MARSHALL DAY Acoustics

RANGITOOPUNI DEVELOPMENT
WWTP & WTP NOISE ASSESSMENT

Rp 001 20250219 | 3 April 2025

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Project: **RANGITOOPUNI DEVELOPMENT**

Prepared for: [redacted]

Attention: [redacted]

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SUMMARY

Marshall Day Acoustics has been appointed to prepare a desktop assessment of noise and vibration from the wastewater treatment plant (WWTP) and potable water treatment plant (WTP) associated with the proposed Rangitoopuni Development, a countryside living subdivision and retirement village in Riverhead.

Noise and vibration from the proposed WWTP and WTP are predicted to be well below the relevant Auckland Unitary Plan (AUP) standards at the nearest existing dwelling notional boundaries. We therefore consider the potential for adverse noise and vibration effects to be negligible.

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1.0 INTRODUCTION

Marshall Day Acoustics has been appointed to assess noise and vibration from the wastewater treatment plant (WWTP) and potable water treatment plant (WTP) associated with the proposed Rangitoopuni Development, a countryside living subdivision and retirement village in Riverhead.

As requested, this is a desktop assessment only. We have not visited the site to measure the existing noise environment.

This report provides:

- The proposed plant locations and noise-generating equipment
- A summary of the relevant noise and vibration performance standards
- Calculated noise levels and an assessment of the noise and vibration effects that may arise

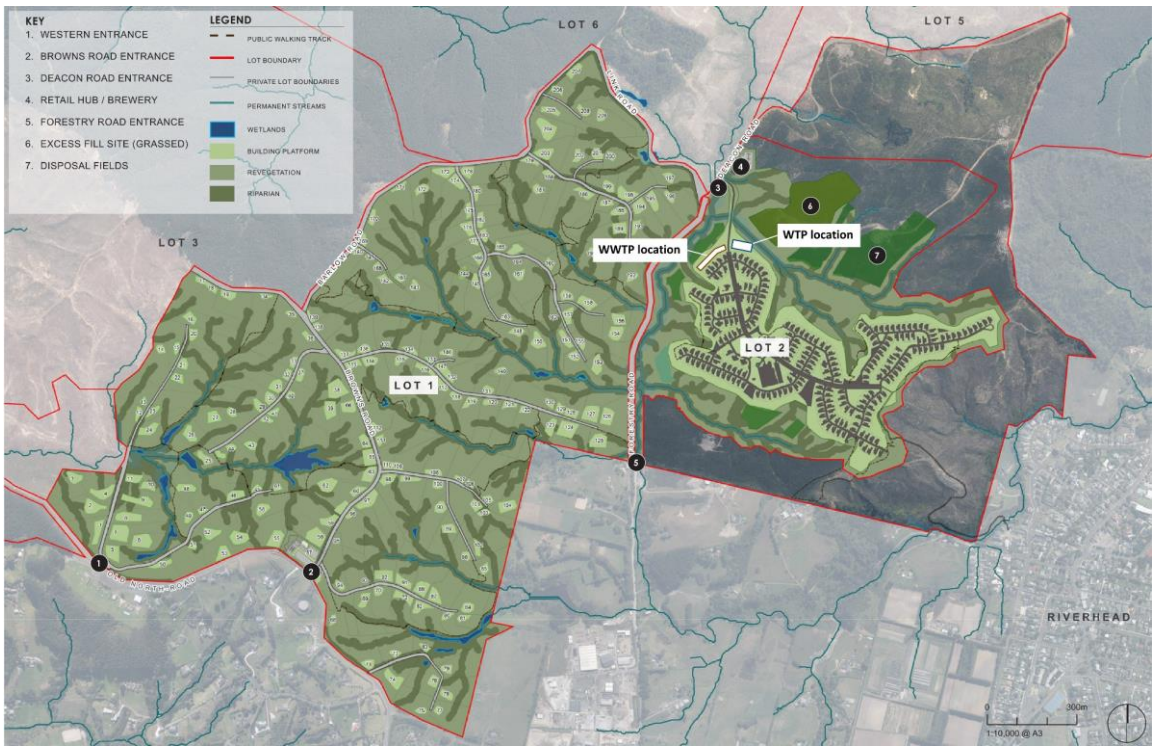
A glossary of the technical terminology used in this report is provided in Appendix A.

