APPENDIX J: NOISE ASSESSMENT REPORT

TNPA Port of Durban Road Upgrades : Environmental Noise Impact Assessment

Revision History

Issue/revision	Remarks	Date	Prepared by	Checked by	Authorised by
Revision 1	Report	08/03/2026	Duduzile Skhosana BA. Env.Sc	Oliver Knoppersen AMIOA	Oliver Knoppersen AMIOA

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LIST OF ABBREVIATIONS

CoRTN	Calculation of Road Traffic Noise (1988)
dB	Decibel
dBA	A-weighted decibel (frequency weighting for human hearing)
Hz	Hertz (frequency)
LAeq,T	Equivalent continuous A-weighted sound pressure level over time T
LReq,T	Equivalent continuous rating level over time T
LR,dn	Equivalent continuous day/night rating level
LoP	Life of Project
Min.	Minimum
NIA	Noise Impact Assessment
PPE	Personal Protective Equipment
SEL	Sound Exposure Level
SPL	Sound Pressure Level
SANS 10103	South African National Standards: Measurement and Rating of Environmental Noise
SANS 0210	South African National Standards: Calculating and Predicting Road Traffic Noise
SANS 10328	South African National Standards: Methods for Environmental Noise Impact Assessments
WHO	World Health Organization

Requirements of the Noise Assessment Protocol, 2020 (GN R. 320 of 20 March 2020)

The table below provides relevant referencing to the requirements of the Noise Protocol, 2020 (GN R. 320 of 20 March 2020):		
Section	**Noise Protocol, 2020 Requirement**	**Reference in ENIA Report**
1. Specialist details and independence	Name, qualifications, CV, and expertise in environmental noise assessment	Details of Specialist & Declaration of Interest, Appendix E
	Declaration of independence of the specialist	Page 8
2. Scope and purpose of report	Purpose of the noise assessment, including applicable legislation	Sections 1 & 2
	Identification of applicable provincial Noise Control Regulations	Section 4.1.4 and 4.1.6
	Determination of existing ambient noise levels and assessment against applicable Noise Control Regulations	Sections 6 & 7
	Consideration of cumulative noise impacts	Section 5.3 & 7
3. Site investigation details	Duration and date of noise monitoring and relevance to findings	Sections 6.1, Table 5-1
	Methodology adopted, including measurement equipment, calibration, standards applied, and modelling used	Section 5 & Appendix D
4. Assessment of environmental sensitivities	Identification of noise-sensitive receptors (residential, schools, hospitals)	Section 3.2, Figures 3-2 & Appendix D
	Identification of areas to be avoided or buffered from noise sources	Section 7
	Maps showing noise sources, affected areas, environmental sensitivities	Figures 3-1, 3-2, 3-3
5. Assumptions, uncertainties, and gaps	Description of assumptions made in monitoring and modelling, and identification of uncertainties or knowledge gaps	Section 5.4
6. Findings and implications	Predicted noise levels and comparison with regulatory limits	Section 7, Tables 7-1 to 7-6

The table below provides relevant referencing to the requirements of the Noise Protocol, 2020 (GN R. 320 of 20 March 2020):		
Section	**Noise Protocol, 2020 Requirement**	**Reference in ENIA Report**
	Identification of potential exceedances and impacts on sensitive receptors	Section 7, Table 7-1, discussion
	Assessment of alternatives and potential environmental noise impacts	Section 7.2.2.2 & 7.2.3.2
7. Mitigation and management measures	Noise mitigation measures for inclusion in the EMPr	Sections 7 & 8
	Recommended conditions for environmental authorisation	Section 8
	Monitoring and compliance requirements	Section 7 & 8
8. Specialist opinion	Reasoned opinion on whether the proposed activity should be authorised from a noise perspective	Sections 8 & Executive Summary

DETAILS OF SPECIALIST & DECLARATION OF INTEREST

Project Title	TNPA Port of Durban Road Upgrades - Noise Impact Assessment
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I, Duduzile Skhosana , declare that –

General declaration:

I act as the independent specialist;
I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
I declare that there are no circumstances that may compromise my objectivity in performing such work;
I have no, and will not engage in, conflicting interests in the undertaking of the activity;

Signature of the specialist: 

Name of company:	Acoustech Consulting
Date:	08/03/2026

EXECUTIVE SUMMARY

Acoustech Consulting was appointed by Life Africa Built Environment Professionals to undertake an Environmental Noise Impact Assessment (ENIA) for the TNPA Port of Durban Road Upgrades, focusing on Bayhead Road and Langeberg Road within the eThekwini Municipality. The assessment forms part of the Environmental Authorisation process and evaluates potential noise impacts associated with both construction activities and operational (road-traffic) conditions arising from the proposed road upgrades.

The project involves the widening of Bayhead Road to a three-lane dual carriageway, upgrades to major intersections, widening of Langeberg Road, replacement or widening of six existing bridges, relocation of underground services, installation of traffic signalling and street lighting, and related civil works to improve port access efficiency. The upgrades are intended to alleviate severe congestion in the Bayhead Logistics Precinct and improve long-term freight mobility into the Port of Durban.

Baseline noise measurements were conducted on 7 - 8 October 2025, capturing road-traffic noise from Bayhead Road (at M1) and ambient noise at two noise sensitive receptors (NR1 and NR2). The measured noise environment is characteristic of an Urban District with workshops, business premises and main roads, as described in SANS 10103:2008, with typical daytime rating levels of 60 dBA and night-time levels of 50 dBA.

The construction phase noise is expected to be temporary in nature and is assessed as having a Low to Medium significance prior to the implementation of mitigation measures.

Operational road traffic noise modelling indicates marginal increases at the assessed receptors under the 2032 (21% growth) and 2036 (64% growth) scenarios. The maximum predicted increase is 0.5 dBA, which remains below the generally accepted threshold of perceptibility and does not result in a measurable excess above ambient rating levels defined in SANS 10103.

Key Mitigation Measures:

Construction Phase

No additional mitigation beyond the implementation of good engineering and construction management practices is required. Adherence to these practices is recommended to minimise the potential for noise nuisance claims.

Operational Phase

Bitumen Rubber Asphalt Open Grade (BRAOG) was assessed as a potential noise reducing surfacing option due to its recognised tyre road interaction noise reduction benefits. Following design and performance considerations for the Port environment, the client elected to implement an AP-1 modified binder. As AP-1 does not provide quantifiable acoustic reduction benefits, no additional operational noise mitigation is proposed.

Operational phase impacts are therefore assessed as Low–Medium environmental significance for both the 2032 and 2036 scenarios.

From an environmental noise perspective and based on the assessment findings, the proposed road upgrades do not present a fatal flaw to the project and are considered

acceptable, subject to the implementation of standard construction management practices.

1. INTRODUCTION

Acoustech Consulting was appointed by Life Africa Built Environment Professionals to conduct an Environmental Noise Impact Assessment (ENIA) for the proposed TNPA Port of Durban Road upgrades along Bayhead and Langeberg Roads. This assessment forms part of the environmental authorisation process and aims to evaluate the potential noise impacts associated with both the construction and operational phases of the proposed project.

The scope of work of this Environmental Noise Impact Assessment is to determine whether the proposed project complies with the Noise Control Regulations (Government Notice R154, Government Gazette No. 13717 of 10 January 1992), promulgated in terms of the Environmental Conservation Act, 1989 (Act No. 73 of 1989), as detailed in Section 4 of this report. The methodologies applied in this ENIA have been undertaken in accordance with the requirements of Government Notice No. 320 of 20 March 2020.

2. REPORT LAYOUT & TERMS OF REFERENCE (TOR)

The noise impact study comprised an investigation of:

- Noise measurements of existing noise levels at the noise sensitive areas. The subsequent determination of the baseline setting (SANS 10103:2008 Rating Level) within the area;
- Noise measurements of existing road-traffic noise from the Bayhead Road, as well as estimated noise emissions from the proposed project.
- Identify noise sensitive areas that will require mitigation recommendations where applicable; and
- Provision of conclusions and recommendations regarding the acceptability of the project from an environmental noise perspective.

3. INDICATIVE PROJECT DESCRIPTION

3.1. Basic Project Overview

The proposed project entails the road infrastructure upgrades which includes widening Bayhead Road to a three-lane dual carriageway, upgrading intersections at South Coast Road, Crabtree Road, and Langeberg Road, widening Langeberg Road northbound, replacing or widening six existing bridges, upgrading stormwater systems, relocating underground services, installing new traffic signaling and street lighting, and undertaking landscaping and fencing works. The upgrades aim to alleviate congestion, extend infrastructure design life, and enhance port logistics efficiency.

A locality plan indicating the project limits is given in **Figure 3-1**.

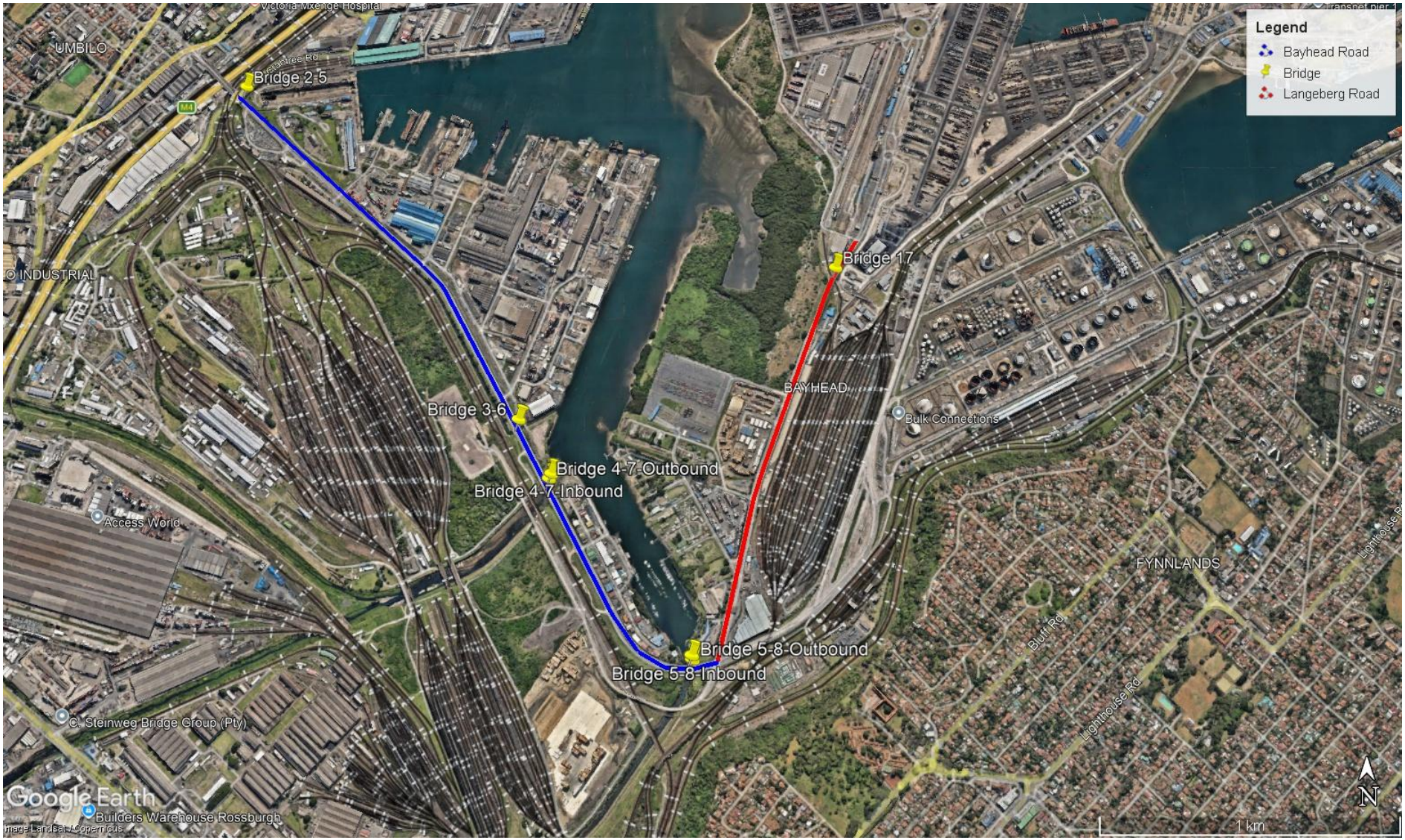


Figure 3-1: Project extents

3.2. Interested & Affected Parties (I&AP's)

Receptors were identified by means of desktop assessment and by site verification. Receptor localities are presented in **Figure** 3-2. The Receptor localities and measurement points are presented in Appendix D in WGS 84 coordinates.

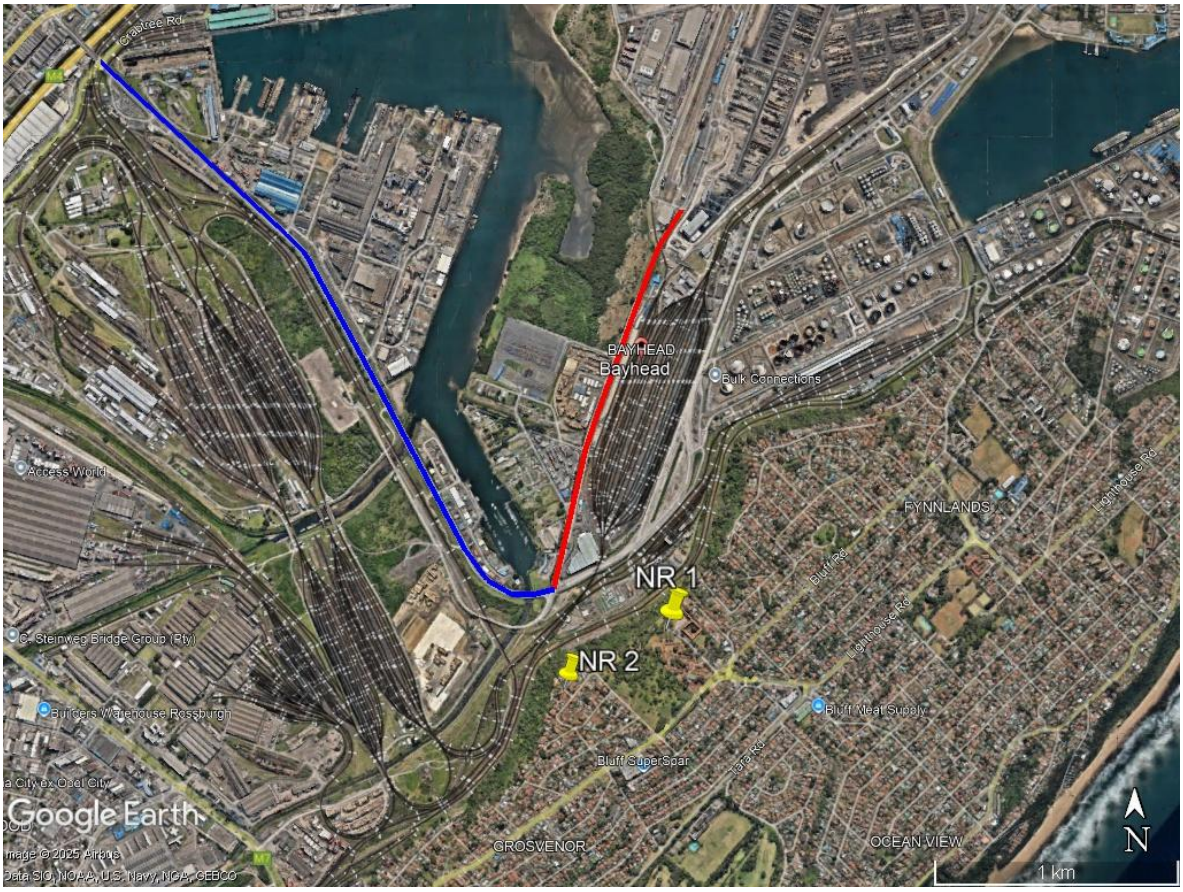


Figure 3-2: Interested & Affected Parties (Identified sensitive receptors)

Note on sensitive receptors:

Residences, dormitories or hotel/ B&B properties are considered the most sensitive of receptors due to the following;

- Construction and road traffic noise has the potential to pose a negative noise impact during the early morning and evenings while occupied.
- Occupancy during night-time hours increases the potential for sleep disturbance, and other noise nuisance symptoms including impact on health.
- Residences are places of rest, and where noise tolerance is lowest.
- Office or workplace environments are generally closed off, utilize HVAC systems for ventilation and have higher internal ambient levels and better facade sound insulation than residences (i.e. Closed windows), and therefore exposure is significantly less than in residential.

- Prevailing outdoor ambient noise levels in urban and industrial localities (especially local workplace ambient noise levels) are higher than suburban or residential areas (i.e. higher threshold levels permitted) (SANS10103:2008).
- Workplace noise tolerance is generally higher than in residential or accommodation setting.

3.3. Road Traffic Noise Measurements (Bayhead Road)

One road traffic noise measurement point (M1) was identified by means of desktop study and site verification. The measurement location is illustrated in **Figure 3-3**.

