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EIAR ATTACHMENT 6.1

NOISE IMPACT ASSESSMENT

PROPOSED EFFLUENT TREATMENT PLANT UPGRADE

DAWN MEATS IRELAND
GREENHILLS, BEAUPARC
CO. MEATH

2022

REPORT NO:	NA_20_9684_R1	**AUTHOR:**	Martin O'Looney, BSc. Nial Ryan, MSc.
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EXECUTIVE SUMMARY

Dawn Meats Ireland Unlimited Company (also referred to as Dawn Meats (Slane)) proposes amendments to the waste water treatment plant design which attained planning permission at Painestown, Beauparc, Navan, Co Meath, and a new proposed pipeline and discharge to the River Boyne.

This report presents the findings of long term annual baseline monitoring at Dawn Meats (Slane) and a predictive analysis of the impact of the construction and operation of the proposed development on noise sensitive receptors.

Appendix A of this report contains a site location map identifying the nearest noise sensitive locations in each geographical direction from the proposed site and pipeline route.

The predicted noise levels at the nearest noise sensitive locations surrounding the facility have been calculated in accordance with the methodology prescribed in ISO 9613-2:1996 "*Attenuation of Sound during Propagation Outdoors*". The resultant predicted noise levels have been assessed in accordance with the methodology prescribed in BS 4142:2014 "*Methods for Rating and Assessing Industrial and Commercial Sound*".

Maximum construction noise levels at the WWTP would be anticipated to arise from excavator activity and water pumps and general construction noise.

During the construction phase of the proposed WWTP compound, noise arising from the construction works is predicted to range from 38 to 47 L_{Ar30}, 7 dBA below to 2 dBA above the existing day-time background noise levels at the nearest noise sensitive locations. It is predicted that there would be a low to no significant impact on noise sensitive locations as a result of the WWTP construction works.

Along the proposed pipeline route, maximum construction noise has been predicted to result in noise levels of L_{Ar30} 81dB at 5m to L_{Ar30} 75dB at 20m, ranging from 24 to 36 dBA above the existing day-time background noise levels.

Construction works at the effluent treatment plant compound would occur over a nine month period. At a pipeline route length of 7.2km and construction period of 10 weeks, the pipeline works would progress at approximately 145m/day. Therefore, pipeline worst-case scenario noise levels would be expected to occur for part of a single day as pipeline works progress past sensitive receptors.

As construction noise would occur over a short period, would be managed through appropriate mitigation measures and would result in no permanent change to the existing noise environment of the area, it is considered that there would be no significant noise impact as a result of construction at the proposed ETP compound and a moderate noise impact as a result of proposed construction works along the pipeline route.

Within the WWTP compound, maximum construction has been predicted to be in compliance with the NRA Guidelines limits of 70 dBA daytime (07:00am to 19:00pm) and 65 dBA Saturday (08:00 – 16:30hrs) periods.. Along the pipeline route at NSL(iv), where the pipeline would pass within 10m of the residence façade, the use of temporary noise barriers would be required in order to comply with the NRA daytime limit of 70 dBA.

It is recommended that guidance on control of noise, as per The National Roads Authority's "*Guidelines for the Treatment of noise and vibration in National Road Schemes*" (2004) and British Standard 5228-1 "*Code of practice for Noise Control on Construction and Open Sites*" be followed during the construction phase.

It is recommended that ETP compound construction works be conducted within the following times and in compliance with the following NRA recommended limits:

Days / Times	$L_{Aeq\ (1hr)}$ dB
Monday to Friday (07:00 – 19:00hrs)	70
Saturday (08:00 – 16:30hrs)	65

It is recommended that pipeline construction works be conducted within the following times and in compliance with the following NRA recommended limit:

Days / Times	$L_{Aeq\ (1hr)}$ dB
Monday to Friday (07:00 – 19:00hrs)	70

Any works which, by necessity, are required to be carried out outside of these times should be notified to the relevant bodies, i.e. the local council or the EPA, and any potentially affected local residents in good time and prior to specified works commencing.

It is recommended that all onsite workers, hauliers and contractors be informed of noise considerations, both onsite and on local access roads, during the operational and construction phases of the proposed development.

It is recommended that considerations with regard to noise be included in a Construction Environmental Management Plan (CEMP), as per the outline CEMP included in this application, to be prepared by the construction firm prior to beginning works.

At the proposed WWTP, maximum noise levels could arise from the operation of large vehicles, aeration blowers operating at maximum output and general background effluent treatment plant noise.

There would be no operational noise associated with the operation of the pipeline.

A worst case scenario has been assessed for noise arising from the operation phase of the proposed effluent treatment plant. This is principally based on the maximum noise which could occur from the operating of a HGV within the site.

The operational phase worst case scenario assessment has predicted that noise levels from HGV's would range from 11 to 21 dBA below the existing background noise levels. An 'inaudible' noise would typically be 10 dB or more below the measured L_{A90} background noise level at a noise sensitive location.

Therefore, it is predicated that worst case scenario noise arising onsite would be inaudible to very lowly audible above the existing daytime background noise levels at the nearest noise sensitive locations.

