



MARSHALL DAY
Acoustics 

FONTERRA HAUTAPU NEW WWTF
ASSESSMENT OF NOISE EFFECTS
Rp 001 20171232 | 21 May 2021

Project: **FONTERRA HAUTAPU NEW WWTF**

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Report No.: **Rp 001 20171232**

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1.0 REPORT SUMMARY AND CONCLUSIONS

The proposed wastewater treatment facility (the WWTF) can be constructed and operated to comply with the relevant noise limits in the operative Waipa District Plan (the WDP). Our assessment concludes that no adverse noise effects will result.

Marshall Day Acoustics have assessed the potential noise effects from the WWTF located next to Fonterra's Hautapu Dairy Manufacturing Site (the Hautapu Site).

Our modelling and on-site observations confirm that noise from the existing Hautapu Site controls the acoustic environment at surrounding noise sensitive activity locations.

We do not anticipate any significant construction and operational vibration effects from the project, given the appreciable setback distances to sensitive rural zoned receivers. Therefore, we have not considered this aspect further in our report.

We have predicted operational noise for the proposed WWTF using measurement data from a similar WWTF currently operating at Fonterra's Stirling dairy manufacturing site.

Our modelling confirms that the WWTF can comply with the relevant noise performance standards apart from a 6dB technical non-compliance at an adjoining industrial activity. Comparing the predicted noise emission from the project to the existing acoustic environment confirms that the project will not perceptibly increase noise levels, nor change the overall character. We therefore conclude that no adverse acoustic amenity effects will result.

We predict that construction noise will readily comply with the relevant limits in the WDP. We anticipate no adverse effects where the works occur during normal construction hours (0730 to 1800 hours Monday to Saturday).

We recommend conditions, should the project be granted consent, to ensure the WWTF is constructed and operated in compliance with the project noise budget and recommended noise conditions of consent.

Appendix A contains a glossary of acoustic terminology used in this report.

2.0 SITE AND DEVELOPMENT DESCRIPTION

2.1 Site Description

The assessment of environmental effects prepared by Mitchell Daysh Limited describes in detail the site of the WWTF. For the purposes of our assessment we note that the site will:

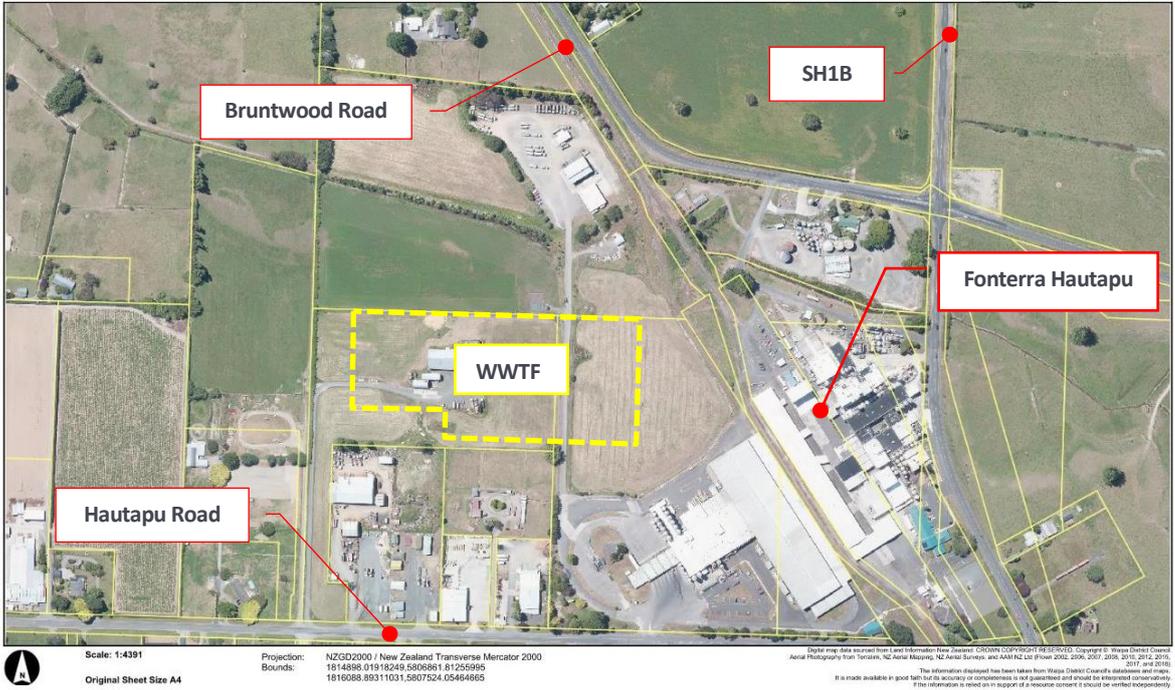
- Sit within the overall footprint of Fonterra-owned land
- Be located within the Industrial Zone with an 'overlay' which identifies the site as part of a wider "Specialised Dairy Industrial Area" in the WDP
- Be split across two distinct lots owned by Fonterra, and
- Adjoin Rural Zone land recently consented for industrial activities and are currently being used by CAMEX Civil Contractors and Hautapu Welders

Figure 1 overleaf shows the site and surrounding receiving environment.

Figure 1: WWTF proposed location and surrounds

Fonterra Hautapu Site 8 WWTF Assessment

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Source: <https://vega.intramaps.co.nz/intramaps90/>

Figure 2 identifies the Industrial Zone and Specialised Dairy Industrial Area overlay (both coloured purple) in addition to the Hautapu Dairy Manufacturing Site (the HDMS) (blue outline).