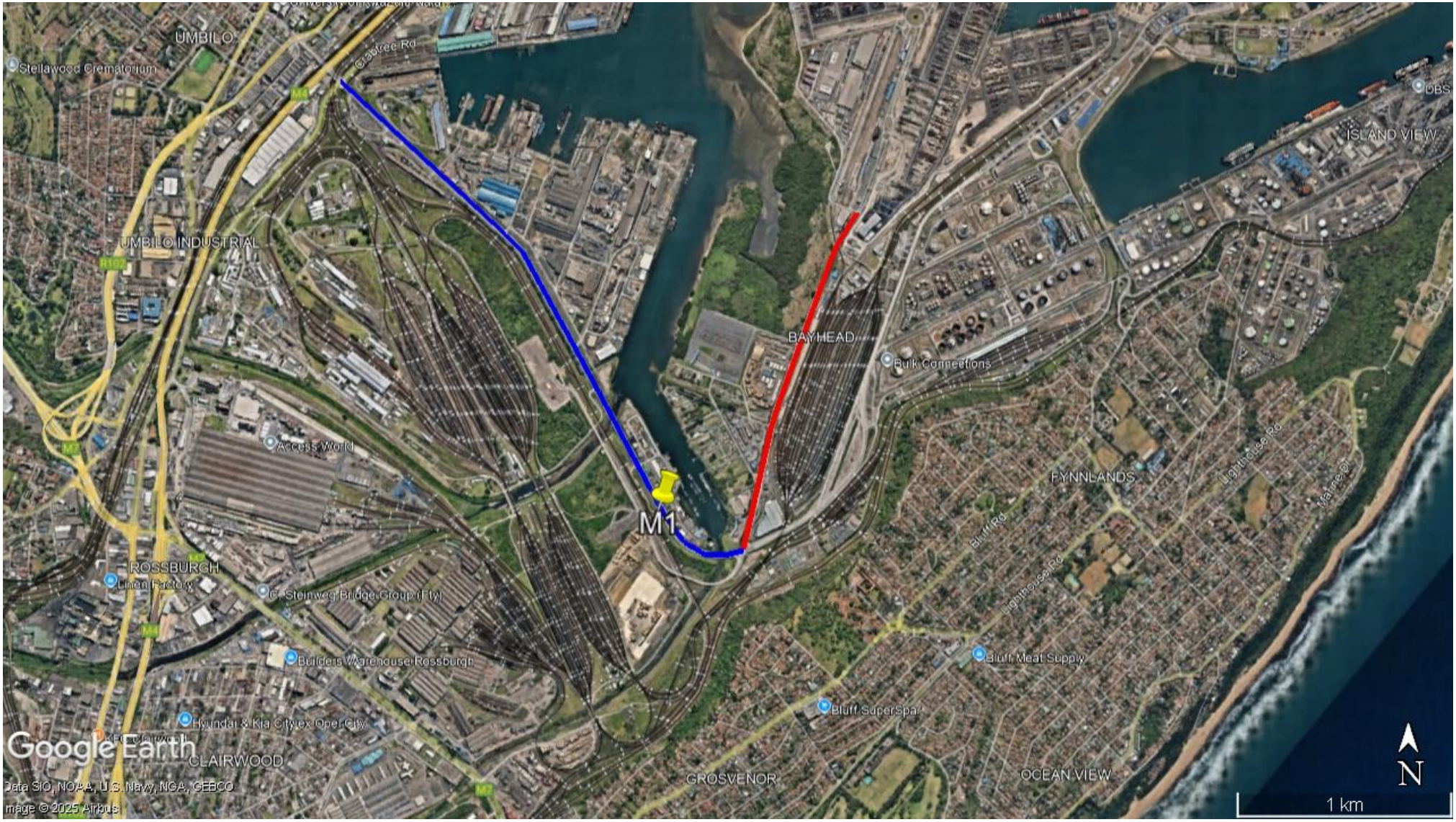


Figure 3-3: Road noise measurement position

3.4. Available Information

Available information as sources from the project main consultant is presented below in **Table 3-1**.

Table 3-1 : Comments received and information gathered relating to the project

Source	Comment or Information
Project team	DFFE Screening Tool TNPA Port of Durban Road Upgrades
Project team	Project Overview & Scope of Services
Project team	Traffic Impact Assessment Version 4 - August 2025

4. LEGAL FRAMEWORK

4.1. South African Legislation & Guidelines

4.1.1 The Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996)

This act lists noise pollution as a matter which falls under the jurisdiction of local government with assistance from the provincial government.

4.1.2 The Environmental Conservation Act, 1989 (Act No 73 of 1989)

This act makes provision for the National Noise Control Regulations, but these relate only to local authorities that request the application of such regulations. In 1996, the responsibility of administering the Noise Control Regulations was devolved to provincial level but only Gauteng, Free State and Western Cape provinces have promulgated their regulations. Although this act has been largely superseded by the National Environmental Management Act (Act No 107 of 1998), the Noise Regulations will still be promulgated in terms of the original Act.

4.1.3 National Environmental Management Act (NEMA) (Act No 107 of 1998)

Government Notice No. 320 of 2020, promulgated in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), sets out the procedures to be followed and the minimum requirements for the assessment and reporting of noise impacts as an identified environmental theme when applying for environmental authorisation.

The Noise Impact Assessment Protocol provides the minimum requirements from the competent authorities for a specialist to undertake a noise-related environmental study. The legislative checklist relevant to the Environmental Noise Impact Assessment (ENIA) has been compiled in accordance with this protocol and is presented at the start of this report to facilitate ease of reference and compliance verification.

The Noise Impact Assessment was undertaken in accordance with the requirements of Government Notice No. 320 of 2020, including specialist competency, assessment methodology, impact evaluation, mitigation measures, and minimum reporting criteria.

4.1.4 The Noise Control Regulations GN R154

No noise control legislation within the Kwa-Zulu Natal province currently exists, with reference to the National GN R154 National Noise Control Regulations. However, the eThekwini by-law works in support of the national noise control regulations.

The Noise Control Regulations (NCR) in terms of Section 25 of the Environmental Conservation Act, 1989 (Act No 73 of 1989) specify the following:

"controlled area' means a piece of land designated by a local authority where, in the case of-

(a) road transport noise in the vicinity of a road-

(i) the reading on an integrating impulse sound level meter, taken outdoors at the end of a period extending from 06:00 to 24:00 while such meter is in operation, exceeds 65 dBA; or

(ii) the equivalent continuous A-weighted sound pressure level at a height of at least 1,2 metres, but not more than 1,4 metres, above the ground for a period extending from 06:00 to 24:00 as calculated in accordance with SABS 0210-1986, titled: 'Code of Practice for calculating and predicting road traffic noise', published under Government Notice No. 358 of 20 February 1987, and projected for a period of 15 years following the date on which the local authority has made such designation, exceeds 65 dBA;

4.1.5 eThekwini Municipality: Nuisance and Behaviour in Public Places By-law, 2015

While KwaZulu-Natal does not have provincial noise legislation, the eThekwini Municipality: Nuisances and Behaviour in Public Places By-law (2015) provides local regulatory support that complements the National Noise Control Regulations (GN R154, 1992). This by-law empowers the municipality to manage and control noise nuisances within its jurisdiction, including in residential, commercial, and public spaces.

Key provisions of the by-law include:

- Defining prohibited noise activities and identifying excessive noise sources.
- Establishing noise limits and setting operating hours for certain activities.
- Granting municipal authorities powers to investigate complaints, issue notices, and enforce compliance.
- Providing mechanisms for addressing persistent noise disturbances that negatively affect public peace and well-being.

By providing local enforcement authority and specifying noise management requirements, the eThekwini by-law effectively reinforces the objectives of the National Noise Control Regulations within the municipal area.

4.1.6 SANS Guidelines (SABS)

SANS 10103:2008, the Measurement and Rating of Environmental Noise with Respect to Annoyance, and to Speech Communication will be used. Besides measurement techniques etc, this document provides noise levels that are expected in various areas (Rating Level). These are used by the Noise Regulations as limits of noise in the various areas. The acceptable rating levels for various districts are given in **Table 4-1,** being the maximum noise level that is acceptable at the boundary of the property for any district. It should be noted that for industries operating in an industrial zone a 24-hour 70 dBA L_{Aeq} is acceptable.

SANS 10328:2008, Methods for environmental noise impact assessments. The document sets out the methodology to compile a comprehensive Environmental noise Impact Assessment. Stipulations include methodologies and minimum requirements, as well as various noise sources for investigations.

SANS10210:2004, Calculating and predicting road traffic noise will be used to for the prediction and measurement relating to road traffic noise.

SANS 10357: 2004, 'The calculation of sound propagation by the Concawe method.' Will be used to calculate noise propagation from the Bayhead Road noise source.

Table 4-1 : Acceptable environmental noise level ratings for various districts as per Table 2, SANS 10103:2008

1	2	3	4	5	6	7
Type of District	**Equivalent Continuous Rating Level for Noise ($L_{Req,T}$) (dBA)**					
	Outdoors			**Indoors with open windows**		
	Day-night ($L_{Req,dn}$)	**Daytime ($L_{Req,d}$)**	**Night-time ($L_{Req,n}$)**	**Day-night ($L_{R,Dn}$)**	**Daytime ($L_{Req,d}$)**	**Night-time ($L_{Req,n}$)**

a) Rural districts	45	45	35	35	35	25
b) Suburban districts (little road traffic)	50	50	40	40	40	30
c) Urban districts	55	55	45	45	45	35
d) Urban districts (with workshops, business premises and main roads)	60	60	50	50	50	40
e) Central business districts	65	65	55	55	55	45
f) Industrial districts	70	70	60	60	60	50

NOTE 1: If the measurement or calculation time interval is considerably shorter than the reference time intervals, significant deviations from the values given in the table might result.

NOTE 2: If the spectrum of the sound contains significant low frequency components, or when an unbalanced spectrum towards the low frequencies is suspected, special precautions should be taken, and specialist advice should be obtained. In this case the indoor sound levels might significantly differ from the values given in columns 5 to 7. (See also annex B.)

NOTE 3: In districts where outdoor $L_{R,dn}$ exceeds 55 dBA, residential buildings (e.g. dormitories, hotel accommodation and residences) should preferably be treated acoustically to obtain indoor $L_{Req,T}$ values in line with those given in Table 1.

NOTE 4: For industrial districts, the $L_{R,dn}$ concept does not necessarily hold. For industries legitimately operating in an industrial district during the entire 24 h day/night cycle, $L_{Req,d} = L_{Req,n}$ =70 dBA can be considered as typical and normal.

NOTE 5: The values given in columns 2 and 5 in this table are equivalent continuous rating levels and include corrections for tonal character, impulsiveness of the noise and the time of day.

NOTE 6: The noise from individual noise sources produced, or caused to be produced, by humans within natural quiet spaces such as national parks, wilderness areas and bird sanctuaries, should not exceed a maximum A weighted sound pressure level of 50 dBA at a distance of 15 m from each individual source.

a) The values given in columns 2 and 5 are equivalent continuous rating levels and include corrections for tonal character and impulsiveness of the noise and the time of day.

b) The values given in columns 3, 4, 6 and 7 are equivalent continuous rating levels and include corrections for tonal character and impulsiveness.

Should the prevailing district ambient noise level be increased due to the introduction of a new noise source/s, the expected community response is given as follows as a function of the excess ambient noise level ($\Delta L_{Req,T}$);

Table 4-2 : Categories of community or group response (extract from Table 5 of SANS10103:2008)

Excess ($\Delta L_{Req,T}$)[a] (dBA)	**Estimated community or group response**	
	Category	**Description**
0 to 10	Little	Sporadic complaints
5 to 15	Medium	Widespread complaints
10 to 20	Strong	Threats of community or group action
> 15	Very Strong	Vigorous community or group action

NOTE: Overlapping ranges for the excess values are given because a spread in the community reaction might be anticipated.

[a] $\Delta L_{Req,T}$ should be calculated from the appropriate of the following:

1) $\Delta L_{Req,T}$ = $L_{Req,T}$ of ambient noise under investigation MINUS $L_{Req,T}$ of the residual noise (determined in the absence of the specific noise under investigation);

2) $\Delta L_{Req,T}$ = $L_{Req,T}$ of ambient noise under investigation MINUS the maximum rating level for the ambient noise given in Table 1;

3) $\Delta L_{Req,T}$ = $L_{Req,T}$ of ambient noise under investigation MINUS the typical rating level for the applicable district as determined from Table 2; or

4) $\Delta L_{Req,T}$ = Expected increase in $L_{Req,T}$ of ambient noise in an area because of a proposed development under investigation.

4.2. International Guidelines and Standards

4.2.1 International Finance Corporation (IFC). Environmental, Health, and Safety (EHS) Guidelines. General EHS guidelines: Environmental Noise Management

The World Bank Group set out standards for Residential, institutional and educational areas (55 dBA Daytime / 45 dBA Night-time or result in a maximum increase in background levels of 3 dB at the nearest receptor location off-site). This standard is based on the WHO Guidelines for Community Noise, 1999.

4.2.2 Department of Transport/Welsh Office, Calculation of Road Traffic Noise (CoRTN), 1988

The CoRTN Standard describes the procedures for calculating noise from road traffic and provides guidance that is appropriate to the calculation of traffic noise for general applications e.g. environmental appraisal of road schemes, highway design and land use planning.

This Standard was the basis for the SANS10210:2004, “Calculating and predicting road traffic noise”. However, noise modelling programs only recognise CoRTN and not SANS10210 and thus the CoRTN standard will be used in the noise modelling. No predicted noise level discrepancies are expected between the use of one or the other standard.

4.3. Other Guidelines Relating to Environmental Acoustics

4.3.1 Blasting & Vibrations

Blasting and Vibration impacts do not have methodologies or legislation in South Africa. Blasting and vibrations is a study into the effect of earthworks blasting in terms of ground, surface and air vibrations. The effects of blasting vary depending on the structure under consideration, the intensity of the blast, the distance of the blast etc. The vibration depends on the frequency as well as the amplitude of the vibration (in millimetres). Blasting is a specialist study and could only be considered in the SANS10103:2008 as a +5 to 10 dBA (impulsive sound, however it should be noted that blasting only occurs irregularly). Blasts are a highly controlled event with warning prior to the noise.

5. APPROACH AND METHODS

5.1. Measurement Criterion

The procedures, as detailed in SANS 10328:2008, SANS10103:2008 and SANS10210:2004 / CoRTN 1988 have been applied to the noise measurements and assessments made in this report. A summary of the approach to this study is outlined below.

5.1.1 Existing Baseline - Noise Measurements

Three baseline road traffic noise measurements (M1) were conducted on 7th of October 2025 at hourly intervals between 06:00 and 00:00. Measurements were taken at a distance of 10 m from the Bayhead carriageway edge and at a height of 1.4 m above ground level. Long-term ambient noise measurements were also conducted at the noise-sensitive receptor NR1 and over a two-day period (7th & 8th October 2025), capturing both daytime and night-time noise conditions. In addition, short-term ambient noise measurements were conducted at NR2 on the 8th of October 2025 during the daytime and night-time periods.

Two SANAS calibrated Type 1 sound level meters were used to perform the noise measurements. The sound level meters were calibrated before and after the noise measurements with a 01dB calibrated sound calibrator. Further details of the sound level meters and their calibration certificates can be found in **Appendix D**.

L_{Aeq} and L_{A10} values were calculated for the measurement points from the noise measurement readings. The L_{Aeq} value is an A-weighted noise level integrated over the period of measurement and L_{A10} is the integrated noise level for 10% of the time of the measurement duration. This is often used to give an indication of the upper limit of fluctuating noise, such as that from road traffic. Consequently, the L_{A10} quantity is higher than L_{Aeq}.

The approximate high and low weather conditions experienced during the measurement period is indicated in **Table 5- 1**.

Table 5-1: Approximate Weather Conditions

Measurement Point	Measurement Date	Temperature (H/L)	Wind Speeds
M1	07/10/2025	27 / 14 Degrees C	13 km/h ENE
NR1	08/10/2025	24 / 19 Degrees C	14.8 km/h E
NR2	08/10/2025	24 / 19 Degrees C	12 km/h E

5.1.2 Estimation of Potential Noise Impacts

The noise impact was determined with reference to legal standards (Noise Control Regulations) and the specifications and guidelines provided in the SABS standards document (SANS 10103:2008). Significance of impacts can be subjective and legal minimum requirements and good engineering practice have therefore been used in each case to determine what is reasonable.

To make the judgment, the predicted noise level (as described in preceding section) at each receptor locality was assessed in relation to each of the following:

- The measured ambient baseline noise levels as described in measurement section above;
- The identified SANS 10103: 2008 "Typical rating levels for noise in districts" based on the measured ambient noise levels;
- 65 dBA limit specified in the Noise Control Regulations for a controlled area;
- SANS 10103:2008 Table 2 — Typical rating levels for noise in districts; "*NOTE 3: In districts where outdoor $L_{R,dn}$ exceeds 55 dBA, residential buildings (e.g. dormitories, hotel accommodation and residences) should preferably be treated acoustically to obtain indoor $L_{Req,T}$ values in line with those given in Table 1*."

The extent of potential impacts has taken into consideration the probable community response to increases in sound levels, based on SANS 10103:2008. Important components and nature of the noise, such as impulsiveness and occurrence of pure tones, have also been accounted for by including correction factors as per SANS10103:2008.

5.2. Modelled Scenario

The modelled scenario was designed and based on the layout as supplied by the project team. The significant noise sources were identified, modelled and the resultant propagation results were obtained. The modelled scenario took into consideration the following:

- Corrections for ground surface conditions and meteorological conditions;
- Topographical ground and structures;
- Forecast predicted noise climate;
- Average Daily Traffic (ADT) data provided indicates an expected increase of 21% by 2032 and 64% by 2036, following the completion of the road works.
- Identification of areas that are expected to be negatively affected by the construction and operational phases.

5.3. Impact Assessment and Management

5.3.1 Introduction

The potential environmental impact of the proposed project was determined by identifying the environmental aspects and then undertaking an environmental risk assessment to determine the potential significant environmental impacts for the construction and operational phases.

