Appendix A

Acoustic Assessment

novo group
Planning. Traffic. Development.

Environment Noise Assessment

Prepared for

ROLLESTON INDUSTRIAL HOLDINGS LTD

Lot 3 DP 52556, Maddisons Road
Rolleston, Selwyn District

December 2019

Environmental Noise Assessment
Prepared for

Rolleston Industrial Holdings Ltd

Lot 3 DP 52556, Maddisons Road
Rolleston, Selwyn District

Novo Group Ltd
Level 1, 279 Montreal Street
PO Box 365, Christchurch 8140
P: (03) 365 5570
E: info@novogroup.co.nz
W: www.novogroup.co.nz

Document Date:	**4/12/2019**
Document Version/Status:	Revision A | FINAL
Project Reference:	021024
Project Manager:	Jeremy Phillips, Director and Senior Planner
Prepared by:	Luke Sadler, Environmental Acoustic Engineering Consultant
Reviewed by	Kim Seaton, Principal Planner

Table of Contents

List of Figures and Tables

Appendices

Introduction

1. Rolleston Industrial Holdings Ltd has commissioned Novo Group to prepare an environmental noise assessment for a Plan Change application to establish a Dairy Processing Management Area (DPMA) at the application site enabling the development of a dairy processing facility. The DPMA will permit modification and/or expansion of the site as needed from time to time without the requirement for a resource consent for each project.

2. In order to control a range of effects that may arise from any future expansion, an Outline Development Plan (ODP) has been prepared for the site. In addition, it is proposed to adopt the noise related rules set out in Appendix 26 of the Selwyn District Plan Rural Volume (Dairy Processing Management Area).

3. This environmental noise assessment will be based on an assumed maximum expansion scenario to assist in the development of an appropriate Noise Control Boundary (NCB) for the site. This assessment makes use of relevant information and methodology from the Noise Assessment undertaken for the Fonterra Darfield DPMA by Marshall Day Acoustics (MDA) (Hay 2015), as it is an accepted procedure, regarding noise, in support of a private plan change in the Selwyn District.

4. The objective of the proposed DPMA and its noise rules is to provide a clear boundary which defines the extent of acceptable noise effects for the surrounding community. Activities within the DPMA's NCB can develop as required, with the understanding of what noise level can be expected when the site is fully developed.

The Proposal

5. It is proposed to develop the site at Lot 3 DP 52556 on Maddisons Road as a dairy processing facility. The site will take primary access from within the IPort industrial subdivision and is predicted to generate 400 vehicle movements per day. The site location is illustrated in Figure 1. The areas north across Maddison Road, as well as to the east and south east are zone as Rural Inner Plains. The areas south and south west is zoned as Business 2A.

Figure 1: Site Location

District Plan

6. Rule 9.16 states that noise limits assessed at the notional boundary of any dwelling, rest home, hospital, or classroom in any educational facility except where that dwelling, rest home, hospital or classroom is located within a Living zone shall comply the limits in **Table 1** below.

Table 1: Maximum Noise Limit at Notional Boundary

Zone of site receiving noise from the activity	Time (hrs)	Noise Limit (dB)	
		L10	Lmax
Rural Inner Plains Zone – Notional Boundary	07:30-20:00	60 dBA	85dBA
Rural Inner Plains Zone – Notional Boundary	20:01-07:29	45dBA	70dBA

7. However, the plan change proposes to adopt the noise related rules set out in Appendix 26 of the Selwyn District Plan Rural Volume (Dairy Processing Management Area) which state that noise arising as a result of any activity within a DPMA shall not exceed the following limits at the Noise Control Boundary shown on the Outline Development Plan:

Table 2: DPMA Noise Limits

Time period	Noise Limits	
	LAeq	LAfmax
Daytime 07:30 – 20:00	55dB	80dB
Night-time 20:0 – 07:30	45dB	70dB

Methodology

8. An accurate noise source inventory is established in order to predict the on-site noise levels and to subsequently develop an appropriate NCB. The dominant noise sources at dairy processing facilities are:

   i. Whole Milk Production (WMP) Dryer Facilities;

   ii. Boilers;

   iii. Other fixed mechanical plant (cooling towers, workshops, cleaning and sanitising facilities etc);

   iv. Product load out, coal and milk reception facilities;

   v. Tanker routes on-site; and

   vi. Rail spurs.

