

Technical Report N

Noise Assessment

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MARSHALL DAY
Acoustics 

REDVALE LANDFILL EXPANSION
ASSESSMENT OF NOISE EFFECTS
Rp 001 20241151 | August 2026

Project: Redvale Landfill Expansion

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Report No.: Rp 001 20241151

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TABLE OF CONTENTS

1.0	REPORT BACKGROUND, SUMMARY AND CONCLUSIONS.....	5
1.1	Introduction	5
1.2	Report summary and conclusions	5
2.0	LANDFILL SITE, ACTIVITY DESCRIPTION AND IDENTIFIED RECEIVERS.....	6
2.1	Site description	6
2.2	Site activity	6
2.2.1	Landfilling activities	6
2.2.2	Energy Park	6
2.2.3	Landfill expansion.....	7
2.3	Construction vs. Operational Works	7
2.4	Identified potentially noise sensitive receivers	8
3.0	EXISTING NOISE ENVIRONMENT	11
3.1	Attended night-time ambient noise measurements	11
3.2	Long-term noise logger results	12
3.3	Historical noise complaints	13
3.3.1	Overall findings.....	13
3.3.2	Noise complaints by year.....	14
3.3.3	Sub-categorisation of noise complaints	14
4.0	NOISE PERFORMANCE STANDARDS	15
4.1	Auckland Unitary Plan Operative in Part	15
4.1.1	AUP:OP zones	15
4.1.2	AUP:OP operational noise performance standard	15
4.1.3	AUP:OP construction noise performance standard	16
4.2	Noise Assessment Context – AUP:OP PA Standards and Existing Consent Conditions.....	16
5.0	OPERATIONAL NOISE IMPACT ASSESSMENT	17
5.1	Operational noise modelling and results	17
5.1.1	Scenario 1 existing and continued operations noise	17
5.1.2	Scenario 2 post-2028 operations noise if consent not granted.....	19
5.1.3	Scenario 3 end of extended resource consent (2036) noise.....	19
5.1.4	Scenario 4 post-2036 aftercare period noise	20
5.2	Assessment of operational noise impacts	21
5.3	Operation noise modelling methodology.....	22
5.3.1	Scenario 1: Existing and continued operations.....	23
5.3.2	Scenario 2: Post-2028 operations if consent not granted.....	23

5.3.3	Scenario 3: 2036 (end date of extended resource consent).....	23
5.3.4	Scenario 4: Post-2036 (aftercare period)	24
6.0	CONSTRUCTION NOISE ASSESSMENT	24
7.0	REPORT CONCLUSIONS	24

APPENDIX A GLOSSARY OF TERMINOLOGY

APPENDIX B EXISTING CONSENTED LAYOUT AND PROPOSED FINAL LAYOUT

APPENDIX C RECEIVER TABLE

APPENDIX D AMBIENT NOISE LOGGING MEASUREMENT RESULTS

APPENDIX E ENVIRONMENT COURT DECISION NZENVCO43 RELEVANT NOISE CONDITIONS

APPENDIX F AUP:OP PERFORMANCE STANDARDS

APPENDIX G SOUND POWER LEVEL DATA USED IN MODELLING

APPENDIX H CALCULATED NOISE CONTOURS

1.0 REPORT BACKGROUND, SUMMARY AND CONCLUSIONS

1.1 Introduction

WM New Zealand (WMNZ) is Aotearoa's leading materials recovery, recycling, and waste management provider, with over 2,000 team members across 70 locations.

WMNZ takes a strategic view of waste needs for the country, carefully operating and planning recycling and landfill infrastructure, and other waste management initiatives, to help ensure New Zealand's waste is managed safely and sustainably.

WMNZ collects over 1 million tonnes of waste and recycles well over 200,000 tonnes every year across New Zealand. Auckland faces an upcoming waste infrastructure challenge. WMNZ's Redvale Landfill and Energy Park (landfill), which currently manages approximately 40% of Auckland's waste, is due to stop accepting waste in December 2028 under the existing resource consents held for the site. There has been a delay in obtaining resource consent for Auckland Regional Landfill (ARL) which is the intended replacement for Redvale and therefore, a transition plan is required to cover the period before ARL is ready to accept waste.

ARL, which is still progressing through the consenting process, is not expected to be operational until approximately 2036. This creates a critical infrastructure gap of around 8-years where Auckland needs reliable, sustainable solutions for managing its residual waste.

WMNZ proposes to expand the existing landfill operations, as described in section 2.2.3 (the project).

Accordingly, WMNZ has engaged Marshall Day Acoustics to understand the acoustical effects from a proposal to seek new consents for Redvale Landfill, north of Auckland.

This report sets out the findings of our noise impact assessment and has been prepared for inclusion in a substantive application under the Fast-track Approvals Act 2024.

We have performed attended measurements and long-term noise monitoring to quantify existing noise emissions from the site. The results inform our assessment of effects.

We have reviewed the noise conditions contained in the current consent (Environment Court decision NZEnvC043) as well as the permitted activity standards for activities operating in the Rural - Mixed Rural Zone (RMRZ) of the AUP:OP (which is the applicable zone for the Redvale Landfill). Our modelling predicts that the project will comply with the limits contained in the current consent conditions as well as the AUP:OP permitted activity standards.

A glossary of terminology is provided in Appendix A.

1.2 Report summary and conclusions

Our assessment confirms that operational noise from the project will comply with the Auckland Unitary Plan Operative in Part (AUP:OP) permitted activity standards at all receivers.

Noise modelling under four operational scenarios shows compliance with the relevant limits. Operational noise from landfilling activities of up to 49 dB L_{Aeq} is consistent in level and character with current daytime operations. Energy Park noise of up to 40 dB L_{Aeq} at night will not cause adverse effects at the closest dwellings.

For operational noise to remain compliant, the noise control elements of the Landfill Management Plan (LMP) must be implemented effectively — specifically, refuse and earth bunding positioned to screen noise from active cells. Where the landfill operates in accordance with the LMP, noise will be reasonable under s16 of the Resource Management Act 1991 (RMA).

Noise will be audible to receivers when outside; however, the level and character will remain largely unchanged from current operations. The proposed extension therefore represents no change in the level of effect already authorised under the existing consent.

Construction noise, managed under the LMP, will comply with the AUP:OP and NZS 6803:1999 Acoustics – Construction Noise.

A glossary of terminology is provided in Appendix A.

2.0 LANDFILL SITE, ACTIVITY DESCRIPTION AND IDENTIFIED RECEIVERS

2.1 Site description

The landfill is located on Landfill Access Road, Dairy Flat and is situated on rural zone land. The site is bounded on all sides by lifestyle blocks and land used for cattle grazing. The landfill and surrounding receiver environment are shown generally in Figure 1 (see page 9).

2.2 Site activity

The following key elements form the basis of current and proposed activities at the landfill.

- Landfilling and associated site preparation and remediation activities, and
- Capture of landfill gas, electricity generation, flaring and leachate evaporation

2.2.1 Landfilling activities

Typical activities include:

- the seasonal (October to April) excavation of new refuse “cells”, all subsequent liner zone preparation and leachate drain construction;
- the formation of noise control bunds using overburden placed on the outside edge of waste piles;
- day-to-day placement and compaction of refuse, winning cover (daily, intermediate and final), placement and compaction of final cover;
- ongoing and final surface drainage works; and
- gas well and header installation and all ancillary works associated with landfill tip face operation.

The landfill accepts waste between 6am and 6pm Monday to Saturday. Plant operations during this period include:

- Landfill compactors, wheeled loaders, excavators and bulldozers;
- Grader, tractor, water cart, articulated dump trucks, and refuse trucks.

2.2.2 Energy Park

The Energy Park operates 24/7. It typically forms a part of the background noise environment (L_{A90}) given its steady-state noise emission characteristic. It is less audible during the daytime than at night. Plant operating includes:

- Up to 14 Jenbacher J320 biogas generators rated at approximately 1MW_e each plus associated cooling systems;
- biogas blowers;¹ and
- three landfill gas flares that operate intermittently.

Several landfill gas blowers are used to pull the gas out of the landfill cells and transport it along a network of pipes. These activities are considered to be a part of operational works and include the piping of landfill gas to a bank of reciprocating engines connected to electrical generators (together called “generators”); the evaporation of landfill leachate using a BeneVap low temperature

¹ Biogas blowers extract biogas from landfill cells.

evaporator, and the intermittent combustion of unwanted landfill gases by way of enclosed flare also occur.

Currently, up to 13 generators operate at any one time based on the available supply of landfill gases. As the remaining landfill capacity decreases with gas production increases, the number of operating generators is expected to progressively rise, reaching up to 14 generators around 2036.² This will have a negligible effect on Energy Park noise emissions.

Sometime after 2036 (the proposed date after which waste will no longer be accepted at the landfill) the number of operational generators would gradually decrease, as landfill gas volume declines, by one generator approximately every two years until closure. It is estimated that a total of eight generators would be operational in 2056.

2.2.3 Landfill expansion

As part of the development of an additional 4.56 Mm³ of airspace to accept more waste the following works are proposed:

- **Class 1 landfill expansion:** placement of waste within the existing landfill footprint, involving the removal of final cover and steepening of the final cap slope from 1V:4H to 1V:3H, to accommodate the additional waste
- **Class 2 footprint extension:** The landfill is proposed to be extended to the south-west of the current landfill boundary, within the area currently occupied by the now decommissioned Managed Fill and Pond 6. The extension will comprise the excavation and lining of a new landfill cell, allowing the acceptance of waste that meets the proposed Class 2 waste acceptance criteria. It will be constructed in a manner similar to the already constructed cells within the current landfill
- **Relocation of ancillary activities:** the relocation of ancillary activities to allow for the placement of waste
- **Sediment Retention Ponds:** the removal and filling of Sediment Retention Pond 6 and the Office Pond while enlarging Pond 1 to capture and treat the stormwater from these catchments.

2.3 Construction vs. Operational Works

The LMP defines construction work as works including all earthworks, building erection, road construction, fencing, initial drainage works and permanent earth bunding. As all of these site establishment works have been completed, including the establishment of the Class 1 landfilling footprint, the remaining works considered to be construction are periodic new building construction, liner installation, final capping, and the periodic construction and capping of earth stockpiles. It is noted that the final section of engineered landfill liner, covering an area of approximately 10,000 m², commenced construction in the western section of the site this earthworks season (October 2025 – April 2026).

Referring to NZS 6803: 1999 “*Acoustics - Construction Noise*”³, in particular the definition of what activities constitute ‘construction work’; we consider that all remaining works including the formation of noise control bunds (by constructing and capping over linear mounds of refuse), form a part of *operating the landfill* therefore should be assessed against the relevant operational noise criteria.

² There is the possibility that refuse receipt rates will be lower than projected. The consequence of this is that the landfill would take longer to fill, thereby necessitating the use of fewer generators.

³ Section 3 “Definitions” – Construction Work

2.4 Identified potentially noise sensitive receivers

We have identified properties surrounding the landfill that may contain noise-sensitive receivers.⁴ All properties with dwellings located close to or inside the 35 dB site daytime noise contour have been included in this assessment. Refer to Figure 2 (see page 10) which shows the location of these receivers.

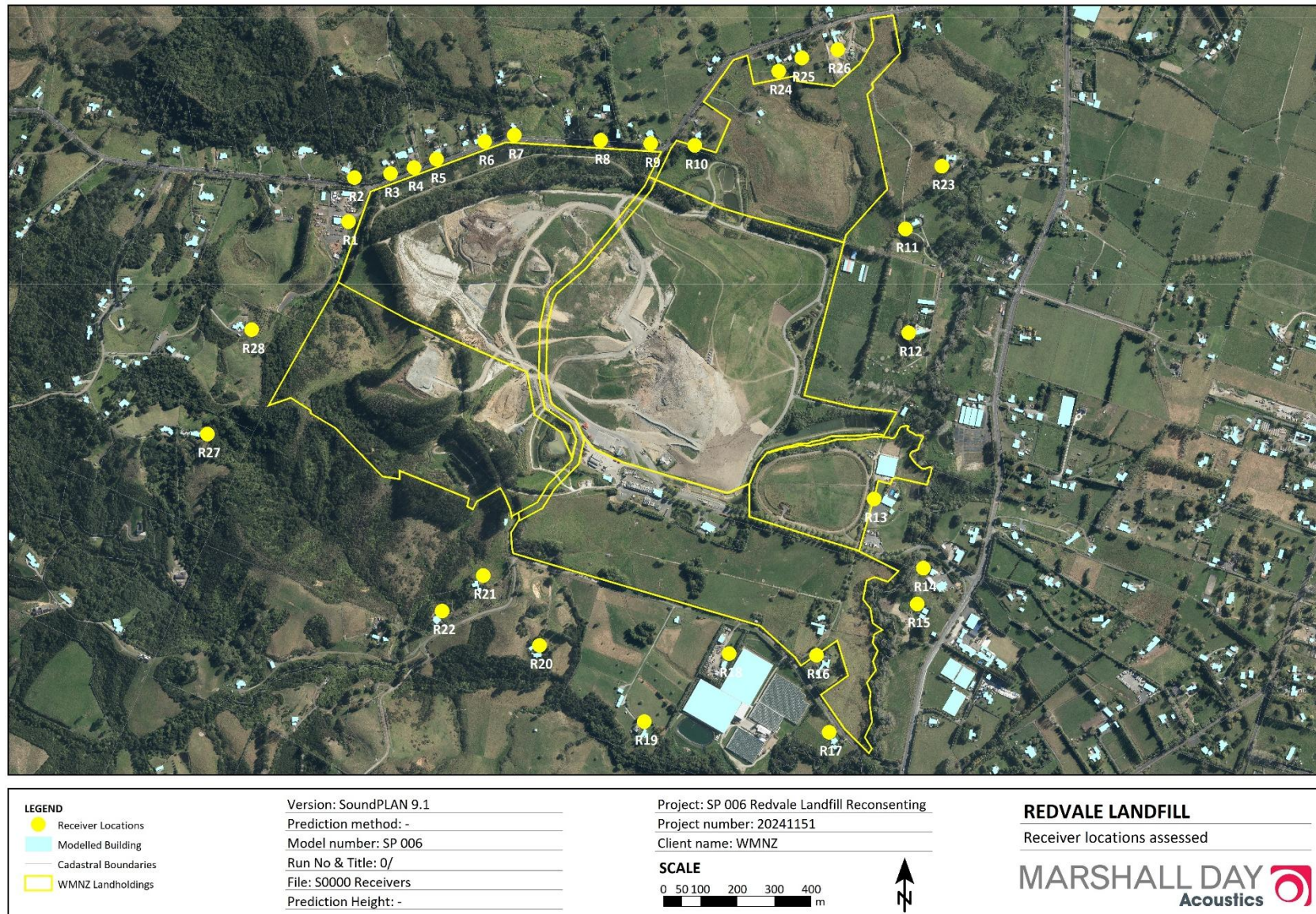
We have also tabulated the receivers, identifying the relevant zoning, presence of a dwelling and the relevant distances to the closest point of the landfill envelope and Energy Park (refer to Appendix C). If compliance with the noise standards is demonstrated at the identified receivers, then it can be inferred with confidence that the noise standards will be met for all other, more distant, receivers not included in the assessment.