5.3.2 Methodology

As per the NEMA EIA Regulations (2017) prescribed requirements, the potential environmental impacts identified for project were evaluated according to severity, duration, extent and significance of the impact, and include the potential occurrence and assessment of cumulative impact. The Risk Assessment Methodology used for the ranking of the impacts is detailed below.

This system derives environmental significance by rating the consequence of the impact on the environment and the likelihood of the impact occurring. Consequence is calculated as the average of the sum of the severity, duration and extent ratings while Likelihood is the average of the frequency of the activity together with the probability of an environmental impact occurring during those frequencies. **Table 5.1** to **Table 5-3** detail the rating assignment process as well as the calculations applied to achieve averages and the overall significance.

The methodology was applied to the identified impacts with and without the application of proposed mitigation measures.

5.3.3 Determination of Consequence

Consequence is calculated as the average of the sum of the ratings of severity, duration and extent of the environmental impact.

Table 5-2: Assessment and Rating of Severity, Duration and Extent

Rating/ Description	1	2	3	4	5
Severity	Negligible / non-harmful / minimal deterioration (0 – 20%)	Minor / potentially harmful / measurable deterioration (20 – 40%)	Moderate / harmful / moderate deterioration (40 – 60%)	Significant / very harmful / substantial deterioration (60 – 80%)	Irreversible / permanent / death (80 – 100%)
Duration	Less than 1 month / quickly reversible	Less than 1 year / quickly reversible	More than 1 year / reversible over time	More than 10 years / reversible over time / life of project or facility	Beyond life of project of facility / permanent

Rating/ Description	1	2	3	4	5
Extent	Within immediate area of activity	Surrounding area within project boundary	Beyond project boundary	Regional / provincial	National / international
Consequence	**(Severity + Duration + Extent) / 3**				

5.3.4 Determination of Likelihood

Likelihood considers the frequency of the activity together with the probability of the environmental impact associated with that activity occurring.

Table 5-3: Assessment and Rating of Frequency and Probability

Rating/ Description	1	2	3	4	5
Frequency	Less than once a year	Once in a year	Quarterly	Weekly	**Daily**
Probability	Almost impossible / Never	Unlikely	Probable	Highly likely	**Definite**
Likelihood	**(Frequency + Probability) / 2**				

5.3.5 Environmental Significance

Environmental significance is the product of the consequence and likelihood values as below;

- **Significance = Consequence X Likelihood**

Table 5-4: Determination of Environmental Significance

Significance	Description
L (1 – 4.9)	Low environmental significance
LM (5 – 9.9)	Low to medium environmental significance
M (10 – 14.99)	Medium environmental significance
MH (15 – 19.9)	Medium to high environmental significance
H (20 – 25)	High environmental significance. Likely to be a fatal flaw.

5.4. Assumptions and Limitations

5.4.1 Acoustical Measurements

There are limitations and uncertainties regarding acoustical measurements. Noise levels have the potential to fluctuate based on numerous factors, including:

- The noise level may change from day to day due to activities within a community (e.g. road traffic fluctuations, see point below) or even at a singular dwelling itself. Dwelling related infrastructure (e.g. air-conditioning units, swimming pool pumps etc.) have the potential to influence noise levels in terms of dB;
- Seasonal changes have the potential to influence sound levels directly (e.g. rainfall) or indirectly, for example by affecting faunal communication(see the following point);
- Faunal communication measurements may fluctuate due to seasonal, time of day or night etc. Certain fauna communicates during certain hours e.g. cicada may only audible during night-hours, crepuscular birds are only audible during evening or night hours, and cricket activity may be more significant during warmer seasons;
- Measurements near mining and industries fluctuate depending on equipment in use, capacity load in use, unforeseen equipment in care and maintenance. Certain equipment may not be running optimally, with the consequence being excessive elevated noise levels (e.g. gas leaks, conveyor pulley roller squeaking, excessive vibrations (and associated noise) from unmaintained dampers on equipment etc)
- Road traffic noise fluctuates due to time of measurement (e.g. peak traffic morning or evening conditions, early morning hours etc.; and
- Metrological conditions can influence noise measurements. These include inversion and diffraction in the temperature layer, change in temperature and humidity etc.
- Road traffic noise measurements (M1) were conducted on 7th and 8th October 2025; however, only the measurements from 7th October were used, as the traffic lane configuration changed on 8th of October 2025.

6. BASELINE NOISE LEVEL MEASUREMENTS

The locations of the baseline noise measurement points are provided in **Figure 3-2** and **Figure 3-3** in Section 3.

6.1. Baseline Noise Measurement Results

6.1.1 Bayhead Road

Noise equivalent (L_{Aeq} and L_{A10}) values are presented in **Table 6-1** for the hourly measurements at Point M1**.** The L_{Aeq} *vs* time road noise log graphs are provided for reference in **Appendix B**. The measured road traffic noise levels have been used to calibrate the noise prediction model.

Table 6-1: Baseline Road Traffic Noise Levels – Noise Measurements

Point	Measured Road Traffic Noise Level (06:00 – 00:00)		Wind Velocity Maximum (km/h)	Wind Direction	Air Temperature min /max (degree Celsius)
	L_{eq} (dBA)	L_{10} (dBA)			
M1	69.6	73.5	13 km	ENE	14/ 27

6.1.2 Noise Sensitive Areas (Sensitive Receptors)

Noise equivalent (L_{Aeq}) values are presented in **Table 6-2** showing measurement results from NR1 and NR2.

The measured noise levels have comparative rating levels (SANS10103:2008) typical of an Urban District; with workshops, business premises and main roads *(60dBA Daytime and 50dBA night-time).* And, according to SANS10103:2008, residential buildings in districts where the outdoor $L_{R,dn}$ exceeds 55 dBA, should be treated acoustically to obtain indoor noise level requirements as specified in SANS10103:2008. Thus, the construction noise requirements should not exceed 60dBA during daytime and 50dBA during night-time at the noise sensitive areas unless residential buildings are treated acoustically to meet indoor noise levels. Note only the lowest of the two L_{Aeq} measurements are considered for each respective position. Refer **Table 4-1** and Section 3.2.

Table 6-2: Noise Measurement Results at Noise Sensitive Receptors

Measurement Point	Distance from Bayhead Road (m)	Date	Time	Recorded Ambient Noise Level (L_{Aeq}) (dBA)	Comparative Rating Level (SANS 10103:2008)

NR1	469	08/10/2025	Daytime 06:00 – 22:00	53.4	**Urban District** (with main roads) 60 dBA / 50 dBA
			Night-time 22:00 – 05:00	53	
NR2	323	08/10/2025	Daytime 10:44 – 11:45 17:11 – 18:09	53.1	**Urban District** (with main roads) 60 dBA / 50 dBA
			Night-time 23:43 – 00:08	52.9	

- The noise measurements at the noise sensitive receptors indicate the district most closely resembles an Urban District with workshops, business premises and main roads.

7. NOISE IMPACT ASSESSMENTS

A worst-case controlled scenario was used to help identify potential issues, identify the significance rating and potential noise impacts in terms of noise legislation and standards.

7.1. Construction Phase

7.1.1 Envisaged Construction Activity

The following construction activities have been identified below.

Activity	Construction phase
Roads / transport infrastructure	• Earth moving and site preparation • New ramp construction and ramp realignment • Demolition, new construction and modification of bridge/s and bridge decks • Road substrate preparation • Road widening • Road milling, surfacing and resurfacing • Construction of retaining walls, traffic barriers and other furniture • Installation / construction of ancillary road infrastructure

The *sound power levels* were selected based on the noise levels presented in **Appendix C**. A cumulative sound power level considering all the various applicable construction equipment has been used as a representative noise level for the general construction activity and modelled as an area source. Typical construction site noise without obstacles can emit 101 dBA of continuous time integrated sound pressure from activities.

The construction phase is temporary and is typically completed within two years.

7.1.2 Construction Phase Noise Impact

The **Table 7-1** shows the predicted construction noise levels and the excess noise level ($\Delta L_{Req,\ d/n}$) at the respective identified sensitive receptor locations.

Table 7-1: Predicted construction noise (L_{Aeq}) and excess noise level (ΔL_{Req})

Noise Sensitive Receptor	Distance from proposed site (m)	Predicted Noise Levels from site	Predicted Noise Levels at Noise Sensitive Receptors	Measured Baseline Noise Levels (Daytime/ Night-time) (L_{Aeq}) (dBA)	Excess Noise Levels (day / night) ($\Delta L_{Req,\ d/n}$) (dBA)
NR1	469	101 dBA	46.6	53.4 / 53	0 / 0
NR2	323	101 dBA	49.8	53.1 / 52.9	0 / 0
* L_{Aeq} is deemed equivalent to $L_{Req,\ d/n}$ for the purposes of comparison.					

7.1.3 Discussion

The continuous typical construction noise levels associated with the proposed road upgrade are not expected to exceed the baseline noise levels at the identified noise sensitive receptors (NR1 and NR2) and are anticipated to remain close to existing ambient conditions.

Predicted construction noise levels at the identified noise sensitive receptors (NR1 and NR2) remain below the measured baseline ambient noise levels. As such, no measurable excess above existing environmental noise conditions is expected. Although certain construction activities may be intermittently audible during daytime hours, the overall impact is not anticipated to constitute a disturbing noise as defined in the Noise Control Regulations. Notwithstanding the above, it is noted that some construction activities may generate higher noise levels and could potentially lead to noise nuisance claims.

The construction phase is temporary and is typically completed within two years.

7.1.4 Mitigation Requirements

The following mitigation measures are required;

1. Construction times must be restricted to daytime hours, the Noise Management plan will provide detailed information regarding these activities.
2. A Noise Management Plan for the construction phase must be provided and include the following:
    - Construction activities must be restricted to daytime hours and must comply with the National Building Regulations (SANS 10400-F: Site Operations, Regulation F6):
        - Monday to Friday: 06:00 – 18:00
        - Saturday: 06:00 – 17:00
        - Sundays and public holidays: No construction activities allowed

    If additional work is required outside of these hours, an application for exemption must be submitted to the local authority, for approval prior to commencement, in order to prevent unreasonable disturbance to the surrounding area.

    - A correspondence noise complaint channel to receive and address any noise nuisance complaints timeously. Where a complaint has been received, a measurement should be performed by a qualified consultant or health officer at the complainant's property to verify the complaint. The project manager will then need to facilitate with adequate noise abatement measures if the noise levels are shown to be non-compliant.
    - Construction areas should be closed off with temporary noise barriers or earth berms if noise complaints are received.
    - All construction vehicles must be well maintained and in good condition.
    - Noise generating equipment such as generators, air compressors, etc. should be enclosed in soundproof enclosures. Many manufacturers of the specialised equipment will offer 'soundproof' enclosures that are purpose built for such equipment.

- Construction staff working in areas where the 8-hour ambient noise is equal to or exceeds 85dBA, should be provided with ear protection equipment.
- Noise intensive operations must be scheduled appropriately and conducted only after sensitive receptors have been notified in advance.

7.1.5 Conclusion

Construction noise is not expected to exceed baseline ambient noise levels at the identified sensitive receptors (NR1 and NR2). The implementation of standard good engineering and construction management practices is nevertheless recommended to minimise the potential for noise nuisance complaints.

7.1.6 Impact Rating of Construction Noise

The impact significance rating of the construction noise is given in **Table 7-2** below.

Table 7-2: Impact Significance Rating for Construction Phase (with and without mitigation)

Impact Significance Points												
Project Locality	Without Mitigation						With Mitigation					
	Consequence			Likelihood		Significance Total & Category	Consequence			Likelihood		Significance Total & Category
	Severity	Duration	Extent	Frequency	Probability		Severity	Duration	Extent	Frequency	Probability	
Site	2	3	3	3	3	**8.1 Low to medium environmental significance**	1	3	2	2	2	**4 Low environmental significance**

The impact significance rating for construction phase noise, both with and without mitigation, is presented in **Table 7-2**. The significance ratings were determined using the methodology outlined in **Section 5.3.**

Construction noise impacts associated with the proposed development are temporary in nature and are therefore considered reversible, with ambient noise levels expected to return to baseline conditions following completion of construction activities.

Construction noise is not anticipated to result in any irreplaceable loss of environmental, cultural, or community resources. While nearby sensitive receptors

(NR1 and NR2) may experience temporary noise intrusion during construction activities, these impacts do not represent permanent loss or degradation.

Appropriate mitigation measures can be implemented to avoid, manage, or reduce construction noise impacts, including restricted working hours and effective equipment maintenance. As shown in **Table 7-2**, the implementation of mitigation measures reduces the impact significance from Low to Medium environmental significance (without mitigation) to Low environmental significance (with mitigation).

7.2. Operational Phase

7.2.1 Simulated Operational Noise Levels (Existing Scenario)

Simulated noise levels of the existing road traffic noise from Bayhead Road are illustrated in **Figure 7-1**.

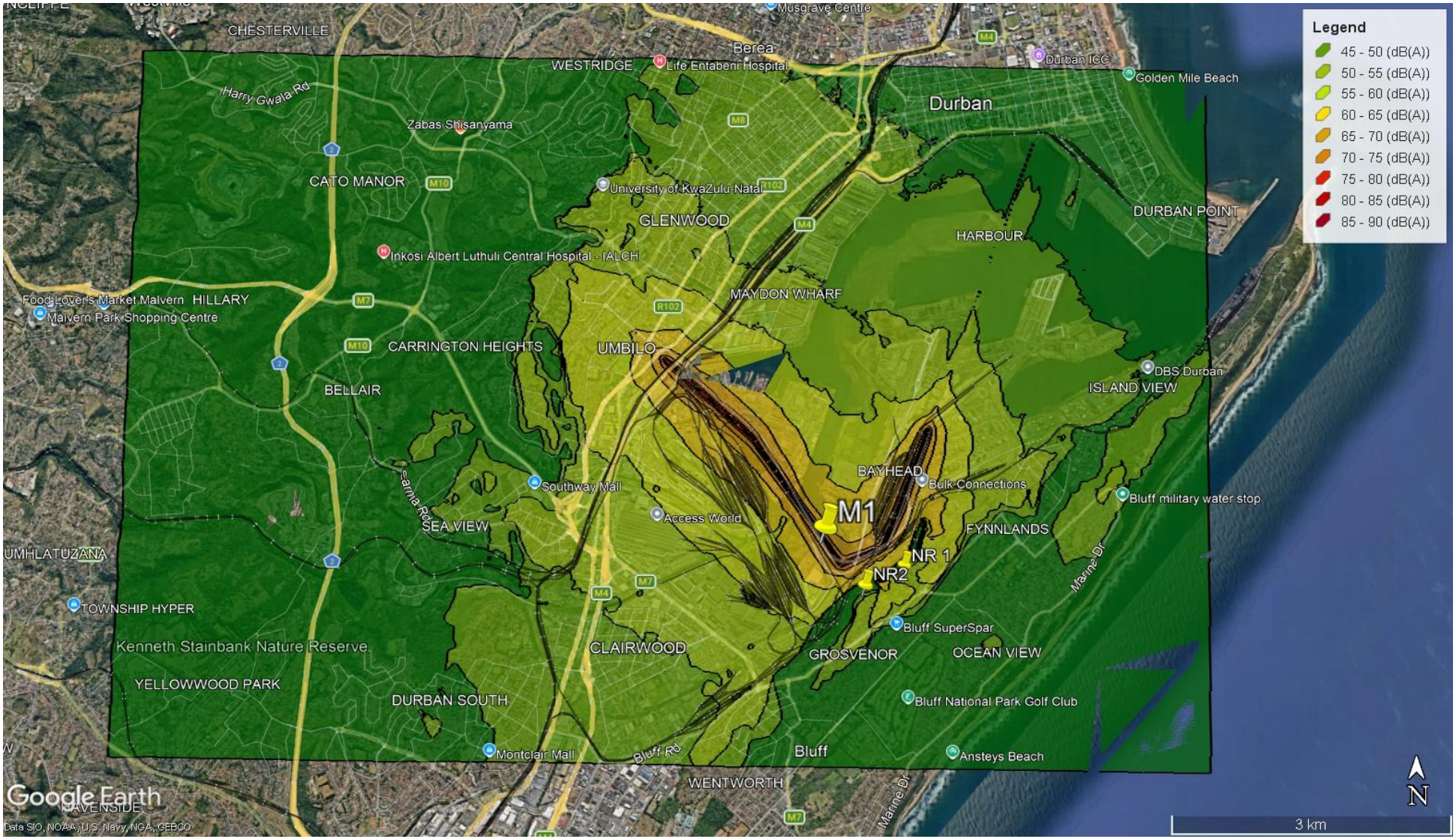


Figure 7-1: Simulated Baseline Road Traffic Noise Levels

7.2.2 Simulated Operational Noise Levels (21%Forecast by 2032)

The simulated road-traffic noise levels for the 2032 (21% increase)forecast scenario is presented in **Figure 7-2**.

Table 7-3 presents the simulated 21% increase in traffic volumes projected for 2032 and the corresponding road traffic noise levels expected at the nearest noise-sensitive receptors.

Table 7-3: Simulated Road-Traffic Noise Levels at Sensitive Receptors for the 21% forecast (2032)

Receiver	Measured Baseline Noise Levels (Day / Night) dBA	Baseline Road Traffic Noise Only	Predicted Operational Road Traffic Noise Levels LReq (dBA)	Increase in Road Traffic Noise (dBA)	*Predicted Daytime Excess Ambient Noise Levels* ($\Delta L_{Red,d}$) (dBA)	*Predicted Night-time Excess Ambient Noise Levels* ($\Delta L_{Req,n}$) (dBA)
NR1	53.4 / 53	49.8	50	+ 0.2	0	0
NR2	53.1 / 52.9	48.6	48.7	+0.1	0	0

Note for positions refer **Figure 3-2**.