Figure 2: WDP Zone and overlays map

WAIPA DISTRICT PLAN
WDP Zones and Overlay Map

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2.2 Site Activities

Fonterra proposes to construct and operate a tank-based WWTF within the yellow dashed envelope shown in Figure 1. The components of the WWTF are broadly summarised as follows:

- A MCC and control building
- Large aeration tanks
- Odour treatment plant
- Dewatering building
- Blower building
- Clarifier tank and other smaller storage tanks, and
- UV and filtration plant

Appendix B shows the conceptual layout of the WWTF.

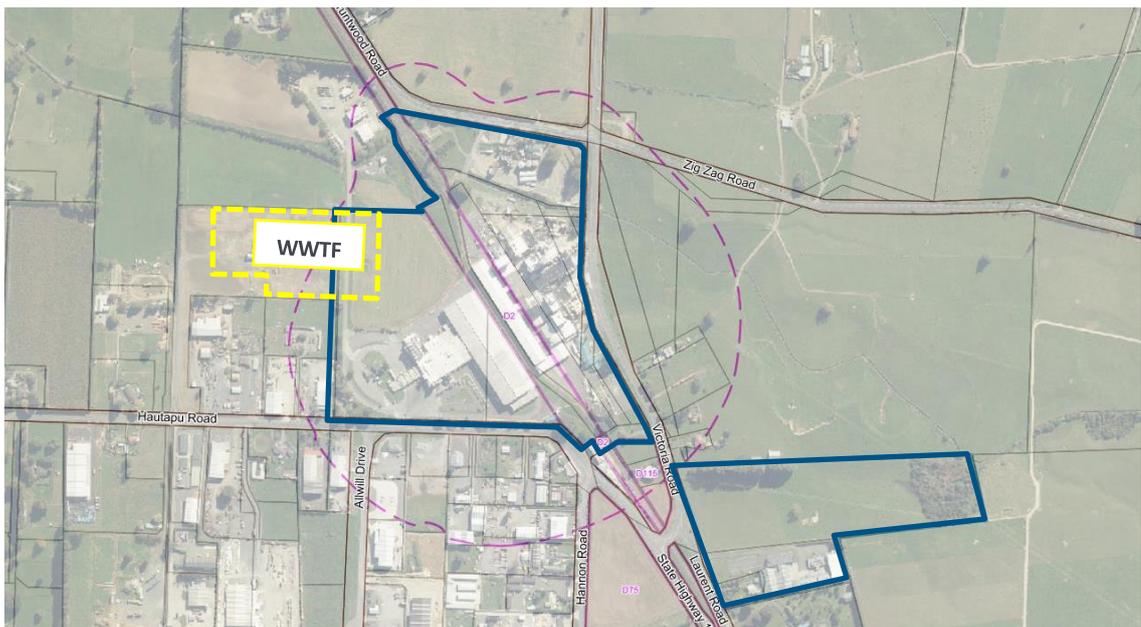
We note that the exact locations of plant and buildings within the envelope may change from those shown in Appendix B. This is expected and commonly occurs during development of the design. However, our assessment is conservative in that it predicts a maximum envelope of noise within which the operational WWTF noise will fit. Our assessment is therefore suitably robust for the purpose of consenting.

3.0 EXISTING NOISE ENVIRONMENT

The Hautapu Site typically controls the existing acoustic environment surrounding the WWTF. The WDP includes site-specific noise rules for the HDMS (as identified on the Planning Maps). The site-specific noise rules include a 55 dB L_{dn} Noise Control Boundary (the NCB) which reflects the existing use rights noise environment for the site.

Figure 3 shows the 55 dB L_{dn} NCB within the context of the receiving environment and shows the identified HDMS relevant to this site-specific noise rule.

Figure 3: Fonterra Hautapu Site 55 dB L_{dn} NCB



4.0 ACOUSTIC PERFORMANCE STANDARDS AND LEGISLATION

The WDP requires that noise from new plant not exceed 45 dB L_{Aeq} during the night-time at the site boundary with adjoining Industrial Zone sites.

To provide a robust assessment, we have also assessed the WWTF using the HDMS site specific criterion of 50dB L_{dn} at the notional boundary of the nearest rural zoned dwellings. In addition, cumulative noise from the Hautapu Site must comply with the 55dB L_{dn} NCB. Compliance is shown where site noise does not exceed receiver-specific limits at seven defined positions.

The WDP requires that construction noise comply with the limits contained in NZS6803:1999.

4.1 Operational noise

4.1.1 Industrial Zone Rule 7.4.2.18

Rule 7.4.2.18 of the WDP states:

“Activities shall be conducted and buildings located, designed and used to ensure that they do not exceed the following noise limits at the boundary of the site:

- | | |
|---|-------------------------------------|
| <i>(a) Monday to Saturday – 7.00am to 10.00pm</i> | <i>60dBA (L_{eq})</i> |
| <i>(b) Sundays & Public Holidays 8.00am to 6.00pm</i> | <i>50dBA (L_{eq})</i> |
| <i>(c) At all other times</i> | <i>45dBA (L_{eq})</i> |
| <i>(d) No single event noise level shall exceed
Night-time – 10.00pm to 7.00am”</i> | <i>70dBA (L_{max})</i> |

4.1.2 HDMS specific noise rules

Rule 7.4.2.25 (a) of the WDP requires that noise from all activities at the Hautapu Site shall not cumulatively exceed the 55dB L_{dn} NCB.

Compliance with 7.4.2.25 (a) is evidenced where the noise levels at positions MP1-MP7 do not exceed the stated limit for each position (refer to Appendix C for relevant limits).

Rule 7.4.2.26 requires that noise from any new plant at the Hautapu Site shall not exceed 50dB L_{dn} at the notional boundary of the nearest rural zoned dwelling(s).

Refer to Appendix C for the full rules as they appear in the WDP.

