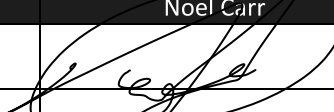
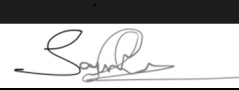


Glan Aqua MEIC Limited

Noise Impact Assessment – Irish Water

Leixlip Water Treatment Plant Co. Dublin

Report Check	Authored by Noel Carr	Reviewed by
Signed		
Date		26.07.2022 Rev 01

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1.0 SUMMARY

NVM Limited were instructed by Glan Aqua MEIC Ltd. on behalf of their clients Irish Water, to undertake a noise impact assessment with respect to the proposed upgrade of their Water Treatment Plant at Leixlip WTP Co. Dublin.

Irish Water is investing over €12 million to reduce the risk of any future boil water notices and safeguard drinking water to 620,000 people in the Greater Dublin Area.

Irish Water, working in partnership with Fingal County Council, has completed essential upgrade works at the Leixlip Water Treatment Plant (WTP).

This investment will benefit over 620,000 people across the Greater Dublin Area (GDA) through an improved water supply. Glan Aqua Limited delivered these works on behalf of Irish Water. The existing water treatment system at the plant had suffered due to limited investment. These upgrades have modernised the existing facilities and improved the quality, reliability and resilience of the water supply serving the Greater Dublin Area.

2018

The works on-site commenced in June 2018 and included upgrading the filtration system, the installation of a new ultraviolet (UV) disinfection process and upgrading of the existing disinfection system. These upgrades have resulted in significant improvement in the drinking water quality for consumers in the Greater Dublin Area, while also reducing the risk of any future boil water notices.

2022.

Following on from these significant works, a further programme of upgrade works will continue at the Leixlip Water Treatment Plant over the coming years to ensure the continued supply of safe drinking water to the Greater Dublin Area. These works will include the installation of pH correction, which is subject to an EPA Direction and upgrades to a number of processes including coagulation and clarification.

The purpose of the assessment was to identify and assess the potential noise impacts associated with the construction and operational phases of the development and to determine the extent of attenuation measures that are required to ensure that the existing baseline noise climate at any local noise sensitive receptor is not adversely impacted.

2.0 INTRODUCTION

NVM limited were requested to complete a noise impact assessment at the current Leixlip WTP Co. Dublin and its immediate environs to establish a criteria for the construction and operational projects associated with planned new development works on the site.

Project details; (www.water.ie/projects/local-projects/leixlip-water-treatment-p/)

An application for planning permission has been submitted to Leixlip Co. Council (planning reference 1535 / Register Reference SD21A/0272), from this submission a request of additional information was made.

Planning item – part 6

The applicant is requested to provide an acoustic assessment undertaken by a suitably qualified acoustic consultant describing and assessing the impact of noise emissions from the proposed alterations to include the accumulative noise impact from existing on-site activities.

The investigation must include, but not be necessarily limited to, the following:

- (a) The identification of any neighbouring noise sensitive receivers who may be potentially impacted by the proposal*
- (b) The identification of all operations conducted onsite as part of the development proposal that are likely to give rise to a public nuisance for the neighbouring noise sensitive receivers.*
- (c) Distances between the development and the nearest noise sensitive receiver and the predicted level of noise (LAeq, 15min) from any development activities when assessed at the boundary of that receiver.*
- (d) An assessment of the existing background (LA90, 15 min) and ambient (LAeq, 15 Min) acoustic environment at the receiver locations representative of the time periods that any noise impacts may occur. NOTE: For the purposes of the assessment background noise includes; noise of the surrounding environment excluding all noise sources currently located on-site.*
- (e) A statement outlining any recommended acoustic control measures that should be incorporated into the development to ensure the use will not create adverse noise impacts on the occupiers of any neighbouring noise sensitive properties.*

The Scope of this report is to meet the following objectives;

- *To work with the Glan Aqua team in identifying the NSL receptor locations adjacent to the site.*
- *To document noise sources which may be considered to influence the site and its surrounding environs.*
- *To calculate construction and operational noise levels.*
- *To identify the construction and operational phases of the site and to provide noise criteria applicable to both.*
- *To assess operational noise levels in line with current criteria and provide mitigations where necessary to the client to control these noise levels.*

The proposed development site is located adjacent to areas that may be classified as being noise sensitive locations where it is desirable to maintain a good quality noise environment for existing residents and to ensure that there is no significant increase in the noise climate due to the development during the operational phase and that short term elevated noise during the construction phase is managed and controlled to acceptable levels.

In order to quantify the current noise climate in the vicinity of the premises an environmental noise survey was conducted. The survey was conducted generally in accordance with ISO 1996: 2016: Acoustics – Description and measurement of environmental noise. And EPA-Guidance notes for noise: Licence Applications, Surveys and Assessments in relation to Scheduled Activities (NG4): 2016

The baseline noise surveys were conducted in proximity to the closest commercial and residential receptors to the subject site boundaries, these were completed to demonstrate the expected variability of noise levels during operational periods.

The recorded baseline noise levels may be described as being typical of any urban environment whose noise climate is primarily influenced by passing road traffic noise and a local urban town environment.

3.0 SURVEY DETAILS

In order to quantify the current noise climate in the vicinity of the site of interest an environmental noise survey was conducted.

The survey was conducted in accordance with;

- ISO 1996: 2016: Acoustics – Description and measurement of environmental noise, and
- The EPA-Guidance notes for noise: Licence Applications, Surveys and Assessments in relation to Scheduled Activities (NG4): 2016. Specific details are set out below.

The project assessment was undertaken by Ciaran Mythen of NVM limited. Ciaran has worked with NVM limited since 2016 and has a B.A (Mod) Honours Degree in Experimental Physics and has over 10 years of experience in acoustics and is a member of the Institute of Acoustics.

3.1 Measurements

Measurements were completed using 2 no. Svan 977 SLM type 1 monitoring devices with 1/3 Octave and audio recording capabilities. Both devices were calibrated pre and post measurements and no drift was noted. Serial no, details of calibration and a brief specification of the devices is provided in the report appendix.

3.2 Choice of Measurement Locations

A list of the existing noise sensitive locations were provided by the Glan Aqua team and once on site a further assessment was made of possible noise sources and receptor locations by the assessor.

The whole site and its immediate vicinity was reviewed to ensure that a topical assessment was undertaken.

The below map highlights the locations previously identified as noise sensitive monitoring points (1 – 5) and the additional points highlighted by the assessor (6-7).

In addition, spot measurements were completed at existing operating plant to establish the existing noise sources from site and further measurements were completed at residential properties off site on Cooldrinagh Terrace.