7.2.2.1 Impact due to Operational Noise Levels (21% by 2032 Forecast)

The predicted noise levels for the 2032 scenario represent the calculated road traffic noise contribution attributable to the upgraded road infrastructure only and do not represent total ambient environmental noise levels, which remain influenced by existing freight traffic and port-related industrial activities within the receiving environment.

Baseline road traffic noise was measured at 49.8 dBA at NR1 and 48.6 dBA at NR2. Under the 2032 traffic growth scenario, predicted road traffic noise increases marginally to 50.0 dBA at NR1, representing an increase of 0.2 dBA. Predicted road traffic noise at NR2 increases slightly to 48.7 dBA, representing an increase of 0.1 dBA.

Increases of 0.2 dBA and 0.1 dBA are substantially below the generally accepted threshold of perceptibility and are therefore considered acoustically negligible. The predicted road traffic noise levels remain below the measured ambient rating levels characteristic of the receiving environment and within the Urban District guideline values defined in SANS 10103. The proposed road upgrades

are therefore not expected to materially alter the prevailing acoustic environment under the 2032 operational scenario.

7.2.2.2 Mitigation Recommendations

For the operational phase of the proposed road upgrade, noise mitigation was initially proposed through the use of Bitumen Rubber Asphalt Open-Grade (BRAOG) surfacing. BRAOG is a rubber-modified, open-graded asphalt known to reduce tyre road interaction noise, achieving reductions of 2–4 dB(A) compared to dense-graded asphalt and 5–8 dB(A) compared to chip-seal surfacing, particularly at speeds above 60 km/h.

Following discussions with the client, it was decided that the road will be constructed using an AP-1 modified binder due to port operational requirements. The AP-1 binder provides higher strength and enhanced chemical resistance suitable for the Port environment. However, it does not have any measurable noise reducing properties, and therefore no quantifiable reduction in operational noise is expected.

7.2.2.3 Conclusion

From a noise perspective, no operational phase mitigation measures are applied with the current AP-1 asphalt specification. It is recommended that good engineering practices are followed during construction and that the road surface is regularly maintained to ensure durability, though these measures do not alter the predicted operational noise levels.

7.2.2.4 Impact Significance Rating of Operational Noise (21% by 2032 Forecast)

The impact significance rating of operational road noise is given in **Table 7-4**.

Table 7-4: Impact Significance Rating for Bayhead Road Operational Phase (21% by 2032 Forecast)

Project Locality	Without Mitigation					
	Consequence			Likelihood		Significance Total & Category
	Severity	Duration	Extent	Frequency	Probability	
Site	1	3	2	4	2	6 Low – Medium environmental significance

Figure 7-2: Simulated Future Traffic Noise Levels for Bayhead Road (2032 Forecast – 21% Increase)

7.2.3 Simulated Operational Noise Levels (64% by 2036 Forecast)

The simulated road noise levels for year 2036 are illustrated in **Figure 7-3.**

Table 7-5 presents the simulated 64% increase in traffic volumes projected for 2036 and the corresponding road traffic noise levels expected at the nearest noise-sensitive receptors.

Table 7-5: Simulated Road-Traffic Noise Levels at Sensitive Receptors for the 64% forecast (2036)

Receiver	Measured Baseline Noise Levels (Day / Night) dBA	Baseline Road Traffic Noise Only	Predicted Operational Road Traffic Noise Levels LReq (dBA)	Increase in Road Traffic Noise (dBA)	*Predicted Daytime Excess Ambient Noise Levels* ($\Delta L_{Red, d}$) (dBA)	*Predicted Night-time Excess Ambient Noise Levels* ($\Delta L_{Req, n}$) (dBA)
NR1	53.4 / 53	49.8	50.3	+ 0.5	0	0
NR2	53.1 / 52.9	48.6	48.8	+0.2	0	0

*Note for positions refer **Figure 3-2**.

7.2.3.1 Impact due to Operational Noise Levels (64% by 2036 Forecast)

The 2036 growth scenario, predicted road traffic noise increases to 50.3 dBA at NR1, representing an overall increase of 0.5 dBA relative to baseline conditions. Predicted road traffic noise at NR2 increases to 48.8 dBA, representing an increase of 0.2 dBA.

Although the 2036 scenario reflects substantial traffic growth in percentage terms (64%), the associated increases in road traffic noise remain below 1 dBA at both receptors. Changes of this magnitude are generally regarded as acoustically negligible and would not be perceptible within the context of the existing industrial and traffic-dominated noise climate.

The predicted values represent the road traffic contribution only and remain below measured ambient rating levels and within the Urban District guideline values defined in SANS 10103. The upgraded road infrastructure is therefore not expected to result in a material change to the existing environmental noise environment.

7.2.3.2 Mitigation Recommendations

For the operational phase of the proposed road upgrade, noise mitigation was initially proposed through the use of Bitumen Rubber Asphalt Open-Grade (BRAOG) surfacing. BRAOG is a rubber-modified, open-graded asphalt known to reduce tyre road interaction noise, achieving reductions of 2–4 dB(A) compared to dense-graded asphalt and 5–8 dB(A) compared to chip-seal surfacing, particularly at speeds above 60 km/h.

Following discussions with the client, it was decided that the road will be constructed using an AP-1 modified binder due to port operational requirements. The AP-1 binder provides higher strength and enhanced chemical resistance suitable for the Port environment. However, it does not have any measurable noise reducing properties, and therefore no quantifiable reduction in operational noise is expected.

7.2.3.3 Conclusion

From a noise perspective, no operational phase mitigation measures are applied with the current AP-1 asphalt specification. It is recommended that good engineering practices are followed during construction and that the road surface is regularly maintained to ensure durability, though these measures do not alter the predicted operational noise levels.

7.2.3.4 Impact Rating of Operational Noise (64% by 2036 Forecast)

The impact significance rating of operational road noise is given in **Table 7-6**.

Table 7-6: Impact Significance Rating for Bayhead Road Operational Phase (64% by 2036 Forecast)

Project Locality	Without Mitigation					
	Consequence			Likelihood		Significance Total & Category
	Severity	Duration	Extent	Frequency	Probability	
Site	1	4	2	4	2	**6.9 Low - Medium environmental significance**

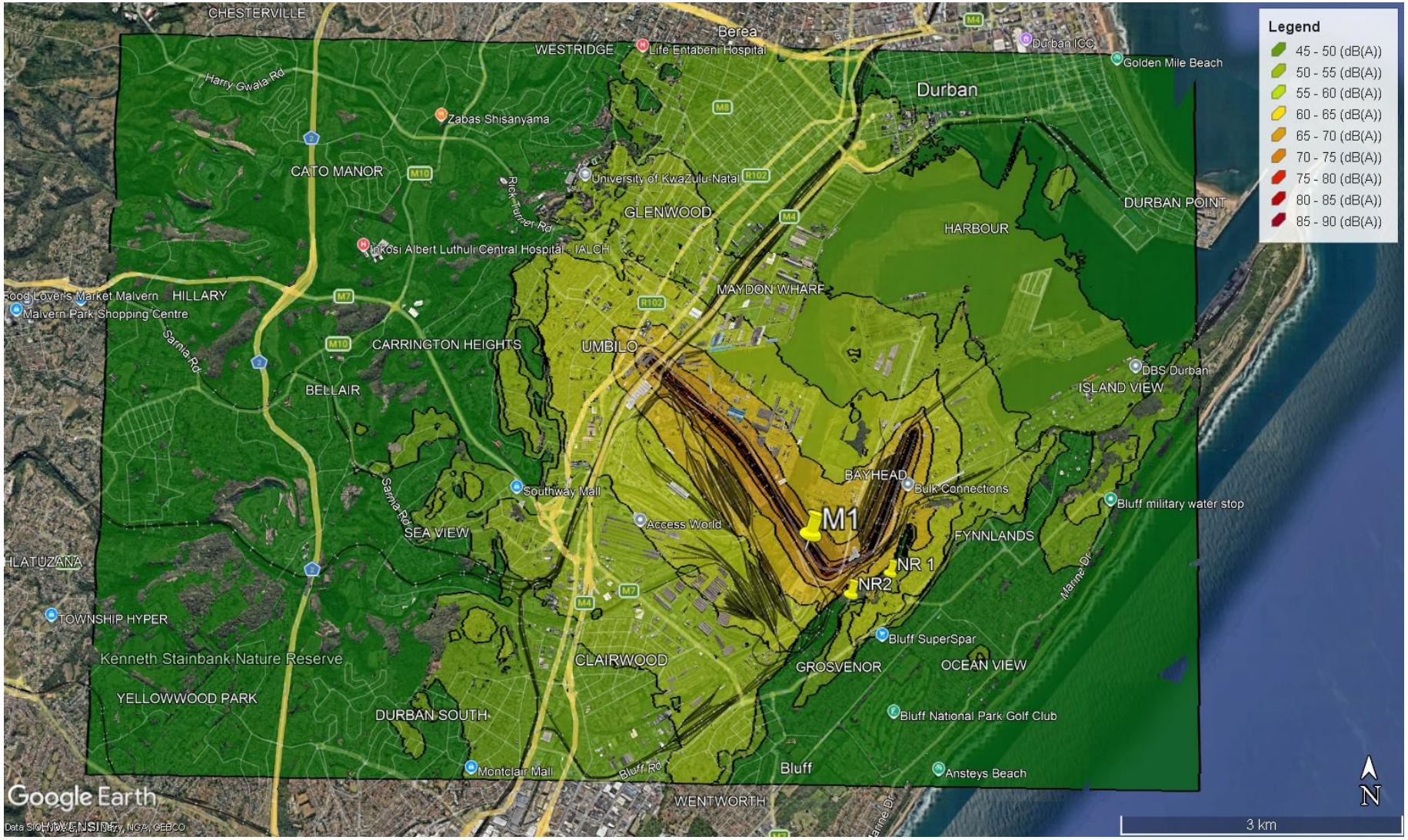


Figure 7-3: Simulated Future Traffic Noise Levels for Bayhead Road (2036 Forecast – 64% Increase)

8. CONCLUSION

The proposed TNPA Port of Durban Road Upgrades form part of critical transport infrastructure improvements required to support port efficiency, freight mobility, and regional economic activity. From an acoustics perspective, the project occurs within an already high activity industrial logistics environment, where existing noise levels are influenced primarily by road freight, port operations, and associated industrial activity.

Baseline measurements confirm that the current acoustic climate is elevated but typical for a heavy logistics zone, with residential receptors located at varying distances from Bayhead Road and Langeberg Road.

Construction Phase

- Construction activities associated with the proposed road upgrades are temporary, localised, and reversible.
- Predicted construction noise levels at the identified sensitive receptors (NR1 and NR2) remain below measured baseline ambient noise levels.
- While certain activities may be intermittently audible, no measurable exceedance of the applicable SANS 10103 rating levels is expected.

Without mitigation, construction phase impacts are assessed as Low–Medium environmental significance due to the duration and frequency of works.

Operational Phase

Noise modelling results for the 2032 (21% traffic growth) and 2036 (64% traffic growth) scenarios indicate:

- No exceedance of measured baseline levels at sensitive receptors.
- No measurable excess above ambient conditions (ΔLReq = 0 dBA).
- Modest absolute increases in traffic volumes without material acoustic consequence.
- The selected AP-1 modified binder does not provide measurable noise reduction; however, based on predicted results, no additional operational mitigation is required.

Without mitigation, operational noise impacts are rated as Low- Medium significance for both forecast years.

9. RECOMMENDATIONS

Construction Phase

Implement standard construction management measures during the construction phase to reduce noise impacts from Low-Medium to Low significance.

1. **Construction Working Hours**
    - Restrict construction to daytime hours:
        - Mon–Fri: 06:00–18:00
        - Sat: 06:00–17:00
        - Sundays and public holidays: no construction activities allowed.
    - Any work outside these hours requires prior approval from the local authority.
2. **Communication with Stakeholders**
    - Maintain ongoing communication with Interested and Affected Parties (I&APs) and respond promptly to noise complaints.
    - Document complaints and mitigation actions to demonstrate compliance.
3. **Construction Noise Management and Monitoring**
    - Manage construction activities to minimise disturbance to nearby sensitive receptors.
    - If noise complaints are received or applicable noise limits are exceeded, implement corrective measures such as:
        - Adjusting working hours or schedules
        - Repositioning equipment
        - Implementing operational controls
    - Record all noise-related incidents and corrective actions and make them available to the competent authority upon request.

Operational Phase

No operational noise mitigation measures are required. Noise modelling indicates that forecast traffic increases will not result in measurable increases in noise levels at identified sensitive receptors.

Overall Assessment:

Based on the findings of this Environmental Noise Impact Assessment, the proposed road upgrades do not present a fatal flaw from a noise impact perspective. Construction phase impacts are temporary and manageable, and operational phase increases are negligible within the context of the existing industrial and traffic dominated acoustic environment. The project is therefore considered acceptable, subject to the implementation of the recommended construction management practices.

10. NOISE IMPACT ASSESSMENT SUMMARY

A summary of the noise impact assessment for Bayhead Road is provided in **Table 9-1**.

Table 10-1: Summary of the Noise Impact Assessment

Phase	Noise Impact Before Mitigation	Noise Impact After Mitigation
Construction Phase	Low to Medium environmental significance- Impact is of a low order and therefore likely to have little real effect. Project can be authorised with low risk of environmental degradation. Mitigation is either easily achieved or little mitigation is required.	Low environmental significance (High Confidence)
Operational (21% by 2032 Forecast)	Low to Medium environmental significance- Impact is of a low order and therefore likely to have little real effect. Project can be authorised with low risk of environmental degradation. Mitigation is either easily achieved or little mitigation is required.	**No Mitigation*** Low - Medium environmental significance (High Confidence)
Operational (64% by 2036 Forecast)	Low to Medium environmental significance- Impact is of a low order and therefore likely to have little real effect. Project can be authorised with low risk of environmental degradation. Mitigation is either easily achieved or little mitigation is required	**No Mitigation*** Low to Medium environmental significance (High Confidence)

11. REFERENCES

1. Calculation of Road Traffic Noise(CoRTN,1998
2. Environment Conservation Act, 1989 (Act 73 of 1989).
3. National Environment Management Act (NEMA 2006).
4. Noise Control Regulations (Attached to the Act No 73 of 1989).
5. Occupational Health and Safety Act, 1993.
6. SANS 10328: 2008. 'Methods for environmental noise impact assessments.'
7. SANS 10103:2008. 'The measurement and rating of environmental noise with respect to land use, health, annoyance and to speech communication.'
8. SANS 10357: 2004. 'The calculation of sound propagation by the Concawe method.'
9. "SoundPLAN, designing a sound environment." URL http://www.soundplan.com/.
10. The Constitution of the Republic of South Africa Act, 1996 (Act No. 108 of 1996).

APPENDIX A

Appendix A: Glossary of Terms & Acronyms

To ensure that there is a clear interpretation of this report the following meanings should be applied to the acoustic terminology.

- **Ambient sound level** or **ambient noise** means that the totally encompassing sound in a given situation at a given time, and usually composed of sound from many sources, both near and far. Note that ambient noise includes the noise from the noise source under investigation. The use of the word *ambient* should however always be clearly defined (compare with *residual noise*).
- **A-weighted sound pressure level (SPL) (noise level) (L_{pA}), in decibels:**

  The sound pressure level of A-weighted sound pressure is given by the equation:

  $L_{pA} = 10 \log (p_A/P_o)^2$ where:

  P_A is the A-weighted sound pressure, in Pascals; and

  P_o is the reference sound pressure (p_o = 20 micro Pascals (µPa))

  Note: The internationally accepted symbol for sound pressure level, dB(A), is used.
- **dB(A)** means the value of the sound pressure level in decibels, determined using a frequency weighting network A. (The "A"-weighted noise levels/ranges of noise levels that can be expected in some typical environments are given in Table A1 at the end of this appendix).
- **Disturbing noise** means a noise level that exceeds the outdoor equivalent continuous rating level of the time period and neighbourhood as given in Table 2 of SANS 10103:2004. For convenience, the latter table is reproduced in this appendix as Table A1.
- **Equivalent continuous A-weighted sound pressure level ($L_{Aeq,T}$)** means the value of the A-weighted sound pressure level of a continuous, steady sound that, within a specified time interval, has the same mean-square should pressure as a sound under consideration whose level varies with time.
- **Equivalent continuous rating level ($L_{Req,T}$)** means the equivalent continuous A-weighted sound pressure level during a specified time interval, plus specified adjustments for tonal character and impulsiveness of the sound and the time of day.
- **Equivalent continuous day/night rating level ($L_{R,dn}$)** means the equivalent continuous A-weighted sound pressure level during a reference time interval of 24-hours, plus specified adjustments for tonal character and impulsiveness of the sound and the time of day. (An adjustment of 10dB is added to the night-time rating level).