⁴ AUP:OP Chapter J – Definitions defines activities sensitive to noise as: Any dwelling, visitor accommodation, boarding house, marae, papakāinga, integrated residential development, retirement village, supported residential care, care centres, lecture theatres in tertiary education facilities, classrooms in education facilities and healthcare facilities with an overnight stay facility.

Figure 1: Redvale Landfill and surrounding environment (~2025)



Figure 2: Assessed receiver locations



3.0 EXISTING NOISE ENVIRONMENT

The landfill is located next to Dairy Flat Highway (DFH). The highway has a weekday (two-way) average daily volume of about 8,109 vehicles per day (vpd), with a seven-day average of 7,388 vpd with at least 9% heavy vehicles⁵ moving past the site. Traffic noise forms a part of the existing noise environment.

The existing noise environment predominantly consists of traffic noise (as noted above), wildlife (birds, insects and farm animals), and site noise in the combined form of landfilling and Energy Park noise during the daytime, and solely Energy Park noise during the night-time. Together, these form the 'existing environment' against which noise from the expanded landfill has been assessed.

3.1 Attended night-time ambient noise measurements

We visited the site on 9 April 2025 and performed a series of attended measurements along Richards Road at the locations shown in Figure 3 (see page 12). Weather conditions during the survey consisted of clear skies with a south-southwest breeze (calm 0-0.2m/s) which represented a slight upwind monitoring condition.

We did not have access to the notional boundaries of the Richards Road dwellings. Therefore, we have used the measurement results obtained at positions DP1-DP3 to derive noise rating levels (L_R) at receiver notional boundary positions using the *derived point method*.

The results at positions DP1-DP3 were also assessed for tonality in accordance with Appendix B4 of NZS 6802:2008. No tonal components were found therefore we can infer from this that no sound containing special audible characteristics is likely to have occurred at the notional boundaries of the Richards Road dwellings.

Table 1 summarises the noise measurement results and derived noise rating levels.

Table 1: Measured existing noise levels and derived receiver results (night-time)

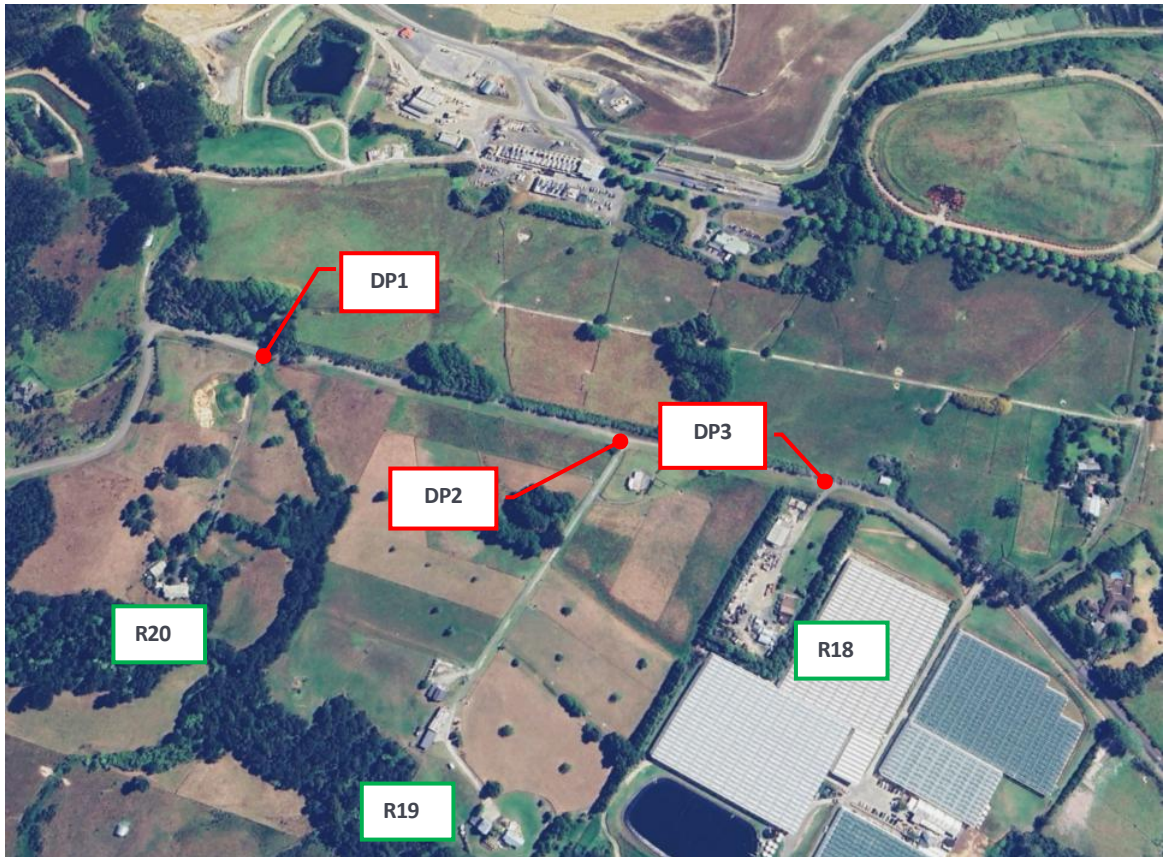
Measurement Position ¹ and receiver location	Measured Noise Levels (dB)				Noise Sources and Comments ³
	L_{Amax}	L_{Aeq}	L_{A10}	L_{A90}	
DP1 (for 115 Richards Road)	43	35	36	34	Broadband noise from Energy Park, birds, distant traffic, crickets, sheep
DP2 (for 87 Richards Road)	44	38	39	36	"hum" from Energy Park, birds, distant traffic, crickets, sheep
DP3 (for 63 Richards Road)	45	38	39	36	"hum" from Energy Park, birds, distant traffic, crickets, sheep
Derived receiver rating levels:		L_R			
115 Richards Road (R20)			33		-
87 Richards Road (R19)			32		-
63 Richards Road (R18)			28		-

Notes:

- (1) Refer to Figure 3 for the measurement positions (DP)
- (2) Adjustments of -8dB (R20) and -4dB (R18 & R19) have been made to results to account for upwind conditions
- (3) Eleven generators running during survey

⁵ July 2012 to September 2025 traffic count data available at "Traffic Counts" Auckland Transport www.at.govt.nz.

Figure 3: Attended measurement positions DP1 to DP3



3.2 Long-term noise logger results

We deployed two noise loggers on site between 28 February and 14 March 2025. The loggers were positioned at the locations shown overleaf in Figure 4.

The loggers automatically measured sound levels in 1-second intervals over the periods deployed. We derived 5-minute interval results through post-processing and averaging the data across the full period of each dataset. We removed any measurement intervals where the weather was outside the allowable meteorological window prescribed in NZS 6801:2008.

Logger NL1 (North) measured sound for 13 complete days. We excluded 49 datapoints due to weather or extraneous noise events.

Logger NL2 (South) measured sound for five days in total. We excluded 51 datapoints due to weather or extraneous noise events. Logging at this position was terminated prematurely due to livestock interfering with the logger installation.

The logged data is summarised in Table 2. Graphs showing the daily noise profile for each logger position can be found in Appendix D.

Table 2: Logger measurement results

Time	Ambient range (dB LAeq)	Ambient average (dB LAeq)	Background range (dB LA90)	Background average (dB LA90)
NL1 (North)				
7am – 10pm	41 – 69	57	34 – 68	55
10pm – 7am	29 – 60	49	25 – 58	45
NL2 (South)				
7am – 10pm	35 – 70	59	34 – 69	57
10pm – 7am	33 – 47	39	31 – 44	37

Figure 4: Noise logger positions NL1 and NL2



3.3 Historical noise complaints

Between 2022 and March 2026, WMNZ received 44 noise-related complaints. All were investigated by WMNZ staff, who took noise measurements at the complainant's property.

Complaints were more frequent in the early part of the day, likely coinciding with landfill opening. A spike in 2025 is partly attributed to the introduction of bird-scaring devices rather than heavy equipment noise.

3.3.1 Overall findings

- Peak complaint hour: 07:00 (10 complaints), then 08:00 (7) and 11:00 (7). Clear morning skew — start-up and early-shift activity
- 64% of complaints come from five complainants.

3.3.2 Noise complaints by year

Table 3 summarises the noise complaints by year.

Table 3: Complaints by year

Year	Noise Complaints
2022	7
2023	1
2024	1
2025	34
2026 YTD	1
Total:	44

3.3.3 Sub-categorisation of noise complaints

Table 4 provides a breakdown of sub-categories for noise complaints including WMNZ comments. Note: more than one sub-category is mentioned in some complaints.

Table 4: Noise complaints sub-categories

Source category	No.	Notes
Plant/machinery (track noise, dozers, scraping, general ops)	21	Dominant source — typical of active landfill working face
Bird scarers/gas guns/'fireworks'	7	Emerging issue from mid-2025; impulsive noise — high annoyance, animal-welfare concerns raised
Reverse beepers	5	Tonal/impulsive; flagged repeatedly by 158 & 184 Richards Rd
Truck/traffic	4	Often linked to early-morning start times
Generators	1	Temporary plant noise (176 HSB Rd, Aug-25)
Unspecified / generally noisy	12	No source identified in complaint text

4.0 NOISE PERFORMANCE STANDARDS

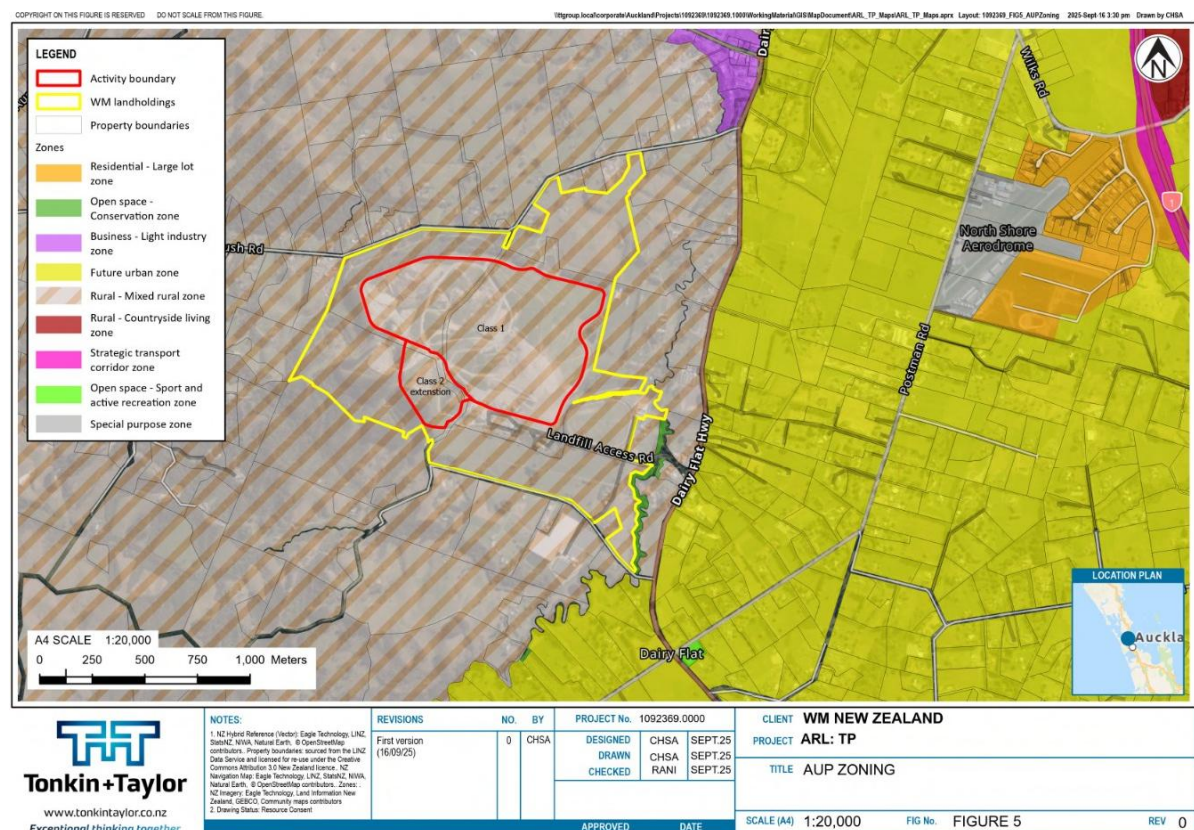
This section sets out the AUP:OP rural zone noise performance standards for operational and construction noise. It also provides context by noting the key differences between the AUP:OP noise standards and the standards in existing consent NZEnvC043 (these are in Appendix E).

4.1 Auckland Unitary Plan Operative in Part

4.1.1 AUP:OP zones

The landfill is on RMRZ land in the AUP:OP. All adjacent land to the west of DFH has the same zone classification. We note that a large swathe of land on the eastern side of the highway is *Future Urban Zone* (FUZ) land. The relevant AUP:OP zones discussed above are indicated in Figure 5.

Figure 5: AUP:OP planning zones



The following sub-sections summarise the relevant AUP:OP performance standards. The full rules as they appear in the AUP:OP are contained in Appendix F.