Fig 1. Map of existing locations

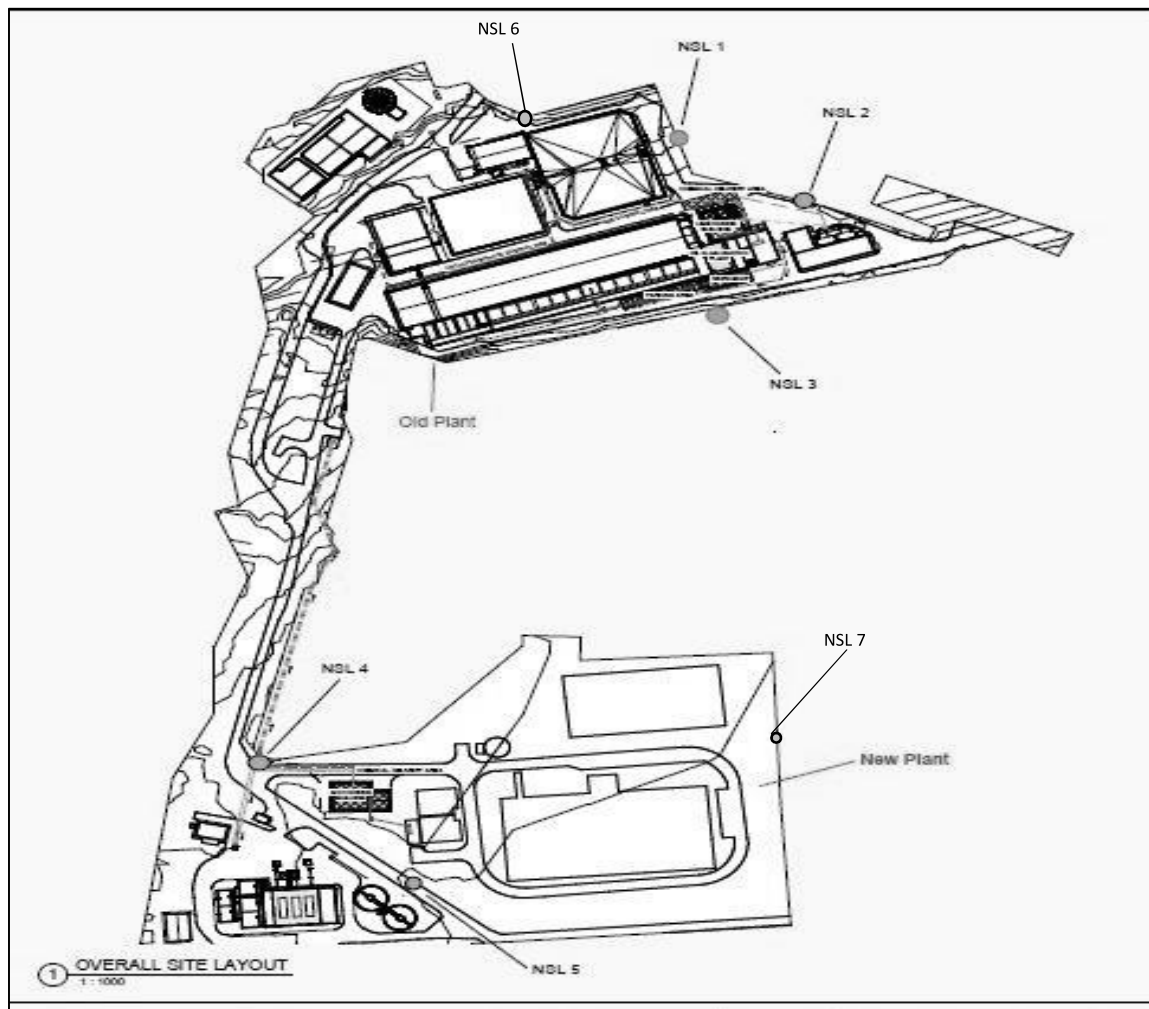


Fig 2. Over view image of site (ref: google earth)



Images of the locations which are noted as monitoring locations within this report are shown in the report Appendix.

3.3 Survey Periods

Measurements were conducted over the course of the following survey periods

- Attended measurements were completed on the 11:00 – 15:30hrs on the 15th of July 2022, furthermore unattended measurements were completed from the 15th – 19th of July to establish the continuous existing environment on the site.

These periods were chosen in order to obtain a comprehensive set of noise levels from the existing facility.

The weather throughout the survey periods was dry and sunny and had no rainfall. Weather details shown below are taken from the Met Eireann website from the closest met station at Johnstown Castle.

Date	Rainfall (mm)	Max Temp (°C)	Min Temp (°C)	Grass Min Temp (°C)	¹ Mean Wind Speed (knots)	Sunshine (hours)
15/07/2022	0.0	22.2	11.9	10.2	6.1	9.6
16/07/2022	0.0	21.9	13.2	11.6	4.6	9.0
17/07/2022	0.0	23.2	14.8	11.7	5.6	7.2
18/07/2022	0.0	25.3	16.1	12.6	5.3	12.1
19/07/2022	0.1	25.1	15.8	13.4	6.8	9.5

Table 2.1 Weather values.

3.4 Procedure

Measurements recorded from the survey periods were noted onto a survey record sheet immediately following each sample including file no. and location details, and were also saved to the instrument for later analysis where appropriate. Survey personnel noted all primary noise sources contributing to the noise build-up.

The unattended meters were calibrated and remained in place for the 4 day unattended monitoring period, on collection the data was downloaded and saved for further review.

3.5 Measurement Parameters

The survey results are presented in terms of the following three parameters, in addition 1/3 Octave measurement results were also included has a reference to establish the existence of any tonal noise from the plant during the assessment period.

- *LAeq* is the equivalent continuous sound level. It is a type of average and is used to describe a fluctuating noise in terms of a single noise level over the sample period.
- *LA10* is the sound level that is exceeded for 10% of the sample period. It is typically used as a descriptor for traffic noise.
- *LA90* is the sound level that is exceeded for 90% of the sample period. It is typically used as a descriptor for background noise.
- *Specific noise* is the noise source under investigation for assessing the likelihood of complaints.
- *Residual noise* is the ambient noise level without the influence of the specific noise source under investigation.

The “A” suffix denotes the fact that the sound levels have been “A-weighted” in order to account for the non-linear nature of human hearing. All sound levels in this report are expressed in terms of decibels (dB) relative to 2×10^{-5} Pa.

4.0 RESULTS

The following results tables and descriptions provide information on the collected measurements and the existing local characteristics of the site and its environs.

N1

At the boundary wall between the existing WTP and the Salmon Leap Public House (a commercial property) to the east of the site. The existing environment is that of local traffic using the R148 as it slows down to turn on to the Salmon Leap Bridge which crosses the River Liffey before entry into Leixlip Village and plant noise from the vicinity of the Clear Water tank.

Results of the noise measurements conducted at NSL 1 during the survey period are detailed below in Table 3.1.