4.1.3 Discussion regarding noise rules

The majority of the WWTF is located on Fonterra land which sits outside of the identified HDMS relevant to the site-specific noise rules discussed in section 4.1.2. As a result the Industrial Zone noise rules are relevant based on a strict planning interpretation of WDP rules.

However, it is our opinion that the intent of the HDMS rules is to control cumulative noise “creep” from existing and proposed plant associated with Fonterra’s activities. The WWTF forms a part of Fonterra’s activity and is after all, partially located in the HDMS. Therefore, to provide a robust assessment, we have also assessed cumulative noise from the WWTF and the remainder of Fonterra’s site using the HDMS specific noise rules.

4.2 Construction Noise

Rule 7.4.2.23 of the WDP requires that all construction noise be measured, assessed and comply with the limits of New Zealand Standard NZS 6803: 1999 “Acoustics - Construction Noise”. In summary, the relevant “long-term” duration limits for daytime construction are 70 dB L_{Aeq} / 85 dB L_{AFmax} .

Refer to Appendix D for the full suite of limits contained in NZS 6803:1999.

4.3 Resource Management Act

Under the provisions of the RMA there is a duty to adopt the best practicable option to ensure that noise (including vibration¹) from any development does not exceed a reasonable level. Specifically, Sections 16 and 17 reference noise effects as follows.

Section 16 states that “every occupier of land (including any premises and any coastal marine area), and every person carrying out an activity in, on, or under a water body or the coastal marine area, shall adopt the best practicable option to ensure that the emission of noise from that land or water does not exceed a reasonable level”.

Section 17 states that “every person has a duty to avoid, remedy, or mitigate any adverse effect on the environment arising from an activity carried on by or on behalf of the person, whether or not the activity is in accordance with –

- (a) Any of sections 10, 10A, 10B and 20A; or*
- (b) A national environmental standard, a rule, a resource consent, or a designation”*

Our report uses the guiding principles of Section 16 and 17 of the RMA as noted above in assessing effects and recommending mitigation measures.

5.0 OPERATIONAL NOISE IMPACT ASSESSMENT

Our predictions of operational noise confirm that the WWTF can comply with the relevant noise performance standards in the WDP apart from a technical 6 dB non-compliance at one Industrial Zone site boundary. As this receiver is an industrial activity, and the site will be unoccupied at night-time, we conclude that the predicted exceedance will result in negligible adverse effects.

The WWTF will generate noise within the range of existing ambient noise levels. Whilst compliant, we predict WWTF noise may be audible at some dwellings during the night-time, although this will depend on the prevailing meteorological conditions. The character of WWTF noise, based on our experience, will be broadband and similar to that of the Hautapu Site. Therefore, given the predicted levels, the character and predicted compliance at rural receivers, we are of the opinion that it will not be intrusive.

We conclude that no adverse noise effects will result.

5.1 Predicted operational noise assessed against Rule 7.4.2.18

We have predicted operational noise to the closest assessment positions stipulated in Rule 7.4.2.18 namely, the WWTF site boundary. The relevant positions are detailed in Table 1 and shown on Figure 4.

We have assessed compliance against the zone limits we describe in Section 4.1.1. The results for receiver R4, shown in Table 1, confirm that WWTF noise can comply at the closest Rural Zone boundary to the west.

The result for receiver R5 – the closest site boundary adjoining another Industrial Zone property (62 Hautapu Road) – shows that noise from the WWTF is predicted to exceed the night-time limit by 6 dB. We also predict a minor 1 dB exceedance of the 50dB L_{Aeq} limit applicable to Sundays & Public Holidays between 8.00am to 6.00pm. Refer to further discussion below Table 1.

¹ RMA 1991 Part 1 Section 2 Interpretation: Noise includes vibration

Table 1: Predicted noise levels generated by WWTF only

Pos. No.	Address/location	District Plan Noise Limits (dB LAeq)	Predicted Noise Level (dB LAeq)	Complies with WDP?
R4	Closest Rural Zone boundary to West	60/50/45	44	Yes
R5	Site boundary with 62 Hautapu Rd	60/50/45	51	No

Discussion regarding predicted exceedance at receiver R5

As noted above, we have predicted a 6 dB exceedance of the Industrial Zone night-time limit at the site boundary with 62 Hautapu Road (receiver R5). This receiver is an industrial activity (Parklands Turf Limited) and is unoccupied at night-time.

In our opinion the imposition of restrictive noise limits between adjoining industrial activities i.e. in this context the proposed WWTF and receiver R5 activities, does not reflect the nature of 24/7 activity undertaken on these sites. On the basis that receiver R5 is an industrial activity, and the site will be unoccupied at night, we consider the predicted noise levels ‘reasonable’ with respect to s16 and will have a negligible effect on all adjoining industrial activities.

No acoustic mitigation measures are necessary on the above basis.

5.2 Predicted cumulative noise assessment

We have carried out a cumulative noise assessment for the WWTF and remainder of the Fonterra site. Table 2 presents the results of our noise predictions and assessment of cumulative noise compliance. The table includes:

- The existing noise level from the HDMS zone received by each receptor i.e. without noise from the WWTF
- Separated noise solely from the WWTF
- The cumulative noise level from combining both existing and proposed noise sources, and
- The last column of the table indicates the degree to which we predict the WWTF will increase the cumulative noise level at sensitive receivers

The results in Table 2 confirm that:

- WWTF noise will comply with Rule 7.4.2.26
- The cumulative noise level increase due to operation of the WWTF will remain below the relevant limit set for each receiver (see Rule 7.4.2.25(a)(i), and
- The WWTF’s operation will not perceptibly increase noise levels (a minimum +/- 3 dB change is required for this to occur)

Table 2: Hautapu Site and WWTF noise levels (dB L_{dn} or L_{Aeq})