4.1.2 AUP:OP operational noise performance standard

Section E25 of the AUP:OP contains the noise performance standards for permitted activities in all zones (with the exception of infrastructure works). Standard E25.6.15 stipulates that the noise rating level (L_R) and maximum noise level (L_{max}) from any activity in the RMRZ as received on another site in the same zone or FUZ shall not exceed the limits in AUP:OP Table E25.6.15.1. This table is summarised in Table 5.

Table 5: RMRZ and FUZ noise limits (from AUP:OP Table E25.6.15.1)

Receiver Zones	Standard	Daytime ¹	All other times
RMRZ and FUZ	E25.6.15	55 dB L_{Aeq}	45 dB L_{Aeq} 75 dB L_{AFmax}

Notes to table:

(1) Daytime is 7am to 10pm Monday to Saturday and 9am to 6pm on Sunday

In accordance with Standard E25.6.1(1) noise arising from activities must be measured and assessed in accordance with NZS 6801:2008 *“Acoustics – Measurement of environmental sound”* and NZS 6802:2008 *“Acoustics – Environmental noise”*.

4.1.3 AUP:OP construction noise performance standard

Standard E25.6.1 (3) of the AUP:OP states that noise from any construction work activity must be measured and assessed in accordance with the requirements of NZS 6803: 1999 *“Acoustics - Construction Noise”*.

Standard E25.6.27(1) sets noise limits for typical⁶ duration construction. As the anticipated length of the construction period would exceed 20 weeks, Standard E25.6.27 (4) is relevant. Subsequently, the construction noise limits set out in Table E25.6.27.1 would be decreased by 5 decibels.

In summary, the noise limits applying to typical construction hours (7:30am to 6:00pm) would be 70 dB L_{Aeq} and 85 dB L_{Amax} assessed at 1m from the façade of occupied buildings.

4.2 Noise Assessment Context – AUP:OP PA Standards and Existing Consent Conditions

Comparing the operational noise limits between AUP:OP standard E25.6.15 and Condition 48 of the existing consent NZEnvC043, we note the following key differences:

- The existing resource consent imposes limits 5 dB lower (stricter) than the AUP:OP permitted activity standard generally.
- The existing resource consent includes a specific 6am to 7am ‘morning shoulder’ limit of 43 dB L_{Aeq} Monday to Saturday, which is more restrictive than the AUP:OP daytime period.
- The existing resource consent limits landfilling operations to daytime hours of 6am to 6pm Monday to Saturday for non-maintenance work.
- The AUP:OP permitted activity daytime period is longer than the consented activity, spanning 7am to 10pm Monday to Saturday and 9am to 6pm on Sundays.

We note that the noise limits contained in existing consent NZEnvC043 are more generally stringent than the AUP:OP permitted activity standard in both the daytime and night-time periods as we note above. As the project is seeking new consents to operate, noise has been assessed against the relevant AUP:OP permitted activity standard, that being E25.6.15. This standard allows up to 55 / 45 dB L_{Aeq} day/night to be emitted, assessed at the notional boundary of dwellings. The AUP:OP considers these performance standards representative of acceptable acoustic amenity for the relevant receiver zones.

Providing further context, the RMNZ permits a range of activities that reflect the working character of the zone. The zone is not an acoustically sensitive environment in the manner of a national park or quiet rural retreat. The AUP:OP noise framework for this zone balances the reasonable acoustic amenity expectations of rural residents with the operational realities of activities that inherently generate noise, with the primary mechanism being containment and management of noise on site.

⁶ Typical duration construction is defined in Clause 7.2.1(b) of NZS 6803:1999 as “continuous construction lasting more than 14 days but less than 20 weeks”

5.0 OPERATIONAL NOISE IMPACT ASSESSMENT

Our assessment confirms that noise from the expanded landfill can be controlled to comply with the AUP:OP permitted activity standards at all existing sensitive receivers. For landfill noise to remain compliant at all times the LMP must be effectively implemented to ensure that refuse and earth bunding is in place at appropriate positions and times relative to the cells being filled to effectively screen noise. Operational noise of up to 49 dB L_{Aeq} from landfilling activities will be at a similar level and character to what currently occurs during the daytime. Energy Park noise will be controlled to no more than 40 dB L_{Aeq} (15-mins) at night-time at the closest existing dwellings. No change in the level of effect already authorised by the existing consent will occur from the proposed extension of operation of the landfill.

5.1 Operational noise modelling and results

The assessment considers the following scenarios at Redvale Landfill. Our modelling methodology is described in Section 5.3, together with a more detailed description of each scenario. The results are summarised in the following sections and shown visually as noise contours in Appendix H.

- Scenario 1: the existing environment and continued operations;
- Scenario 2: if the new consent is not granted, the situation from 2028 onwards;
- Scenario 3: if the new consent is granted, the situation in 2036 (if not earlier) where the landfill ceases accepting waste; and
- Scenario 4: the situation when the landfill is filled to capacity and capped with final cover (post-2036) – although still emitting some sound via the landfill gas generators and other associated sources (but not landfilling).

5.1.1 Scenario 1 existing and continued operations noise

The results in Table 6 are for the existing and continued operation of the landfill. They indicate that landfill noise complies with the relevant limits in Condition 48 of NZEnvC043 and the AUP:OP permitted activity standards at the identified receivers at all times.

Table 6: Calculated rating noise levels ("S1" existing and continued operations)

ID	Address	Noise Limits [MS/D/N]	Noise Rating Level (dB L _R)			Complies with the consent conditions and AUP:OP limits?
		(dB L _{Aeq})	6-7am	Daytime	Night-time	
R1	223 Horseshoe Bush Rd	43/50/40	39	45	23	☑
R2	212 Horseshoe Bush Rd	43/50/40	40	45	22	☑
R3	200 Horseshoe Bush Rd	43/50/40	42	47	22	☑
R4	194A Horseshoe Bush Rd	43/50/40	43	48	22	☑
R5	188 Horseshoe Bush Rd	43/50/40	43	49	23	☑
R6	176 Horseshoe Bush Rd	43/50/40	43	49	22	☑
R7	154 Horseshoe Bush Rd	43/50/40	41	47	22	☑
R8	146 Horseshoe Bush Rd	43/50/40	38	45	22	☑
R9	132 Horseshoe Bush Rd	43/50/40	37	45	25	☑
R10	115 Horseshoe Bush Rd	43/50/40	33	43	25	☑
R11	1319 Dairy Flat Highway	43/50/40	34	40	25	☑
R12	1317 Dairy Flat Highway	43/50/40	39	42	31	☑
R13	36 Landfill Access Rd	43/50/40	39	43	38	☑
R14	1215A Dairy Flat Highway	43/50/40	37	41	36	☑
R15	1215 Dairy Flat Highway	43/50/40	38	42	37	☑
R16	34 Richards Rd	43/50/40	41	44	40	☑
R17	19 Richards Rd	43/50/40	39	41	37	☑
R18	63 Richards Rd	43/50/40	38	42	35	☑
R19	87 Richards Rd	43/50/40	38	42	36	☑
R20	115 Richards Rd	43/50/40	36	39	34	☑
R21	126 Richards Rd	43/50/40	35	42	33	☑
R22	158 Richards Rd	43/50/40	32	39	28	☑
R23	1351 Dairy Flat Highway	43/50/40	34	39	25	☑
R24	85 Horseshoe Bush Rd	43/50/40	34	40	25	☑
R25	71 Horseshoe Bush Rd	43/50/40	33	40	25	☑
R26	67 Horseshoe Bush Rd	43/50/40	25	34	24	☑
R27	73 Tender Rd	43/50/40	35	38	33	☑
R28	1247 Dairy Flat Highway	43/50/40	28	35	21	☑

Notes:

(1) MS = morning shoulder (6am to 7am); D = Daytime (7am to 6pm); N = Night-time (8pm to 6am)

5.1.2 Scenario 2 post-2028 operations noise if consent not granted

For this scenario no landfilling noise will be emitted – only noise from the Energy Park. We predict a sound level range of 21–40 dB L_{Aeq} (15 mins) anytime of the day (refer to column 6 of Table 6 for receiver results).

The predicted levels comply with the AUP:OP Standard E25.6.15 (refer to ANE Section 4.2) at all assessed receiver locations in all periods.

5.1.3 Scenario 3 end of extended resource consent (2036) noise

This scenario models landfill activities in the western half of the site. The results in Table 7 indicate that landfill noise is predicted to comply with the AUP:OP Standard E25.6.15 at all times.

Table 7: Calculated rating noise levels (“S3” proposed operations as at 2036)

ID	Address	Noise Limits [D/N]	Noise Rating Level (dB L_R)			Complies?
		(dB L_{Aeq})	6-7am ²	Daytime	Night-time	
R1	223 Horseshoe Bush Rd	55/45	26	33	23	☑
R2	212 Horseshoe Bush Rd	55/45	26	33	23	☑
R3	200 Horseshoe Bush Rd	55/45	25	31	22	☑
R4	194A Horseshoe Bush Rd	55/45	25	33	23	☑
R5	188 Horseshoe Bush Rd	55/45	26	32	23	☑
R6	176 Horseshoe Bush Rd	55/45	26	33	22	☑
R7	154 Horseshoe Bush Rd	55/45	25	33	22	☑
R8	146 Horseshoe Bush Rd	55/45	26	33	22	☑
R9	132 Horseshoe Bush Rd	55/45	31	38	25	☑
R10	115 Horseshoe Bush Rd	55/45	30	38	25	☑
R11	1319 Dairy Flat Highway	55/45	30	36	26	☑
R12	1317 Dairy Flat Highway	55/45	33	38	32	☑
R13	36 Landfill Access Rd	55/45	38	41	38	☑
R14	1215A Dairy Flat Highway	55/45	38	41	37	☑
R15	1215 Dairy Flat Highway	55/45	38	41	37	☑
R16	34 Richards Rd	55/45	41	43	40	☑
R17	19 Richards Rd	55/45	39	41	38	☑
R18	63 Richards Rd	55/45	37	42	36	☑
R19	87 Richards Rd	55/45	37	42	36	☑
R20	115 Richards Rd	55/45	35	37	34	☑
R21	126 Richards Rd	55/45	41	48	33	☑

ID	Address	Noise Limits [D/N] (dB L _{Aeq})	Noise Rating Level (dB L _R)			Complies?
			6-7am ²	Daytime	Night-time	
R22	158 Richards Rd	55/45	38	45	29	☑
R23	1351 Dairy Flat Highway	55/45	29	36	26	☑
R24	85 Horseshoe Bush Rd	55/45	30	37	26	☑
R25	71 Horseshoe Bush Rd	55/45	30	37	25	☑
R26	67 Horseshoe Bush Rd	55/45	25	28	24	☑
R27	73 Tender Rd	55/45	38	43	33	☑
R28	1247 Dairy Flat Highway	55/45	23	28	22	☑

Notes:

- (1) Daytime is 7am to 10pm Monday to Saturday and 9am to 6pm on Sunday
(2) The 6-7am period falls within the night-time prescribed timeframe of the AUP:OP

5.1.4 Scenario 4 post-2036 aftercare period noise

This scenario models only noise from the Energy Park, with the proposed 2036 final cap contours in place. The results in Table 8 indicate that Redvale is predicted to comply with AUP:OP Standard E25.6.15 at all times. With only the Energy Park operating, site noise emissions are consistent throughout the day.

Table 8: Calculated rating noise levels ("S4" post-2036 aftercare period)

ID.	Address	Noise Limits [D/N] (dB L _{Aeq})	Noise Rating Level (dB L _R)			Complies?
			6-7am ²	Daytime	Night-time	
R1	223 Horseshoe Bush Rd	55/45	21	21	21	☑
R2	212 Horseshoe Bush Rd	55/45	21	21	21	☑
R3	200 Horseshoe Bush Rd	55/45	21	21	21	☑
R4	194A Horseshoe Bush Rd	55/45	21	21	21	☑
R5	188 Horseshoe Bush Rd	55/45	21	21	21	☑
R6	176 Horseshoe Bush Rd	55/45	20	20	20	☑
R7	154 Horseshoe Bush Rd	55/45	20	20	20	☑
R8	146 Horseshoe Bush Rd	55/45	20	20	20	☑
R9	132 Horseshoe Bush Rd	55/45	23	23	23	☑
R10	115 Horseshoe Bush Rd	55/45	23	23	23	☑
R11	1319 Dairy Flat Highway	55/45	24	24	24	☑
R12	1317 Dairy Flat Highway	55/45	30	30	30	☑
R13	36 Landfill Access Rd	55/45	36	36	36	☑

ID.	Address	Noise Limits [D/N]	Noise Rating Level (dB L _R)			Complies?
		(dB L _{Aeq})	6-7am ²	Daytime	Night-time	
R14	1215A Dairy Flat Highway	55/45	35	35	35	☒
R15	1215 Dairy Flat Highway	55/45	35	35	35	☒
R16	34 Richards Rd	55/45	39	39	39	☒
R17	19 Richards Rd	55/45	36	36	36	☒
R18	63 Richards Rd	55/45	34	34	34	☒
R19	87 Richards Rd	55/45	34	34	34	☒
R20	115 Richards Rd	55/45	32	32	32	☒
R21	126 Richards Rd	55/45	31	31	31	☒
R22	158 Richards Rd	55/45	27	27	27	☒
R23	1351 Dairy Flat Highway	55/45	24	24	24	☒
R24	85 Horseshoe Bush Rd	55/45	24	24	24	☒
R25	71 Horseshoe Bush Rd	55/45	23	23	23	☒
R26	67 Horseshoe Bush Rd	55/45	22	22	22	☒
R27	73 Tender Rd	55/45	32	32	32	☒
R28	1247 Dairy Flat Highway	55/45	20	20	20	☒

5.2 Assessment of operational noise impacts

We have assessed operational noise impacts for each modelled scenario. The following sets out our findings.

Scenario 1: Existing and continued operations

The predicted sound levels range between:

- 25—43 dB L_{Aeq} (6-7am);
- 34—49 dB L_{Aeq} (Daytime); and
- 21—40 dB L_{Aeq} (15-mins) at night-time

which comply with the consented noise limits (refer to Section 4.1) at all existing sensitive receiver locations in all periods.

For all noise complaint investigations to date, the measured noise level was within consented limits at the time the measurement was taken, noting that compliance assessments by a suitably qualified expert in accordance with NZS 6801:2008 and NZS 6801:2008 were not undertaken to verify these complaints.