- **Integrating sound level meter** means a device that integrates a function of the root mean square value of sound pressure over a period of time and indicates the result in dBA.
- **LoP –** means Life of Project.
- **Min.** means minimum.
- **Noise** means any acoustic phenomenon producing any aural sensation perceived as disagreeable or disturbing by an individual or group. Noise may therefore be defined as any *unwanted* sound or sound that is *loud, unpleasant or unexpected*.
- **Noise climate** is a term used to describe the general character of the environment with regard to sound. As well as the ambient noise level (quantitative aspect), it includes the qualitative aspect and the character of the fluctuating noise component.
- **Noise Control Regulations** means the regulations as promulgated by the Department of Environmental Affairs and Tourism and to be used by the provincial authorities to prepare their specific regulations. The Gauteng and Free State Provinces have promulgated their own regulations and thus sections of the project are governed by the Gauteng Noise Control Regulations and the Noise Control Regulations for the Free State Province.
- **Noise impact criteria** means the standards applied for assessing noise impact.
- **Noise level** means the reading on an integrating impulse sound level meter taken at a measuring point in the presence of any alleged disturbing noise at the end of a total period of at least 10 minutes after such a meter was put into operation, and, if the alleged disturbing noise has a discernible pitch, for example, a whistle, buzz, drone or music, to which 5dBA has been added. (the ”A” weighted noise levels/ranges of noise levels that can be expected in some typical environments are given in Table A2 at the end of this appendix).
- **Noise nuisance** means any sound which disturbs or impairs or may disturb or impair the convenience or peace of any reasonable person considering the quantitatively measurable such as barking dogs, etc. (compared with disturbing noise which is measurable).
- **Noise-sensitive Development** means and Interested or Affected Party (I&AP), receptor or any other party that has a concern about an activity.
- **Residual sound level** means the ambient noise that remains at a position in a given situation when one or more specific noises are suppressed (compare with *ambient noise).*

Sound exposure level or SEL means the level of sound accumulated over a given time interval or event. Technically the sound exposure level is the level of the time-integrated mean square A-weighted sound for stated time or event, with a reference time of one second.

- **Sound power level** indicates the total acoustic energy that a machine, or piece of equipment, radiates to its environment.

- **Sound (pressure) level** means the reading on a sound level meter taken at a measuring point.
- SANS 10103 means the latest edition of the South African Bureau of Standards Code of Practice SANS 10103 titled The Measurement and Rating of Environmental Noise with Respect to Land *Use, Health, Annoyance and to Speech Communication.*
- **SANS 0210** means the latest edition of the South African Bureau of Standards Code of Practice SANS 0210 entitled *Calculating and Predicting Road Traffic Noise.*
- **SANS 10328** means the latest edition of the South African Bureau of Standards Code of Practice SANS 10328 titled *Methods for Environmental Noise Impact Assessments.*
- **SEL** - Sound Exposure Level
- **Sound** means the aural sensation caused by rapid, but very small, pressure variations in the air. In quantifying the subjective aural sensation, "loudness", the letters dBA after a numeral denote two separate phenomena:

  "dBA", short for decibel, is related to the human's subjective response to the change in amplitude (or largeness) of the pressure variations.

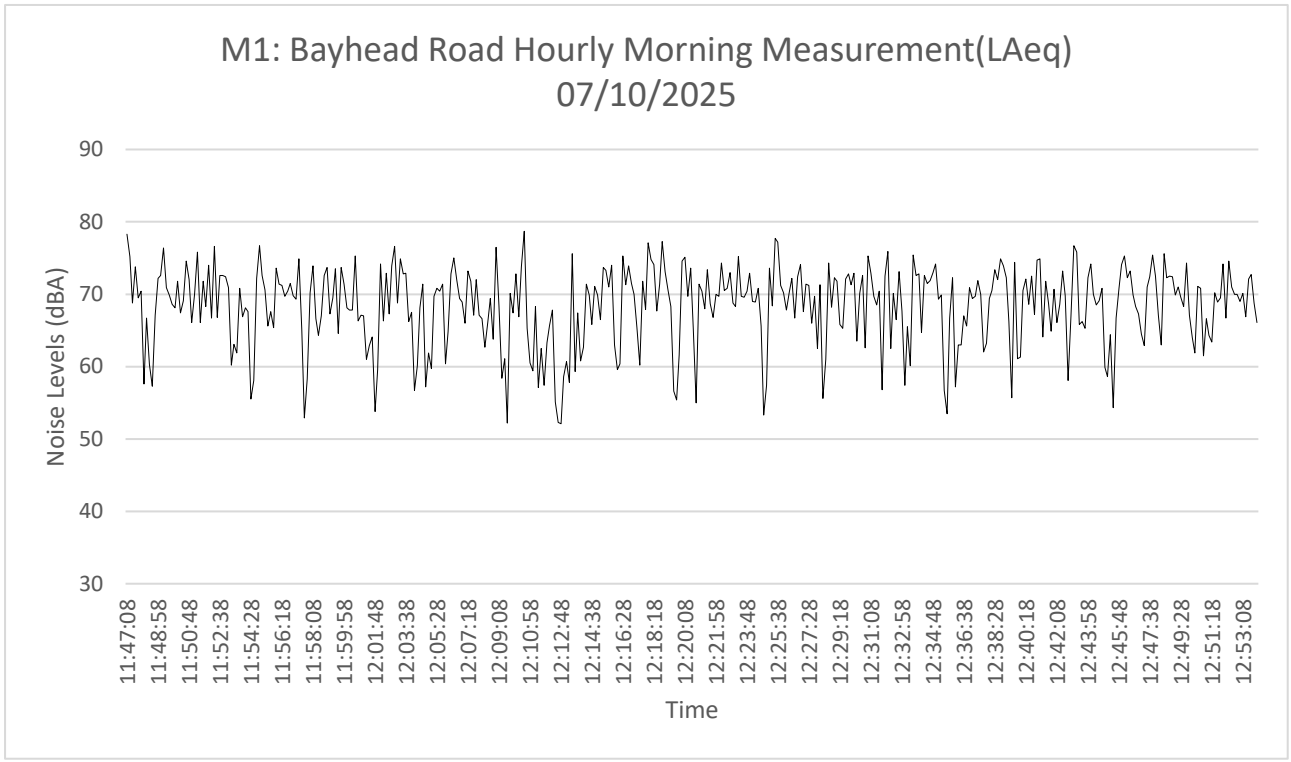
  The "A" denotes the ear's different sensitivity to sounds at different frequencies. The ear is very much less sensitive to low (bass) frequency pressure variations compared to mid-frequencies.

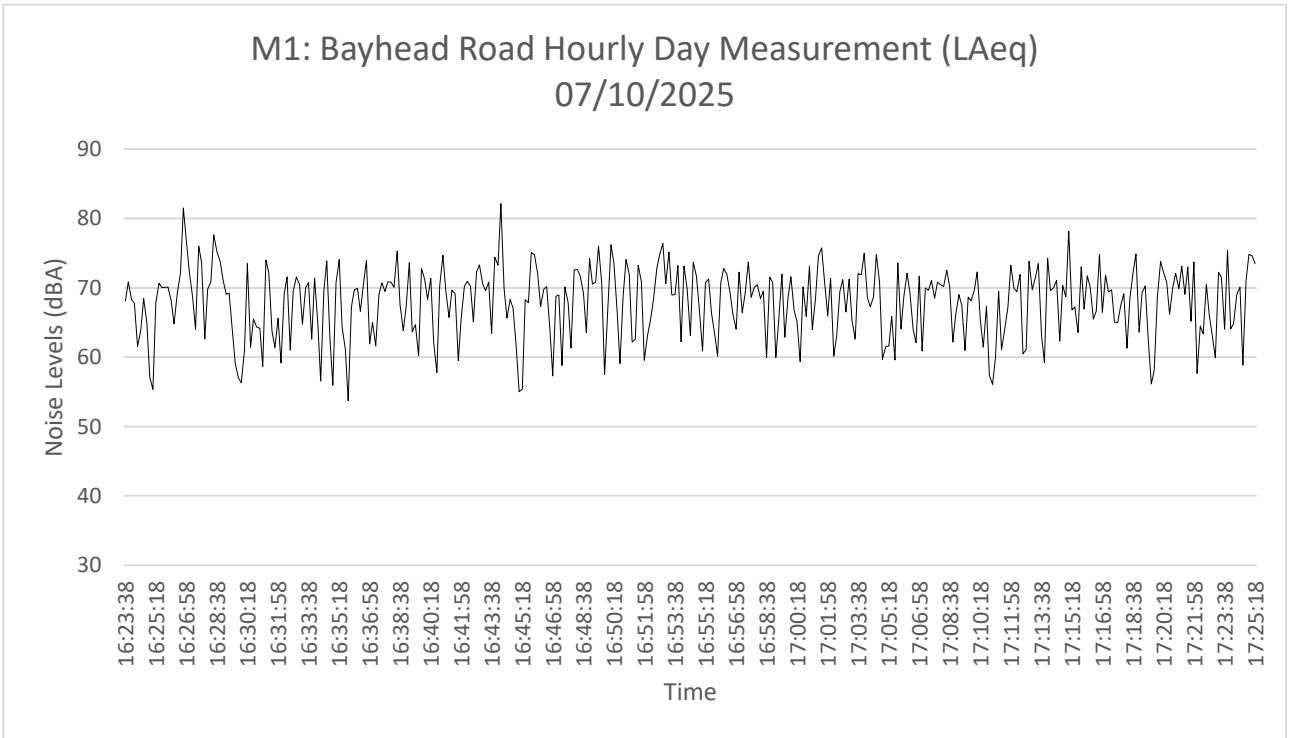
  The level of environmental sound usually varies continuously with time. A human's subjective response to varying sounds is primarily governed by the total sound energy received. The total sound energy is the average level of the fluctuating sound, occurring during a period of time, multiplied by the total time period. In order to compare the effects of different fluctuating sounds, one compares the average sound level over the time period with the constant level of a steady, non-varying sound that will produce the same energy during the same time period. The average energy of sound varying in amplitude is thus equivalent to the continuous, non-varying sound. The two energies are equivalent.

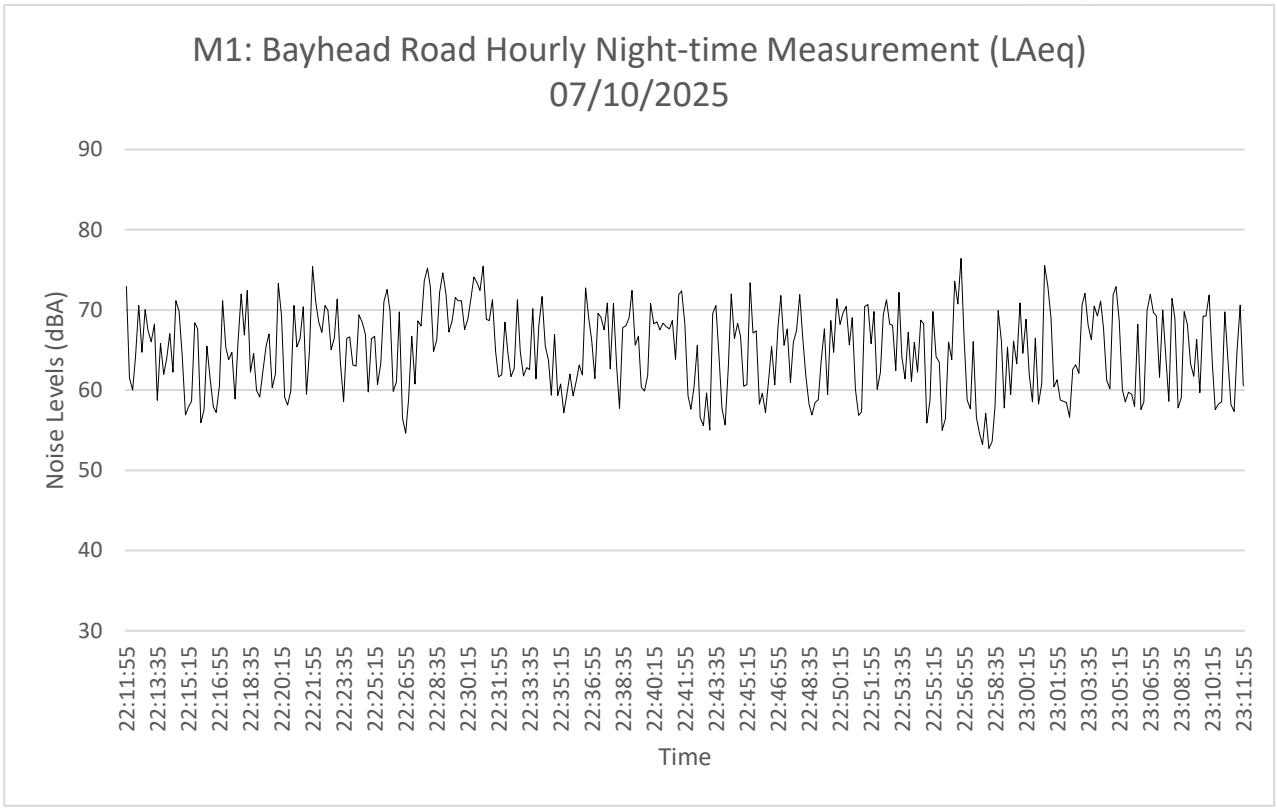
Refer also the various South African National Standards referenced above and the Noise Control Regulations for additional, in some instances, more detailed definitions.

APPENDIX B

Appendix B: Bayhead Hourly Road Noise Measurement Time Log Graphs and Ambient Noise level graphs for the Noise Sensitive Receptors.