However, it should be noted that during evening and night time periods, lorry noise levels would be anticipated to range from 3-4 dBA below background at NSL2 (275m) and NSL3 (335m). Therefore, there would be anticipated to be a slight impact at these locations should lorry activities occur outside of daytime hours.

Maximum equipment noise would also be greater than 10 dBA below the existing evening and night-time background noise levels at receptors. Normal site operational noise at the site would also be expected to be inaudible at the nearest noise sensitive locations.

The principal factors controlling noise from the proposed development are by design, in particular the set-back distance from nearby noise sensitive locations and the construction of an earth berm surrounding the development.

All operational noise from the proposed development has been predicted to be in compliance with the EPA (NG4) daytime, evening and night-time guidance limits.

It is also concluded that Dawn Meats (Slane) would remain in compliance with their EPA IE licenced noise limits.

It is the main conclusion of this report that no significant alteration to the existing noise environment would occur as a result of the proposed development at Greenhills, Beauparc, Co. Meath.

In order to ensure continued good practice in relation to the management of noise at the Dawn Meats (Slane) facility, it is recommended that the existing site Noise Management Programme be updated prior to commissioning of the proposed effluent treatment plant. The draft programme outlined in Appendix C may be used as a starting point, subject to periodic site specific review.

1.0 INTRODUCTION & SCOPE OF WORK

Dawn Meats Ireland Unlimited Company are applying for planning permission to Meath County Council for a development consisting of the following:

a) Demolition of an existing storage building (17.50 m^2) and construction of a new single-storey industrial type building to enclose the DAF unit granted planning permission under planning reference LB180300 and to provide new enclosed office/laboratory and control room (total floor area 127 m^2).
b) Alterations to location, sizing and heights of approved treatment tanks, install a new sludge press at intake to WWTP, relocate and replace the current drum screen, install 1no additional aeration tank, replace approved clarifier and sand filter tanks with membrane bioreactor (MBR) tank and UV filter, and alteration to perimeter berm to increase the approved development area by 323m^2 to that granted planning permission under planning reference LB180300.
c) Treated wastewater rising main from the site of the proposed development to a new discharge point at the River Boyne (distance 7.2km), where pipeline shall be laid along a section of Windmill Road, the L1013, Yellow Furze Road, the L1600 (Boyne Rd), and the unnamed local road leading from the L1600 to the private lands abutting the River Boyne at the discharge point.

…at Painestown, Seneschalstown, Dollardstown, Hayestown-Carryduff Little & Ardmulchan, Navan, Co Meath.

The facility intends to provide for the discharge of final effluent to the River Boyne. This would necessitate the construction of a rising main from the Dawn Meats (Slane) site to the River Boyne.

Dawn Meats (Slane) is located in a rural location off the N2, approximately 4.5km south of the village of Slane, Co. Meath. The site of the abattoir was originally a farmyard where on-farm slaughter of cattle was undertaken. The facility at Slane, which was previously operating as Newgrange Meats, was acquired by the Dunbia Group in 2001. The facility was then incorporated into the Dawn Meats Group in September 2018.

The topography in the area surrounding the proposed development at Greenhills is generally flat, ranging between 80-100m above sea level with a gentle slope rising to the north-east.

The area is rural in character with residences in the area predominantly linearly aligned along the existing road network. Maps of the proposed site boundary and surrounding noise sensitive locations is provided in Appendix A.

Panther Environmental Solutions Ltd (PES Ltd) was commissioned by Dawn Meats (Slane) to carry out an Environmental Impact Assessment and compile an accompanying Environmental Impact Statement.

In support of an overall Environmental Impact Assessment, the primary aims of this survey were to:

1. Identify noise sensitive locations;
2. Determine the baseline noise levels at the closest NSLs;
3. Predict the impact of the proposed development's construction and operational phases on the noise sensitive receptors.

CONSTRUCTION PHASE NOISE CRITERIA

Construction noise, while inherently noisy and disruptive, is temporary in duration. The works involving "heavy machinery" for the purposes of excavation usually causes the most disturbances to nearby residents.

It is anticipated that the construction phase of the main effluent treatment compound would occur over c. 9 months from excavation, construction, installation and commissioning of plant. It is anticipated that the construction phase of the rising main would occur over 9-10 weeks. Rising main and the WWTP extension works would be undertaken concurrently.

OPERATIONAL PHASE NOISE CRITERIA

The primary operational sources of noise within the proposed development would be the operation of pumps and aeration equipment at the biological treatment plant.

At present, effluent is screened and pumped to one of two on-site effluent storage lagoons in series. Effluent passes from the first lagoon through a screen and Dissolved Air Flotation (DAF) unit to the second lagoon. Trade effluent is then tankered off-site to a municipal wastewater treatment plant or other suitable waste water treatment facility.