Scenario 2: post-2028 operations if consent not granted

For this scenario we predict sound level ranges of 21–40 dB L_{Aeq} (15 mins) any time of the day, which are less than the AUP:OP permitted activity standards (refer to Section 4.2) at all existing sensitive receiver locations in all periods.

We predict that Scenario 2 noise levels will be at or below the daytime ambient and background noise environment. At night, Energy Park noise will be within the range of existing ambient and background noise. Site noise during the daytime will be perceptibly lower than what currently occurs for all assessed receivers due to the cessation of landfill operations and equal to or more than half as loud for many receivers.

Scenario 3: end of extended resource consent (2036)

The predicted sound levels range between:

- 23–41 dB L_{Aeq} (6-7am)
- 28–48 dB L_{Aeq} (Daytime), and
- 22–40 dB L_{Aeq} (15-mins) at night-time

which are less than the AUP:OP permitted activity standards (refer to Section 4.2) at all receiver locations in all periods.

For Richards Road receivers, noise from landfill activities is predicted to be generally similar to the levels predicted in Scenario 1. For receivers on Horseshoe Bush Road there will be a perceptible reduction in noise, in some cases a more than halving of loudness (as landfilling would predominantly occur at greater setback distances to the south-west). No change in the level of effect already authorised by the existing consent will occur from the proposed extension of operation of the landfill.

Scenario 4: post-2036 aftercare period

The predicted sound levels range between 20–39 dB L_{Aeq} any time of the day and are less than AUP:OP Standard E25.6.15 (refer to Section 4.2) at all existing sensitive receiver locations in all periods.

Site noise during the daytime will be perceptibly lower than what currently occurs for all assessed receivers and equal to or more than half as loud for many receivers.

For most receivers on Richards Road and DFH, Energy Park noise at night will be perceived as being similar to what presently occurs. For all remaining receivers there will be a perceptible reduction in noise, in some cases a halving of loudness, for some Horseshoe Bush Road receivers.

5.3 Operation noise modelling methodology

We have calculated operation sound levels in accordance with the algorithms detailed in ISO 9613-2:1996⁷ and implemented in SoundPLAN® environmental noise modelling software (version 9.1). ISO 9613 considers a range of frequency dependent attenuation factors including atmospheric absorption, ground and barrier effects, directivity, as well as spherical spreading.

The ISO 9613-2 standard adopts the conservative approach of assuming that wind is always blowing from the noise source towards all receivers (downwind). The calculations also hold for average propagation under a well-developed moderate ground-based temperature inversion, such as commonly occurs on clear, calm nights.

The following subsections describe the scenarios we have modelled.

⁷ International Standard ISO 9613-2:1996 *Acoustics - Attenuation of sound during propagation outdoors – Part 2: General method of calculation*.

5.3.1 Scenario 1: Existing and continued operations

This scenario models landfill activities based on the 2024 surveyed landform using LiDAR,⁸ with the landfill at approximately 85% capacity by volume as of June 2025. This scenario models:

- Class 1 refuse receipt and placement at the southeastern end of the Phase 11 area (~RL 112 metres)
- Class 2 receipt and placement in Phase 22C and Phase 19B(2)⁹
- Refuse trucks enter the site from Landfill Access Road and travel up the north-south haul route located toward the centre of the site before splitting off left or right depending on the refuse class and cell being filled. The refuse is placed via excavator, bulldozer, and compactor.

Other landfill activities included in this scenario are:

- Placement of refuse into noise control bunds up to 4m in height
- Carting cover, i.e., the excavation and hauling of earth from other areas of the site and placing over fresh landfill
- Receipt and placement of managed fill
- Removal of overnight cover
- Operation of 13 landfill gas generators and ancillary equipment (as detailed in the project application's drawings).

We understand that WMNZ uses a standard operating procedure whereby refuse is 'built up' in blocks which create operating platforms. The natural development of the landfill is that the northern and eastern faces of each block are built up as fast as practicable, creating a refuse bund behind which the machinery operates. This results in shielding of receivers to the north from landfill activities for a significant proportion of time – estimated by WMNZ to be up to 90%. This shielding provides up to 4 decibels of additional sound reduction for receivers located to the north – which is considered a perceptible reduction in sound level.

We predict up to 54 dB L_{Aeq} at receiver R5 during refuse bund construction. This complies with AUP:OP Standard E25.6.15 in the daytime prescribed timeframe (0700 to 2200 hours). This activity is only undertaken between 0700 and 1800 hours.

This scenario has been assessed against the noise performance standards contained in the current resource consent NZEnvC043.

5.3.2 Scenario 2: Post-2028 operations if consent not granted

If WMNZ is not granted consent to extend landfill operations past 2028 it will no longer receive new waste albeit, Redvale Landfill will be undertaking post-closure operations (required under its consent) and the Energy Park will still be operating with up to 13 landfill gas generators running.

5.3.3 Scenario 3: 2036 (end date of extended resource consent)

This scenario models landfill activities in the western half of the site (the proposed expansion area) on the basis that an extension of time is granted. Class 1 and Class 2 refuse are placed in separate areas. The refuse is placed via excavator, bulldozer, and compactor. Other landfill activities are the

⁸ LiDAR: Light Detection and Ranging is a remote sensing method that uses pulsed laser light to measure time (and thus distance) and create highly accurate 3D maps of the terrain.

⁹ While this is currently Class 2, this may be Class 1 in future.

same as for Scenario 1. This includes the operation of 14 landfill gas generators and ancillary equipment including the BeneVap.

This scenario has been assessed against the permitted activity noise performance standards contained in the AUP:OP on the basis that WMNZ is seeking a new resource consent.

5.3.4 Scenario 4: Post-2036 (aftercare period)

This scenario models the remaining site activities with the proposed 2036 final cap contours in place. The landfill will be filled to its new capacity and capped albeit, still producing landfill gas. Therefore, eight landfill gas generators and ancillary sources will be operational.

This scenario has been assessed against the permitted activity noise performance standards contained in the AUP:OP on the basis that WMNZ is seeking a new resource consent.

Our modelling uses the sound power levels listed in Appendix G.

6.0 CONSTRUCTION NOISE ASSESSMENT

Engineered landfill liner commenced construction in the western section of the site this earthworks season (October 2025 – April 2026). We consider this is the only significant activity fitting the definition of “construction” as per report Section 2.3. Based on past noise surveys of construction activities (in which compliance was readily demonstrated) and considering the less stringent limits that apply to temporary construction activities, we consider that these works and all other similar works can be designed and managed using the LMP to readily comply with the relevant noise limits in NZS 6803:1999.

No adverse construction noise effects are anticipated on this basis.

7.0 REPORT CONCLUSIONS

Where the landfill continues to operate compliantly and in accordance with the noise control elements in the LMP, we conclude that **operational noise will be reasonable** with respect to s16 of the Resource Management Act 1991.

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 A. Alternative ways of expressing A-weighted decibels are dBA or dB(A).
Background sound	The sound that is continuously present in a room or outdoor location. Often expressed as the A-weighted sound level exceeded for 90 % of a given time period i.e., L_{A90}.
Construction work	Means any work in connection with the construction, erection, installation, carrying out, repair, maintenance, cleaning, painting, renewal, removal, alteration, dismantling, or demolition of a structure (Source: Section 3 ‘Definitions’ NZS 6803: 1999. Includes any work in connection with any excavation, site preparation, or preparatory work, carried out for the purpose of any construction work.
dB	Decibel. The unit of sound level.
L_{A10}	The A-weighted sound level exceeded for 10% of the measurement period, measured in dB. Commonly referred to as the average maximum noise level.
L_{Aeq}	The equivalent continuous A-weighted sound level. Commonly referred to as the average sound level and is measured in dB.
L_{A90}	See ‘background sound’
L_{AFmax}	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_w	Sound Power Level. The calculated level of total sound power radiated by a sound source. Usually A-weighted i.e. L_{WA}.
Notional boundary	A line 20 metres from any side of a dwelling, or the legal boundary where this is closer to the dwelling.
NZS 6801:2008	New Zealand Standard NZS 6801:2008 “Acoustics – Measurement of environmental sound”
NZS 6802:2008	New Zealand Standard NZS 6802:2008 “Acoustics - Environmental Noise”
NZS 6803:1999	New Zealand Standard NZS 6803: 1999 “Acoustics - Construction Noise”
Rating level	A derived level used for comparison with a noise limit. Considers any and all corrections described in NZS 6801 and NZS 6802, e.g. duration, special audible character, residual sound etc.
Specific sound	A component of total sound that can be identified as associated with a specific source. Specific sound is the ‘sound of interest’ in an assessment.
Special audible characteristics	Distinctive characteristics of a sound that make it more likely to cause annoyance or disturbance. A penalty of up to 5 decibels can be applied when assessing sounds with SAC Examples are tonality – a hum or a whine) and impulsiveness – bangs or thumps.
Total sound (Ambient sound)	The totally encompassing sound in a given situation at a given time, from all sources near and far, including the Specific Sound.

APPENDIX B EXISTING CONSENTED LAYOUT AND PROPOSED FINAL LAYOUT

Figure 6: Consented 2028 final cap contours and drainage plan

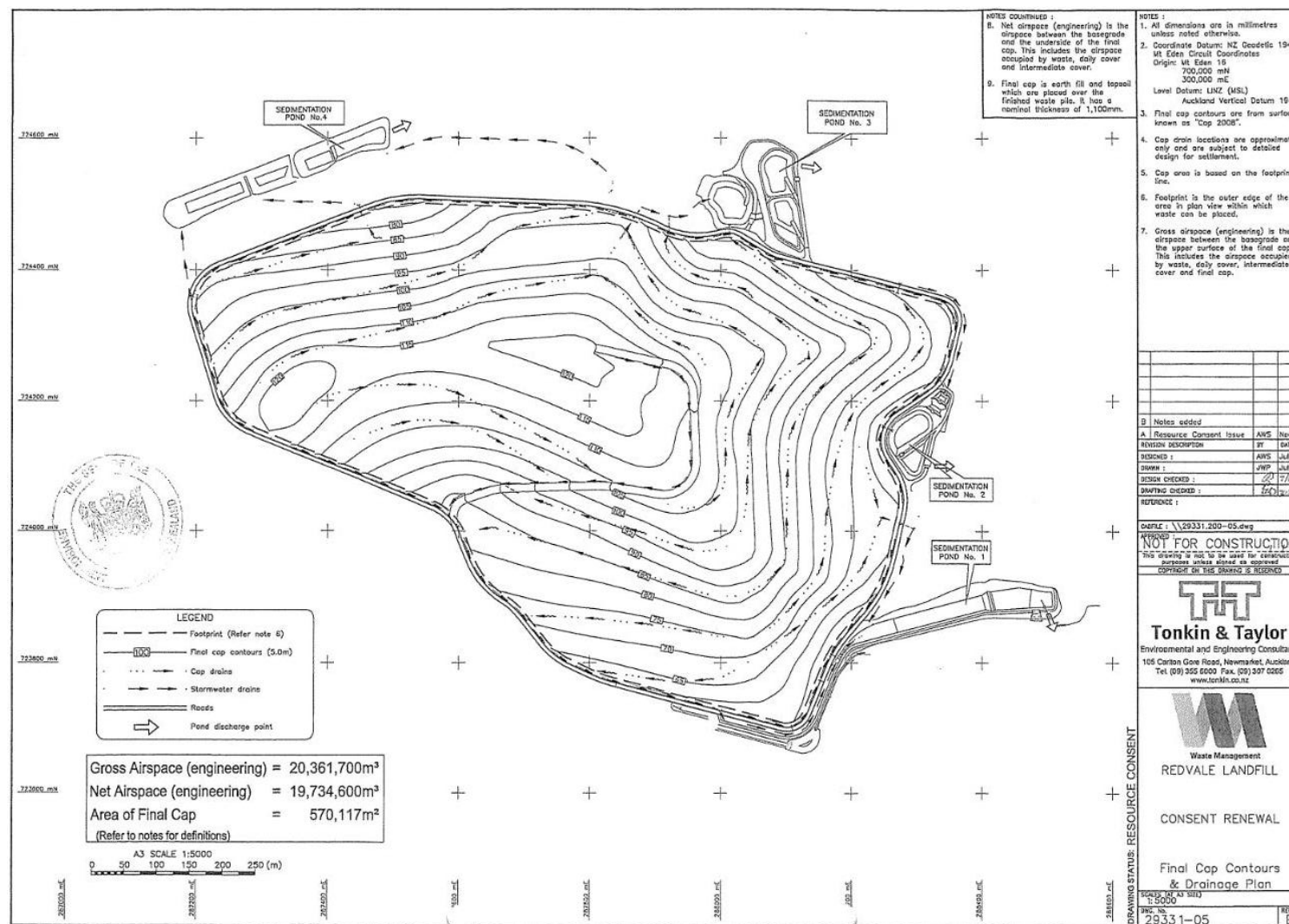


Figure 7: Proposed final cap contours



APPENDIX C RECEIVER TABLE

Table 9: Assessed receivers

ID	Address	Zoning ¹ / Usage	Min. distance to ² : (m)	
			Landfill envelope	Energy Park
R1	223 Horseshoe Bush Road	Rural / Dwelling	199	1,013
R2	212 Horseshoe Bush Road	Rural / Dwelling	199	1,086
R3	200 Horseshoe Bush Road	Rural / Dwelling	157	1,031
R4	194A Horseshoe Bush Road	Rural / Dwelling	152	1,006
R5	188 Horseshoe Bush Road	Rural / Dwelling	154	991
R6	176 Horseshoe Bush Road	Rural / Dwelling	151	975
R7	154 Horseshoe Bush Road	Rural / Dwelling	152	962
R8	146 Horseshoe Bush Road	Rural / Dwelling	150	900
R9	132 Horseshoe Bush Road	Rural / Dwelling	162	890
R10	115 Horseshoe Bush Road	Rural / Dwelling	190	901
R11	1319 Dairy Flat Highway	Rural / Dwelling	235	988
R12	1317 Dairy Flat Highway	Rural / Dwelling	270	817
R13	36 Landfill Access Road	Rural / Country Club	344	601
R14	1215A Dairy Flat Highway	Rural / Dwelling	558	763
R15	1215 Dairy Flat Highway	Rural / Dwelling	588	778
R16	34 Richards Road	Rural / Dwelling	506	618
R17	19 Richards Road	Rural / Dwelling	708	795
R18	63 Richards Road	Rural / Dwelling	446	469
R19	87 Richards Road	Rural / Dwelling	660	598
R20	115 Richards Road	Rural / Dwelling	436	485
R21	126 Richards Road	Rural / Dwelling	260	461
R22	158 Richards Road	Rural / Dwelling	391	606
R23	1351 Dairy Flat Highway	Rural / Dwelling	421	1,178
R24	85 Horseshoe Bush Road	Rural / Dwelling	449	1,156
R25	71 Horseshoe Bush Road	Rural / Dwelling	500	1,212
R26	67 Horseshoe Bush Road	Rural / Vacant	547	1,272
R27	73 Tender Road	Rural / Dwelling	656	1,137
R28	1247 Dairy Flat Highway	Rural / Dwelling	439	1,085