2.0 PROPOSED PLANT LOCATION & EQUIPMENT

2.1 Proposed Location

The proposed WWTP and WTP are located to the north of the retirement village, as indicated in Figure 1. The proposed layouts of the WWTP and WTP are provided in Figure 2 and Figure 3. Most of the WWTP and WTP equipment proposed will either be underground or enclosed within a shed or container.

Figure 1: Rangitoopuni development with WWTP and WTP location (base drawing courtesy of Boffa Miskell)



The nearest existing dwellings are located immediately south and to the east of the lot boundaries (red lines in Figure 1).

Figure 2: Proposed WWTP & WTP layout (courtesy of GWE Consulting Engineers)

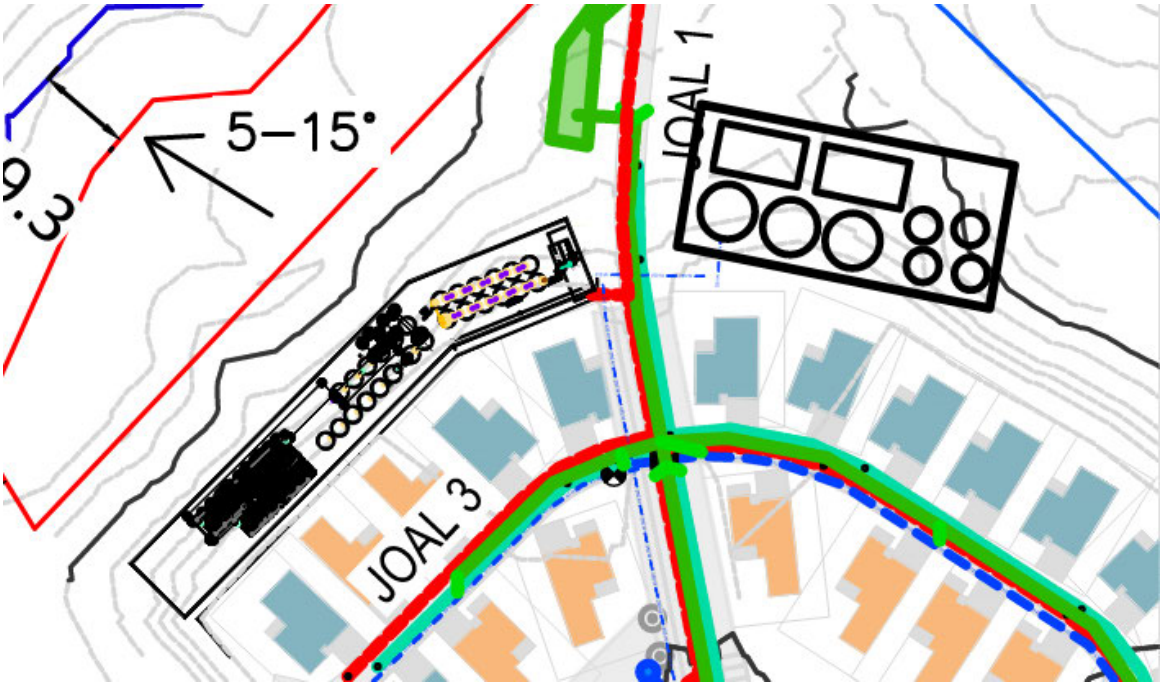
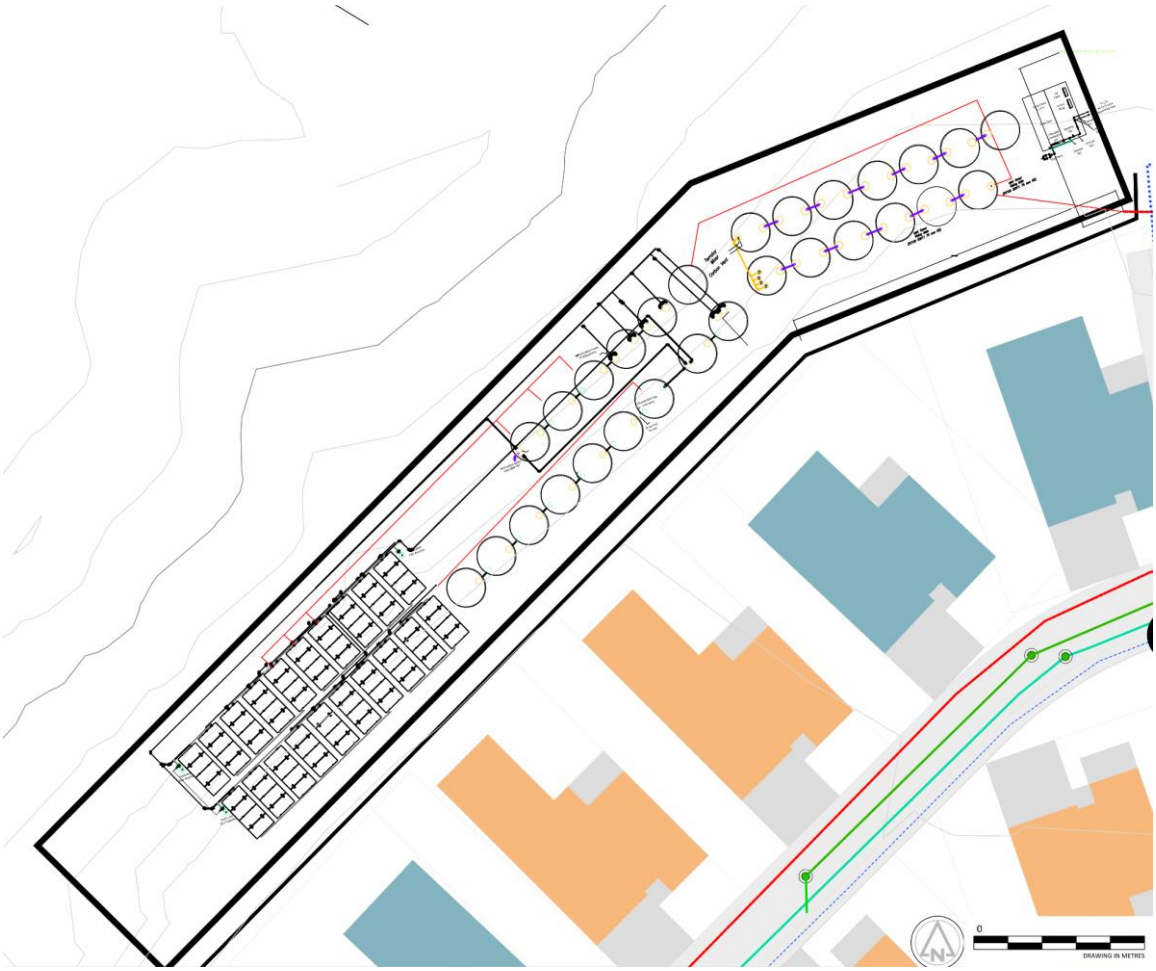