No.	Date	Start Time	End time	Elapsed time	Filename	LAeq [dB]	LAFmax [dB]	LAFmin [dB]	LAF10 [dB]	LAF90 [dB]
1	15/07/2022	11:35:59	11:50:59	00:45:00	L1779	53.7	67.7	49.1	54.5	50.8
2	15/07/2022	11:50:59	12:05:59	00:45:00	L1779	53.2	64.4	48.6	54.6	51.1
3	15/07/2022	12:05:59	12:20:59	00:45:00	L1779	53.9	69.0	48.8	54.7	50.6

Table 4.1 Noise Monitoring Results from NSL 1

N2

At the boundary wall between the existing WTP and the Salmon Leap Public House (a commercial property) to the east of the site at a distance of ≥ 20 from the site boundary. On this monitoring point the meter was located adjacent to the food area which resides at the rear of the public house. The existing environment is that of local traffic using the R148 as it slows down to turn on to the Salmon Leap Bridge which crosses the River Liffey before entry into Leixlip Village. Main noise levels noted at this location is from the WTP transformers and the tanks/pipes behind the Clear water tank building.

There are residential properties (Rose villa and Cache Creek) across the road from the public house (Dublin Road R148) at ~ 48 m from the proposed site area, spot measurements were completed at the boundaries of these properties, however the boundary location was deemed to be most representative location of existing site noise.

Results of the noise measurements conducted at NSL 1 during the survey period are detailed below in Table 3.2.

No.	Date	Start Time	End time	Elapsed time	Filename	LAeq [dB]	LAFmax [dB]	LAFmin [dB]	LAF10 [dB]	LAF90 [dB]
4	15/07/2022	12:25:06	12:40:06	00:45:00	L1780	55.9	64.6	53.7	56.8	54.3
5	15/07/2022	12:40:06	12:55:06	00:45:00	L1780	55.6	64.5	53.5	56.6	54.4
6	15/07/2022	12:55:06	13:10:06	00:45:00	L1780	56.0	69.3	54.0	56.8	54.7

Table 4.2 Noise Monitoring Results from NSL 2

N3

N3 location was at the boundary wall between the existing WTP and the open green area which runs in line with the site and to the west of residential properties located on Cooldrinagh Road which are ~ 260 m from the site boundary. The main associated noise levels are from the Filter building at the corner of the site. Followed by motorway noise and *local* Leixlip traffic on the R148, as the road can be seen through the side gate of the plant.

Results of the noise measurements conducted at NSL 3 during the survey period are detailed below in Table 3.

No.	Date	Start Time	End time	Elapsed time	Filename	LAeq [dB]	LAFmax [dB]	LAFmin [dB]	LAF10 [dB]	LAF90 [dB]
21	15/07/2022	11:27:19	11:42:19	00:15:00	L88	52.3	75.6	47.7	52.5	49.4
22	15/07/2022	11:42:19	11:57:19	00:15:00	L88	53.4	64.4	48.7	55.8	50.4
23	15/07/2022	11:57:19	12:12:19	00:15:00	L88	51.9	62.8	48.7	53.1	50.1

Table 4.3 Noise Monitoring Results from NSL 3

N4

N4 measurements were completed at the gate entrance of the new site. The main noise which influences this location is that from M4 motorway traffic and general noise levels from the local environment (vehicle noise and some low level plant noise).

No.	Date	Start Time	End time	Elapsed time	Filename	LAeq [dB]	LAFmax [dB]	LAFmin [dB]	LAF10 [dB]	LAF90 [dB]
7	15/07/2022	14:04:52	14:19:52	00:45:00	L1781	60.5	77.1	55.1	62.1	57.8
8	15/07/2022	14:19:52	14:34:52	00:45:00	L1781	61.5	69.3	55.5	63.8	57.8
9	15/07/2022	14:34:52	14:49:52	00:45:00	L1781	61.1	69.5	56.4	62.7	58.6

Table 4.4 Noise Monitoring Results from NSL 4

N5

At this location, the motorway is the dominant source of noise. The centre of the motorway is ~75 meters away. Water flowing noises are audible from the direction of the Sludge Building located on site which is ~35 m away, independently noise level spikes were noted from occasional light aircraft flying overhead from the direction of Weston airfield which is approximately ~600m away on the opposite side of the M4 motorway.

No.	Date	Start Time	End time	Elapsed time	Filename	LAeq [dB]	LAFmax [dB]	LAFmin [dB]	LAF10 [dB]	LAF90 [dB]
6	15/07/2022	14:02:44	14:17:44	00:15:00	L91	63.0	66.6	59.1	64.4	61.3
7	15/07/2022	14:17:44	14:32:44	00:15:00	L91	63.1	66.8	58.6	64.3	61.3
8	15/07/2022	14:32:44	14:47:44	00:15:00	L91	63.2	67.3	59.1	64.4	61.6

Table 4.5 Noise Monitoring Results from NSL 5

N6

The below table is a summary of values recorded at N6 a residential property at 3A Cooldrinagh terrace which borders the open green area to the east of the site and runs adjacent to (The Walled Orchard) a group of properties which also border the WTP site.

These properties are located at ~250m from the proposed works areas.

No.	Date	Start Time	End time	Elapsed time	Filename	LAeq [dB]	LAFmax [dB]	LAFmin [dB]	LAF10 [dB]	LAF90 [dB]
1	15/07/2022	11:00:00	12:00:00	01:00:00	L3672	54.8	78.1	46.4	57.1	48.5
2	15/07/2022	12:00:00	13:00:00	01:00:00	L3672	58.9	82.6	46.9	61.4	49.1

Table 4.6 Noise Monitoring Results from NSL 6

N7

The location is at the east boundary of the new plant building and the measurement values were influenced predominantly by motorway noise.

No.	Date	Start Time	End time	Elapsed time	Filename	LAeq [dB]	LAFmax [dB]	LAFmin [dB]	LAF10 [dB]	LAF90 [dB]
1	15/07/2022	15:00:00	16:00:00	01:00:00	L3673	59.0	72.7	52.1	61.1	55.4
2	15/07/2022	16:00:00	17:00:00	01:00:00	L3673	58.4	68.6	51.2	60.3	55.7
88	19/07/2022	06:00:00	07:00:00	01:00:00	L3673	58.6	71.1	51.0	60.4	55.7
89	19/07/2022	07:00:00	08:00:00	01:00:00	L3673	57.5	65.6	50.3	58.9	55.3

Table 4.7 Noise Monitoring Results from NSL 7

4.1 Significance

Based on noise surveys conducted in the vicinity of the existing site, it may be concluded that the existing baseline noise levels range are typical of that in urban area with the prominent noise from these surveys coming from road traffic, motorway traffic, overhead airport associated noise and other commercial related activities such as operating plant and vehicle noise from the adjacent ESB dam and the existing WTP facility.

The levels range from 52 – 58 dB LAeq at locations close to the site boundary and from 58 – 63 dB LAeq where there is an influence from the adjacent M4 motorway.

The existing background noise levels from LA90 values are that of ~ 48 – 55 dB (A).

4.2 Sensitivity

The proposed site is located adjacent to areas that are classified as being noise sensitive locations where it is desirable to maintain a good quality noise environment for existing residents and to ensure that there is no significant increase in the noise climate due to the development during the operational phase and that short term elevated noise during the construction phase is managed and controlled to acceptable levels.