Notes to table:

- (1) "Rural" meaning *Mixed Rural Zone* in the AUP:OP
- (2) This distance is measured from dwelling notional boundary to relevant site feature

APPENDIX D AMBIENT NOISE LOGGING MEASUREMENT RESULTS

Figure 8: Logger NL1 data summary

Refined Dataset (With Acceptable Completeness)	Data completeness:	LAmax (dB)				LA10 (dB)*				LAeq (dB)				LA90 (dB)*			
		L _{24hr}	LD	LE	LN	L _{24hr}	LD	LE	LN	L _{24hr}	LD	LE	LN	L _{24hr}	LD	LE	LN
28 Feb '25 (Fri)	38%	---	---	---	49 - 68	---	---	---	45 - 58	---	---	---	44 - 57	---	---	---	40 - 55
01 Mar '25 (Sat)	84%	43 - 75	58 - 75	---	43 - 69	39 - 70	53 - 70	---	39 - 58	38 - 69	50 - 69	---	38 - 56	35 - 68	45 - 68	---	35 - 55
02 Mar '25 (Sun)	99%	41 - 75	56 - 75	---	41 - 67	39 - 70	44 - 70	---	39 - 58	37 - 69	42 - 69	---	37 - 57	35 - 68	36 - 68	---	35 - 54
03 Mar '25 (Mon)	100%	42 - 72	58 - 72	---	42 - 65	37 - 71	53 - 71	---	37 - 61	36 - 69	50 - 69	---	36 - 60	33 - 67	43 - 67	---	33 - 58
04 Mar '25 (Tue)	86%	42 - 74	56 - 74	---	42 - 63	40 - 64	42 - 64	---	40 - 57	40 - 61	41 - 61	---	40 - 56	38 - 59	38 - 59	---	38 - 52
05 Mar '25 (Wed)	80%	40 - 81	56 - 81	---	40 - 64	36 - 68	53 - 68	---	36 - 53	34 - 66	51 - 66	---	34 - 49	30 - 64	39 - 64	---	30 - 44
06 Mar '25 (Thu)	98%	39 - 73	55 - 73	---	39 - 69	31 - 61	46 - 61	---	31 - 53	29 - 57	43 - 57	---	29 - 50	26 - 52	38 - 52	---	26 - 45
07 Mar '25 (Fri)	99%	39 - 77	58 - 77	---	39 - 67	33 - 61	49 - 61	---	33 - 54	31 - 58	47 - 58	---	31 - 50	28 - 55	40 - 55	---	28 - 39
08 Mar '25 (Sat)	97%	47 - 70	55 - 70	---	47 - 68	37 - 60	51 - 60	---	37 - 58	36 - 60	48 - 60	---	36 - 55	31 - 59	41 - 59	---	31 - 48
09 Mar '25 (Sun)	94%	39 - 71	56 - 71	---	39 - 65	35 - 58	47 - 58	---	35 - 56	34 - 55	45 - 55	---	34 - 54	31 - 52	34 - 52	---	31 - 52
10 Mar '25 (Mon)	38%	36 - 70	---	---	36 - 63	32 - 59	---	---	32 - 54	31 - 57	---	---	31 - 51	29 - 54	---	---	29 - 46
11 Mar '25 (Tue)	100%	39 - 72	56 - 72	---	39 - 66	34 - 59	47 - 59	---	34 - 53	32 - 57	42 - 57	---	32 - 49	30 - 55	34 - 55	---	30 - 41
12 Mar '25 (Wed)	80%	54 - 72	57 - 72	---	54 - 63	46 - 60	52 - 60	---	46 - 59	41 - 59	48 - 59	---	41 - 58	31 - 57	41 - 57	---	31 - 56
13 Mar '25 (Thu)	91%	39 - 71	57 - 71	---	39 - 62	30 - 59	52 - 59	---	30 - 56	29 - 58	49 - 58	---	29 - 53	25 - 57	42 - 57	---	25 - 48
14 Mar '25 (Fri)	0%	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
OVERALL RANGE	79%	36 - 81	55 - 81	---	36 - 69	30 - 71	42 - 71	---	30 - 61	29 - 69	41 - 69	---	29 - 60	25 - 68	34 - 68	---	25 - 58

Figure 9: Logger NL1 histogram

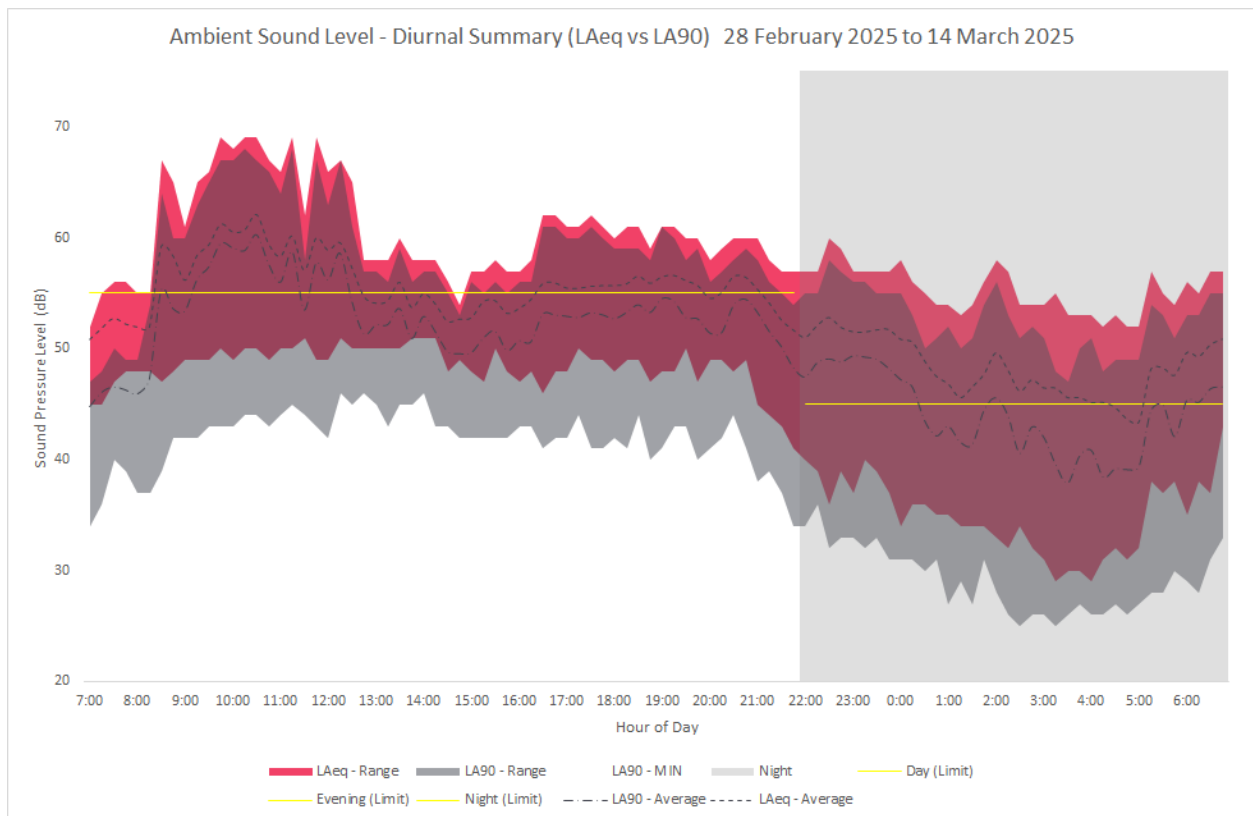
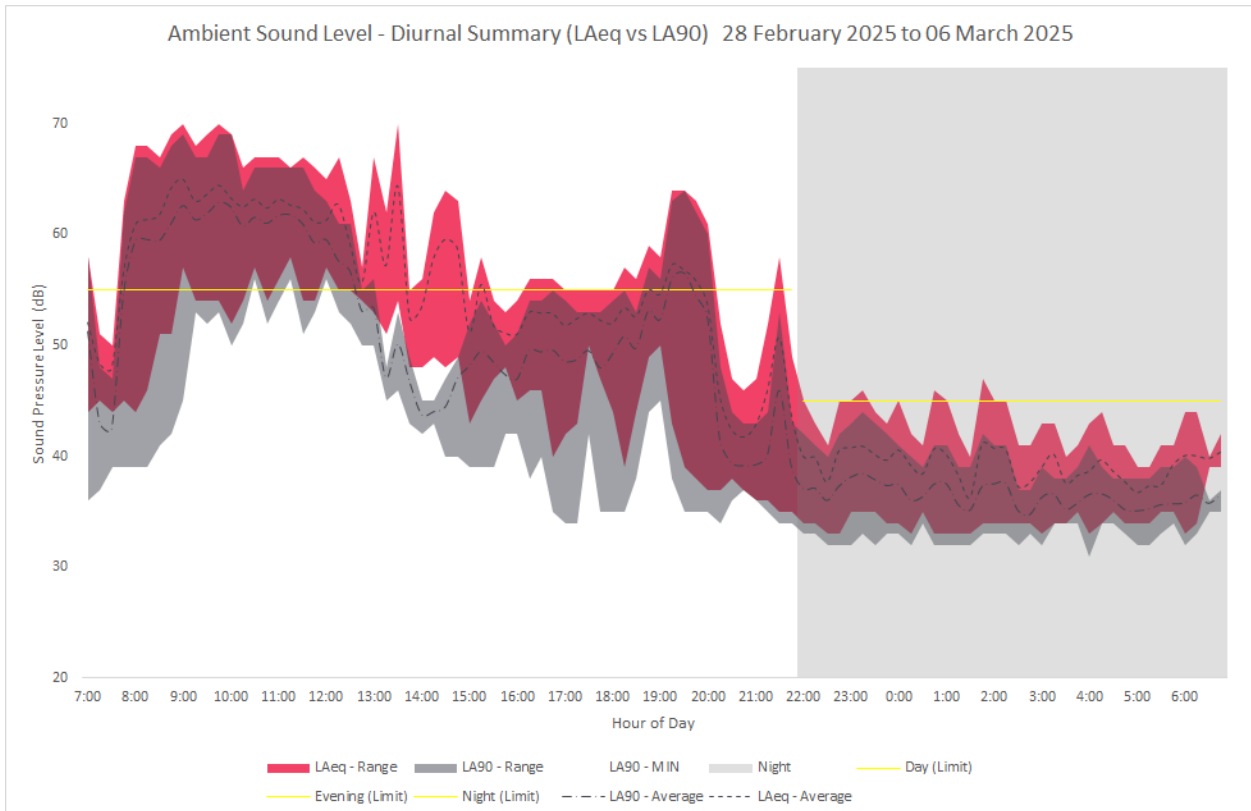


Figure 10: Logger NL2 data summary

Refined Dataset (Excludes Weather Events)	Data completeness:	L _{Amax} (dB)				LA10 (dB)*				LAeq (dB)				LA90 (dB)*			
		L _{24hr}	LD	LE	LN	L _{24hr}	LD	LE	LN	L _{24hr}	LD	LE	LN	L _{24hr}	LD	LE	LN
		24hour	7-22	0-0	22-7	24hour	7-22	0-0	22-7	24hour	7-22	0-0	22-7	24hour	7-22	0-0	22-7
28 Feb '25 (Fri)	50%	39 - 77	53 - 77	---	39 - 61	38 - 68	48 - 68	---	38 - 48	37 - 67	46 - 67	---	37 - 46	36 - 66	43 - 66	---	36 - 44
01 Mar '25 (Sat)	84%	36 - 73	39 - 73	---	36 - 61	34 - 71	38 - 71	---	34 - 40	33 - 70	37 - 70	---	33 - 40	32 - 69	36 - 69	---	32 - 36
02 Mar '25 (Sun)	98%	37 - 96	40 - 96	---	37 - 60	35 - 69	37 - 69	---	35 - 41	34 - 70	36 - 70	---	34 - 40	34 - 64	36 - 64	---	34 - 37
03 Mar '25 (Mon)	100%	35 - 71	37 - 71	---	35 - 62	33 - 62	35 - 62	---	33 - 43	33 - 62	35 - 62	---	33 - 41	31 - 61	34 - 61	---	31 - 37
04 Mar '25 (Tue)	86%	39 - 94	52 - 94	---	39 - 60	35 - 61	39 - 61	---	35 - 50	34 - 67	39 - 67	---	34 - 47	32 - 57	34 - 57	---	32 - 42
05 Mar '25 (Wed)	80%	40 - 77	46 - 77	---	40 - 61	37 - 64	43 - 64	---	37 - 50	35 - 63	40 - 63	---	35 - 46	32 - 62	37 - 62	---	32 - 41
06 Mar '25 (Thu)	20%	61 - 75	61 - 75	---	---	46 - 66	46 - 66	---	---	45 - 65	45 - 65	---	---	37 - 63	37 - 63	---	---
OVERALL RANGE	83%	35 - 96	37 - 96	-	35 - 62	33 - 71	35 - 71	-	33 - 50	33 - 70	35 - 70	-	33 - 47	31 - 69	34 - 69	-	31 - 44

