver locations including the receivers north of the site in Australia Avenue that previously marginally exceeded the noise EPL noise limits for this location.

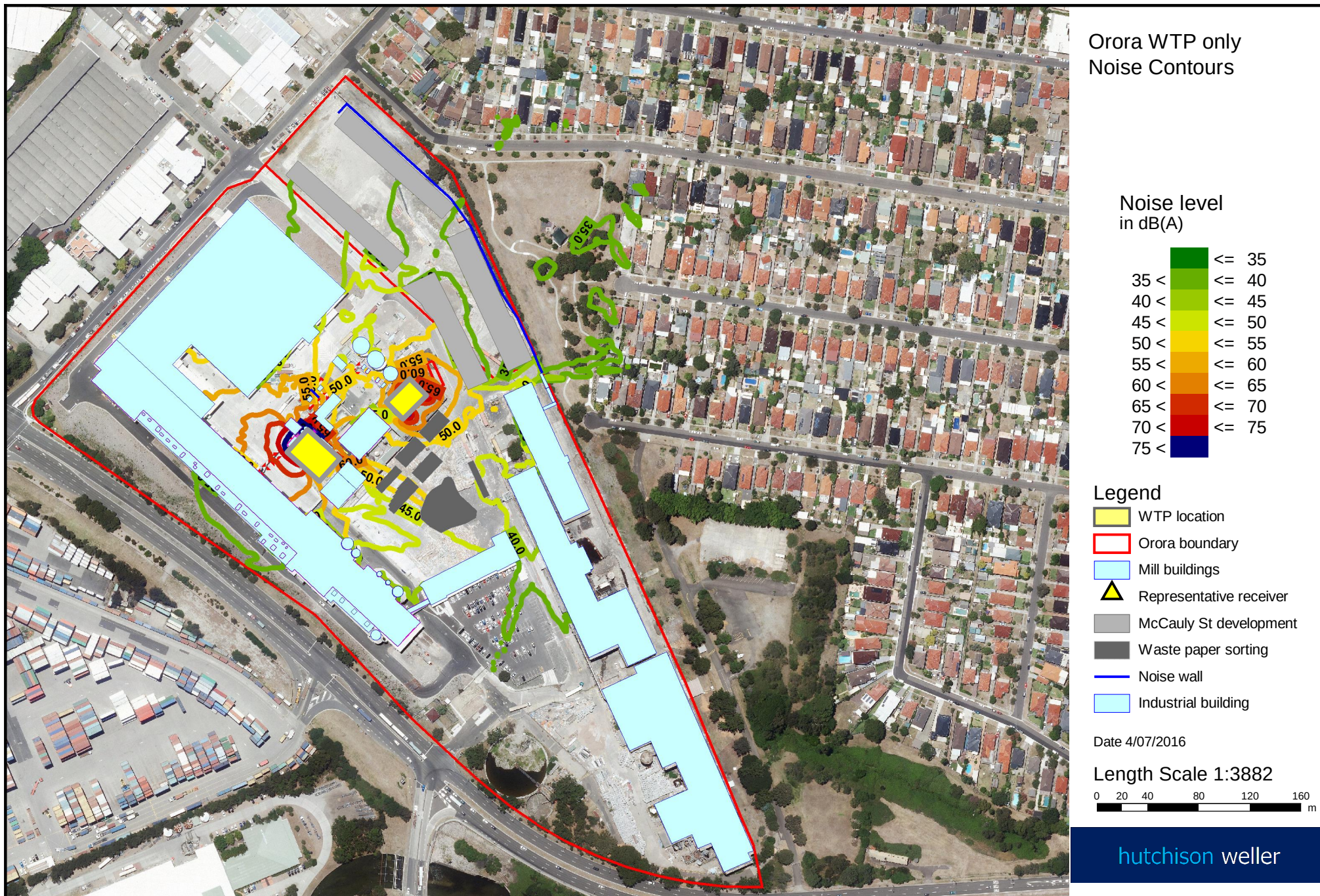


Figure 3 - 1 Predicted noise level contours – WTP

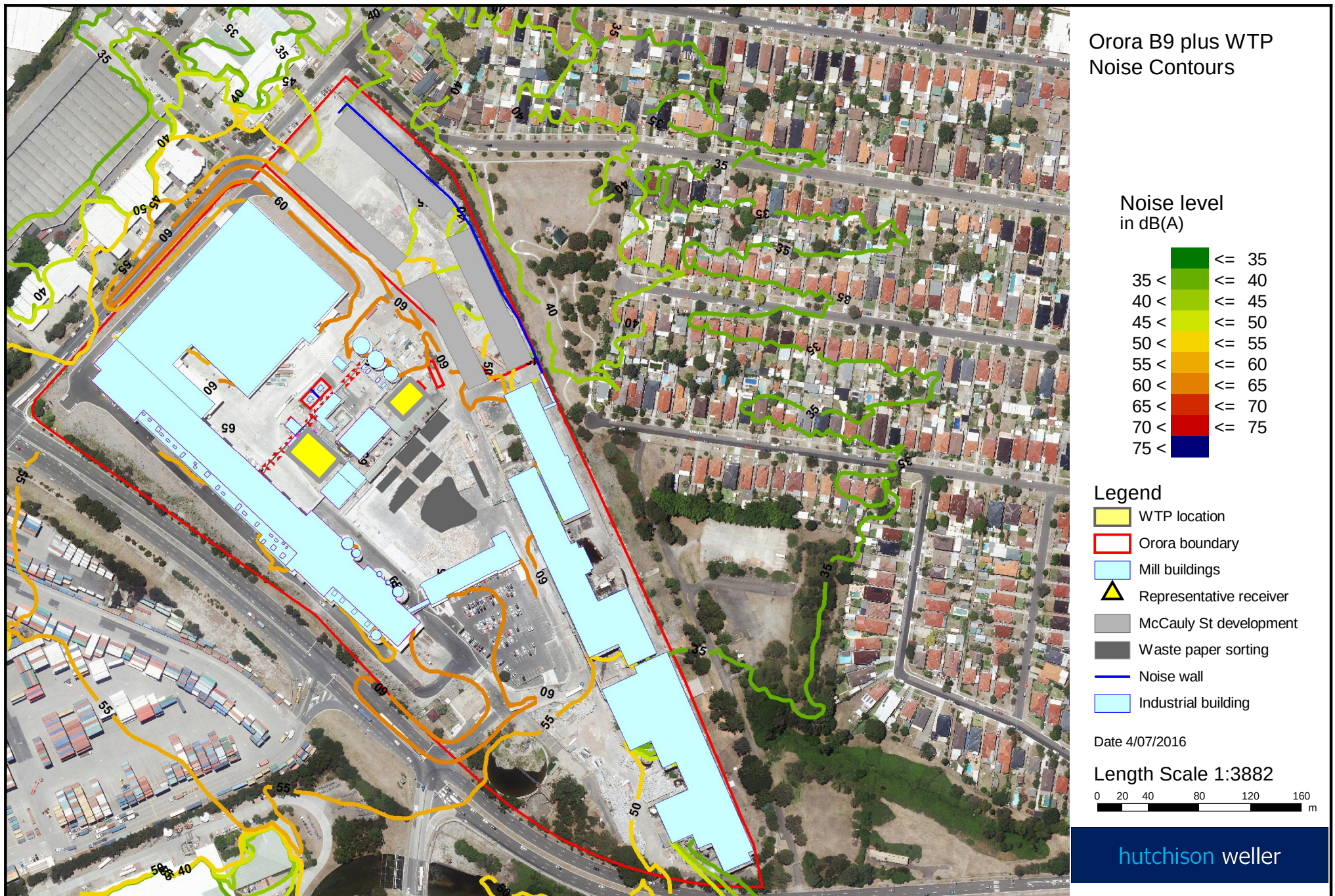


Figure 3-2 Predicted noise level contours – B9 and WTP

4. Summary and conclusion

4.1 Summary

Based on the expected construction and location and equipment list for the WTP, there would be no exceedances of the site EPL and project approval noise goals with the upgrade of the WTP. The upgraded WTP would only increase noise levels experienced by some sensitive receivers by 1 dB and at others the upgraded WTP would be inaudible. The updated noise model also indicates the benefit of the new light industrial development in the McCauley St precinct which provides an additional effective noise barrier between residential areas and the B9 operations.

Where the location, quantity and size of the equipment selected for the WTP does not alter significantly from the proposed equipment list, it is expected that there would be no requirements for additional mitigation of the noise emissions other than the Blower and decanters specified for the system.

A review of the final design is recommended to confirm these assumptions prior to finalizing the detailed design for the WTP.

Orora will perform local noise measurements of the equipment related to the WTP within three months of practical completion. The resultant noise data will be confirmed against the original project assumptions and any modifications or additions of noise attenuation will be added to ensure compliance with the site Operational Noise Limits.

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