An overview of the subjective perception of changes in noise levels is provided Table 3.8. Changes in noise levels of 3 to 5 dB are noticeable resulting in a slight or moderate noise impact. Changes in noise level in excess of 6 dB would be clearly noticeable and the impact may be moderate or significant.

Changes in Noise Level	Subjective Perceived Change	% Change in Loudness
0 dB	No Change	0%
1 to 2 dB	Negligible change	10%
3 to 5 dB	Noticeable change	30%
6 to 9 dB	Clearly noticeable	70%
>10 dB	Substantial Change	>100%
Level	Description of Noise	
<45dB(A)	Very quiet low traffic noise	
45-50 dB (A)	low Level quiet residential area	
50-60 dB (A)	low to moderate audible but not intrusive	
60-65 dB (A)	moderate-audible, slightly intrusive	
>65 dB (A)	loud traffic noise-busy town centre	
>75dB(A)	Very loud, close to side of motorway	

Table 3.8: Subjective response to changes in noise level, and description of typical noise levels

There is a likelihood of noise complaints when additional noise from a development significantly exceeds the existing background noise level. When the additional noise is equal to or lower than the background noise, complaints are considered unlikely.

4.3 Noise Criteria

WHO

The World Health Organisation (WHO) document Guidelines on community noise (1999) sets out guideline values considered necessary to protect communities from environmental noise. With respect to residential settings, the document notes that an outdoor LAeq 16 h level of 55 dB is an indicator of serious annoyance during daytime and evening hours, with 50 dB being an indicator of moderate annoyance. Irish authorities issuing guidance generally reference 55 dB as a standard monitoring nuisance noise detector / guidance value.

The WHO guidance also recommends an external night time criterion of 45 dB to prevent sleep disturbance.

All guidance values generally referenced to a T15min, T30 minute or 1 hour reference value in exception to an 8 hour measurement period.

EPA

The EPA (Environmental Protection Agency) have issued guidance documentation with reference to industrial, waste and agricultural facilities and licensed premises where scheduled activities are controlled.

The EPA document NG4 (License applications, for surveys and assessments in relation to scheduled activities) is the most recent and relevant document when reviewing day, evening and night time reference values.

The values noted by the EPA in NG4 are shown as 55 dB day, 50 dB and 45 dB (A). With reference to night time values the EPA note, that noise relating to clearly audible, or measurable tones and impulses should be avoided at night.

Best practice would generally be to measure noise as a reference at a Noise Sensitive Location (receptor location) or boundary thereof to establish noise nuisance.

BS 4142:2014

Method for rating and assessing industrial and commercial sound 2014.

The above standard sets out a methodology which can be used to assess the possible impact of noise emissions from given industrial tasks, activities or a licensed premises.

The use of BS4142 in this instance would be considered appropriate as an investigative assessment due to the commercial nature of the site in question and the works involved being undertaken by the contractor for the site. The standard itself states that it describes methods for determining, at the outside of a building “noise levels from factories, or industrial premises, or fixed installations, or sources of an industrial nature in commercial premises”. Once operating an assessment using the BS 4142 methodology should be considered to confirm the details noted within this report.

Construction Noise Limit Criteria.

There are no National mandatory limits set for construction noise in Ireland. Criteria for daytime construction noise are often set at a level higher than for other permanent intrusive noise sources because it is recognised that it is a short-term activity.

In setting criteria for construction noise, account has to be taken of the technical feasibility of the proposed criterion, and also the trade-off between the noise level, and the duration of the noise exposure. Excessively strict construction noise criteria may require a reduction in the intensity of the work. This could prolong a project, and result in more noise nuisance.

For prolonged external exposures above 70 dB (A), the level of noise intrusion into houses may however prove unacceptable. A level of 70 dB(A) is the daytime construction noise limit proposed in the National Roads Authority guidelines for road construction projects (“*Guidelines for the Treatment of Noise and Vibration in National Roads Schemes*”).

The construction noise limits, which are presented in the table below represent a reasonable compromise between the practical limitations in a construction project, and the need to ensure an acceptable ambient noise level for the nearby residents.

In addition to the standard workday criterion of 70 dB (A), the guidelines specify a reduced limit of 65 dB (A) for work on Saturdays, and 60 dB (A) for evening periods, and Sundays and Bank holidays. While these criteria were developed for roads projects, they are also applicable to general construction projects.

The limits are similar to limits which have previously been specified by Local Authorities for construction projects in Ireland.

Days	Times	LAeq (1hr) dB	LAMax dB
Monday to Friday	07.00 to 19.00	70	80
Monday to Friday	19.00 to 22.00	60	65
Saturday	08.00 to 16.30	65	75
Sundays and Bank Holidays	08.00 to 16.30	60	65

Table 3.9: Maximum permissible noise levels at the façade of dwellings during construction (NRA Published guidelines 2004).

Construction noise at any given noise sensitive location will be variable throughout the construction project, depending on the activities underway and the distance from the main construction activities to the receiving properties. The implementation of construction phase noise attenuation measures and the engagement of an independent acoustic consultant to audit construction phase noise sources shall ensure that the construction phase noise limit criteria as detailed in Table 3.9 shall not be exceeded.

4.4 - Operational Noise Limit Criteria.

The adoption of absolute noise limit levels for daytime, evening and night time periods is not always appropriate in terms of measuring noise levels during the operation of a development, primarily as a result of the contribution of other ambient noise sources which alone may result in noise levels above an absolute noise level.

Consequently, it is generally more appropriate to set a services noise emission target relative to the existing background noise. **BS 4142, "Rating Industrial Noise Affecting Mixed Residential and Industrial Areas"**, sets out a methodology which can be used to establish acceptable levels of services noise.

However, in order to predict the potential noise impact that a development alone may have on a receptor, it is necessary to adopt appropriate noise assessment criteria. In this case with regard to the proposed operating hours of the development, an assessment of the following periods is necessary with the associated recommended maximum noise levels experienced at any local noise sensitive receptor.

Period	Times		Levels
Daytime	(07:00hrs	19:00hrs)	55 dB(A) LAeq
Evening	(19:00hrs	23:00hrs)	50 dB(A) LAeq
Night time	(23:00hrs	07:00hrs)	45 dB(A) LAeq

Table 3.10: Recommended Operational noise limits

4.5 –Characteristic of the Proposed Development.