Figure 11: Logger NL2 histogram



APPENDIX E ENVIRONMENT COURT DECISION NZENVCO43 RELEVANT NOISE CONDITIONS

47. The hours of operation for the landfill shall be 6.00am to 6.00pm Monday to Saturday. Operation of the landfill includes all tipping operations and site preparation works that involve the use of landfill machinery, including machinery used to remove temporary cover. These hours may be extended to no later than 9.00 pm for equipment maintenance works only.
48. Any noise emitted from activities authorised by this consent shall comply with the following noise limits at the notional boundary of any dwelling existing as at the date of granting consent (excluding any houses on land owned by the consent holder):

Time period	Time period Noise limit
0600 to 0700 hours Monday to Saturday	43 dB L _{Aeq}
0700 to 2000 hours Monday to Saturday	50 dB L _{Aeq}
At all other times	40 dB L _{Aeq}
At all other times	75 dB L _{max}

49. Noise levels shall be measured and assessed in accordance with New Zealand Standards NZS 6801:2008 "Acoustics - Measurement of Environmental Sound" and NZS 6802:2008 "Acoustics - Environmental Noise". Construction noise shall be measured and assessed in accordance with NZS 6803: 1999 "Acoustics - Construction Noise".
50. Prior to the commencement of operation of any new plant on site (e.g. generators, leachate evaporators, blowers and flares), the potential noise levels at the notional boundary of the nearest affected dwellings shall be calculated based on the simultaneous operation of the new and existing plant that would reasonably be expected to operate together. Any noise mitigation measures that may be required to maintain compliance at all times shall be identified and applied prior to the operation of the new plant. Once the new plant is operational, the noise emissions shall be measured to confirm compliance or otherwise with the relevant noise limits. If non-compliance with those noise limits is identified, the operation of the new plant shall be suspended until further noise mitigation measures are implemented. Once compliant noise emissions are confirmed the process shall be documented and submitted to the satisfaction of Auckland Council.
51. The consent holder shall update the Noise Management Plan (NMP), being a section of the LMP, to include the requirements below. The objective of the NMP shall be to outline the methods and measures by which the consent holder will demonstrate the adoption of the best practicable option (BPO), as defined in the RMA, and ensure compliance with consent noise limits. Any material changes shall be to the satisfaction of Auckland Council.
- The applicable noise limits for all operational noise;
 - Any restrictions on heavy machinery or plant (excluding generators, flares and ancillary equipment) that may be required to meet the night time noise controls in Condition 48;
 - Any noise mitigation measures required by the conditions of consent or to achieve the BPO;
 - The methodology for control of the low frequency combustion noise from gas flares;
 - Guidance on minimising noise effects on neighbours when using starter pistols and guns as bird and vermin control;
 - Any other noise mitigation measures available (and relevant timings) to reduce noise levels for the

surrounding receivers as far as practicable, for example;

- i) using the quietest machinery and methods practicable;
 - ii) Keeping all machinery maintained in good condition e.g. all tracked plant will be greased to reduce squeaking;
 - iii) Regular checks on machinery and plant to ensure that it is not generating unnecessary noise, and rectifying if necessary;
 - iv) When selecting any new machinery or plant, the degree of noise generation between models will be considered as an important factor;
 - v) Fitting exhaust silencers where practicable;
 - vi) When machinery or plant is not required to be running, it should be switched off and not left idling;
 - vii) Noisy plant and machinery shall be strategically positioned on the site to reduce the effects on neighbours where practicable;
 - viii) All plant and equipment owned or operated by the consent holder shall use broadband reversing alarms in place of traditional pure tone beepers and the consent holder should use its best endeavours to encourage contractors and customers etc to adopt the same alarms;
 - ix) The consent holder should use its best endeavours to ensure that its employees, contractors and customers exercise care when closing tail gates of waste disposal trucks, so that they are not slammed or allowed to fall closed causing unnecessary noise;
 - x) Horns should not be used unless in the case of an emergency;
 - xi) When generators are to be decommissioned, generator noise will be an important factor in the selection of generators to be decommissioned first;
 - xii) All staff should be familiar with the NMP to ensure awareness of the impacts of noise and the above methods that can be used to minimise noise emissions.
- (g) The process for installing new generators with respect to noise control to ensure that noise limits are complied with at all times once operational. This shall include consideration of the recommendations contained in the document Supplementary Evidence of Evidence of Matthew Cottle on behalf of WMNZ dated 5 September 2014.
- (h) The appropriate contact person and phone numbers, including out of hours contact details, for any noise complaints.
- (i) The process for dealing with any noise complaints received, including keeping a register of complaints, any noise monitoring undertaken and the mitigation measures, if any, put in place. The register will be made available to Auckland Council on request.
- (j) Outline the process for carrying out annual noise monitoring, The Plan should set out but not be limited to the following:
- xiii) The relevant measurement and assessment locations;
 - xiv) The relevant noise limits;
 - xv) The relevant operating conditions under which measurements are to be taken; and
 - xvi) The process for reporting the results of the compliance assessment to Council.
- (k) The consent holder shall construct, with reference to the document Supplementary Statement of Evidence of Matthew Cottle on behalf of WMNZ dated 05 September 2014:
- i) Acoustic screening for the blowers, implemented within 3 months of grant of consent;
 - ii) Low-noise cooling fan blades; implemented within 3 months of grant of consent;

- iii) A 4.5m barrier to mitigate the noise breaking out from the existing generator enclosures; and implemented within 3 months of grant of consent;
- iv) A 6m high barrier to mitigate the noise breaking out from all new generator enclosures, or housing all new generators within their container enclosures inside a purpose-built building, as required and in accordance with the NMP.

The above timeframes may be adjusted with the written approval of Council's Team Leader Northern Monitoring, Orewa.

52. When requested by Auckland Council, the consent holder shall forward to the satisfaction of Auckland Council commissioning and / or monitoring reports demonstrating that the use complies with the noise conditions of these consents. In the event that there is non-compliance with Condition 48, the activity shall be modified (or ceased) forthwith, until such time as compliance can be demonstrated.

Vibration

53. The consent holder shall ensure that appropriate methodology is adopted to reduce, as far as practicable, low frequency noise emissions arising from the process of starting up any gas flare(s) on site. As part of the NMP for the landfill, the consent holder shall keep a detailed register for the gas flares including details of any complaints received; reaction to any reasonable complaints; any noise issues identified; and details of any noise reduction measures that have been investigated as part of an ongoing commitment to proactively minimise the low frequency noise emissions. The register shall be made available to Auckland Council for inspection upon their reasonable request.

APPENDIX F AUP:OP PERFORMANCE STANDARDS

Operation noise

E25.6.15. Rural – Mixed Rural Zone, Rural – Rural Production Zone, Rural – Rural Coastal Zone or Future Urban Zone interface

- (1) The noise (rating) level and maximum noise level from any activity in the Rural – Mixed Rural Zone, Rural – Rural Production Zone, Rural – Rural Coastal Zone or Future Urban Zone measured within the boundary of any site in a residential zone must not exceed the levels in Table E25.6.15.1 Noise levels at the Rural – Mixed Rural Zone, Rural – Rural Production Zone, Rural – Rural Coastal Zone or Future Urban Zone interface below:

Table E25.6.15.1 Noise levels at the Rural – Mixed Rural Zone, Rural – Rural Production Zone, Rural – Rural Coastal Zone or Future Urban Zone interface

Time	Noise level
Monday to Saturday	55dB L _{Aeq}
7am-10pm	
Sunday 9am-6pm	
All other times	45dB L _{Aeq} 75dB L _{Afmax}

- (2) Standard E25.6.15(1) above does not apply to:

- (a) animal noise on farms unless they are confined within a building or enclosure on a permanent or semi-permanent basis; or
- (b) the use of mobile agricultural horticultural or forestry vehicles or machinery, or other mobile or portable agricultural, horticultural or forestry equipment; or

Note 1

The operator of such vehicles or machinery is required by the Resource Management Act 1991 to adopt the best practicable option to ensure that noise emissions do not exceed a reasonable level, which will depend on the time they are used, how loud they are, how long it is used for and how often it is used near dwellings.

- (c) the use of post-harvest facilities including vehicle access ways and milking sheds set back at least 100m from any residential zone.

Operation vibration

- (2) 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 limits of Table E25.6.30.2 Vibration levels for stationary machinery when measured in any occupied room of any building on another site or in any occupied unit under different ownership from the source of the vibration. Vibration must be measured in accordance with ISO 2631-2:2003 Mechanical vibration and shock – Evaluation of human exposure to whole-body vibration – Part 2: Vibration in buildings (1Hz to 80Hz):

Table E25.6.30.2 Vibration levels for stationary machinery

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

Construction noise

E25.6.27. Construction noise levels in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone

- (1) Noise from construction activities in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone must not exceed the levels in Table E25.6.27.1 Construction noise levels for activities sensitive to noise in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone when measured 1m from the façade of any building that contains an activity sensitive to noise that is occupied during the works.

Table E25.6.27.1 Construction noise levels for activities sensitive to noise in all zones except the Business – City Centre Zone and the Business – Metropolitan Centre Zone

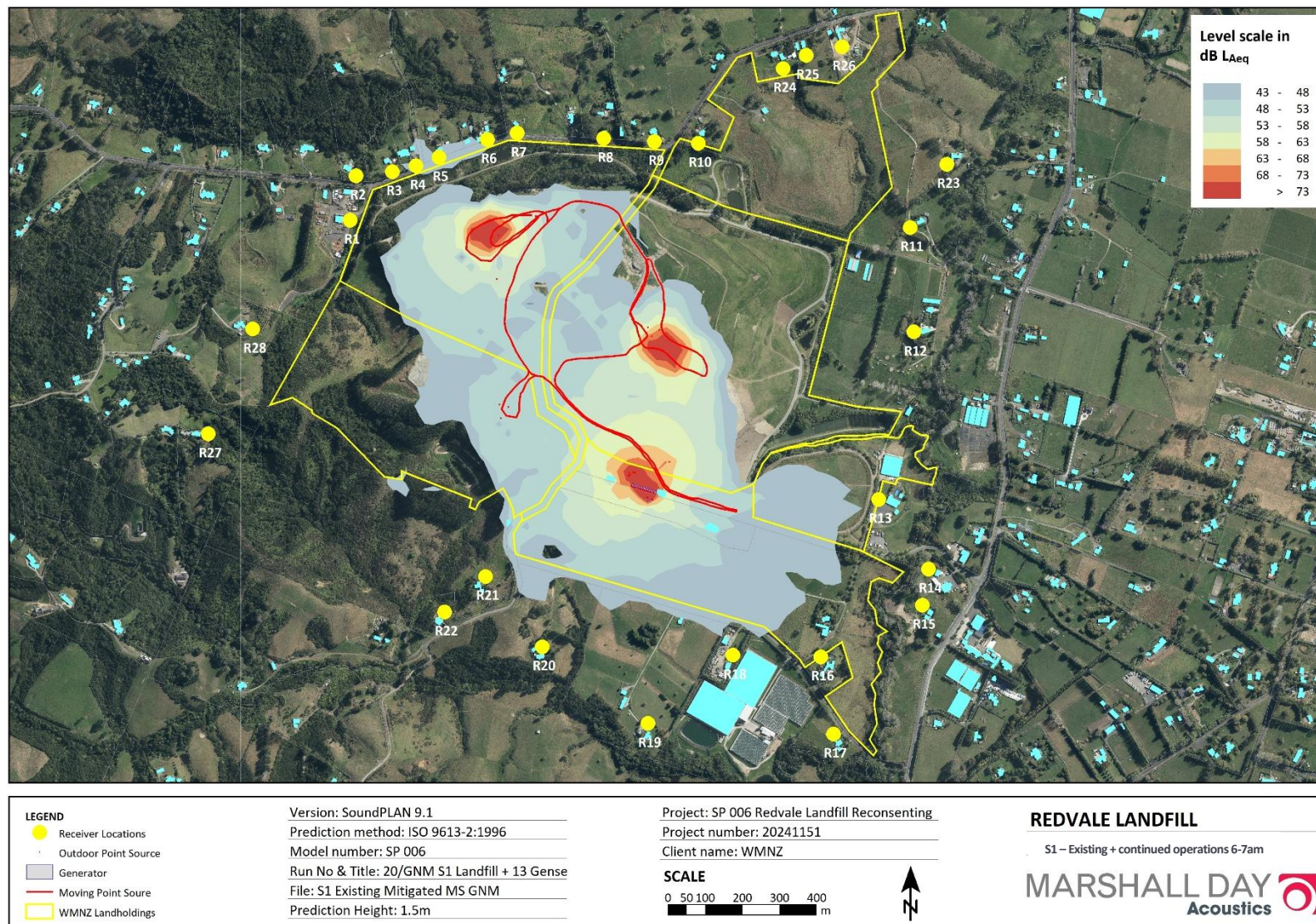
Time of week	Time Period	Maximum noise level (dBA)	
		L _{eq}	L _{max}
Weekdays	6:30am - 7:30am	60	75
	7:30am - 6:00pm	75	90
	6:00pm - 8:00pm	70	85
	8:00pm - 6:30am	45	75
Saturdays	6:30am - 7:30am	45	75
	7:30am - 6:00pm	75	90
	6:00pm - 8:00pm	45	75
	8:00pm - 6:30am	45	75
Sundays and public holidays	6:30am - 7:30am	45	75
	7:30am - 6:00pm	55	85
	6:00pm - 8:00pm	45	75
	8:00pm - 6:30am	45	75