M1: Bayhead Road Hourly Night-time Measurement (LAeq)
07/10/2025
Noise Levels (dBA)
90
80
70
60
50
40
30
22:11:55
22:13:35
22:15:15
22:16:55
22:18:35
22:20:15
22:21:55
22:23:35
22:25:15
22:26:55
22:28:35
22:30:15
22:31:55
22:33:35
22:35:15
22:36:55
22:38:35
22:40:15
22:41:55
22:43:35
22:45:15
22:46:55
22:48:35
22:50:15
22:51:55
22:53:35
22:55:15
22:56:55
22:58:35
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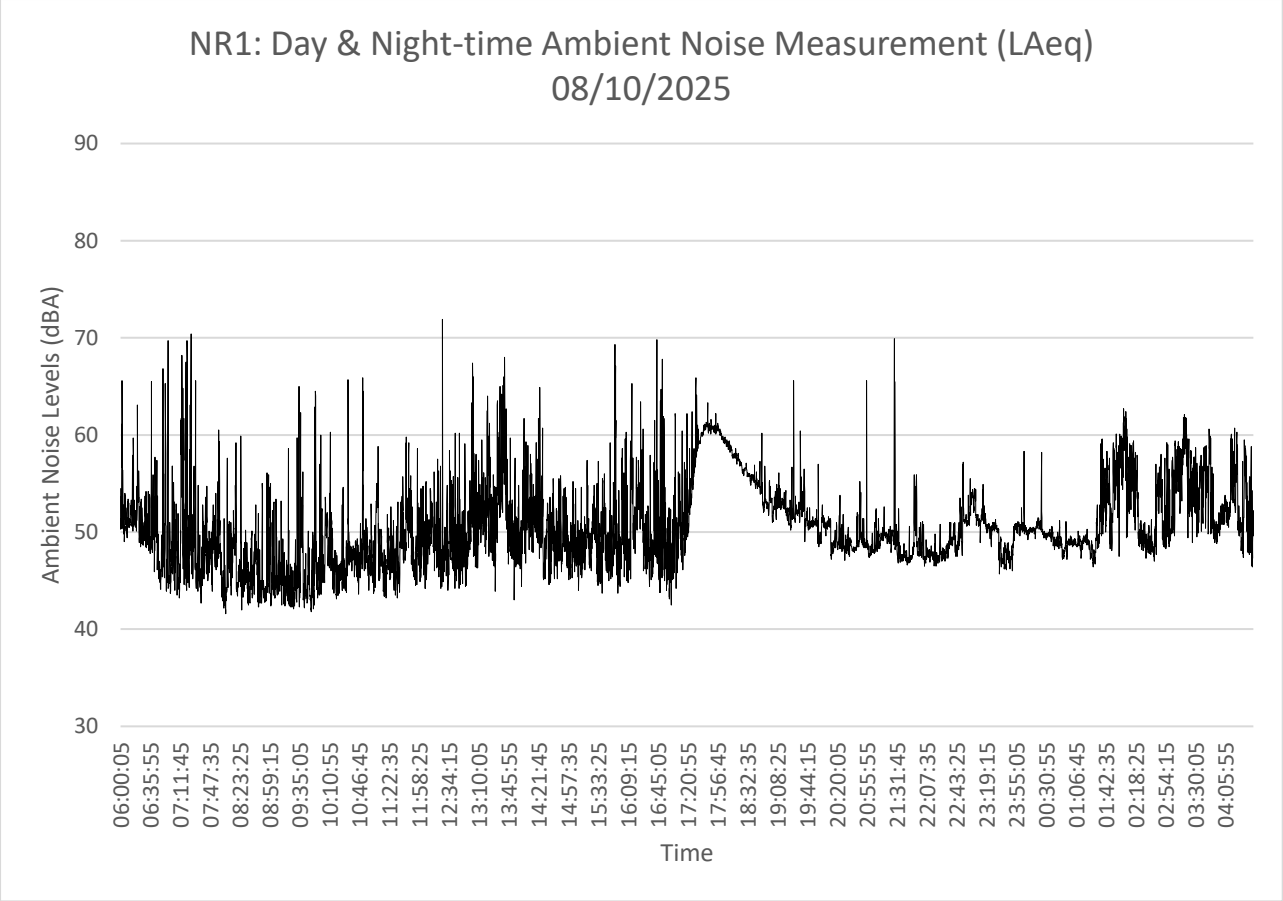
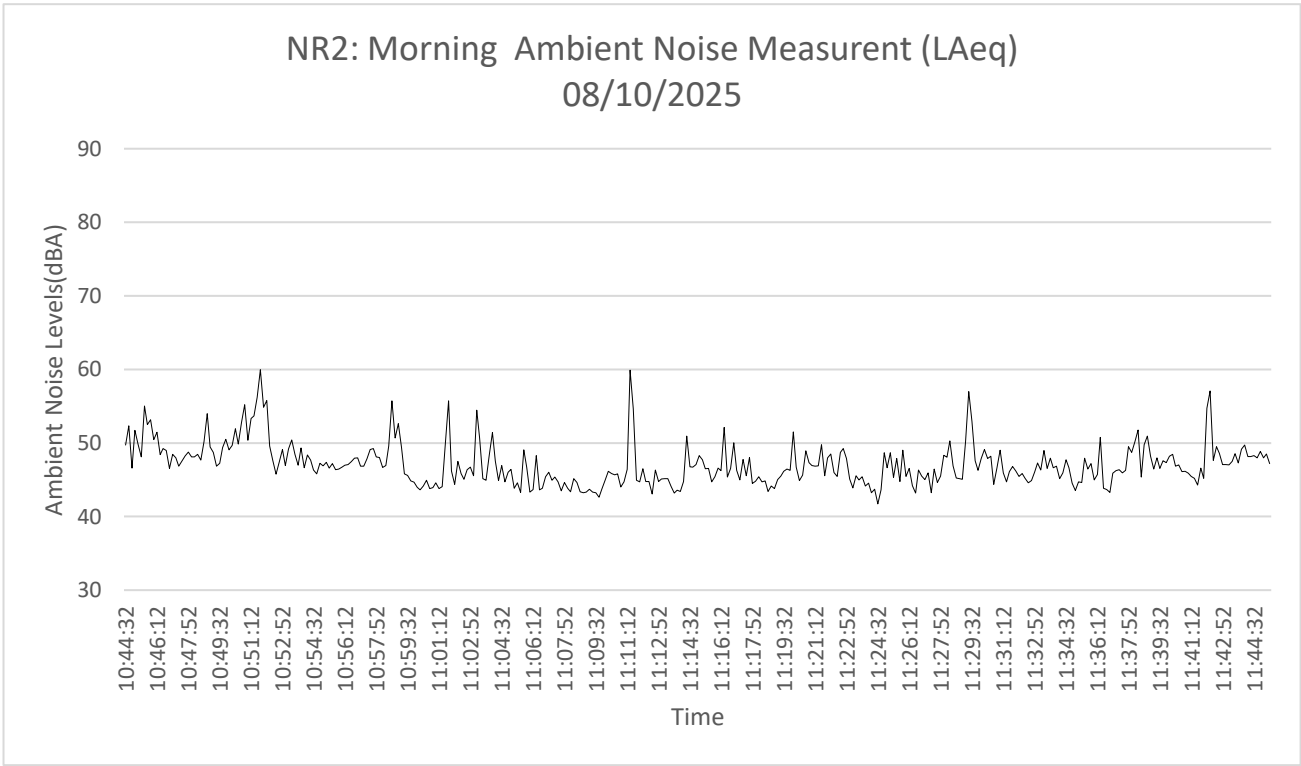
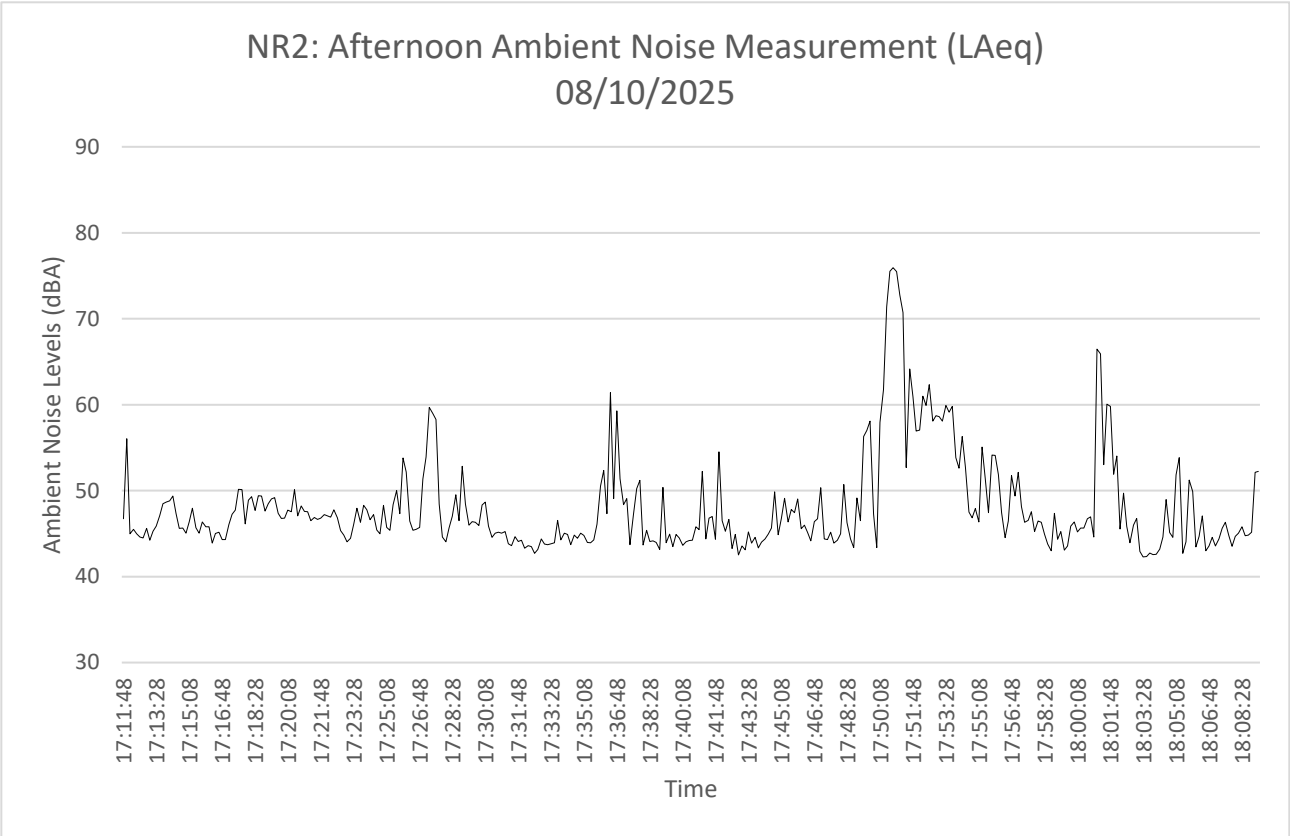
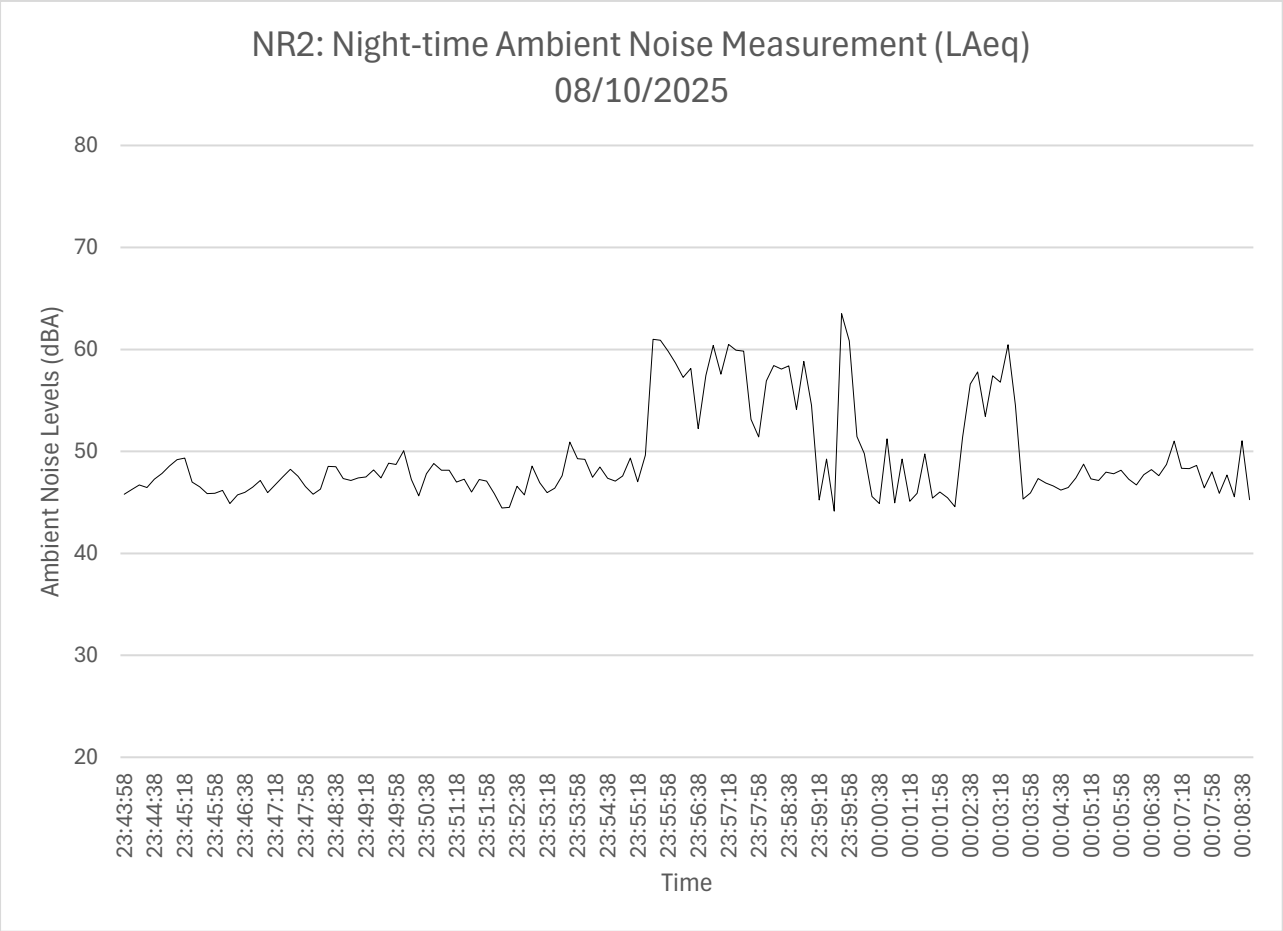
23:03:35
23:05:15
23:06:55
23:08:35
23:10:15
23:11:55
Time


NR1: Day & Night-time Ambient Noise Measurement (LAeq)
08/10/2025
Ambient Noise Levels (dBA)
90
80
70
60
50
40
30
06:00:05
06:35:55
07:11:45
07:47:35
08:23:25
08:59:15
09:35:05
10:10:55
10:46:45
11:22:35
11:58:25
12:34:15
13:10:05
13:45:55
14:21:45
14:57:35
15:33:25
16:09:15
16:45:05
17:20:55
17:56:45
18:32:35
19:08:25
19:44:15
20:20:05
20:55:55
21:31:45
22:07:35
22:43:25
23:19:15
23:55:05
00:30:55
01:06:45
01:42:35
02:18:25
02:54:15
03:30:05
04:05:55
Time


NR2: Morning Ambient Noise Measurent (LAeq)
08/10/2025
Ambient Noise Levels(dBA)
90
80
70
60
50
40
30
10:44:32
10:46:12
10:47:52
10:49:32
10:51:12
10:52:52
10:54:32
10:56:12
10:57:52
10:59:32
11:01:12
11:02:52
11:04:32
11:06:12
11:07:52
11:09:32
11:11:12
11:12:52
11:14:32
11:16:12
11:17:52
11:19:32
11:21:12
11:22:52
11:24:32
11:26:12
11:27:52
11:29:32
11:31:12
11:32:52
11:34:32
11:36:12
11:37:52
11:39:32
11:41:12
11:42:52
11:44:32
Time


NR2: Afternoon Ambient Noise Measurement (LAeq)
08/10/2025
Ambient Noise Levels (dBA)
90
80
70
60
50
40
30
17:11:48
17:13:28
17:15:08
17:16:48
17:18:28
17:20:08
17:21:48
17:23:28
17:25:08
17:26:48
17:28:28
17:30:08
17:31:48
17:33:28
17:35:08
17:36:48
17:38:28
17:40:08
17:41:48
17:43:28
17:45:08
17:46:48
17:48:28
17:50:08
17:51:48
17:53:28
17:55:08
17:56:48
17:58:28
18:00:08
18:01:48
18:03:28
18:05:08
18:06:48
18:08:28
Time


NR2: Night-time Ambient Noise Measurement (LAeq)
08/10/2025
Ambient Noise Levels (dBA)
80
70
60
50
40
30
20
23:43:58
23:44:38
23:45:18
23:45:58
23:46:38
23:47:18
23:47:58
23:48:38
23:49:18
23:49:58
23:50:38
23:51:18
23:51:58
23:52:38
23:53:18
23:53:58
23:54:38
23:55:18
23:55:58
23:56:38
23:57:18
23:57:58
23:58:38
23:59:18
23:59:58
00:00:38
00:01:18
00:01:58
00:02:38
00:03:18
00:03:58
00:04:38
00:05:18
00:05:58
00:06:38
00:07:18
00:07:58
00:08:38
Time

APPENDIX C

Appendix C: Sound Power Levels of Typical Noise Sources

Table 11-1: Sound power levels of construction equipment and assorted noise sources[1].

Noise Source	Sound Power (dBA)		Constant Operating Sound Power (dBA)
	Max (peak)	Min	
Pile driver (Impact noise)			132
Pneumatic chip hammer	131	121	
Jack Hammers, Rock Drills	130	112	
Rock drill			130
Trucks (All types)	127	99	
Tractors	126	108	
Front End/Wheel loader	125	70	
Backhoes	124	101	
Scrapers, Graders	124	111	
Pneumatic Wrenches	121	116	
Concrete Mixers	120	106	
Crane max	120	107	
Mechanical shovel			120
Pavers			120
Pneumatic breaker			120
Air Compressors	119	106	
Concrete joint cutter	119	116	
Portable saw	119	105	
Jawcrusher diesel ca 250 kW			118
Stud welder			118
Bulldozer	117	110	
Breaker, mini-robot mounted			115
Piling, vibrating hammer			115
Concrete Pumps	114	109	
Roller Compactor	114	104	
Earth Tamper	113	107	
Generators	113	103	
Saws	113	101	
Concrete Vibrator	112	101	
Cutter, circular, steel (electric)			112
Hammer	112	104	
Impact crusher			112
Earthmover	111	104	
Drill rig, rotary type (diesel)			110
Road grinder (petrol)			108
Road sweeper			107
Water jetting unit (diesel)	107	94	
Dredger, Suction, Grout pumps	105	103	
Road ripper, excavator mounted			105
Paint line remover			104

[1] www.fhwa.dot.gov

Concrete crusher	103	94	
Soil pump			103
Poker, vibratory, hand-held (electric)			102
Generator, portable			100
Power pack (diesel)			100
Power swivel			100
Trucks (Typical onsite)			99

Noise Source	Constant Operating Sound Power (dBA)
Jig-saw, hand-held, wood (electric)	99
Road ripper, mini-robot mounted	97
Air blower (electric)	95
Excavator, mini-robot mounted	94
Agitator (electric)	90
Concrete buster	90
Grout mixer	90
Drill, hand-held (battery)	89
Gantry Operational Noise (onsite)	89
Pump Noise (onsite)	89
Paint line marker (low pressure)	87

Estimated equivalent sound power levels for typical noise generated by general site operations.

General Site Operation	Sound Power (dBA)		Constant Operating Sound Power (dBA)
	Max (peak)	Min	
Construction site noise	132	N/A	112

APPENDIX D

Appendix D: Site Investigation Localities & Equipment/Calibration

10-2: Site Investigation Localities (WGS 84 UTM)

Measurement Locality	Latitude	Longitude
Measurements		
M1	29°54'11.6"S	31°00'19.9"E

Receptor Locality	Latitude	Longitude
Measurements		
NR1	29°54'23.15"S	31° 0'52.07"E
NR2	29°54'30.79"S	31° 0'36.55"E

10-3: Equipment and Calibration

Sound Level Meters (Class / Type 1)	Serial No.	Calibration date	Calibration Certificate No. (M & N Acoustic Services)
Svantek 957 (SLM)	14528	07 August 2025	2025-AS-1976
Svantek 979 (SLM)	69437	22 August 2024	2024-AS-1967
01dB Calibrator	990541	28 November 2024	2024-AS-3134

sanas Calibration Laboratory
CAL-048-13-00
CAL-048-01-00

M AND N ACOUSTIC SERVICES (Pty) Ltd
Co. Reg. No: 2012/123238/07 VAT NO: 4300255876 BEE Status: Level 4
P.O. Box 61713, Pierre van Ryneveld, 0045
15 Mustang Avenue, Pierre van Ryneveld, 0045
Tel: 012 689-2008 (076 920 3070) • Fax: 086 211 4690
E-mail: admin@mnacoustics.co.za / marianka@mnacoustics.co.za
Website: www.mnacoustics.co.za

CERTIFICATE OF CALIBRATION

CERTIFICATE NUMBER	2025-AS-2291
ORGANISATION	ACOUSTECH CONSULTING
ORGANISATION ADRESS	14A JUDITH STREET, OBSERVATORY, JOHANNESBURG, 2198
CALIBRATION OF	SOUND & VIBRATION ANALYZER complete with built-in ⅓-OCTAVE/OCTAVE FILTER, ½" PRE-AMPLIFIER and ½" MICROPHONE
MANUFACTURERS	SVANTEK and ACOS
MODEL NUMBERS	SVAN 957, SV12 L and 7052E
SERIAL NUMBERS	14528, 17740 and 83257
DATE OF CALIBRATION	05 – 07 AUGUST 2025
RECOMMENDED DUE DATE	AUGUST 2027 **(SEE REMARKS 4.8)**
PAGE NUMBER	PAGE 1 OF 6

This certificate is issued in accordance with the conditions of approval granted by the South African National Accreditation System (SANAS). This Certificate may not be reproduced without the written approval of SANAS and M and N Acoustic Services.