The proposed development involves the following;

Demolition of existing workshop and (defunct) Activated Carbon Building adjacent the old/northern Treatment Plant Building;

Construction of a Sulphuric Acid Storage and Dosing Facility Building (single storey up to approximately 8.7 metres in height) adjacent the new/southern Treatment Plant Building;

Construction of a Lime Storage & Dosing Facility Building (single storey up to approximately 11 metres in height) adjoining the old/northern Treatment Plant Building, associated external storage silos (2) with external staircase (up to approximately 12.3 metres in height) partially enveloped with a perforated metal architectural screen, and ancillary plant and equipment;

Reconfiguration and repurposing for use as a De-Alkalisation Plant of existing (disused) High-Lift Pump Hall within the old/northern Treatment Plant Building;

Construction of a new ancillary Workshop Building (single storey up to approximately 4.5 metres in height) to the rear/south of the 'old/northern Treatment Plant Building;

Temporary and enabling works to facilitate construction and continued / uninterrupted operation of the Treatment Plant site;

Associated network of underground pipelines/connections, and redirection of existing where necessary, throughout the site; provision of additional car parking (to the rear/south of the old/northern Treatment Plant Building), modification and extension of existing drainage, utility and services infrastructure and connections to serve and facilitate new and reconfigured buildings, and all other associated and ancillary development and works above and below ground level.

4.6 Site Set Up

The set-up of the site prior to construction works commencing shall include the following: Isolation of site from adjoining areas by security fencing and hoarding.

- Demarcation of site compounds and installation of site offices and staff facilities.
- Demarcation of staff car-parking area.
- Demarcation of plant storage area.
- Demarcation of materials storage area.
- Demarcation of waste storage area.

4.7 Site Demolition & Site Clearance

The existing site shall be prepared by stripping top and subsoils and the clearance of existing vegetation, to accommodate the bulk dig, and new build developments. Demolition activities are required to remove existing buildings and the bases, this phase of works shall occur over an expected 6 -8 week period from August 2022.

4.8 Construction Works

The new buildings to include Lime Storage & Dosing Facility Building, work shop and Sulphuric Acid Storage and Dosing Facility Building and other all associated services and boundary works shall be constructed over an expected 8 month period from September – March 2023.

4.9 Operational Phase

The proposed new buildings, and extensions to the site shall be designed and constructed using modern materials and construction methods that ensures a high degree of acoustic insulation that will minimise the noise impact of all aspects of the developments operation on the receiving environment.

4.10 - Predicated noise impact of proposed development.

The demolition phase of the development shall be conducted utilising standard demolition techniques as follows. *Manual Stripping of buildings and of internal fixings and metals, and plant to clear the site.*

This stage of demolition will generate medium levels of noise generated principally as a result of works involving both plant and hand held power tools. As these works will occur generally within the structures of the buildings, all efforts shall be made to limit any significant noise impact from these activities.

4.11 Demolition of structures

The demolition of the structures shall be facilitated by the use of excavators. These activities by their nature shall generate significant noise levels, boundary monitoring of noise levels during these periods will ensure controls are placed on site activities to avoid any disruption to adjacent receptor locations.

4.12 Removal of C&D waste from site

With regard to the significant volume of bulky waste material principally comprising of concrete, soil, metal and wood that shall be generated by the demolition of the buildings, there will be a requirement for a significant volume of HGV trucks to remove the material from the site.

The movement of the on-site C&D waste stockpile by excavator and loading shovel and the subsequent loading of the waste material onto HGV's has the potential to generate increased levels of noise on-site. The transport of C&D waste from the site by HGV shall generate increased levels of noise both within the site and on local public roads.

5.0 PREDICTED LEVELS

The predicted maximum noise levels that will be experienced at the nearest residences as a result of demolition activities have been calculated using the activity LAeq method outlined in *BS 5228 1:2009 – Code of Practice for noise and vibration control on construction and open sites – Part 1 Noise*

The equivalent continuous sound pressure levels measured at a reference distance of 10 metres for the individual items of plant to be used on-site are presented in Table 3.11 below and the predicted noise levels (*using the formula $L_p(R2) = L_p(R1) - 20 \cdot \log_{10}(R2/R1)$*) are presented in Table 3.12.

Principal noise sources associated with demolition activities	
Plant Item	LAeq @ 10m dB(A)
Generator (enclosed)	70
Compressor (enclosed)	73
Tracked Excavator	72
Dump Truck	80
Concrete/Steel cutting equipment	84

Notes: Noise levels from activities are referenced from BS 5228 1:2009 – Code of Practice for noise and vibration control on construction and open sites – Part 1 Noise

Table 5.1: Principal noise sources associated with demolition activities.

Closest receptor distance from site works area	Predicted level	Rated Predicted Level +5dB
	LAeq, 60min in dB(A)	LAeq, 60min
Salmon Leap Public house NSL 1 (c.20m)	75 ²	70
Rose villa Residential property NSL 2 (c.45m)	62	67
Cache Creek residential property NSL 3 (c.60m)	60	65
Properties at Cooldrinagh Terrace NSL 4 (~240m)	49	54

Table 5.2: Predicted Noise levels at receptor locations

² Traffic noise was an influence at Location NSL 1 on completion of background readings, the site will operate the use of sound mitigation techniques such as noise attenuation barriers to control activities which may be deemed to have a high noise impact on receptor locations.

NSL1

The maximum predicted LAeq,1hr value of ~65dB(A) was calculated at a closest distance of 20m from receptor N1 located The Salmon Leap Public house to the north east of the site. Given the nature of demolition activities which will generate impulsive noise, a tonal penalty of +5 dB (A) is added to the predicted value resulting in a rated LAeq, 1hr value of 70dB (A).

NSL 2

The maximum predicted rated LAeq,1hr value of 62dB(A) was calculated at a closest distance of c. 45m from receptor N2 (Rosevilla private residence) located to the north east of the site. Given the nature of demolition activities which will generate impulsive noise, a tonal penalty of +5 dB (A) is added to the predicted value resulting in a rated LAeq, 1hr value of 67dB (A).

NSL 3

The maximum predicted rated LAeq, 1hr value of 60dB (A) was calculated at a closest distance of c. 60m from receptor N3 located to the north west of the site. Given the nature of demolition activities which will generate impulsive noise, a tonal penalty of +5 dB (A) is added to the predicted value resulting in a rated LAeq, 1hr value of 65dB (A).

NSL 4

The maximum predicted rated LAeq, 1hr value of 48dB(A) was calculated at a closest distance of c. 240m from receptor N4 (Residential properties on Cooldrinagh Terrace) located to the north west of the site. Given the nature of demolition activities which will generate impulsive noise, a tonal penalty of +5 dB (A) is added to the predicted value resulting in a rated LAeq, 1hr value of 53dB (A).

Predicted traffic noise

Based on the assumption of up to 20 HGV movements per day on the haul routes to and from the site along public roads the resulting average traffic noise level at the houses adjacent to the haul routes is calculated as follows: The predicted noise levels at any receptor located within 5m of the haul route road has been calculated using a standard international acoustical formula as described below.

$$LA_{eq, T} = SEL + 10\log_{10}(N) - 10\log_{10}(T) + 20\log_{10}(r_1/r_2) \text{ dB}$$

where LAeq, T is the equivalent continuous sound level over time period (T) (3600 sec);

SEL is the A weighted Sound Exposure Level of the noise event (77dB);

N is the number of events over the time period T (11);

r1 is the distance at which SEL is assessed (5m)

r2 is the closest distance to the receptor from the road (10m)

The calculations assumed a typical scenario of 1 / 2 truck / plant movements per hour based on a 10 hour working day (7am – 7pm) , a maximum Sound Exposure Level of 77 dB(A) for the trucks and the minimum distance between the local road passing by each of the nearest noise sensitive receptors to the public road (c. 10 – 15m m).