The proposed primary second stage and the biological plant would consist of the following stages:

- Screen
- Balancing Tank,
- Dissolved Air Flotation (DAF) Unit,
- Sludge Tank,
- UV Filter.
- Anoxic tank,
- Aeration Tanks,
- Membrane Bioreactor (MBR),

Screen

The proposed new drum screen would replace the existing drum screen. The new screen (1mm wedge wire) would be capable of receiving 400 M^3 per day raw effluent. Screenings would be collected in a designated bin and disposed of as CAT 1 waste

Balancing Tank

The proposed Balance Tank would have a maximum operating volume of 790 M^3. This would be an over-ground, glass-lined steel tank, with adequate mechanical mixing. The tank would be covered with ventilation provided to an adjacent odour scrubber in order to prevent potential odour emissions.

DAF Unit

A Dissolved Air Flotation treatment unit would be located within the new industrial type building.

The DAF unit would treat the balanced screened effluent. Solids would be removed from the raw effluent using a chemical programme with a coagulant and flocculent, followed by diffused air. The aeration system would be sized to optimise fat removal and sludge concentration.

Anoxic Tank

The anoxic tank will have a maximum operating volume of 790 M^3. This will be an over-ground, glass-lined steel tank, with an internal submersible mixer in order to ensure adequate treatment of all inflow.

Aeration Tank

It is proposed to construct two aeration basins, which would have sufficient capacity to treat the effluent currently generated to a high standard. The aeration tanks would have a maximum operating volume of 830 M^3 each. These would be over-ground, glass-lined steel tanks, with adequate diffused-bubble aeration/mixing (3 x 75 kW) in order to ensure adequate oxygen for the microbial population.

Sludge Tank

A sludge holding tank (300 M^3) would be required to store the DAF sludge and biological activated sludge prior to on-site dewatering and then off-site treatment. This would be an over-ground, glass lined steel tank, with adequate mixing (2.5 Kw/hr submersible mixer). The tank would be covered with ventilation provided to an adjacent odour scrubber in order to prevent potential odour emissions.

Membrane Bio-Reactor (MBR)

The Membrane bioreactor (MBR) would be an over-ground (5.4m x 5.4m x 4.5m high) concrete tank on a 5.8m x 5.8m plinth, with 6 no membrane cassettes to treat peak flows of 400 M3/day. The tank would be equipped with a 3 x 45kW air scour for the removal of solids from the membranes.

UV Filter

A UV filtration unit would be installed on the final effluent line prior to the final sump.

2.0 NOISE LEGISLATIVE REQUIREMENTS

Planning and Development Act (2000), as amended

Local authorities are responsible for the planning and environmental regulation of any proposed developments. The current planning and environmental regulatory framework requires these developments to comply with the Planning and Development Act (2000) and related regulations.

The local authorities and An Bord Pleanala attach conditions relating to environmental management of these developments to planning permissions granted. Local authorities consider the land use and planning issues associated with the proposed developments in their County Development Plans.

The EPA Act (Noise) Regulations 1994 (Relevant statutory instrument: S.I. No. 179 of 1994)

The relevant part of the Environmental Protection Agency Act 1992 dealing with noise is Part VI, Sections 106 to 108. These Sections deal with the control of noise, the power of local authorities to prevent or limit noise and the issue of noise as a nuisance.

The 1994 Regulations came into effect in July 1994 and outline the procedures for dealing with noise nuisance. The Regulations allow affected individuals, local authorities or the EPA to take action against an activity causing a noise nuisance.

These Regulations replaced the procedures for noise complaints contained in the Local Government (Planning & Development) Act 1963. Companies must show that reasonable care was taken to prevent or limit the noise from their activities.

If the courts decide that a company is responsible for causing a noise nuisance, they can order the company to take measures to reduce, prevent or limit it.

EPA "*Guidance Note on Noise (NG4)*" (2016)

It deals in general terms with the approach to be taken in the measurement and control of noise, and provides advice in relation to the settling of noise ELV's and compliance monitoring. In relation to production facilities and ancillary activities, it is recommended that noise from the activities on site shall not exceed the following noise ELV's at the nearest noise-sensitive receptor:

Divisions	Times	dB(A)
Day	(07:00 to 19:00hrs)	55dB LAr,T
Evening	(19:00 to 23:00hrs)	50dB LAr,T
Night	(23:00 to 07:00hrs)	45dB LAeq,T

The National Roads Authority (NRA) Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004)

The NRA's guidance document Guidelines for the Treatment of Noise and Vibration in National Road Schemes (2004) is the recognised Irish guidance document for the assessment of road traffic noise. This document sets out the key items that should be included in a noise and vibration assessment for any significant road scheme. As a minimum, it stipulates that the following items should be included:

- A series of noise surveys to quantify the prevailing noise climate at sensitive receptors along the existing and proposed routes
- Preparation and calibration of a suitable noise prediction model;
- Prediction of *Do Minimum and Do Something* noise levels for opening and design years;
- Comparison of predicted *Do Something* noise levels with the design goal and three conditions that must be satisfied before mitigation measures are deemed necessary;
- Specification and assessment of road traffic mitigation measures, where required;
- Assessment and review of construction impacts and mitigation measures;
- Assessment and review of vibration.

This NRA document has been referred to in the consideration of road traffic noise associated with the proposed development. The document also presents maximum permissible noise levels at dwelling facades during construction activities. This provides a useful reference for assessing construction noise of the proposed development.