The measurement results recorded in this certificate were correct at the time of calibration. The subsequent accuracy will depend on factors such as care, handling, frequency of use and the number of different users. It is recommended that re-calibration should be performed at an interval, which will ensure that the instrument remains within the desired limits and/or manufacturer's specifications.

The South African National Accreditation System (SANAS) is member of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). This arrangement allows for mutual recognition of technical test and calibration data by member accreditation bodies worldwide. For more information on the arrangement please consult www.ilac.org

Calibrated by Calibration Technician:	D.N. MASIMULA	**Clause 3.1 & 3.2**
Calibrated/Supervised by Calibration Technician:	W.S SHANYONI	**Clause 3**
Authorized/Checked by SANAS Technical Signatory:	M. NAUDÉ	**Date of Issue: 08 AUGUST 2025**

Director: Marianka Naudé (082 727 3312)

sanas Calibration Laboratory
148
1302

M AND N ACOUSTIC SERVICES (Pty) Ltd
Co. Reg. No: 2012/123238/07 VAT NO: 4300255876 BEE Status: Level 4
P.O. Box 61713, Pierre van Ryneveld, 0045

No. 15, Mustang Avenue
Pierre van Ryneveld, 0045

Tel: 012 689-2007 (076 920 3070) • Fax: 086 211 4690
E-mail: admin@mnacoustics.co.za / marianka@mnacoustics.co.za
Website: www.mnacoustics.co.za

CERTIFICATE OF CALIBRATION

CERTIFICATE NUMBER	2024-AS-1976
ORGANISATION	ACOUSTECH CONSULTING
ORGANISATION ADRESS	P O BOX 752595, GARDENVIEW, 2047
CALIBRATION OF	SOUND & VIBRATION ANALYZER complete with built-in ⅓-OCTAVE/OCTAVE FILTER, ½" PRE-AMPLIFIER and ½" MICROPHONE
MANUFACTURERS	SVANTEK and G.R.A.S
MODEL NUMBERS	SV979, SV17 and 40AE
SERIAL NUMBERS	69437, 72724 and 617115
DATE OF CALIBRATION	22 AUGUST 2024
RECOMMENDED DUE DATE	AUGUST 2025
PAGE NUMBER	PAGE 1 OF 6

This certificate is issued in accordance with the conditions of approval granted by the South African National Accreditation System (SANAS). This Certificate may not be reproduced without the written approval of SANAS and M and N Acoustic Services.

The measurement results recorded in this certificate were correct at the time of calibration. The subsequent accuracy will depend on factors such as care, handling, frequency of use and the number of different users. It is recommended that re-calibration should be performed at an interval, which will ensure that the instrument remains within the desired limits and/or manufacturer's specifications.

The South African National Accreditation System (SANAS) is member of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). This arrangement allows for mutual recognition of technical test and calibration data by member accreditation bodies worldwide. For more information on the arrangement please consult www.ilac.org

Calibrated by Calibration Technician:	K.L. MONTSHO	**Clause 3.1 & 3.2**
Calibrated/Supervised by Calibration Technician:	W.S SIBANYONI	**Clause 3.1 - 3.4**
Authorized/Checked by SANAS Technical Signatory:	M. NAUDÉ	**Date of Issue: 27 AUGUST 2024**

Director: Marianka Naudé

sanas
Calibration Laboratory
CAL-048-13-00
CAL-048-01-00

M AND N ACOUSTIC SERVICES (Pty) Ltd
Co. Reg. No: 2012/123238/07 VAT NO: 4300255876 BEE Status: Level 4
P.O. Box 61713, Pierre van Ryneveld, 0045
15 Mustang Avenue, Pierre van Ryneveld, 0045
Tel: 012 689-2008 (076 920 3070) • Fax: 086 211 4690
E-mail: admin@mnacoustics.co.za / marianka@mnacoustics.co.za
Website: www.mnacoustics.co.za

CERTIFICATE OF CALIBRATION

CERTIFICATE NUMBER	2024-AS-3134
ORGANISATION	ACOUSTECH CONSULTING
ORGANISATION ADRESS	14A JUDITH STREET, OBSERVATORY, JOHANNESBURG, 2198
CALIBRATION OF	SOUND LEVEL CALIBRATOR complete with ½" ADAPTER
MANUFACTURER	01 dB
MODEL NUMBER	CAL 01 and BAC 012
SERIAL NUMBER	990541
DATE OF CALIBRATION	28 NOVEMBER 2024
RECOMMENDED DUE DATE	NOVEMBER 2025
PAGE NUMBER	PAGE 1 OF 3

This certificate is issued in accordance with the conditions of approval granted by the South African National Accreditation System (SANAS). This Certificate may not be reproduced without the written approval of SANAS and M and N Acoustic Services.

The measurement results recorded in this certificate were correct at the time of calibration. The subsequent accuracy will depend on factors such as care, handling, frequency of use and the number of different users. It is recommended that re-calibration should be performed at an interval, which will ensure that the instrument remains within the desired limits and/or manufacturer's specifications.

The South African National Accreditation System (SANAS) is member of the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA). This arrangement allows for mutual recognition of technical test and calibration data by member accreditation bodies worldwide. For more information on the arrangement please consult www.ilac.org

Calibrated by:	Authorized/Checked by:	Date of Issue:
W.S. SIBANYONI (CALIBRATION TECHNICIAN)	M. NAUDÉ (SANAS TECHNICAL SIGNATORY)	02 DECEMBER 2024

Director: Marianka Naudé (082 727 3312)

APPENDIX E

Appendix E: CV's

CV

Oliver Knoppersen

Acoustic Consultant

Profile

Oliver worked for Pro Acoustic Consulting Engineers from 2009 to 2015 in an internship that shaped his knowledge of acoustics. In 2015 he joined Acoustech Consulting. He specialises in many areas of acoustics, but his main interests lie in building acoustics, Industrial acoustics, Studio Acoustics and Environmental Acoustics. He has been involved in a number of projects in South Africa as well as on the African Continent. He has been involved in Green Star Rated buildings, offices, studios, a number of industrial projects and environmental projects in South Africa and abroad. Some of his most prestigious projects include Menlyn Park Shopping Centre, , YFM Radio Studios (South Africa), Kusile Power Station (South Africa), Ingula Power Station (South Africa), KCM Copper Mine (Zambia) and the initial phase of Hillside Aluminium Plant.

Experience and skills

Oliver's skills and experience include a working knowledge of all SABS standards (SANS, South African National Standards) South African Regulations, ISO Acoustic Standards and international best practice relating to architectural and environmental acoustics.

As a consultant, the ability to assess existing layouts and designs, and provide carefully designed solutions in cross disciplinary environments is critical. Oliver brings the following skills to the team – Environmental acoustic modelling and simulation -SoundPLAN), manipulation and creation of dxf/dwg drawings, internal acoustical design, sound insulation design, noise mitigation design, noise measurement & analysis, project management, producing design documentation and excellent communication.

.

Selected Projects

Parliament New Assembly, Cape Town
Acoustic design for all areas including the Assembly Chamber, offices, meeting rooms, executive offices and boardrooms

Globeleq - Kribi Power Development Company. Noise assessment, noise and low frequency mitigation design of a 216MW Gas to Power Station (13 closed cycle combustion engines). To be completed in early 2021.

Kusile Power Station

Design of the desulphurisation Plant to meet max. 85dBA at 1 m from the plant façade. Completed 2012

KMC Copper Mine, Zambia

Noise reduction to meet the noise specifications for an adjacent hospital. Completed in 2018

South African Reserve Bank, Pretoria
Office Refurbishment including new acoustic design for all offices, meeting rooms, executive offices and boardrooms

Richards Bay Hillside Aluminium Smelter

Industrial Noise Survey in order to provide Noise Control Recommendations. Completed in 2018.

South32 Wolvekrans Colliery Mega-facility

Noise Impact Assessment . Completed in 2019

Bidvest Quarry 2 Extension Durban Noise Impact Assessment

Noise Impact Assessment at a terminal at the Durban Harbour. Completed in 2016

National Multi Product Pipeline (NMPP) – Noise Impact Assessment and Noise Mitigation Design

Pipeline from Durban to Jameson Park with Pump Stations. Noise Impact Assessment and Noise Control Recommendations. Completed in 2014

Position
Director and Senior Acoustic Consultant

ID Number
8608245163086

Nationality
South African

Languages
English

Residential address
24 Orwell Street
Kensington
Johannesburg
2094

Contact detail
oliver@acoustech.co.za
082 807 4895
011 648 4998

Formal qualifications
AMIOA Institute of Acoustics (IOA UK) 2018

Key skills
Architectural Acoustics
Industrial Acoustics
Noise Control
Environmental Acoustics
Broadcasting Studios Acoustics

Experience
16 years

References

Thinga Nethanani
NTC Group
Project Manager
083 260 8877

Yovka Raytcheva-Schaap
Zutari
Environmentally Sustainable Design (ESD) Consulting & Project Management
082 779 2551

Marlin Nadasen
Naidu Consulting
Manager
083 780 4809

Professional Experience

2009-2015: Trainee Consultant: Worked for Pro Acoustic with two professional engineers (Jean Knoppersen and Ivan Lin) and my colleague Steven Liddell (Now owner of Venta Acoustics UK) in the field of acoustics.

I underwent training in the use of Soundplan to produce large scale terrain models; acquire and interpret source noise levels for use in the model, run calculations using the appropriate methodologies/standards; interpret the results of the noise model calculations; assess the results against appropriate criteria and write reports in preparation for issue to clients, subject to checks by senior staff.

Understood GreenStar Assessment (a rating system similar to BREEAM), Prepared technical letters and reports under guidance from senior staff;

I attended client meetings and design team workshops with senior staff to gain experience and understanding. I would usually action the items discussed.

I understood Environmental Noise Surveys, source noise measurements and sound insulation testing. Initially, this was under the supervision of experienced staff. Later I undertook this work on my own.

Assistant project manager in the design and construction of radio studios, working closely with a specialist contractor including frequent site visits. Gained exposure to practical operational requirements of the studios, construction methodologies and consideration of onsite factors and limitations,

I was responsible for the maintenance and calibration of equipment (sound level meters).

2015 to Present: Worked with a professional engineer (Jean Knoppersen) in the field of acoustics.
I was responsible for the maintenance and calibration of equipment (sound level meters).

I understood Environmental Noise Surveys, source noise measurements and sound insulation testing. I undertook this work on my own.

Prepared technical letters and reports under guidance from senior staff;

I attended client meetings and design team workshops. I would usually action the items discussed.

Proficient at Noise prediction modelling to produce large scale terrain models; acquire and interpret source noise levels for use in the model, run calculations using the appropriate methodologies/standards; interperate the results of the noise model calculations; assess the results against appropriate criteria and write reports in preparation for issue to clients, subject to checks by senior staff.

2019: Promoted to Directorship in Acoustech Consulting

Project List

Nedcore Sandton
9-hour Noise Measurements - Green Star Design

Mpower Radio Studio Witbank
Studio Design + Project Management

NMPP Pipeline and Pump Stations
24-hour Noise Measurements

O.R Tambo Hotel
Sound Insulation Measurements

Tanza Night Club
Noise Measurements

VOPAK (Chemical Storage Facility)
Industrial Noise Measurements + Noise Modelling (Soundplan)

YFM Radio Studio Craighall Park
Studio Design + Project Management

Stark TV Studios
Sound Insulation Measurements

Department of international Relations & Cooperation Conference Room
Room Acoustics + Sound Insulation Measurements

Discovery Data Centre
Noise Measurements

Holiday Inn Express Hotel Roodepoort
Sound Insulation Measurements

Jacaranda FM Radio Studio Nelspruit
Studio Design + Project Management

Park Inn Hotel Sandton
Sound Insulation Measurements

KPMG Campus
Noise Measurements

Menlyn Maine
Noise Measurements

Nedcor Phase 2 Greenstar
Green Star Internal Noise Measurements

NMPP Pipeline and Pump Stations
Enclosure Design + Noise Modelling

Radioheads Radio Studio
Studio Design+Project Management

Voice of WITS (University Radio Studio)
Design+Project Management

Zouk Night Club
Noise Measurements

ABSA Towers West Green Star Measurements

Able Partitions
Sound Insulation Measurements+Report

CheckersHyper Mayville
HVAC Measurements

Danone Factory
Factory Noise Measurements

Gautrain Sandton Extract Fans
Fan Noise Measurements

Hilton Hotel Sandton
Noise+ Sound Insulation
Measurements+Report

Jan Smuts Research Project
Road Traffic Noise
Research+Presentation

Kusile Power Station
Industrial Noise Modelling+Report

Middelburg Eastern Bypass
Road Traffic Noise Modelling+Report

Nedbank Newtown Noise
Measurements+Report

Ilanga Mall HVAC Noise
Measurements

NMPP
Site Inspection+Noise Measurements

Planet Fitness Bedfordview
Structural borne Investigation+Noise
Measurements+Report

Planet Fitness Village Walk
Noise Measurements

SCAW Metals
Environmental Noise
Measurements+Report

South Point Braamfontein
Office HVAC Noise Measurements

Vodafone Innovation Centre
Noise Measurements and Façade
Design

WITS Generators
Generator Noise Measurements

8 Melville Road
Noise survey + Report

90 Grayston Drive
Green Star 9 hour Noise survey +
Report

102 Rivonia Road
Green Star 9 hour Noise survey +
Report

Erf 108 Corlett Drive
1 hour Measurement

DSTV City Green Star
9 hour Noise survey + Report

Formula One Hotel
Sound Insulation Measurements +
Report

Grayston Sun Hotel
Noise survey + Report

Grosvenor Studio (EWH)
Studio Design and Project
Management

Grundfos Green Star
9 hour Noise survey + Report

Hyundai Head Office
Green Star 9 hour Noise survey +
Report

Jet Blast and Drilling Middelburg
Sound Insulation Measurements

Kusile Power Station Noise Study
Review
Industrial Noise Modelling+Report

Lakeside Office Park
1 hour Measurement+Report

Market Theatre
STI+Reverb+room Impulse Response
Measurements

Newtown Junction Green Star
9 hour Noise survey + Report

Newtown Majestic Green Star 9
hour Noise survey + Report

NWU Potchesfstroom Amphitheatre
Room Impulse Response
Measurements

Pentad Office Pretoria
Office Measurements+Report

Swaziland Broadcast Studios (SBIS)
Project Management

Unilever depot
Noise
Modelling+Measurements+Report

USAID Pretoria Green Star
9 hour Noise survey + Report

Vodacom Data Park
Noise Measurements+Façade
Design+Report

Vopak Revision (Chemical Storage
Facility)
Industrial Noise Modelling+Report

Abbotts College
Room Impulse Response
Measurements (Study with Ecophon)

The Baron Restaurant, Bryanston
Room Acoustics

Kathleen Close Apartment Building
Attenuator Design for Heat
Exchangers

Michelangelo Legacy Hotel Nightclub
Measurements+Report

MTN Gallo Manor Call Centre
Open Plan Office Measurements

Primedia 94.7 Radio Studio
Independent Consulting on Studio
Building to ensure compliance with
clients specifications

ABSA Tower South+270RR
HVAC Measurements+ Noise
Modelling

MIS Engineering
Noise Measurements+Report

5 Packard Street
Road Noise Study – Noise Modelling
and Noise Mitigation Design

ABSA Contact Centre Service Yard
12-hour Noise Measurements
Mechanical Noise Mitigation Design

Anglo-American 55 Marshall Street
Site Inspections of implementation
of boardroom acoustic design

Bretton Wood Apartment Building
Heat Exchangers
Noise Mitigation Design

Davar Partners International
Studio Design and Project
Management

Oscar Pistorius Trial
Noise Modelling and Research

Joe Public Voice Over and Recording
Studio
Studio Design

Margate Indoor Shooting Range
Noise Mitigation and Internal
Acoustic Design

Planet Fitness Gym Bedfordview
Sound Insulation Measurements and Noise Mitigation Design

Rheinmettal Denel Munitions
Noise Mitigation and Internal Acoustic Design

SAMHS Military Hospital Generators
Noise Measurements and Noise Mitigation Design

Universal Music Studio
Music Studio Design and Project Management

Vodacom MTB Data Building
Occupational Noise Measurements and Report

Advantedge Generator
Generator Noise Measurements and Report

Big Brother House
Sound Insulation Recommendations and Noise Survey

Bounce
16-hour Noise Survey and Report

DSTV
Mechanical Noise Investigation

Johnny's Restaurant Generator
Noise Measurements and Report

Kansanshi Smelter Zambia
Industrial Noise Measurements and Report

Life Wilgers Hospital
Mechanical Noise Measurements and Noise Mitigation Report

Menlyn Park Shopping Centre
Green Star Acoustic Analysis and Report

Quantum Foods
Mechanical Noise Mitigation Design

Rebel Foods
Mechanical Noise Mitigation Design

Revelation Church of God Music Studio
Music Studio Design and Project Management

SASRIA Generator
Generator Noise Mitigation Design

Southlands Food Depot
12 Hour Noise Measurements, Noise Nuisance Assessment and noise mitigation design

St Andrews School for Girls
New Hall Internal Acoustic Design

St Johns College
Room Acoustic Design

USAID Southern Africa
Green Star Internal Noise Audit

Waterkloof Glen Pretoria
9-Hour Noise Measurements

Sun City Casino Entertainment Centre Refurbishment
Sound Insulation and Room Acoustic Design

Times Square Menlyn Maine Casino, Arena and Hotel
Façade Design, Sound Insulation and Room Acoustics Design, Hotel Room Acoustic Design, Conference Centre Design, Arena Acoustic Design

Bidvest Chemical Storage Terminal
Noise Measurements, Noise Modelling and Environmental Noise Impact Assessment

Bloemfontein Advocate Office Building Sound Insulation Measurements and recommendations

Broadwalk Office Park
Noise Measurements

Econet
Acoustic Investigation into existing TV Studios and provided recommendations to achieve better acoustic performing studios.