The maximum predicted LAeq, 1hr values as a result of the HGV traffic movements at the nearest noise sensitive receptors located along the haul route roads is predicted to be 58dB (A), LAeq, 1hr. It is not expected that the predicted short-term increase in HGV movements associated with the construction phase of the development will have an adverse impact on the existing noise climate of the local area or on the wider area.

Construction Phase Predicted Noise Impact

During the construction phase there will be extensive site works, involving construction machinery, construction activities on site, and construction traffic, which will all generate noise. The highest noise levels will be generated during the site preparation works, foundation construction activities and on site general construction activities. The construction noise levels will be of a relatively short term duration (c. 7 - 9 months) and will only occur during daytime hours which will serve to minimize the noise impacts at local existing receptors.

Operational Phase Predicted Noise Impact

The noise aspects to be considered for the operational phase of the development can be divided into two categories:

Short term noise sources associated with deliveries etc. And common day to day working activities at the premises,

Fixed noise sources associated with external fixed mechanical plant located at the development building. Transient noise sources associated with the movement of deliveries vehicles and customer vehicles to and from the premises

Vehicle Noise Sources

Currently all loading takes place on site, with HGV's typically entering site from the R148 and they are loaded by a loader with a bucket, before exiting on the same route. Loadings are generally short in duration up to a maximum of 30 minutes, this generates noise levels of up to 66 dB (a) LAeq, 30min at 5m when the truck is moving into position and up to 74dB (A) LAeq, 10min at 5m during loading. Once the proposed extension is completed all loading will be completed internally and automatically, this will reduce the noise from both machinery and HGV's.

Fixed Plant External Noise Sources

Attended measurements were completed at a distance of 1m from the existing external pipe work and transformers on site, the levels from these measurements are shown below;

No.	Date	StartTime	Endtime	Elapsed time	Filename	LAeq [dB]	LAFmax [dB]	LAFmin [dB]	LAF10 [dB]	LAF90 [dB]
4	15/07/2022	12:39:29	12:54:29	00:05:00	L89 pipe work	63.6	66.5	60.9	64.2	62.2
5	15/07/2022	12:46:20	13:01:20	00:02:00	L90 transformers	63.3	66.0	61.7	64.2	62.3

Table 5.1: existing on site noise sources.

There will be no changes to the current external plant on site, any new additions to plant will be within the newly developed buildings, the expected levels from site during operational phases shall be in the range of 58 – 60 dB (A) at the site boundaries which are similar to the existing levels on site.

Fixed Plant Internal Noise Sources

The lime building shall be constructed at the old plant site, which is located close to the site boundary at the Salmon Leap Public House. The lime dosing building will have some augers that operate intermittently. Measurements completed at similar plants show the noise emitted from a similar unit at c. 58 dB (A) at 1m, it is estimated that the site noise levels will not vary from current levels which range between 54 – 58 dB (A).

Car Park Vehicle Noise Sources

Car parking on site for contractors and deliveries will be provided to the south of the site.

Operational Phase Predicted Noise Impact

Predicted operational phase noise assessment at closest receptors.

The following impact data shows the plant in full operation 24 hrs a day – these levels are shown to demonstrate a worst case scenario of events when the total plant is operating during the planned 24 /7 period. A predicted value based on the plant operating to the same levels currently generated on site is shown below, possible noise abatement from materials used on new build will further design noise levels to lower than predicted levels.

As mentioned an additional BS4142 assessment of the noise levels from the newly designed plant should be completed within 12 months after completion to confirm operating levels and impact on neighbouring properties.

At Location 1 the L_{A90} values ranged from 47dB when the site was operating was operating. This would indicate that its maximum impact at this location is in the region of 50 dB.

³At Location 2 the L_{A90} values ranged from 51dB when the site operating at full capacity. This would indicate that its maximum impact at this location is in the region of 54dB.

*for additional NSL locations it should be noted that background noise levels were influenced by external noise sources (local traffic and domestic noise levels) which was dominant when operating in the adjacent areas, hence the called noise at these locations given the distance between source and receptor would expected to be unchanged.

³ Location 2 was influenced by passing traffic on R148.

6.0 MITIGATION MEASURES

6.1 Construction Phase Noise Control Measures

The following noise control and mitigation shall be incorporated into a Construction Noise Management Plan and shall be implemented to ensure that noise generated by construction site activities will be minimised.

Regular maintenance of items of plant to ensure that they are operating efficiently;

Machinery and vehicle engines shall be turned off when not in use;

The use of vehicle horns will be discouraged before 08:00hrs and after 17:00hrs. Appropriate signage at the site entrance shall specify these conditions.

Mobile site plant shall be fitted with multi-frequency reverse alarm beacons to minimise noise nuisance from plant vehicles without compromising Health & Safety Regulations.

Noise generating items of plant such as pumps and generators will be enclosed as far as practicable and will be oriented away from the direction to receptors.

Location of noisy plant away from receptors Restriction of noisy site activities such as rock breaking, crushing, piling and angle grinding before 08:00hrs and after 18:00hrs. Location of material delivery area and site compound away from adjacent receptors.

The contractor may be required to complete a programme of noise monitoring to ensure that construction site activities are controlled to minimise the potential for noise nuisance or complaint during construction works.

All monitoring shall be conducted by an independent environmental consultant.

Noise levels shall be monitored at the closest receptors to any given phase of construction activities. A real time noise monitoring system shall be installed which will transmit real time noise levels by modem to a designated on-site site engineer. This will ensure that noise levels will be managed and controlled to ensure a minimal impact on local receptors.

6.2 Operational Phase Noise Control Measures

All vehicles shall immediately turn off their engines upon entering the bulk loading bay area. Appropriate signage shall be installed within the loading bay to alert all drivers of this requirement.

The plant operators shall maintain a noise complaint log and upon receipt of a noise related complaint shall engage an independent acoustic consultant to investigate the complaint. Delivery truck drivers shall be instructed to turn off idling engines if arriving on-site during out of store opening hours.

An independent noise survey shall be conducted once the development becomes operational to assess the noise impact at the closest residential receptors to the site in accordance with the proposed monitoring programme detailed below

7.0 MONITORING

7.1 Noise Monitoring Programme – Operational Phase

An environmental noise survey shall be conducted in accordance with the requirements of ISO 1996:2016 Acoustics – description and measurement of environmental noise and a BS4142 assessment within 12 months of the development becoming operational to ensure that the development is not having an adverse noise impact on the receiving environment and on local residential receptors.

The measurement parameters to be recorded include wind speed, temperature, LAeq, LA90, LA10 and LMax. And 1/3 Octave Band Frequency analysis.