The National Roads Authority (NRA) Guideline Construction Noise Limits

Days / Times	**$L_{Aeq\ (1hr)}$ dB**	**$L_{pA\ (max)slow}$ dB**
Monday to Friday (07:00 – 19:00hrs)	70	80
Monday to Friday (19:00 – 22:00hrs)	60	65
Saturday (08:00 – 16:30hrs)	65	75
Sundays and Bank Holidays (08:00 – 16:30hrs)	60	65

Dawn Meats (Slane) EPA Industrial Emissions Licence (P0811-02)

The current Dawn Meats (Slane) licence, issued by the EPA, provides for the following conditions in relation to noise;

Condition 4.1 Noise
"*Noise from the installation shall not give rise to sound pressure levels measured at the Noise Sensitive Locations of the installation which exceed the limit value(s).*"

Condition 6.15 Noise
"*The licensee shall carry out a noise survey of the site operations not later than two months from the date of grant of this licence and annually thereafter. The noise survey shall pay particular regard to tonal and impulsive noise sources during night time operations. The survey programme shall be undertaken in accordance with the methodology specified in the 'Guidance Note for Noise: Licence Applications, Surveys and Assessments in Relation to Scheduled Activities (NG4)' as published by the Agency."*

Condition 6.20
"*Where refrigeration trailers are parked at the installation overnight these shall be powered on electricity to minimise noise emissions.*"

Schedule B.4 Noise Emissions

Daytime dB $L_{Ar,T}$ (30 minutes)	**Evening dB $L_{Ar,T}$ (30 minutes)**	**Night-time dB $L_{Aeq,T}$ (30 minutes)**
55	50	45

Note 1: There shall be no clearly audible tonal component or impulsive component in the noise emission from the activity of any noise-sensitive location.

Schedule C.6 Noise Emissions

Location [Note 1]	**Measurement**	**Frequency**
RA1 (295177E. 270076N) dwelling east of installation RA2 (29528lE. 270016N) dwelling north of installation RA3 (295651E, 269816N) dwelling north of installation RA4 (295839E, 269504N) dwelling southeast of installation	$L_{Aeq,T}$ L_{A90} L_{A10} 1/3 Octave Band Analysis	Annually
Period	**Minimum Survey Duration**	
Daytime	A minimum of 3 sampling periods at each noise monitoring location [Note3]	
Evening-time	A minimum of 1 sampling period at each noise monitoring location.	
Night-time [Note 2]	A minimum of 2 sampling periods at each noise monitoring location.	

Note 1 Locations shown on Figure 8.1 Noise Monitoring Locations of the Environmental Impact Statement
Note 2 Night-time measurements should be made between 2300 hrs and 0400 hrs, Sunday to Thursday, with 2300 hrs being the preferred start time.
Note 3 Sampling period is to be the time period T stated as per Schedule B.4 Noise Emissions, of this licence. This applies to day, evening and night time periods.

Daytime	**Evening-time**	**Night-time**
0700 hrs to 1900 hrs.	1900 hrs to 2300hrs	2300hrs to 0700 hrs

3.0 MEASUREMENT PARAMETERS

The parameters used to assess the noise are as follows:

Leq(30): The noise values recorded continuously at every instant during the 30 minute sampling period are integrated by the noise metre to give a single value that represents the continuous equivalent sound level over the 30 minute period during this survey.

L_{10} and L_{90}: are both statistical noise levels. L_{10} indicates that for 10% of the monitoring period the sound levels were greater than the quoted value. L_{90} indicates that for 90% of the monitoring period, the sound levels were greater than the quoted value. L_{10} is used to express event noise. L_{90} is used to express background noise, usually filtering out loud and intermittent interferences such as traffic noise.

Continuous: noise produced without interruption.

Intermittent: noise that is punctuated with interruptions e.g. equipment operating in cycles or events such as single passing vehicle or aircraft.

Impulsive: a noise of short duration (typically less than one second), the sound pressure of which is significantly higher than the background; brief and abrupt.

Tonal: noise which contains a clearly audible tone i.e. a distinguishable, discrete or continuous note (whine, hiss, hum or screech etc).
For the purpose of this noise assessment, a tonal characteristic incurs a penalty of +5dB(A) in accordance with Section 4.3 of the EPA 2016 IPPC Licensing Guidance Note for Noise in Relation to Scheduled Activities.

In order for a tone or impulsive element to warrant a penalty, it should be clearly noticeable and audible. Situations in which a 5 dB penalty applies include the following:

- The noise contains a distinguishable, discrete continuous note (whine, hiss, screech, hum etc).
- The noise contains distinct impulses (bangs, clicks, clatters, or thumps).
- The noise is irregular enough to attract attention.
- The tonal components are clearly audible and the level in a 1/3rd octave band is greater than or equal to the following level in the two adjacent bands;
    - 15dB in low-frequency bands (25Hz to 125Hz);
    - 8dB in middle-frequency bands (160Hz to 400Hz), and;
    - 5dB in high-frequency bands (500Hz to 10,000Hz)

Any tonal noise detected during the daytime (07:00am to 19:00pm) or evening period (19:00pm to 23:00pm) shall incur a penalty of 5 dB(A), and would be considered a non-compliance during the night-time period (23:00pm to 07:00am).