Pos. No.	Address/location	District Plan Noise Limit	Existing Site (i.e. sans WWTF)	New WWTF	Cumulative Noise Level	Change due to WWTF
<u>Applicable DP Rule 7.4.2.26</u>						
R1	59 Bruntwood Road	50 dB L _{dn}	48	41	48	NC
R2	90 Hautapu Road	50 dB L _{dn}	46	37	46	NC
R3	346 Peake Road	50 dB L _{dn}	43	38	44	+1dB
<u>Applicable DP Rule 7.4.2.25(a)(i)</u>						
MP1	59 Hautapu Road	50 dB L _{Aeq}	47	33	48	+1dB
MP2	Southern boundary	52 dB L _{Aeq}	48	46	50	+2dB
MP3	40 Bruntwood Road	42 dB L _{Aeq}	42	31	42	NC
MP4	5 Zigzag Road	51 dB L _{Aeq}	50	27	50	NC
MP5	Bridge on Zigzag Road	45 dB L _{Aeq}	46	22	46	NC
MP6	252 Victoria Road	62 dB L _{Aeq}	57	23	57	NC
MP7	238 Victoria Road	52 dB L _{Aeq}	48	23	48	NC

5.3 Assessment of cumulative operational noise effects

The WWTF will generate noise within the range of existing ambient noise levels. Whilst compliant, WWTF noise may be audible at some receivers during the night-time depending on the prevailing meteorological conditions. Based on our experience, the character of WWTF noise will be broadband and similar to that of the Hautapu Site. The WWTF will not routinely be occupied at night-time, with any requirement to do so will only be in exceptional circumstances in response to a breakdown or emergency requiring immediate attention. As such, typical sources of noise associated with sleep disturbance such as forklift and truck movements will not be present. Therefore, we are of the opinion WWTF noise will not be intrusive.

We conclude that no adverse acoustic amenity impacts will result.

5.4 Noise prediction methodology

We have predicted noise from the proposed WWTF using ISO 9613-2:1996 “Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation” as implemented in SoundPLAN® environmental noise modelling software. ISO 9613 considers a range of frequency-dependent attenuation factors including atmospheric absorption, ground and barrier effects, directivity, as well as spherical spreading.

ISO9613 adopts the conservative approach of assuming that wind is always blowing from the noise source towards the receiver (this makes things louder). The calculations also hold for average propagation under a well-developed moderate ground-based temperature inversion, such as can commonly occur on clear, calm nights.

For the purposes of this assessment we have used the following inputs and assumptions:

- WWTF noise is based on acoustic measurements of an equivalent MBR plant located at Fonterra’s Stirling site
- A total noise budget of 98 dB L_{WA} for this plant

- The WWTF operates continuously, and
- The WWTF site will have full paving therefore is acoustically “hard” (this makes things louder)

5.5 Closest potentially affected receivers

Noise from the WWTF’s operation has the potential to affect a number of residential receivers in the adjacent Rural Zone².

Table 3 identifies these receivers, zoning / primary use and distance to the WWTF site, and the seven monitoring positions detailed in Rule 7.4.2.25(a)(i).