9. The ODP does not consist of detailed design information at this stage, such as scale of production, number of plant equipment, number of milk tankers in the fleet, exact location of associated structures. Only the wider potential footprint areas of were the processes would take place was available at the time of assessment (refer to Development Plan below)

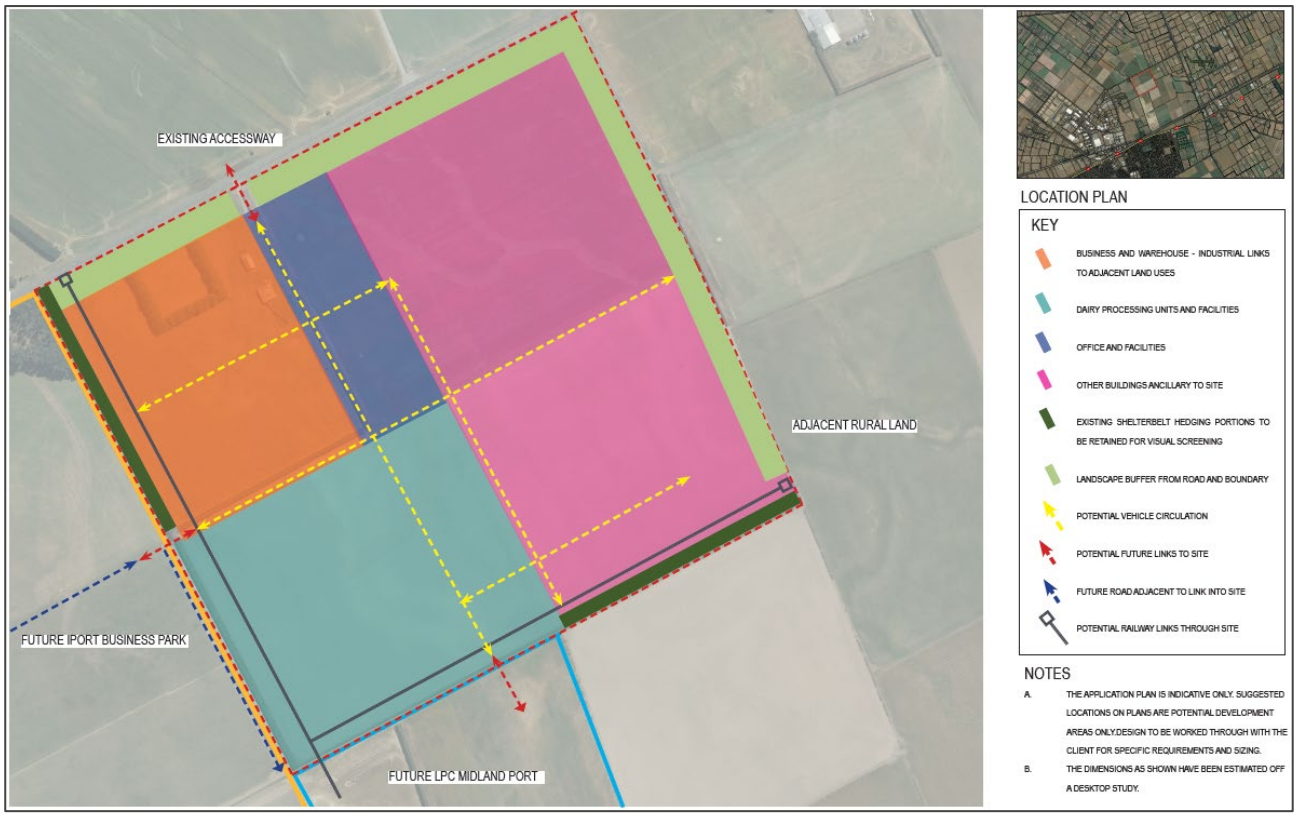

Figure 2: Indicative Development Plan

10. SoundPLAN noise modelling software was used to predict the Dairy Hub noise propagation and to subsequently establish the NCB (refer to Appendix 1 for dispersing model and Appendix 2 for recommended NCB). SoundPLAN makes use of the calculation method as per ISO 9613-2:1996 “Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation.

11. The table below presents the relevant noise sources and related sound power levels used in the dispersion model.

Noise source	Sound power levels dB							
Octave band frequencies, Hz	63	125	250	500	1000	2000	4000	dBA
Milk Tanker	99	103	100	101	100	100	93	105
Milk Reception	93	92	95	97	95	91	89	98
Dryer exhaust Stack	99	87	83	83	80	77	75	85
Cooling Tower	87	85	77	75	74	72	73	80
HVAC	38	55	64	64	62	63	61	70

Delivery vehicle	44	60	62	65	69	68	63	79
Train Idling	Total sound power level of 108dBA used in the model							

12. When considering potential future noise effects, it is important to understand the likely noise sources, their location and the duration and time of day of operation. Due to the limited information about the detailed location of the components as well as daily operations, however, the following approach in terms of the noise prediction has been taken:

- A line source was assigned to the perimeter of the site with cumulative sound power levels used to predict the worst case noise propagation with the facilities running simultaneously at the nearest extent to the neighbouring properties for worst case effect.
- Line sources were also assigned to the potential vehicle circulation and rail links, with a worst case 15minunte period of two tanker movements (or the equivalent of 20 light vehicle movements) and 1 train movement happening simultaneously.