As per top-right-hand corner of each results table, NP indicates no penalty for tonal noise and P indicates a penalty for tonal noise.

The noise measurements were 'A' weighted (to equate to human ear hearing) and the time-weighting 'Fast' was applied.

4.0 BASELINE NOISE ASSESSMENT

Long Term Monitoring Data

As part of the sites IE licence compliance, annual noise monitoring is carried out at the following local noise sensitive receptors. Locations RA1 to RA4 are specifically required to be monitored under the IE licence, and RA5 has been included in the annual monitoring programme since 2017 as agreed with the EPA.

Table 4.1: Annual Noise Monitoring Locations at Dawn Meats (Slane)

Location Ref. No.	Grid Reference (Easting: Northing)	Location Type	Location
RA1	295177: 270076	Noise Sensitive Receptor	House along roadway leading to site, east of site ~300m from the facility.
RA2	295281: 270016	Noise Sensitive Receptor	House along roadway leading to site, north of site ~250m from the facility.
RA3	295651: 269816	Noise Sensitive Receptor	House along roadway leading to site, north of site ~300m from the facility.
RA4	295839: 269504	Noise Sensitive Receptor	House along roadway leading to site, south of site near crossroads~520m from facility.
RA5	295650: 269250	Noise Sensitive Receptor	Houses to southeast of site along L1013 roadway ~500m from the facility.

These locations are shown in a map provided in Appendix A.1 of this report. The results of these annual monitoring surveys are presented in Table 4.1 below.

The following table details the annual monitoring carried out between 2013 and 2019 at noise sensitive receptors in the vicinity of the Dawn Meats (Slane) facility. Noise monitoring for 2020 and 2021 have not been included due to expected deviations in ambient noise levels during Covid restrictions.

Table 4.2: Long Term Annual Noise Results at Dawn Meats (Slane)

Date	Start Time	End Time	Duration [hh:mm]	Period	Location	Description	LAeq,T	LAF_{90}	LAF_{10}
18/12/2013	12:25	14:00	01:35	Day	RA1	House along roadway leading to site, east of site ~300m from site.	63	50	62
18/12/2013	00:23	01:23	01:00	Night	RA1	House along roadway leading to site, east of site ~300m from site.	55	42	46
18/12/2013	09:35	11:05	01:30	Day	RA2	House along roadway leading to site, north of site ~250m from site.	53	47	52
17/12/2013	23:03	00:03	01:00	Night	RA2	House along roadway leading to site, north of site ~250m from site.	45	37	41
17/12/2013	10:35	12:11	01:36	Day	RA3	House along roadway leading to site, north of site ~300m from site.	50	45	52
18/12/2013	00:06	01:12	01:06	Night	RA3	House along roadway leading to site, north of site ~300m from site.	41	39	42
18/12/2013	11:24	12:54	01:30	Day	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	65	46	58
17/12/2013	23:23	00:23	01:00	Night	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	54	33	41
05/02/2015	13:51	15:23	01:32	Day	RA1	House along roadway leading to site, east of site ~300m from site.	52	39	50
06/02/2015	00:38	01:39	01:01	Night	RA1	House along roadway leading to site, east of site ~300m from site.	48	36	43
05/02/2015	12:14	13:46	01:32	Day	RA2	House along roadway leading to site, north of site ~250m from site.	47	37	42
05/02/2015	23:19	00:22	01:03	Night	RA2	House along roadway leading to site, north of site ~250m from site.	40	36	40
05/02/2015	12:05	13:35	01:30	Day	RA3	House along roadway leading to site, north of site ~300m from site.	49	36	53
05/02/2015	23:24	00:30	01:06	Night	RA3	House along roadway leading to site, north of site ~300m from site.	38	32	40
05/02/2015	13:42	15:16	01:34	Day	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	61	39	55
06/02/2015	00:41	01:41	01:00	Night	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	46	27	39