APPENDIX G SOUND POWER LEVEL DATA USED IN MODELLING

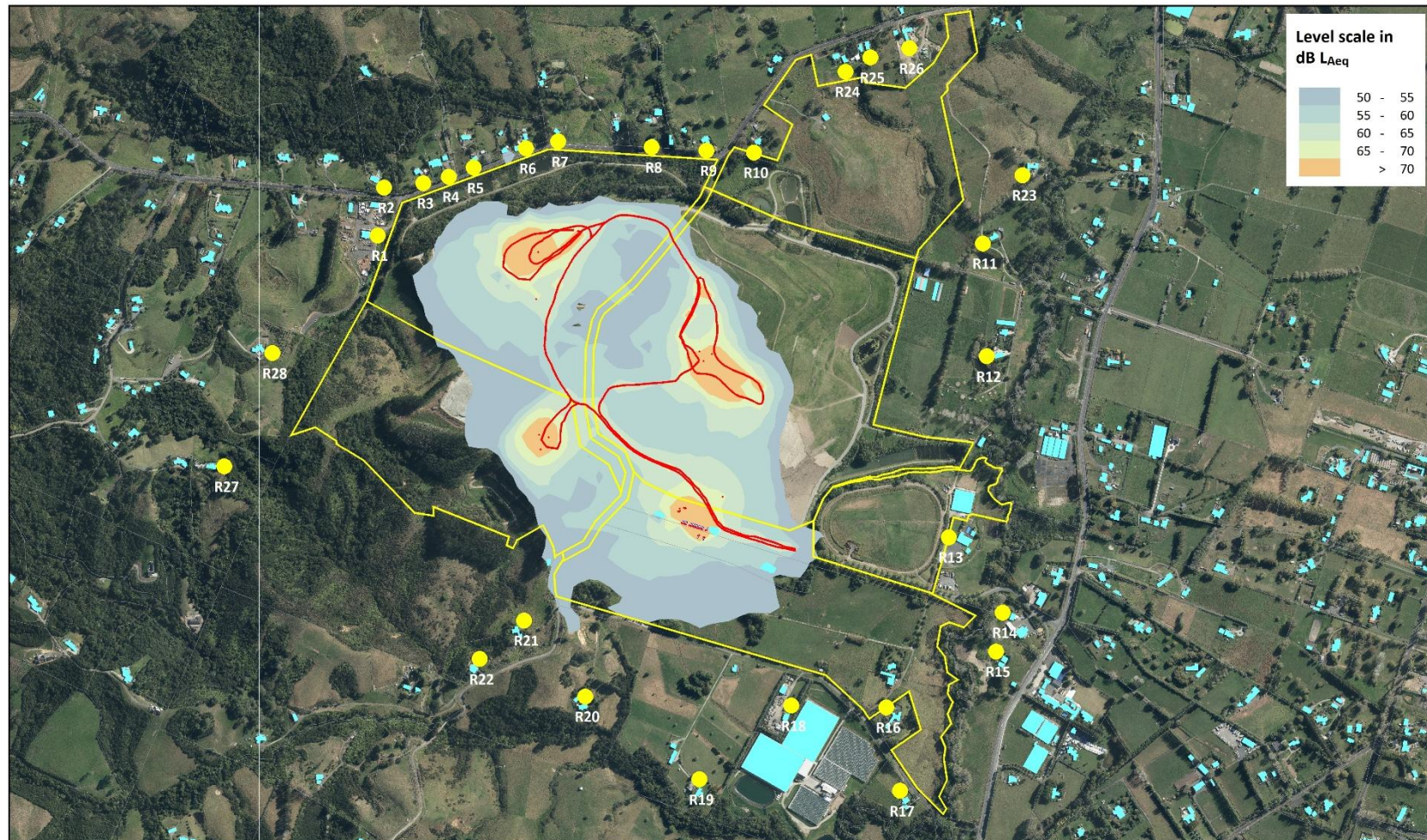
Table 10: Modelled source sound power levels

	Octave Band Centre Frequency (Hz)							
Source	63	125	250	500	1000	2000	4000	dBA
<u>Landfilling sources:</u>								
Excavator	103	112	106	102	98	96	92	105
Articulated dump truck	110	108	110	107	103	100	96	109
Refuse trucks	112	105	103	100	96	94	88	102
Bulldozer	101	110	99	99	106	104	97	110
Compactor	106	115	108	103	105	102	95	109
Water truck	105	101	97	93	93	89	84	97
Water pump	94	93	91	91	91	90	82	96
<u>Energy Park:</u>								
Genset cooling fans	91	95	90	88	87	83	77	91
Genset exhaust	98	99	94	89	85	82	78	92
Genset louvre	95	98	83	77	73	69	64	85
Genset container breakout	98	108	99	91	93	83	80	98
Genset fuel pump	95	100	91	86	84	85	84	92
Blower – large	90	87	92	106	97	97	94	105
Centrifugal fan	110	108	100	99	95	92	87	101
BeneVap leachate evaporator	104	100	94	94	91	85	84	96