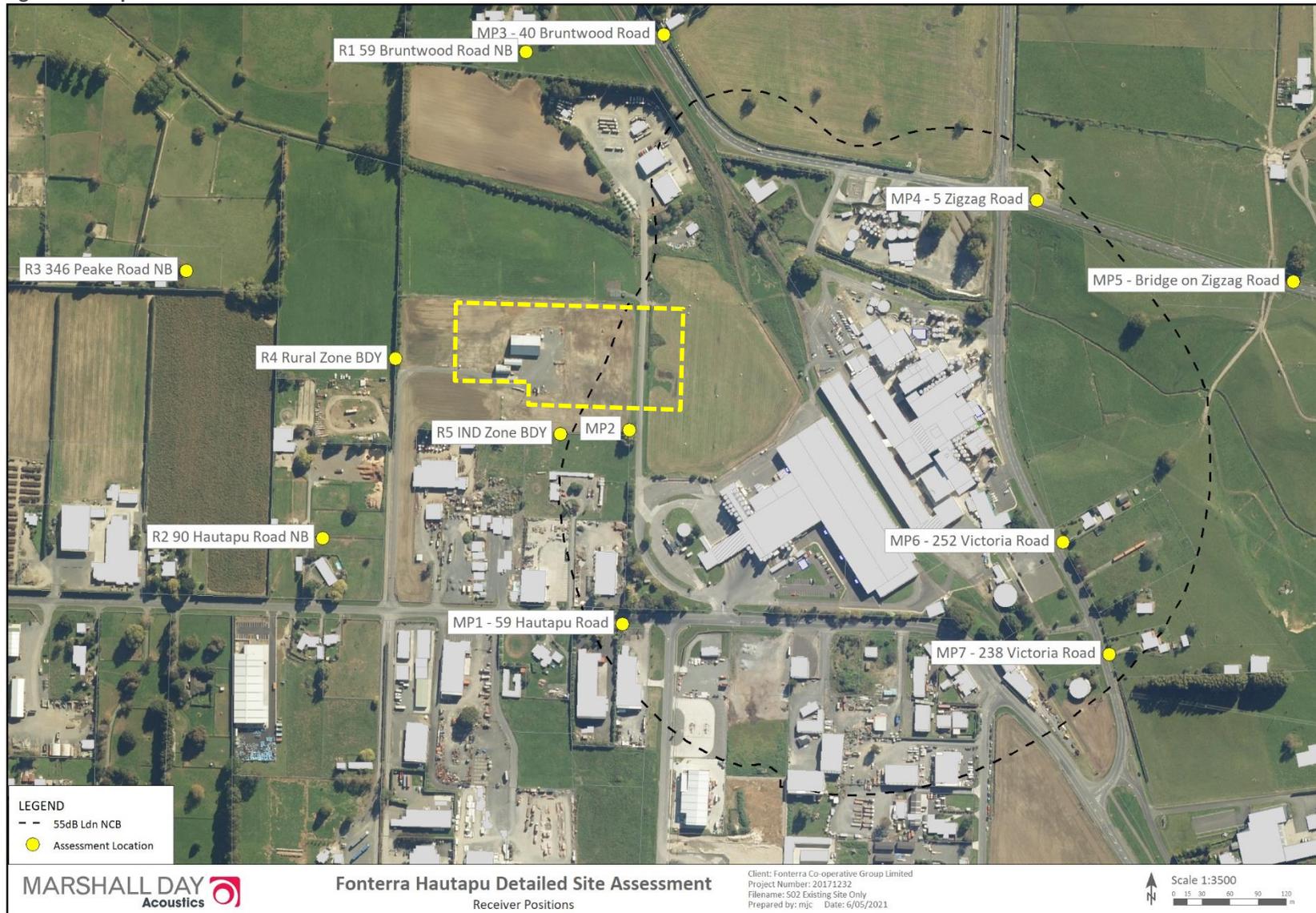
Table 3: Receiver locations

Pos. No.	Address/location	Zoning / Usage	Location Relative to Site
Applicable WDP Rule 7.4.2.26:			
R1	59 Bruntwood Road	Rural / Dwelling	285m north of site
R2	90 Hautapu Road	Rural / Dwelling	235m SW of site
R3	346 Peake Road	Rural / Dwelling	315m west of site
Applicable Rule 7.4.2.25(a)(i):			
MP1	59 Hautapu Road	WDP monitoring position	240m south of site
MP2	Southern boundary	WDP monitoring position	39m south of site
MP3	40 Bruntwood Road	WDP monitoring position	281 north of site
MP4	5 Zigzag Road	WDP monitoring position	439m NE of site
MP5	Bridge on Zigzag Road	WDP monitoring position	697m east of site
MP6	252 Victoria Road	WDP monitoring position	481m SE of site
MP7	238 Victoria Road	WDP monitoring position	576m SE of site

Figure 4 overleaf displays the surrounding receiver locations as well as the 55 dB L_{dn} NCB.

² The WDP includes residential activities in its definition of ‘noise sensitive activities’ refer Volume 1 Part B Definitions

Figure 4: Compliance locations



6.0 CONSTRUCTION NOISE ASSESSMENT

We predict that construction noise will readily comply with Rule 7.4.2.23 of the WDP. Where work occurs during normal construction hours (0730 to 1800 hours Monday to Saturday) no adverse effects will occur.

6.1 Predicted construction noise levels

Table 4 lists the plant and activities we anticipate will be used to construct the WWTF. The table includes the per unit sound power level and the minimum distance required to comply with the 'long-term' duration limit of 70dB L_{Aeq} (refer to Section 4.2).

We predict that construction noise will readily comply with the relevant limits at all noise sensitive activities. No adverse effects will result.

Table 4: Predicted construction noise levels

Activity	Equipment	Sound Power (dB L _{WA})	Façade Noise Level (dB L _{Aeq})			Limit Setback (m)	
			R1	R2	R3	70dB L _{Aeq}	
Site enabling works	20T excavator	103	44	46	43	25	
	Truck and trailer	105	46	48	45	30	
Strip topsoil and bulk excavation to form building platform	20T excavator	103	44	46	43	25	
	5-axle dump truck	106	47	49	46	33	
	Bulldozer	113	54	56	53	63	
Piling / foundations	Excavator mounted piling rig	111	52	54	51	52	
	Concrete pump	106	47	49	46	33	
	20T Excavator	103	44	46	43	25	
	Truck	105	46	48	45	30	
	Generator (150kVA)	93	34	36	33	8	
	Erect precast concrete wall panels, steel framing, roof structures, pipes etc.	30T mobile crane	98	39	41	38	14
		Grinder (hand tools)	108	49	51	48	40
Concrete truck and pump		103	44	46	43	25	
Generator (150kVA)		93	34	36	33	8	
Pump (150mm dia.)		93	34	36	33	8	
Compressor		93	34	36	33	8	
Truck idling		91	32	34	31	6	

Activity	Equipment	Sound Power (dB L _{WA})	Façade Noise Level (dB L _{Aeq})			Limit Setback (m)
			R1	R2	R3	70dB L _{Aeq}
Site landscaping and access roads	7T excavator	102	43	45	42	22
	20T excavator	103	44	46	43	25
	3-axle dump trucks	106	47	49	46	33
	7t vibratory roller	102	43	45	42	22
	Bitumen truck	103	44	46	43	25

Notes to table:

- (1) Appendix A provides an explanation of technical terms
- (2) In accordance with the requirements of NZS 6803: 1999 (Section C.2) inclusive of 3 decibels facade reflection
- (3) R1 represents the receiver located at 59 Bruntwood Road – 285m to the north of the site
- (4) R2 represents the receiver located at 90 Hautapu Road – 235m to the SW of the site
- (5) R3 represents the receiver located at 346 Peake Road – 315m to the west of the site

The prediction results in the table confirm that construction activities will readily comply with the relevant noise limit. We do not anticipate adverse effects where the work is carried out during normal construction hours.

6.2 Construction noise prediction methodology

The contractor will develop a detailed construction programme prior to the commencement of construction activities. This will form part of the project’s Construction Management Plan. We have therefore assumed an indicative construction methodology in order to carry out predictions.

We have assumed that typical construction techniques will be employed on this project. Initial earthworks will occur, followed by ground improvement measures around building foundations. Following this, cranes will install precast panels and steel beams or large trusses. A large component of the remaining works will be internal fitout.