Date	Start Time	End Time	Duration [hh:mm]	Period	Location	Description	LAeq,T	LAF_{90}	LAF_{10}
19/10/2015	13:51	15:21	01:30	Day	RA1	House along roadway leading to site, east of site ~300m from site.	54	36	53
20/10/2015	00:34	01:37	01:03	Night	RA1	House along roadway leading to site, east of site ~300m from site.	48	32	42
19/10/2015	11:58	14:02	02:04	Day	RA2	House along roadway leading to site, north of site ~250m from site.	45	38	44
19/10/2015	23:23	00:23	01:00	Night	RA2	House along roadway leading to site, north of site ~250m from site.	40	38	40
19/10/2015	12:09	13:40	01:31	Day	RA3	House along roadway leading to site, north of site ~300m from site.	44	35	48
19/10/2015	23:27	00:27	01:00	Night	RA3	House along roadway leading to site, north of site ~300m from site.	36	31	36
19/10/2015	14:11	15:55	01:44	Day	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	62	39	55
20/10/2015	01:06	02:06	01:00	Night	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	46	37	41
14/09/2016	10:56	12:26	01:30	Day	RA1	House along roadway leading to site, east of site ~300m from site.	64	55	41
14/09/2016	23:12	00:12	01:00	Night	RA1	House along roadway leading to site, east of site ~300m from site.	50	42	36
14/09/2016	12:37	14:07	01:30	Day	RA2	House along roadway leading to site, north of site ~250m from site.	51	47	39
15/09/2016	00:31	01:32	01:01	Night	RA2	House along roadway leading to site, north of site ~250m from site.	40	38	35
14/09/2016	12:40	14:10	01:30	Day	RA3	House along roadway leading to site, north of site ~300m from site.	44	46	39
15/09/2016	00:31	01:30	00:59	Night	RA3	House along roadway leading to site, north of site ~300m from site.	34	37	31
14/09/2016	10:58	12:28	01:30	Day	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	31	54	44
14/09/2016	23:16	00:16	01:00	Night	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	47	44	37
14/09/2016	14:17	15:47	01:30	Day	RA5	Houses to southeast of site along L1013 roadway ~500m from site	55	59	43
15/09/2016	01:45	02:45	01:00	Night	RA5	Houses to southeast of site along L1013 roadway ~500m from site	41	43	36

Date	Start Time	End Time	Duration [hh:mm]	Period	Location	Description	LAeq,T	LAF_{90}	LAF_{10}
16/08/2017	14:54	16:24	01:30	Day	RA1	House along roadway leading to site, east of site ~300m from site.	51	39	48
16/08/2017	21:23	22:53	01:30	Evening	RA1	House along roadway leading to site, east of site ~300m from site.	57	36	47
17/08/2017	00:24	00:54	00:30	Night	RA1	House along roadway leading to site, east of site ~300m from site.	39	37	40
16/08/2017	11:43	13:14	01:31	Day	RA2	House along roadway leading to site, north of site ~250m from site.	53	44	53
16/08/2017	21:45	22:15	00:30	Evening	RA2	House along roadway leading to site, north of site ~250m from site.	46	33	39
16/08/2017	23:48	00:18	00:30	Night	RA2	House along roadway leading to site, north of site ~250m from site.	38	34	40
16/08/2017	11:00	12:30	01:30	Day	RA3	House along roadway leading to site, north of site ~300m from site.	45	40	48
16/08/2017	21:48	22:18	00:30	Evening	RA3	House along roadway leading to site, north of site ~300m from site.	38	32	41
16/08/2017	23:50	00:20	00:30	Night	RA3	House along roadway leading to site, north of site ~300m from site.	35	32	39
16/08/2017	13:27	15:00	01:33	Day	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	61	41	56
16/08/2017	21:03	21:33	00:30	Evening	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	61	38	48
16/08/2017	23:05	23:45	00:40	Night	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	55	31	43
16/08/2017	12:49	14:19	01:30	Day	RA5	Houses to southeast of site along L1013 roadway ~500m from site.	54	43	59
16/08/2017	20:57	21:27	00:30	Evening	RA5	Houses to southeast of site along L1013 roadway ~500m from site.	53	37	51
16/08/2017	23:01	23:31	00:30	Night	RA5	Houses to southeast of site along L1013 roadway ~500m from site.	55	29	51

Date	Start Time	End Time	Duration [hh:mm]	Period	Location	Description	LAeq,T	LAF_{90}	LAF_{10}
16/10/2018	13:37	15:07	01:30	Day	RA1	House along roadway leading to site, east of site ~300m from site.	54	42	52
16/10/2018	21:06	21:36	00:30	Evening	RA1	House along roadway leading to site, east of site ~300m from site.	53	39	47
17/10/2018	00:36	01:36	01:00	Night	RA1	House along roadway leading to site, east of site ~300m from site.	48	33	41
16/10/2018	11:55	13:26	01:31	Day	RA2	House along roadway leading to site, north of site ~250m from site.	56	45	53
16/10/2018	20:26	20:56	00:30	Evening	RA2	House along roadway leading to site, north of site ~250m from site.	48	37	40
17/10/2018	00:31	01:31	01:00	Night	RA2	House along roadway leading to site, north of site ~250m from site.	42	33	39
16/10/2018	11:46	13:16	01:30	Day	RA3	House along roadway leading to site, north of site ~300m from site.	49	45	52
16/10/2018	20:31	21:01	00:30	Evening	RA3	House along roadway leading to site, north of site ~300m from site.	38	38	40
17/10/2018	01:36	02:36	01:00	Night	RA3	House along roadway leading to site, north of site ~300m from site.	38	36	40
16/10/2018	13:42	15:14	01:32	Day	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	60	42	53
16/10/2018	21:09	21:39	00:30	Evening	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	60	32	46
17/10/2018	23:25	00:25	01:00	Night	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	57	34	41
16/10/2018	15:27	16:57	01:30	Day	RA5	Houses to southeast of site along L1013 roadway ~500m from site.	50	39	54
16/10/2018	21:46	22:16	00:30	Evening	RA5	Houses to southeast of site along L1013 roadway ~500m from site.	44	27	46
16/10/2018	23:20	00:21	01:01	Night	RA5	Houses to southeast of site along L1013 roadway ~500m from site.	40	30	40
22/10/2019	13:49	15:19	01:30	Day	RA1	House along roadway leading to site, east of site ~300m from site.	59	53	44
21/10/2019	21:38	22:08	00:30	Evening	RA1	House along roadway leading to site, east of site ~300m from site.	44	38	32
21/10/2019	23:47	00:18	00:31	Night	RA1	House along roadway leading to site, east of site ~300m from site.	42	37	31