Krank'ed Up Music Festival
Noise Monitoring during a Music Festival

Menlyn Park Shopping Centre Phase 1
Green Star As Built Audit Retail Tool

Optimum Mine Ventilation Shaft
Environmental Impact Assessment

Statistics of South Africa Office Building
Sound Insulation Measurements to ensure compliance with clients specifications

Studio Blu Conference Venue
Noise Impact assessment and noise mitigation design

Unilever Dust Extractors
Noise Measurements and noise mitigation design to reduce noise from dust extractors to the rest of the plant area.

Assemblies of God Church Nelspruit
Noise Impact Assessment

BMW M Festival
Noise Monitoring during the Music Festival

El Devino Complex Noise Complaint
Noise Nuisance Assessment

Houghton Hotel Conference Centre
Internal Acoustic Design

I4C Office
Measurement Reverberation Time Measurement before and after acoustic treatment

Ingula Pump Storage Eskom
Noise Mitigation Design

Jehovah Witness Hostel Rwanda
Acoustic Recommendations to reduce noise from the city (Night clubs, restaurants and a stadium) to the existing hostel

Midstream College Music Festival
Noise Monitoring during a Music Festival

NOOA Petroleum Chemical Storage
Noise Measurements, Noise Modelling and Environmental Noise Impact Assessment

199 Bryanston Drive Office Park Generator
Noise Measurements and Noise Mitigation Design

Accenture Office Building
Sound Insultation measurements to ensure compliance with clients specifications

Andiccio24 Restaurant
Noise Nuisance Assessment

Booysens Magistrate Court
Sound Insultation measurements to ensure compliance with the acoustic design

Discovery Head Office Boardroom
Acoustic recommendations

DSTV Delicious Festival, Kyalami
Noise Management Plan and Noise Monitoring during a Music Festival

Formfunc Office
Greenstar IEQ 5 Audit

FSM
Sound Insulation Tests of existing prefabricated mining accommodation

Generator Noise Wapadrand
Noise Measurements of a Generator

Hillside Aluminium Smelter Richards Bay
Noise Survey to assess the noise levels that the employees experience with a view to provide noise mitigation measures. Next phase would be to provide noise mitigation design for each area.

Jolly Roger Tavern Pretoria
Noise Nuisance Assessment and noise mitigation design

KCM Copper Mine Ball Mills
Noise Impact Assessment, Noise Mitigation Design. The project is awaiting the go ahead for the implementation of the noise mitigation (approx. $6 million project)

Menlyn Park Shopping Centre Phase 2
Green Star Acoustic Design Retail Tool

Nampak House Boardroom
Acoustic recommendations

Natural Dehydrated Foods Nelspruit
Noise Impact Assessment

Silver Stream Office Park Generator
Noise Measurements and Noise Mitigation Design

Talco Grain and Milling
Noise Measurements, Mechanical Noise Mitigation Design

Times Square: Sun Arena
Compliance Measurements: Reverberation Time, Sound Insulation Tests, HVAC noise Measurements

Vodacom Boardroom
Acoustic recommendations

Fort Ikapa Cape Town Shooting Range
Noise Impact Assessment

Altitude Beach Restaurant
Noise Impact Assessment

Sudor Coal Weltevreden Colliery
Noise Impact Assessment

140 West Street Sandton
5th Floor demising wall design

Standard Bank Head Office Rosebank
Gas Generator Noise Mitigation Design

Alpla Office Design
Noise mitigation to ensure office noise levels specifications are met.

Castle Gate Lifestyle Centre
Generator noise measurements

Illovo Central
Chiller Noise Mitigation Design

UIF Sunnyside Office Development
Architectural Acoustic Design of the building

Africrest Residential
Sound Insulation Testing

Air Liquide Large Industries
Industrial Office Noise Reduction Design

Altitude Beach Restaurant
Noise Survey and Noise Mitigation

Barloworld Generator Civic Theatre
Noise Mitigation design

Bayport Financial Services
Generator Noise Survey

Bokpoort PV Plant Generators
Noise Impact Assessment

Castle Gate Lifestyle Centre
Generator Noise Survey

Data Centre Lagos
32MW Generator Noise Mitigation Design

New Way Generators
Generator Noise Survey for Teraco Data Centres

Smart P.E.T Factory
Noise Assessment and noise mitigation design

Virgin Active Morningside
Noise Assessment and noise mitigation design

ABSA Branches
Noise investigation and acoustic measurements

Air Liquide Large Industries
T17 Building – Noise Mitigation

Foreign, Commonwealth and Development Office, Nairobi
Noise Assessment

Hotel Development, Douala Cameroon
Noise Survey

IBM Office Fit-Out
full acoustic design of the offices

AATC Aparthotel
Full acoustic design of the Hotel

SPEKE Resort Conference Centre.
Architectural acoustic design of the 4000m2 conference hall and meeting rooms

Arena De Cotonou, Benin
Architectural acoustic design of the 10 000-seater Arena

Amahoro Stadium, Rwanda
Acoustic Review of the 45 000-seater Stadium refurbishment project

Summary CV

Duduzile Skhosana

Consultant

Profile

Duduzile is currently working for Acoustech Consulting as a Consultant with vast experience providing administrative skills in office settings. Accustomed to addressing the changing needs of an office and supporting colleagues and superiors with excellent assistance skills. Works closely with a professional engineer and an Acoustics Consultant aiding in various projects that involve environmental noise surveys, noise monitoring, sound insulation testing and source noise measurements. She brings forth high quality organizational skills and a self-motivated drive to achieve excellence. Proficient in various software applications and filing systems, A commitment to handle confidential tasks safely and professionally.

Duties

Ad Hoc Administrative duties

Assists with quotations for new work opportunities.

Assists with preparations of reports in line with the terms of reference of some projects.

Assists with collection of data and analysis for various project through noise surveys, source noise measurements, sound insulation testing and run calculations using appropriate standards to interpret results of the noise model calculations with Svan PC++

Selected Projects

Bokpoort PV Plant

Assisted with noise measurements for the Noise Impact Assessment. (2020)

Sudor Coal

Assisted with ambient noise measurements (2020)

Monchique Apartments

Noise investigation between two apartments – Assisted with noise measurements (2020)

Castle Gate Lifestyle Centre

Generator Noise Assessment – Assisted with noise measurements and report (2020)

Sky Hotel Sandton

Sound Insulation Tests- Assisted with tests and calculations (2020)

New Way Power Generator

Generator Noise Assessment for Teraco– assisted with noise measurements and reports (2021)

Broadway Sweets

Noise Survey – Assisted with noise measurements tests (2021)

Swiss Reinsurance

Assisted with sound insulation tests (2021)

ABinBev

Assisted with sound insulation tests (2021)

Croft & Co

Reverberation Time Measurements – Performed measurements before and after installation of Ecophon Solo Panels (2021)

Virgin Active Morningside

Noise Investigation between gym and resident (2021)

WKC

Assisted with ambient noise measurements (2021)

Sibanye-Stillwater

Biennial Noise Monitoring for - Driefontein, Kloof, Rand Uranium, Ezulwini, Burnstone & Beatrix mine (2021)

Paper & Pulp Industries

Assisted with noise measurements and report (2021)

Rainbow Skyreach

Assisted with light aircraft noise measurements and report writing (2021)

Smart P.E.T Factory

Assisted with noise survey (2021)

Africrest

Assisted with sound insulation testing of refurbished apartments (2021)

Bayport Sandton Generator Noise Assessment

Generator Noise Assessment – Conducted noise measurements and assisted in report writing (2021)

Altitude Beach Fourways

Noise Monitoring (2021 & 2022)

GIBS

Sound insulation testing of a studio (2022)

St John's College (Hall)

Performed Sound Insulation Tests (2022)

50 Coleraine Drive Estate

Generator Noise Assessment – Assisted with noise measurements and report (2022)

Feltex Auto Trim Silverton

Factory Noise Measurements (2022)

Clarina Ext 43 Township

Conducted a noise impact assessment (2022)

Ukhuni Business Furniture

Assisted with an acoustic assessment on meeting capsule pods - Sound Insulation (2022)

Sandton Mosque

Assisted with noise measurements (2022)

Zwavelstream Clinic

Performed noise measurements (2022)

ABSA

Assisted with an acoustic noise survey at various branches (2022)

Ekandustria

Performed a noise survey and assessment

Tasbet Park Extension 3 Township

Conducted a noise impact assessment

75 Sandpiper Street Generator Noise Assessment – Assisted with noise measurements and report writing

Medupi Power Station

Assisted with ambient noise measurements (2022)

Acoustech Consulting (Pty) Ltd REG 2015/098932/07
Directors: J Knoppersen Pr Eng BSc Eng (Wits) GDE (Wits); O Knoppersen AMIOA (IOA)
Associates: W Meyer BSc Eng (Mech) (UKZN)

DSTV Delicious

Noise monitoring during the music festival (2022)

BMW M Festival

Noise monitoring during the music festival (2022)

Crocodile Reserve BESS Facility

Conducted a noise impact assessment (2022)

Unica Iron & Steel (Unit 2)

Conducted a noise impact assessment (2022)

Waterfall Country Estate Generator

Generator Noise Survey (2022)

Lotus Gardens ERF 399 Township

Conducted a noise impact assessment (2022)

Grandmark International Pretoria

Conducted a noise survey and assessment (2022)

4 Fricker Road (Illovo) Generator

Generator Noise Survey & Assessment (2022)

Kameelhoek Mine

Conducted a noise impact assessment (2023)

UJ 3D Printed House

Sound Insulation measurements (2023)

Boundary Place Generator

Generator Noise Survey & Assessment (2023)

79 Kallenbach Drive Generator

Generator Noise Survey & Assessment (2023)

15 Fricker Road (Assore) Generator

Generator Noise Survey & Assessment (2023)

5 Sturdee Avenue (Rosebank) Generator

Generator Noise Survey & Assessment (2023)

Rosebank Corner Generators

Generator Noise Survey & Assessment (2023)

Grayston Ridge Office Park Generators

Generator Noise Survey & Assessment (2023)

DSTV Delicious

Noise monitoring during the music festival (2023)

Tenbosch Mine

Conducted a noise impact assessment (2023)

Canal Walk Shopping Centre

Ambient Noise Measurements (2023)

Park Hyatt Winston

Sound Insulation Measurements (2023/2024)

Hatfield Plaza

Noise Survey & Assessment of Bar/ Restaurants (2024)

158 Jan Smuts Ave

Generator Noise Survey & Assessment (2024)

PNP Norwood

Post Generator Noise Mitigation Measurements (2024)

1 Sixty Jan Smuts Ave

Generator Noise Survey & Assessment (2024)

Parliament (CPT)

Ambient Noise Measurements (2024)

South Coast Phase 3 Pipeline NIA

Conducted a noise impact assessment (2024)

Canal Walk Shopping Centre

Generator Noise Survey and Assessment (2024)

Colgate- Palmolive Boksburg

Noise Control Noise Survey (2024)

DSTV Delicious

Noise monitoring during the music festival (2024)

Witberg

Noise Monitoring (2024)

BMW M Festival

Noise monitoring during the music festival (2024)

Baby Steps

Noise Investigation (2024)

Kyalami 9- Hour Event

Noise monitoring during the event (2024)

XM Conference & Awards

Event Noise Monitoring (2024)

Waterfall Estate Padel Court

Noise Assessment (2024)

British American Tobacco South Africa (Heidelberg)

Noise Survey & Assessment(2024)

Kwanda Resources

Noise Monitoring (2024)

Standard Bank Kingsmead

Reverberation measurements (2025)

BHBW Site

Noise Assessment (2025)

Sibanye-Stillwater

Noise Monitoring for - Driefontein, Kloof, Rand Uranium, Ezulwini, Burnstone & Beatrix mine (2025)

Kwanda Resources

Noise Monitoring(2025)

Broadway Sweets (Germiston)

Noise Survey (2025)

JW Krugersdorp Dining Hall

Reverberation measurements (2025)

Clanwilliam Dam Crusher Plant

Environmental Noise Impact Assessment(2025)

RCL Foods Groceries Factory Randfontein

Environmental Noise Survey & Assessment (2025)

Position
Assistant Consultant

ID Number
9206010109084

Nationality
South African

Languages
English

Residential address
162 Anderson Street
Marshalltown

Johannesburg
2001

Contact detail
dudu@acoustech.co.za
071 164 8193
011 648 4998

Formal qualifications
BA Geography & Environmental Science (Monash University)

Key skills
Environmental Acoustics

Experience
5 years 9 Months

References

Jean Knoppersen

082 456 0977

Oliver Knoppersen

082 807 4895

Grace Langa
Sibanye-Stillwater
Superintendent Environmental Compliance Coordinator

011 278 9770
083 375 5770

SPECIALIST DECLARATION

forestry, fisheries
& the environment

Department:
Forestry, Fisheries and the Environment
REPUBLIC OF SOUTH AFRICA

Private Bag X447, Pretoria, 0001, Environment House, 473 Steve Biko Road, Pretoria, 0002 Tel: +27 12 399 9000, Fax: +27 86 625 1042

SPECIALIST DECLARATION FORM – AUGUST 2023

Specialist Declaration form for assessments undertaken for application for authorisation in terms of the National Environmental Management Act, Act No. 107 of 1998, as amended and the Environmental Impact Assessment (EIA) Regulations, 2014, as amended (the Regulations)

REPORT TITLE
TNPA Port of Durban Road Upgrades – Noise Impact Assessment

Kindly note the following:

1. This form must always be used for assessment that are in support of applications that must be subjected to Basic Assessment or Scoping & Environmental Impact Reporting, where this Department is the Competent Authority.
2. This form is current as of August 2023. It is the responsibility of the Applicant / Environmental Assessment Practitioner (EAP) to ascertain whether subsequent versions of the form have been published or produced by the Competent Authority. The latest available Departmental templates are available at https://www.dffe.gov.za/documents/forms.
3. An electronic copy of the signed declaration form must be appended to all Draft and Final Reports submitted to the department for consideration.
4. The specialist must be aware of and comply with '*the Procedures for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the act, when applying for environmental authorisation - GN 320/2020)*', where applicable.

1. SPECIALIST INFORMATION

Title of Specialist Assessment	TNPA Port of Durban Road Upgrades Noise Impact Assessment
Specialist Company Name	Acoustech Consulting
Specialist Name	Duduzile Skhosana
Specialist Identity Number	9206010109084
Specialist Qualifications:	BA. Env. Sc
Professional affiliation/registration:	
Physical address:	14A Judith Street, Observatory, Johannesburg,2198
Postal address:	14A Judith Street, Observatory, Johannesburg, 2198
Postal address	Click or tap here to enter text.
Telephone	011 648 4998
Cell phone	0711648193
E-mail	dudu@acoustech.co.za

2. DECLARATION BY THE SPECIALIST

I, Duduzile Skhosana declare that –

- I act as the independent specialist in this application;
- I am aware of the procedures and requirements for the assessment and minimum criteria for reporting on identified environmental themes in terms of sections 24(5)(a) and (h) and 44 of the National Environmental Management Act (NEMA), 1998, as amended, when applying for environmental authorisation which were promulgated in Government Notice No. 320 of 20 March 2020 (i.e. "the Protocols") and in Government Notice No. 1150 of 30 October 2020.
- I will perform the work relating to the application in an objective manner, even if this results in views and findings that are not favourable to the applicant;
- I declare that there are no circumstances that may compromise my objectivity in performing such work;
- I have expertise in conducting the specialist report relevant to this application, including knowledge of the Act, Regulations and any guidelines that have relevance to the proposed activity;
- I will comply with the Act, Regulations and all other applicable legislation;
- I have no, and will not engage in, conflicting interests in the undertaking of the activity;
- I undertake to disclose to the applicant and the competent authority all material information in my possession that reasonably has or may have the potential of influencing –
    - any decision to be taken with respect to the application by the competent authority; and;
    - the objectivity of any report, plan or document to be prepared by myself for submission to the competent authority;
- All the particulars furnished by me in this form are true and correct; and
- I realise that a false declaration is an offence in terms of Regulation 48 and is punishable in terms of section 24F of the NEMA Act.

Signature of the Specialist

Acoustech Consulting

Name of Company:

11 Dec 2025

Date

3. UNDERTAKING UNDER OATH/ AFFIRMATION

I, _ Duduzile Skhosana_____, swear under oath / affirm that all the information submitted or to be submitted for the purposes of this application is true and correct.

Signature of the Specialist

Acoustech Consulting

Name of Company

11 December 2025

Date

Click or tap here to enter text. 7271005 0 MAHCRE CST

Signature of the Commissioner of Oaths

11 Dec 2025

Date

SUID-AFRIKAANSE POLISIEDIENS
STATION COMMANDER
2025 -12- 11
CLIENT SERVICE CENTRE
NORWOOD
SOUTH AFRICAN POLICE SERVICES