We have predicted construction noise in general accordance with the method detailed in Annex D³ of NZS6803:1999. The method considers:

- the sound power level
- period of operation
- distance from source to receiver and screening of each source
- façade reflection, and
- the degree of soft ground attenuation

³ Annex D refers to BS5228-1: 1997 (now superseded by BS 5228-1:2009)

7.0 Recommended condition of consent

We recommend the following conditions, should consent be granted:

1. *At least 20 working days prior to the commencement of construction of any buildings authorised by this consent, the consent holder shall provide to Waipa District Council an acoustic design report prepared by a suitably qualified expert certifying that the operation of the consented activity will satisfy the requirements of Rule 7.4.2.26 of the Waipa District Plan.*

2. *At the completion of construction, the consent holder shall engage a suitably qualified expert to perform commissioning measurements of the operational site. The measurements shall be undertaken at the boundary of the site, or at a proxy position(s) should extraneous noise affect the reliability of the results.*

The results shall be reported to Waipa District Council no less than 20 days after completion of the commissioning measurements.

3. *Should the commissioning measurements required in condition 2 above identify non-compliant operation, the consent holder shall engage the services of a suitably qualified expert to identify the source(s) of non-compliance. A report shall be prepared and submitted to Waipa District Council which outlines the proposed mitigation measures, timeline for implementation and methodology for re-assessing compliance.*

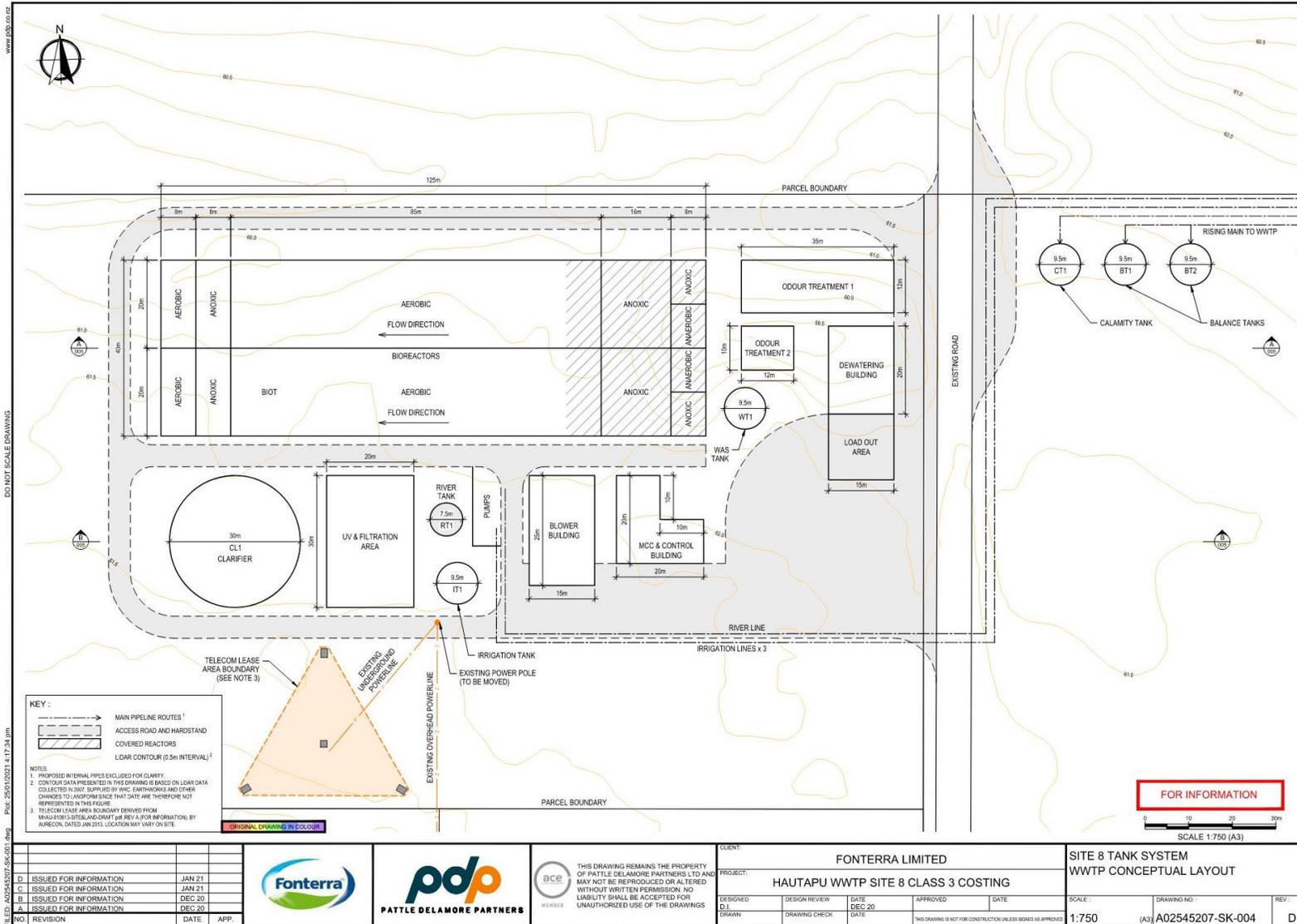
A further set of commissioning measurements shall be undertaken and reported to Council, as per the requirements of condition 2, at the conclusion of implementing all mitigation measures.