Noise measurements shall be conducted over 60 minute intervals between 07:00hrs – 00:00hrs to determine the noise levels over the course of a day period.

The survey shall be undertaken by an independent acoustic consultant and the results of which shall be maintained by site management and made available to the Local Authority if required.

APPENDIX

- A1. Site monitoring position images
- A2. Calibration Certificates
- A3. Actual site locations (photos).
- A4. Overview of site (TMP)
- A5. Data sets.

A1. Survey monitoring locations

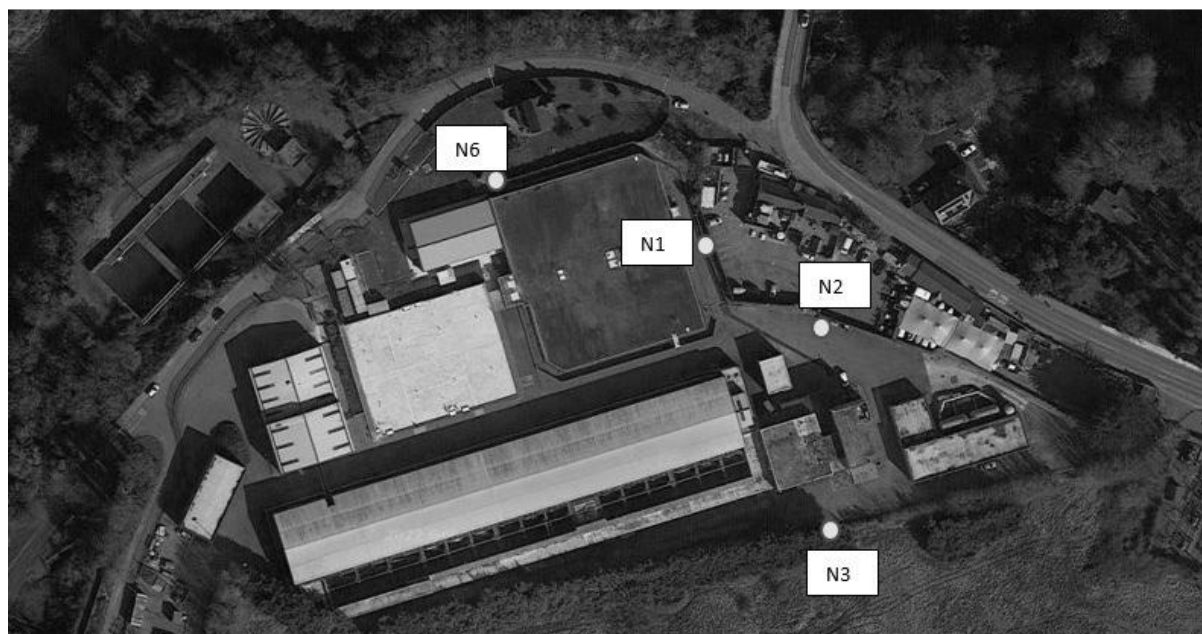


Image A.1 – Site Overview existing plant

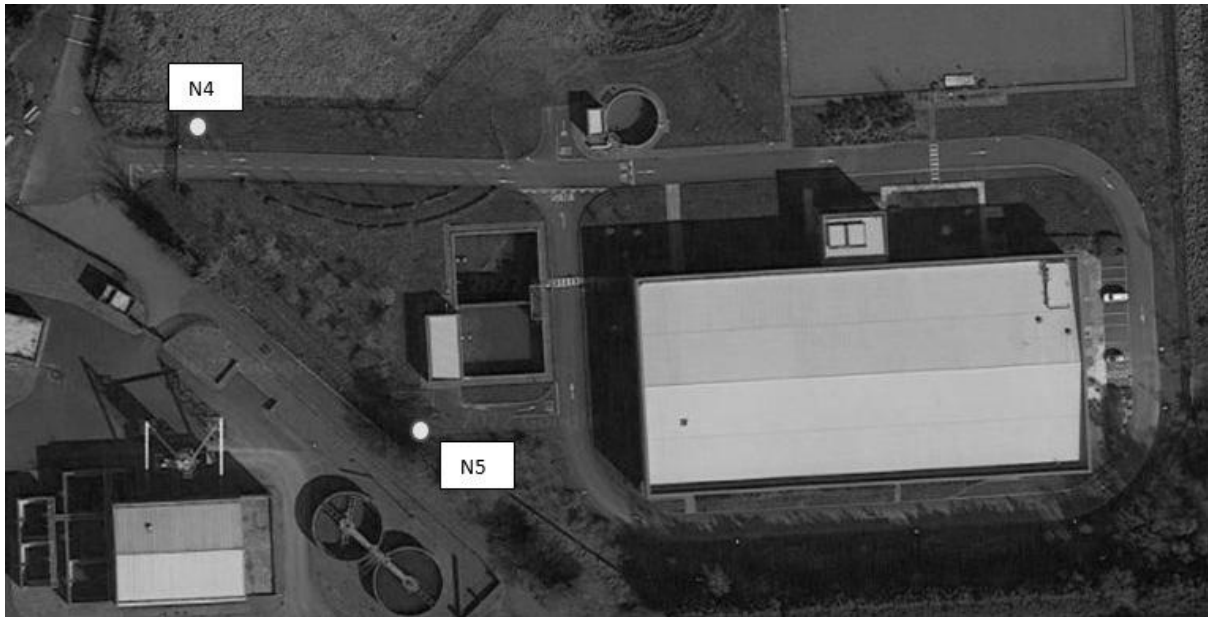


Image A.2 – Site Overview new plant



Image A.3 – Site Overview new plant + N7 monitoring location.



Statement of Calibration

Issued to:

NVM Limited
Unit 13
Boyne Business Park
Drogheda
Co. Louth

Calibration Reference

SLM220164

Test Date: 09/06/2022

Procedure: TP-SLM-1

Equipment

Item Calibrated:	Sound Level Meter	Model	977
Make:	Svantek	Serial Number:	92146

Calibration Procedure

The sound level meter was allowed to stabilize for a suitable period, as described in the manufacturer's instruction manual, in laboratory conditions. The sound level meter was calibrated by carrying out the verification tests detailed in IEC 61672-3 (2006), Periodic tests, specification of sound level meters. Tolerances for verification procedures are specified in IEC 61672-1 (2003).

Calibration Standards

Description	Serial Number
National Instruments PXI-4461	19C91D2
Stanford Research DS360	123803

The standards used in this calibration are traceable to NIST and/or other National Measurement Institutes (NMI's) that are signatories of the International Committee of Weights and Measures (CIPM) mutual recognition agreement (MRA).