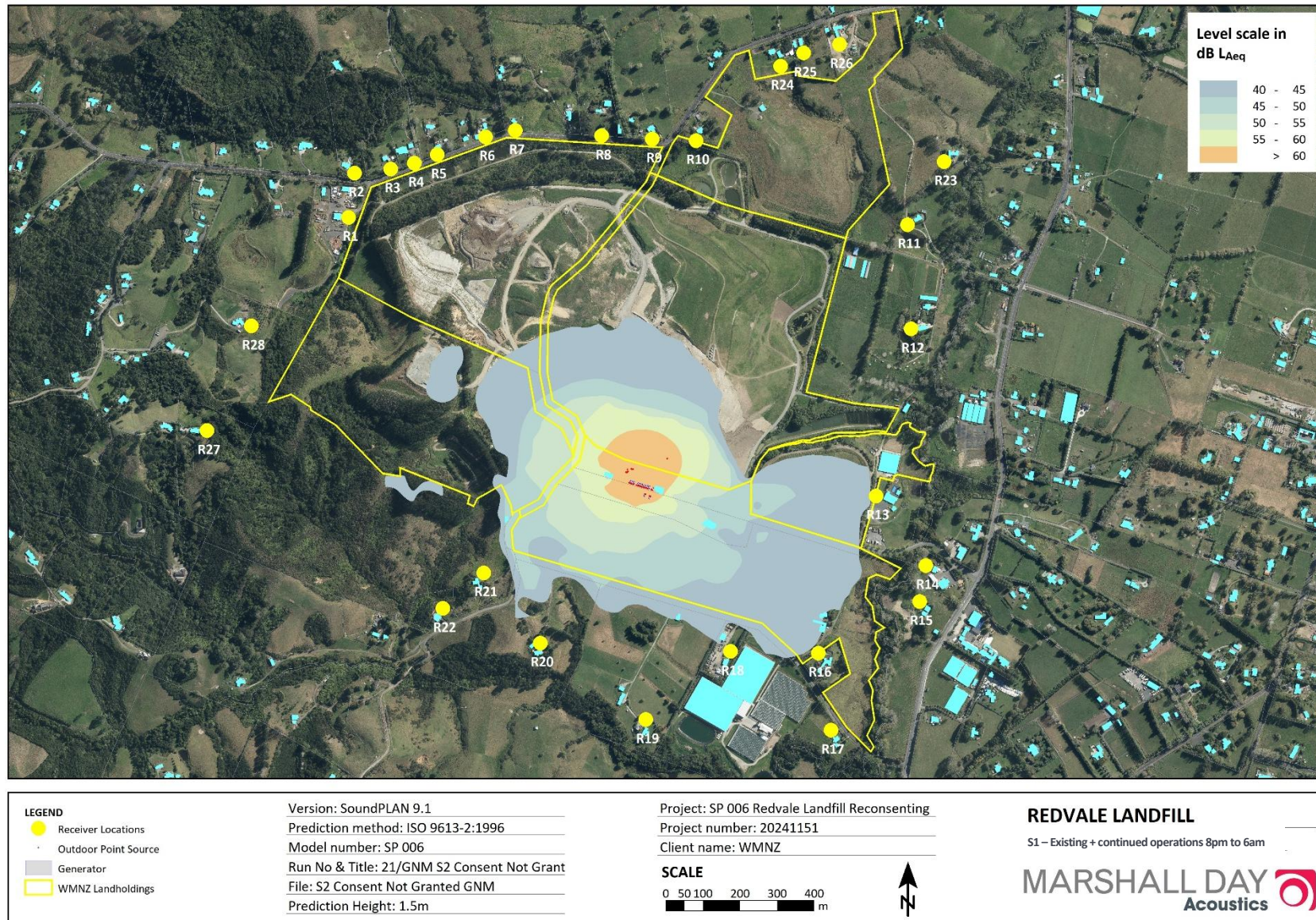
APPENDIX H CALCULATED NOISE CONTOURS

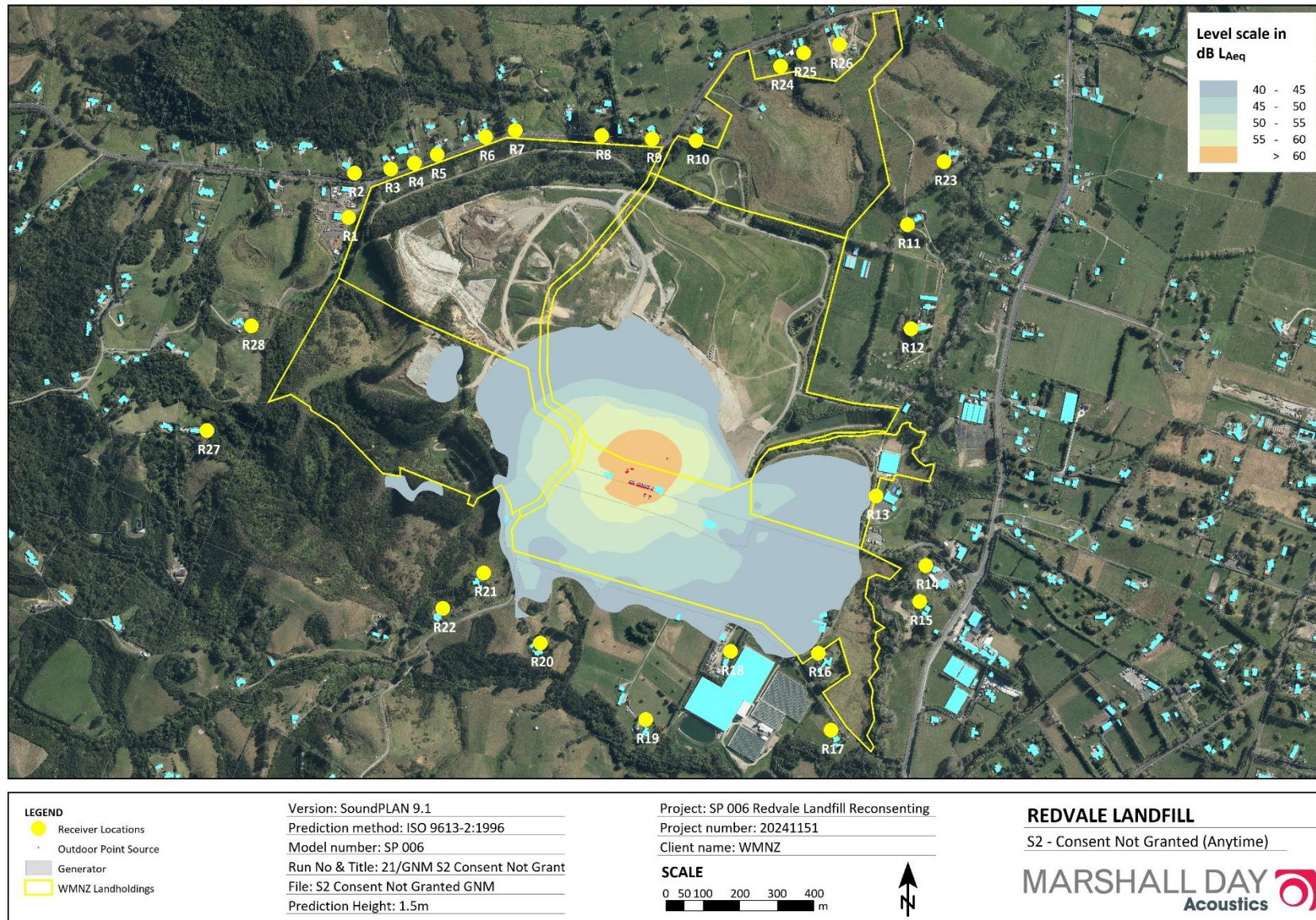


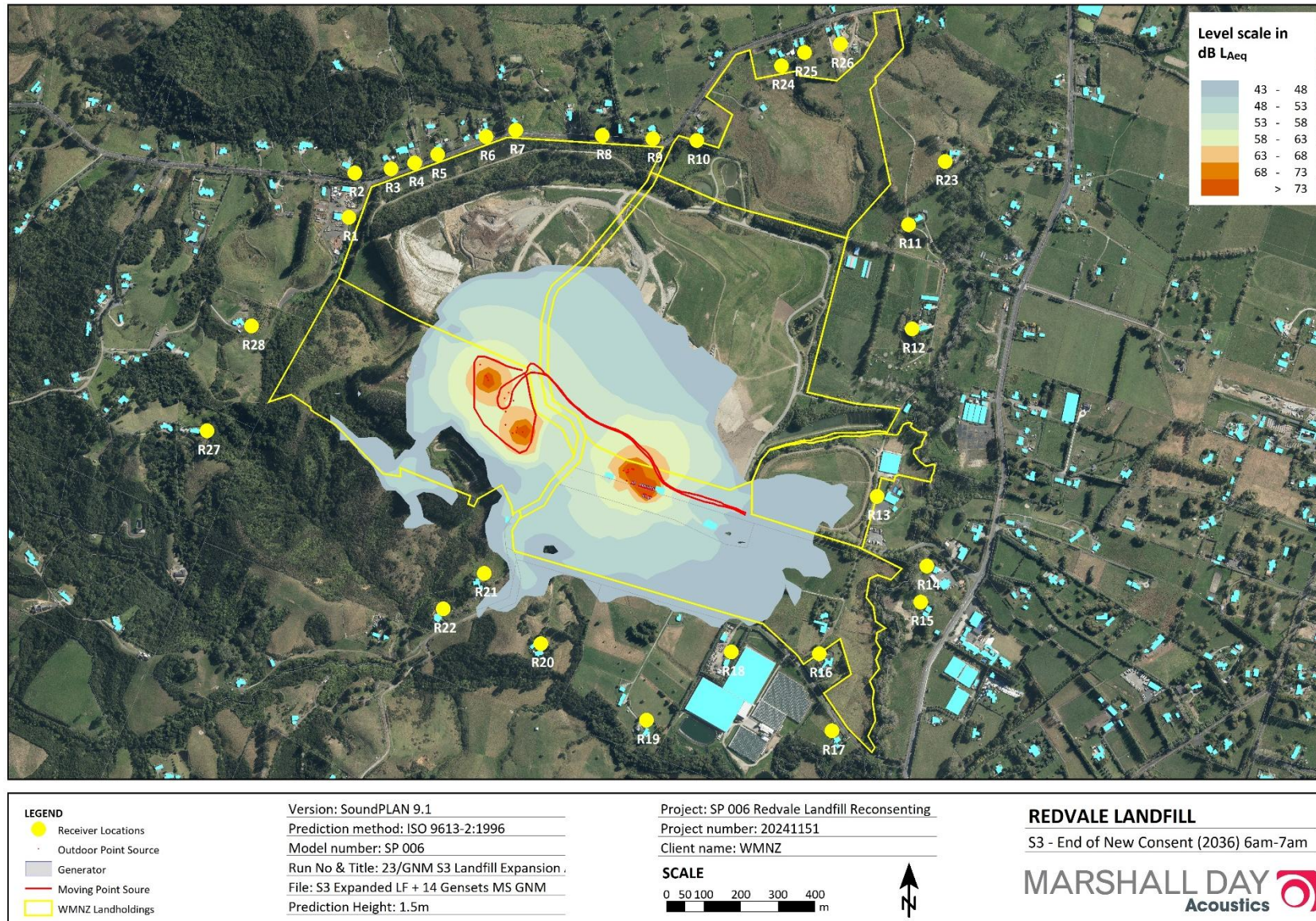
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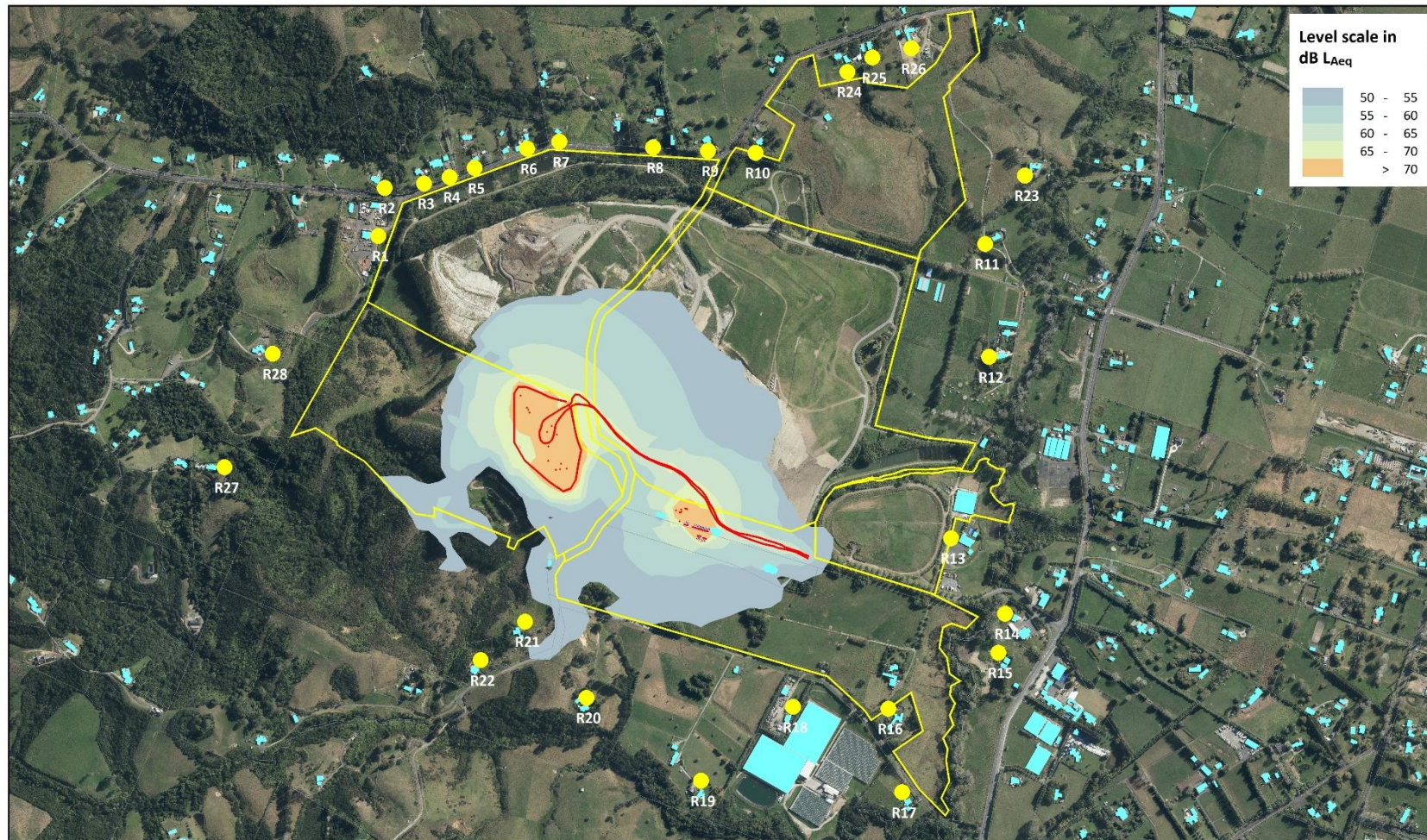


LEGEND Receiver Locations Outdoor Point Source Generator Moving Point Source WMNZ Landholdings	Version: SoundPLAN 9.1 Prediction method: ISO 9613-2:1996 Model number: SP 006 Run No & Title: 20/GNM S1 Landfill + 13 Gense File: S1 Existing Mitigated DAY GNM Prediction Height: 1.5m	Project: SP 006 Redvale Landfill Reconsenting Project number: 20241151 Client name: WMNZ SCALE 0 50 100 200 300 400 m 	REDVALE LANDFILL S1 – Existing + continued operations 7am to 6pm
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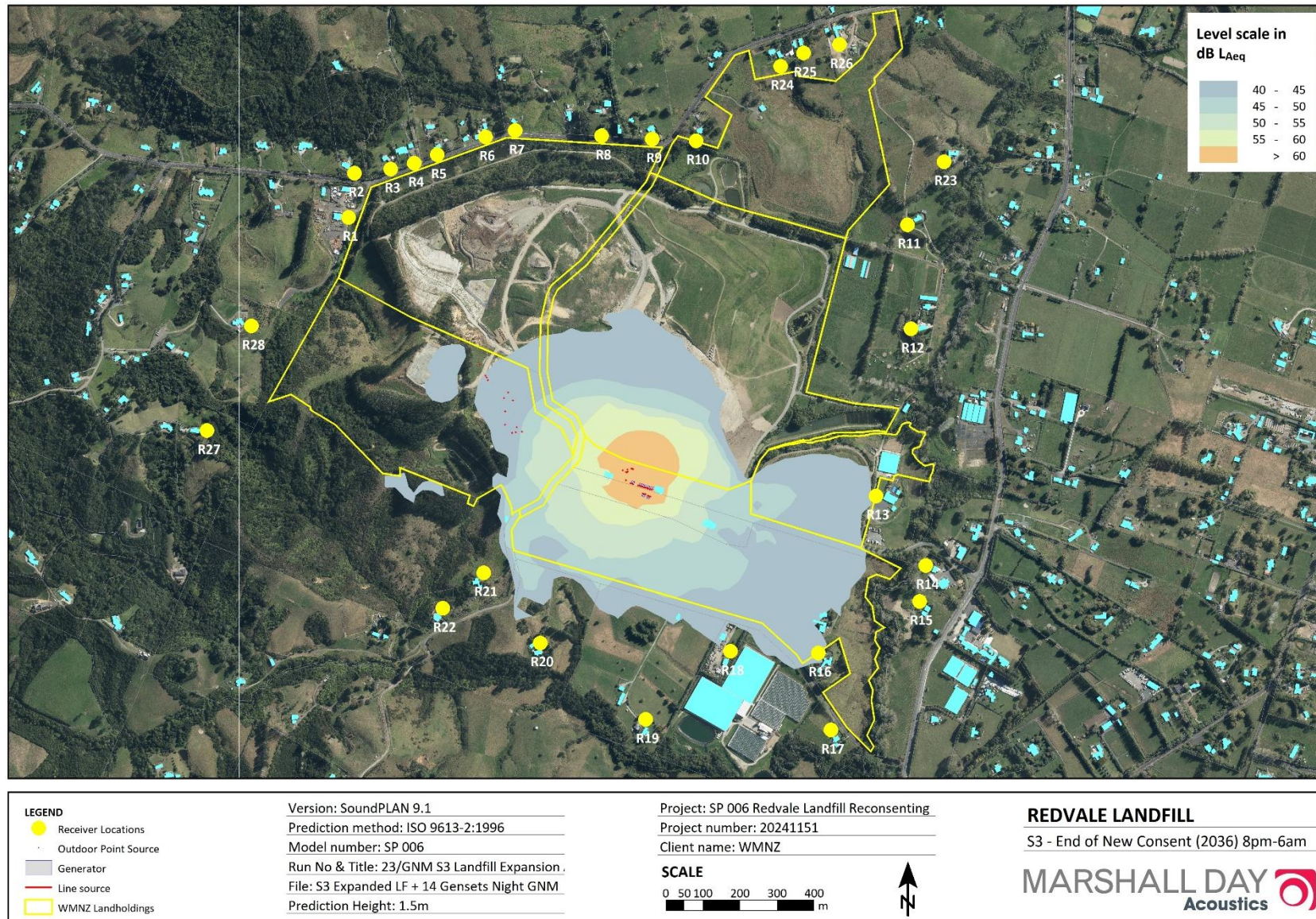


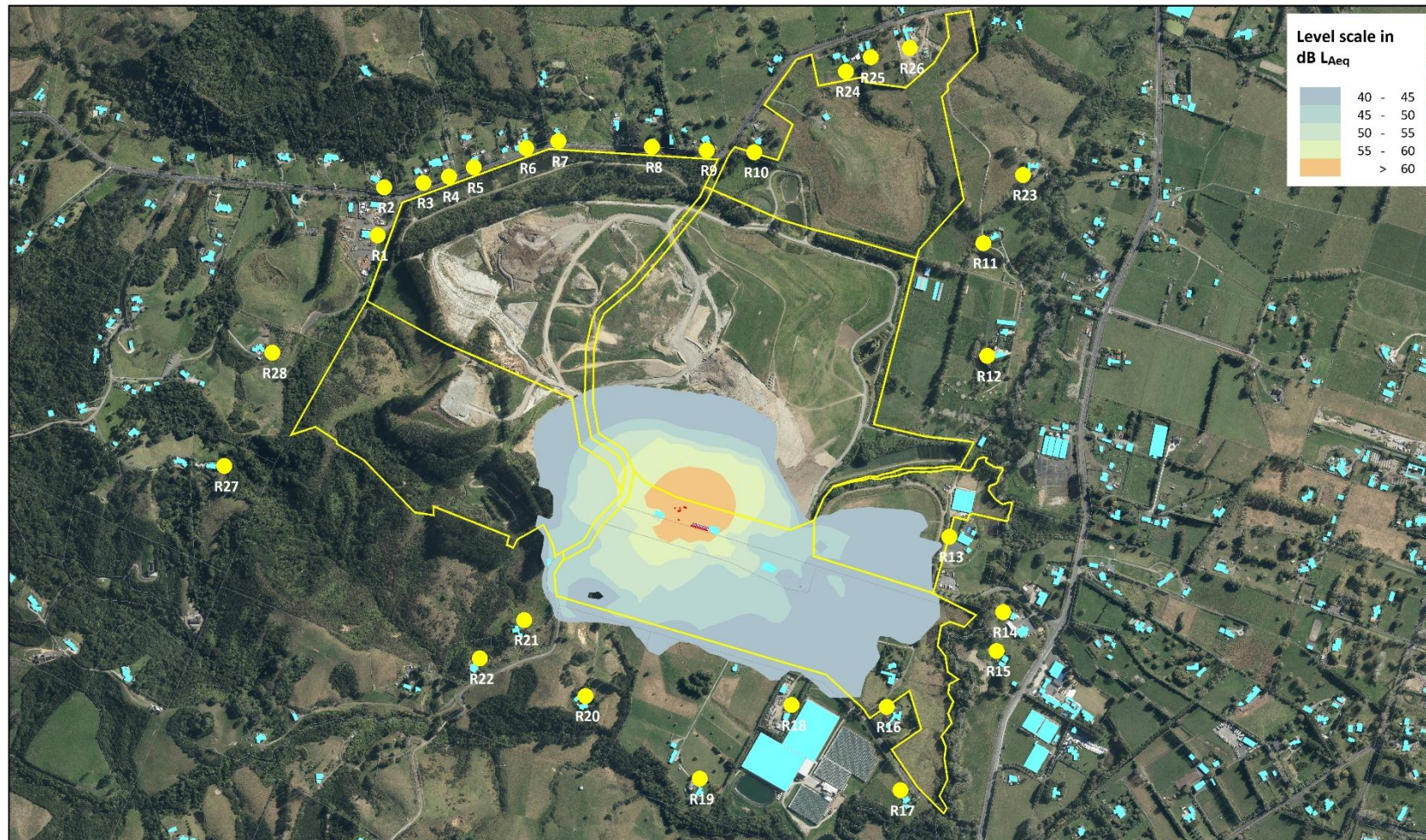






LEGEND Receiver Locations Outdoor Point Source Generator Moving Point Source WMNZ Landholdings Version: SoundPLAN 9.1 Prediction method: ISO 9613-2:1996 Model number: SP 006 Run No & Title: 23/GNM S3 Landfill Expansion File: S3 Expanded LF + 14 Gensets DAY GNM Prediction Height: 1.5m Project: SP 006 Redvale Landfill Reconsenting Project number: 20241151 Client name: WMNZ SCALE 050100200300400 m N REDVALE LANDFILL S3 - End of New Consent (2036) 7am-6pm MARSHALL DAY Acoustics





LEGEND Receiver Locations Outdoor Point Source Generator WMNZ Landholdings	Version: SoundPLAN 9.1 Prediction method: ISO 9613-2:1996 Model number: SP 006 Run No & Title: 25/GNM S4 Aftercare Period File: S4 Aftercare Period GNM Prediction Height: 1.5m	Project: SP 006 Redvale Landfill Reconsenting Project number: 20241151 Client name: WMNZ	REDVALE LANDFILL S4 - Aftercare Period (anytime)
	SCALE 0 50 100 200 300 400 m		MARSHALL DAY Acoustics