4. *All noise associated with the construction of the consented activity shall be measured, assessed and comply with the requirements of New Zealand Standard NZS 6803: 1999 "Acoustics - Construction Noise".*

APPENDIX A GLOSSARY OF TERMINOLOGY

A-weighting	<p>The process by which noise levels are corrected to account for the non-linear frequency response of the human ear.</p> <p>All noise levels are quoted relative to a sound pressure of 2×10^{-5} Pa</p>
dB	<p>Decibel. The unit of sound level.</p> <p>Expressed as a logarithmic ratio of sound pressure 'P' relative to a reference pressure of $P_r = 20 \mu\text{Pa}$ i.e. $\text{dB} = 20 \times \log(P/P_r)$</p>
dBA	<p>The unit of sound level, which has its frequency characteristics modified by a filter (A-weighted) to approximate the frequency bias of the human ear.</p>
$L_{Aeq}(t)$	<p>The equivalent continuous (time-averaged) A-weighted sound level. This is commonly referred to as the average noise level.</p> <p>The suffix "t" represents the measurement time interval to which the noise level relates, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.</p>
L_{AFmax}	<p>The A-weighted maximum noise level. The highest noise level that occurs during the measurement period.</p>
L_{dn}	<p>The day night noise level which is calculated from the 24-hour L_{Aeq} with a 10 dB penalty applied to the night-time (2200-0700 hours) L_{Aeq}.</p>
Noise sensitive activities	<p>Buildings used for residential activities, including boarding establishments, homes for elderly persons, retirement villages, in-house aged care facilities, hotels and motels, and other buildings used for residential accommodation but excluding camping grounds</p>
Notional Boundary	<p>Means a line 20m from the most exposed external walls of a dwelling or building used for accommodation; or the legal boundary of the site on which the dwelling is located, where the boundary is closer than 20m to the dwelling or building used for accommodation.</p>
NZS 6801:2008	<p>New Zealand Standard NZS 6801:2008 "Acoustics – Measurement of environmental sound"</p>
NZS 6802:2008	<p>New Zealand Standard NZS 6802:2008 "Acoustics - Environmental Noise"</p>
NZS 6803:1999	<p>New Zealand Standard NZS 6803: 1999 "Acoustics - Construction Noise"</p>
SWL or L_w	<p><u>Sound Power Level</u></p> <p>A logarithmic ratio of the acoustic power output of a source relative to 10^{-12} watts and expressed in decibels. Sound power level is calculated from measured sound pressure levels and represents the level of total sound power radiated by a sound source.</p>

APPENDIX B SITE CONCEPTUAL LAYOUT



APPENDIX C WDP NOISE PERFORMANCE STANDARDS

Rule - Construction noise

- 7.4.2.23 Construction noise emanating from a site shall meet the limits recommended in and be measured and assessed in accordance with New Zealand Standard NZS 6803:1999 Acoustics – Construction Noise.

Activities that fail to comply with this rule will require a resource consent for a restricted discretionary activity with the discretion being restricted over:

- Time and duration of effect; and
- Effects on surrounding buildings and properties.

These matters will be considered in accordance with the assessment criteria in Section 21.

Rules - Noise: Te Awamutu and Hautapu Dairy Manufacturing sites

- 7.4.2.24 Te Awamutu Dairy Manufacturing site - all activities shall be conducted and buildings located, designed and used to ensure that the cumulative noise levels from the site do not exceed:

- (a) 55dBA Ldn at the Dairy Manufacturing Noise Contour as shown on the Planning Maps.
- (i) The following levels at the following locations will be considered evidence of compliance with (a) above (refer Map 7.4.3(a)):

Measurement site (see Map 7.4.3(a))	Noise limit (dB LAeq)
170 Leith Street	54
443 Factory Road	51
69 Raeburn Street	47
165 Greenough Crescent	48
111 Leith Street	49
152 Wylie Street	49

- (b) No single event noise shall exceed 75dB (L_{Amax}) measured at the boundary of the Dairy Manufacturing Noise Contour as shown on the Planning Maps.

All noise levels shall be measured in accordance with the requirements of NZS 6801:2008 – Acoustics – Environmental Sound and assessed in accordance with NZS 6802:2008 – Acoustics – Environmental Noise.

- 7.4.2.25 Hautapu Dairy Manufacturing site - all activities shall be conducted and buildings located, designed and used to ensure that the cumulative noise levels from the site do not exceed:

- (a) 55dBA Ldn at the Dairy Manufacturing Noise Contour as shown on the Planning Maps.

- (i) The following levels at the following locations shall be considered evidence of compliance with (a) above (refer Map 7.4.3(b)):

Measurement site (see Map 7.4.3(b))	Noise limit (dB LAeq)
59 Hautapu Road	50
238 Victoria Road	52
252 Victoria Road	62
5 Zig Zag Road	51
Zig Zag Road (stock underpass)	45
40 Bruntwood Road	42
Southern Boundary	52

- (b) No single event noise shall exceed 75dB (LAmax) measured at the boundary of the Dairy Manufacturing Noise Contour as shown on the Planning Maps.

All noise levels shall be measured in accordance with the requirements of NZS 6801:2008 – Acoustics – Environmental Sound and assessed in accordance with NZS 6802:2008 – Acoustics – Environmental Noise.

7.4.2.26 All new, replacement or upgrading of Dairy Manufacturing Site facilities or equipment shall be accompanied by an acoustic certificate verifying that the equipment has been designed and installed to, by itself, not exceed a maximum of 50dBA Ldn at the nearest residential property boundary or notional boundary of the nearest rural zoned dwelling, not owned by the operator of the Dairy Manufacturing Site.

7.4.2.27 The management of noise emitted from all new, replacement or upgrading of Dairy Manufacturing Site facilities or equipment will be incorporated into a site wide Noise Management Plan. This Plan will cover:

- The method to be adopted to develop an onsite awareness for the management of noise; and
- The approach to be adopted when adding any new plant or modifying existing plant on site; and
- Any proposals to be adopted to ensure compliance with the noise limits and to satisfy the requirement of section 16 of the Resource Managements Act; and
- A complaints procedure in relation to noise emissions for the site.