Date	Start Time	End Time	Duration [hh:mm]	Period	Location	Description	LAeq,T	LAF_{90}	LAF_{10}
22/10/2019	12:20	13:50	01:30	Day	RA2	House along roadway leading to site, north of site ~250m from site.	55	48	42
21/10/2019	20:59	21:29	00:30	Evening	RA2	House along roadway leading to site, north of site ~250m from site.	43	39	35
21/10/2019	23:10	23:40	00:30	Night	RA2	House along roadway leading to site, north of site ~250m from site.	49	38	31
22/10/2019	13:13	13:43	00:30	Day	RA3	House along roadway leading to site, north of site ~300m from site.	43	44	40
21/10/2019	20:58	21:28	00:30	Evening	RA3	House along roadway leading to site, north of site ~300m from site.	37	38	33
21/10/2019	23:08	23:38	00:30	Night	RA3	House along roadway leading to site, north of site ~300m from site.	38	37	31
22/10/2019	13:57	15:30	01:33	Day	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	63	57	42
21/10/2019	21:45	22:15	00:30	Evening	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	46	44	35
21/10/2019	23:55	00:25	00:30	Night	RA4	House along roadway leading to site, south of site near crossroads~520m from site.	46	43	33
22/10/2019	15:29	16:59	01:30	Day	RA5	Houses to southeast of site along L1013 roadway ~500m from site	53	55	41
21/10/2019	22:28	22:58	00:30	Evening	RA5	Houses to southeast of site along L1013 roadway ~500m from site	52	42	24
22/10/2019	00:32	01:02	00:30	Night	RA5	Houses to southeast of site along L1013 roadway ~500m from site	31	34	24

4.1 QUIET AREA SCREENING

The location of the development has been screened in order to determine if it is located in an area that could be considered a 'Quiet Area' according to the EPA NG4 Guidance, which states:

The location of the proposed development should be screened in order to determine if it is to be located in or near an area that could be considered a 'Quiet Area' in open country according to the Agency publication Environmental Quality Objectives - Noise in Quiet Areas.

This is achieved using the following checklist:

Table 4.3: Quiet Area Screening Checklist

Screening Question	Answer	
	Yes	No
Is the site >3km away from urban areas with a population >1,000 people?	✓	
Is the site >10km away from urban areas with a population >5,000 people?		✓
Is the site >15km away from urban areas with a population >10,000 people?	✓	
Is the site >3km away from any local industry?		✓
Is the site >10km away from any major industry centre?		✓
Is the site >5km away from any national primary route?		✓
Is the site >7.5km away from any motorway or dual carriageway?	✓	
QUIET AREA?		✓
Other Relevant Comments	Yellow Furze (pop: <1,000) – 0.7 km NW. Slane (pop: 1,349) – 4.25km NE. Navan (pop: 28,158) – 8.0 km E. N2 primary route – 1.35 km NE.	

The proposed development location does not comply with all criteria, as per the above checklist. Therefore, it is considered that the development would not be located within a '*Quiet Area*'.

4.2 AREAS OF LOW BACKGROUND NOISE SCREENING

When an area is not identified as being *a 'Quiet Area'*, the existing background noise levels measured during the environmental noise survey should be examined to determine if they satisfy the following criteria:

- Average Daytime Background Noise Level ≤ 40dB L_{AF90}
- Average Evening Background Noise Level ≤ 35dB L_{AF90}
- Average Night-time Background Noise Level ≤ 30dB L_{AF90}

Noise monitoring has indicated that background L_{AF90} noise levels do not fall below the levels as outlined in Step 3, Chapter 4.4.2 of the EPA *Guidance Note on Noise from Scheduled* Activities (NG4), at any of the monitoring locations.

The following noise levels are averages based upon annual noise monitoring carried out in the vicinity of Dawn Meats (Slane) under the sites IE licence between 2014 and 2019. Background LAF_{90} noise levels at the monitoring locations are generally influenced by traffic on local and surrounding roads and the existing Dawn Meats (Slane) facility.

Table 4.4: Low Background Noise Area Screening Table

Ref	Location	Daytime		Evening		Night-time	
		LAeq, T	**LAF_{90}**	**LAeq, T**	**LAF_{90}**	**LAeq,T**	**LAF_{90}**
RA1	House along roadway leading to site, east of site ~300m from site.	57	45	51	38	47	37
RA2	House along roadway leading to site, north of site ~250m from site.	51	44	46	36	42	36
RA3	House along roadway leading to site, north of site ~300m from site.	46	42	38	36	37	35
RA4	House along roadway leading to site, south of site near crossroads ~520m from site.	58	45	56	38	50	36
RA5	Houses to southeast of site along L1013 roadway ~500m from site	53	49	50	35	42	34
Average		**53**	**45**	**48**	**37**	**44**	**36**

On average, background noise levels exceed 40dB L_{AF90} during the daytime period, exceed 35 dB L_{AF90} during the evening period and exceed 30 dB L_{AF90} during the night-time period.