13. The assumed maximum expansion scenario used as a basis for our consideration is based on similar sized areas on which Dairy Production facilities operate. This would entail:

i. Up to two WMP dryers ;

ii. Up to two boilers ;

iii. Associated ancillary mechanical services;

iv. Associated dry store space; and

v. Associated number of tanker and rail movements.

14. As per the noise assessment process as part of a private plan change for a DMPMA in the Selwyn District, a Noise Control Boundary (NCB) is established as part of the ODP. The intention is that the NCB would replace the existing noise limits relating to compliance at the notional boundary of any residential dwelling.

15. Construction will be subject to New Zealand Standard NZS 6803:1999 “Acoustics – Construction Noise”.

Assumptions

16. The dispersion models represent a worst-case scenario with down wind conditions for all receptors. It is assumed that all relevant processes and components are running simultaneously and at full capacity.

Assessment Results

17. The dispersion model (refer to Attachment 1) indicates that the noise levels from the DPMA will comply with the day and night time notional boundary limits at the current surrounding dwellings. It is therefore appropriate to propose an NCB that is informed by the 45dBA contour as per the dispersion model.

18. The predicted noise levels between the site boundary and the recommended NCB range from 45dBA – 50dBA, therefore any potential noise sensitive constructed in this area will sufficiently be sound insulated

as required by Appendix 26 of the Selwyn District Plan Rural Volume, which states that any sensitive activity within the Noise Control Boundary as shown in the Outline Development Plan in shall be designed to achieve an outside to inside noise level difference of not less than 20 dB D tr, 2m, nTw to any bedroom. The design shall include a ventilation system that enables bedroom windows to remain closed.

Proposed Noise Control Boundary

19. According to Hay (2015) (Fonterra Darfield DPMA Noise Assessment) the purpose of a NCB is to:

    i. Provide certainty as to how far any noise effects may extend, while also providing flexibility to modify and develop the site without having to gain a resource consent for every change.

    ii. Provide certainty for neighbours and Council as to exactly where the Dairy Hub shall comply with noise limits.

    iii. Provide an easily found line for the purpose of future noise monitoring and assessment, even when such monitoring may be occurring in the dark.

20. For the purpose of the Rolleston Dairy Hub NCB the preference is to have the NCB follow simple offsets from the site boundary via a straight line.

21. The proposed NCB does cut across privately owned rural land to the north, north east, east and south east. Currently there are no dwellings in these areas, but dwellings could potentially be constructed in these areas. The plan change application is proposing to adopt the noise related rules set out in Appendix 26 of the Selwyn District Plan Rural Volume, triggering requirements for acoustic insulation to be built into new buildings for sensitive activities to be located within the NCB.

22. The proposed NCB does also cut across privately owned Business 2A Zone properties to the south and south west, however, there are no noise limits that apply at any point within the boundary of a Business 2A Zone. Using the limits associated with a Business 1, 1A or 3 Zone site, the predicted worst case exceedance of the night time from the Dairy Processing Facility will not be unreasonable considering the nature of the activities at IPort and LPC Midland Port.

Conclusion and Recommendations

23. Rolleston Industrial Holdings Ltd has commissioned Novo Group to prepare an environmental noise assessment for a Plan Change application to establish a Dairy Processing Management Area (DPMA) at the application site enabling the development of a dairy processing facility.

24. A SoundPLAN model was developed to predict the worst case propagation, including the ‘loudest’ noise along the perimeter of the site, noting that limited operational information was available at the time the model was developed. The dispersion model indicates that the dairy processing activities will comply at the notional boundary of the existing surrounding residential dwellings.

25. With the recommended NCB informed by the dispersion model, it is considered appropriate in providing effective control of noise effects from the dairy hub on the surrounding sensitive activities, however, if more detailed information becomes available it is recommended that the NCB be amended if significant changes to the scale of the operation is envisaged.

26. It is concluded that by implementing the recommended NCB, with current surrounding sensitive activities located outside the NCB and any potential sensitive activities that may be constructed within the NCB but appropriately insulated in accordance with Appendix 26, the effect from the Rolleston Dairy Hub is less than minor.