Signed on behalf of Sonitus Systems:





CALIBRATION CERTIFICATE

Date of issue: 21-04-2022

Certificate No: 1502428-1

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OBJECT OF CALIBRATION

Manufacturer: **SVANTEK**
Model: **SVAN 977C**
Serial No.: 97571
Description: Sound Level Meter

SENSOR

Manufacturer:	ACO	SVANTEK
Model:	7052E	SV12L
Serial No.:	55037	32440
Description:	Microphone	Preamplifier

APPLICANT

NVM Ireland Ltd
1st Floor, Unit 13 Boyne Business Park, Drogheda, Co Louth, Ireland

ENVIRONMENTAL CONDITIONS

Temperature:	21.8 – 23.3	°C
Humidity:	32 – 37	%
Pressure:	97.4 – 100.3	kPa

DATE OF CALIBRATION 21-04-2022

APPROVED BY B. Hunt



AcSoft Calibration | Bedford Technology Park
Thurleigh | Bedford | MK44 2YA

+44 (0) 1234 639550
www.acsoft.co.uk

A3. Images of Monitoring Locations

Location N1 Salmon Leap Inn



Location N2 / N2* Salmon Leap Boundary



Location N3 on site.



Location N4



Location N5



Location N6 -NSL



Location N7 New Building boundary.



Existing Site Transformers



Existing Site Pipe work





NSL 3A Cooldrinagh Terrace



A.4 Site TMP showing locations of new buildings



A.5 Site Results

A5.1 Attended measurements

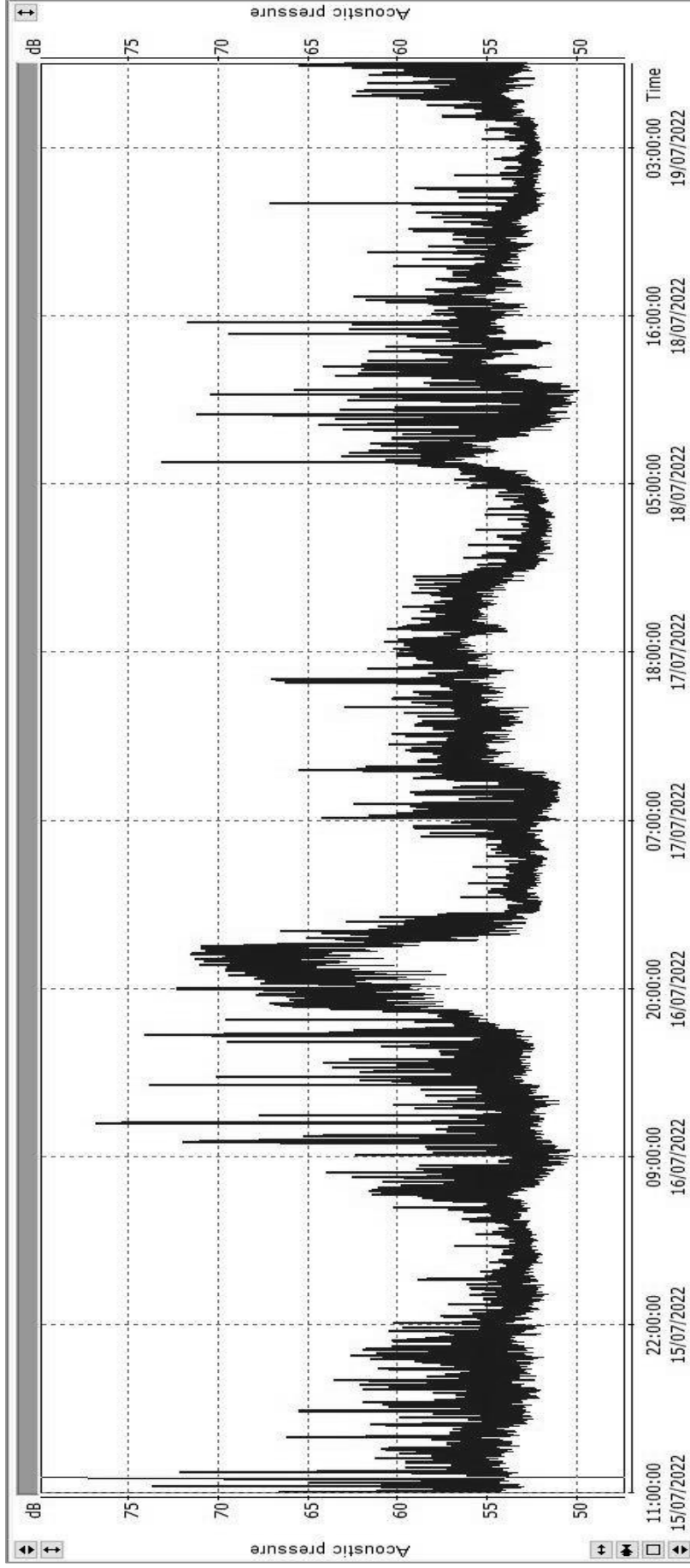
No.	Date & time	P1 (A, Fast)	P1 (A, Fast)	P1 (A, Lin)	P1 (A, Lin)	P1 (A, Lin)
		LAFmax (SR) [dB]	LAFmin (SR) [dB]	LAeq (SR) [dB]	LAeq Ln (SR) [dB]	LAeq Ln (SR) [dB]
					L10	L90
1	11:42	75.6	47.7	52.3	52.5	49.4
2	11:57	64.4	48.7	53.4	55.8	50.4
3	12:12	62.8	48.7	51.9	53.1	50.1
4	12:54	66.5	60.9	63.6	64.2	62.2
5	13:01	66	61.7	63.3	64.2	62.3
6	14:17	66.6	59	63	64.4	61.3
7	14:32	66.8	58.5	63	64.3	61.3

A5.2 Attended measurements

No.	Date & time	P1 (A, Fast)	P1 (A, Fast)	P1 (A, Lin)	P1 (A, Lin)	P1 (A, Lin)
		LAFmax (SR) [dB]	LAFmin (SR) [dB]	LAeq (SR) [dB]	LAeq Ln (SR) [dB]	LAeq Ln (SR) [dB]
					L10	L90
1	11:50	67.7	49	53.7	54.5	50.8
2	12:05	64.4	48.6	53.2	54.6	51.1
3	12:20	69	48.8	53.9	54.7	50.6
4	12:40	64.6	53.7	55.9	56.8	54.3
5	12:55	64.5	53.5	55.6	56.6	54.4
6	13:10	69.3	54	56	56.8	54.7
7	14:19	77.1	55	60.5	62.1	57.8
8	14:34	69.3	55.5	61.5	63.8	57.8
9	14:49	69.5	56.4	61	62.7	58.6
10	15:45	59.4	51	54	55.4	52.1
11	16:00	64.5	48.1	52.9	54.5	50.2
12	16:21	60.8	46.5	51.3	53.4	48.4
13	16:32	90.2	75.3	84.1	86.4	80.8
14	16:40	84.1	64.2	78.5	81.4	70.8
15	16:46	68.8	56.8	63.9	65.9	60.1

Short Term LAeq values

Location N2* The Boundary beside The Salmon Leap Public House – (attended N2 location).



Location N7 the boundary of the new building adjacent to the new construction project area.