Figure 3: WWTP layout (courtesy of GWE Consulting Engineers)



2.2 WWTP & WTP Equipment

At this early stage of the project, specific plant and equipment selections have not yet been confirmed. Indicative noise-generating plant and equipment pump and are listed below, based on the information provided to us from GWE Consulting Engineers:

WWTP:

- 12x 1.5 kW submersible recirculation pumps
- 60 W fan on AX 100 pods
- MCC and UV disinfection units enclosed within a shed

WTP:

- All pumps enclosed within two 40 ft containers

3.0 NOISE & VIBRATION PERFORMANCE STANDARDS

The entire development is zoned *Rural – Countryside Living Zone* under the Auckland Unitary Plan (AUP). The nearest existing dwellings are zoned *Rural – Mixed Rural Zone* and situated over 700 metres south of the proposed WWTP and WTP locations.

3.1 Noise Performance Standards

AUP Standard E25.6.3.2 states that the noise (rating) level from any activity in the *Rural – Countryside Living Zone* measured within the notional boundary on any site in any rural zone must not exceed the following noise limits:

Table 1: AUP Table E25.6.3.2 noise limits

Time	Noise level
Monday to Saturday 7am-10pm Sunday 9am-6pm	50 dB L_{Aeq}
All other times	40 dB L_{Aeq} 75 dB L_{AFmax}

The AUP requires that noise levels arising from activities must be measured and assessed in accordance with the New Zealand Standard NZS 6801:2008 "*Acoustics – Measurement of environmental sound*" and the New Zealand Standard NZS 6802:2008 "*Acoustics – Environmental noise*" (except where more specific requirements apply).

As the water treatment plants will operate 24 hours per day, seven days per week, the critical noise limits are 40 dB L_{Aeq} and 75 dB L_{AFmax} at the notional boundary of any site in a rural zone.

3.2 Vibration Performance Standards

AUP Standard E25.6.30 states that permanently installed stationary vibrating, reciprocating and rotating machinery and all piping, ducting and other equipment attached to such machinery must be installed and maintained so that any resulting vibration does not exceed the following limits:

Table 2: AUP Table E25.6.30.2 vibration limits

Affected occupied building or area	Time of day	Maximum vibration level in root mean square velocity (mm/s) between 8 and 80 Hz
Noise sensitive spaces	7am-10pm	0.20
Bedrooms and sleeping areas only within activities sensitive to noise	10pm-7am	0.14

4.0 CALCULATED NOISE LEVELS

As specific plant and equipment selections have not yet been confirmed at this early stage of the project, we have used noise data from similar WWTP and WTP projects that Marshall Day Acoustics has been involved with:

Table 3: Noise data

Equipment	Quantity	Noise data (per item)
WWTP submersible pumps	12	80 dB L_{WA}
Fan on AX 100 pods	1	75 dB L_{WA}
MCC and UV disinfection shed	1	75 dB L_{Aeq} reverberant noise level
WTP containers	2	85 dB L_{Aeq} reverberant noise level

Based on the noise data summarised in Table 3, noise levels at the nearest existing dwellings on Forestry Road, over 700 metres away, are calculated to be less than 25 dB L_{Aeq}, well below the 40 dB L_{Aeq} AUP night-time noise limit.

5.0 OPERATIONAL VIBRATION

Vibration from the WWTP and WTP would readily comply with the AUP standards without specific vibration mitigation.

6.0 CONCLUSIONS

At the nearest existing dwellings on Forestry Road, noise and vibration from the proposed WWTP and WTP will be well below the relevant AUP standards and generally imperceptible. We therefore consider the potential for adverse noise and vibration effects to be negligible.

APPENDIX A GLOSSARY OF TERMINOLOGY

A-weighting	A set of frequency-dependent sound level adjustments that are used to better represent how humans hear sounds. Humans are less sensitive to low and very high frequency sounds. Sound levels using an "A" frequency weighting are expressed as dB L_A. Alternative ways of expressing A-weighted decibels are dBA or dB(A).
dB	Decibel. The unit of sound level.
L_{Aeq}	The equivalent continuous A-weighted sound level. Commonly referred to as the average sound level and is measured in dB.
L_{Amax}	The A-weighted maximum sound level. The highest sound level which occurs during the measurement period. Usually measured with a fast time–weighting i.e. L_{AFmax}
L_P	Sound pressure level. The sound level measured at distance from a source. Distinctly different from sound power level (L_W)
L_w	Sound Power Level. The calculated level of total sound power radiated by a sound source. Usually A-weighted i.e. L_{WA}.
Noise	A subjective term used to describe sound that is unwanted by, or distracting to, the receiver.
Notional boundary	A line 20 metres from any side of a dwelling, or the legal boundary where this is closer to the dwelling. This definition is from NZS 6802:2008.
Rating level	A derived level used for comparison with a noise limit. Takes into account any and all corrections described in NZS 6801 and NZS 6802, e.g. duration, special audible character, residual sound etc. This definition is from NZS 6802:2008.