Activities that fail to comply with Rules 7.4.2.24 to 7.4.2.27 will require a resource consent for a restricted discretionary activity, with the discretion being restricted over:

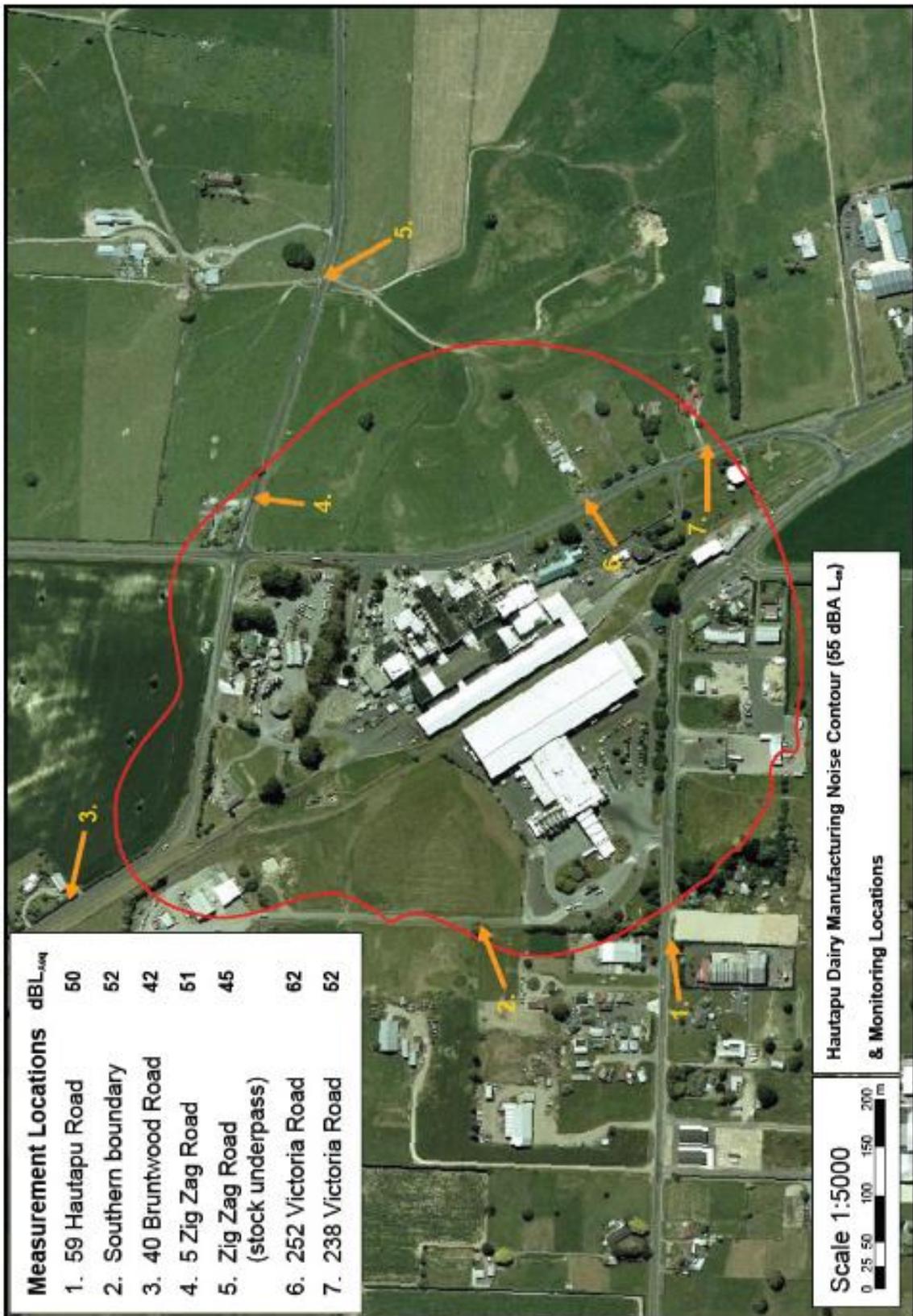
- The time, frequency and duration of noise; and
- Health, safety and amenity effects on surrounding properties, and;
- Whether all practicable means have been employed to reduce noise emissions; and
- Proposed mitigation measures to reduce the impact of noise on surrounding residents.

These matters will be considered in accordance with the assessment criteria in Section 21.

Rules - Signs

7.4.2.28 The following signs are permitted:

- Signs giving information such as the name or street number of premises, the business carried on, names of people occupying premises, and hours of operation. There must be no more than two signs on a site with no sign exceeding 3m² visible in any one direction and the total maximum area of signs shall not exceed 5m², provided that in the Hautapu Industrial Structure Plan Area there must be no more than two signs on a site with no



Map 7.4.3(b) - Hautapu Dairy Manufacturing Noise Contour

APPENDIX D NZS 6803:1999 CONSTRUCTION NOISE LIMITS

Time of week	Time period	Duration of work					
		Typical duration (dBA)		Short-term duration (dBA)		Long-term duration (dBA)	
		L _{eq}	L _{max}	L _{eq}	L _{max}	L _{eq}	L _{max}
Weekdays	0630-0730	60	75	65	75	55	75
	0730-1800	75	90	80	95	70	85
	1800-2000	70	85	75	90	65	80
	2000-0630	45	75	45	75	45	75
Saturdays	0630-0730	45	75	45	75	45	75
	0730-1800	75	90	80	95	70	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75
Sundays and public holidays	0630-0730	45	75	45	75	45	75
	0730-1800	55	85	55	85	55	85
	1800-2000	45	75	45	75	45	75
	2000-0630	45	75	45	75	45	75