Given the noise monitoring results obtained, it is considered that this area would not be classified as a "Low Background Noise Area". Therefore, the existing Dawn Meats (Slane) licence noise limits are considered to be appropriate for the area.

5.0 PREDICTIVE NOISE ASSESSMENT

The International Standards Authority guidance ISO 9613-2:1996 has been used in the prediction of the propagation of potential noise from the proposed works and development to the nearest noise sensitive receptors. The British Standard BS4142:2014 has been used to assess the potential for noise impact at local noise receptors as a result of the proposed development.

ISO 9613-2:1996

All measurements were taken at 1.2 – 1.5 metres height above local ground level and 1 – 5 metres away from reflective surfaces.

The methodology used in this report is based upon the international standard ISO 9613-2 "*Attenuation of Sound during Propagation Outdoors*". This standard outlines a method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources.

The central formula for this calculation is as follows:

$$A = A_{div} + A_{gr} + A_{bar} + A_{misc}$$

Where

A	is the attenuation due to site conditions
A_{div}	is the attenuation due to the geometrical divergence (distance from source)
A_{gr}	is the attenuation due to the ground effect
A_{bar}	is the attenuation due to a barrier
A_{misc}	is the attenuation due to miscellaneous other effects as appropriate

This attenuation factor is then subtracted from the predicted operational noise at the proposed activity. The resultant figure is the predicted noise from the proposed activity at a given noise sensitive location.

This figure may then be added logarithmically to the existing background noise at the noise sensitive location to attain the predicted noise level if the proposed activity were to begin.

BS 4142:2014

The British Standard EN BS 4142 "*Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas*" provides a method for predicting the likelihood of impact from noisy activities such as industrial activities, quarries and landfills etc.

A correction factor, typically of up to +6dB for tonal elements and +9dB for impulsive elements, may be applied arithmetically to the predicted noise from the proposed activity based upon the character of the noise and its likelihood to cause nuisance. This is termed the 'rating level'.

When making an assessment on the impact of a specific sound, an initial estimation is made by subtracting the measured background sound level from the rating level. Typically, the greater the difference, the greater the magnitude of impact:

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact.
- A difference of around +5dB is likely to be an indication of an adverse impact.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact.
- Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

5.1 SELECTION OF RECEPTOR LOCATIONS FOR PREDICTIVE NOISE

Selected receptor locations are illustrated in maps provided in Appendix A.

WWTP

In order to predict the impact of the construction and operational phases of the proposed amendments to the approved WWTP extension, sample noise-sensitive locations were selected based upon the nearest location within groups of NSL's sharing similar orientation with regard to the proposed site and intervening topography.

Table 5.1: WWTP Predictive Noise Receptor Locations

Location Ref. No.	Grid Reference (Easting: Northing)	Location Type	Location
NSL1	295651: 269816	Noise Sensitive Receptor	Residences located 500m East of the proposed site (RA3).
NSL2	295281: 270016	Noise Sensitive Receptor	Residences located 275m North of the proposed site (RA2).
NSL3	294857: 269613	Noise Sensitive Receptor	Residences located 335m West / South-West of the proposed site.
NSL4	295839: 269504	Noise Sensitive Receptor	Residences located 735m South / South-East of the proposed site (RA5).
NSL 5	294530: 270014	Noise Sensitive Receptor	School located 665m North-West of the proposed site.

Pipe Line

The proposed pipeline would pass along the roadside on the Windmill Road, L1013 road, Yellow Furze road and through the village, L1600 road, and local road leading to the River Boyne. The pipeline route is mapped in Appendix A.

The pipeline will pass close by roadside houses, and the school and church in the village of Yellow Furze. Typical set back distances would be greater than 20m for the majority of residences and structures along the route, however, distances of 5 to 10 metres from the façade may occur, depending on the precise location along the road.

5.2 SOURCE NOISE SPECIFICATIONS & FORMULAE

Construction Noise

The noisiest aspect of the proposed development is likely to be the construction phase of the project. During construction, the noisiest phase is typically excavation and landscaping activities.

The guidance document BS5228-Part 1 2009 "*Code of practice for noise and vibration control on construction and open sites. Noise*" provides typical noise levels for standard construction equipment during typical construction and demolition activities.

The typical noise level of construction is summarised in the following table.

Table 5.2: Construction Plant Noise Levels (Ref: BS5228:2009)

Sound Pressure Level (dBA) @ Octave Band Centre Frequency									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
C2.3 - 22T Excavator (clearing site) @ 1 m	75	88	88	91	93	92	91	86	99
C2.14 - 22T Excavator (excavating) @ 1 m	80	83	89	91	92	90	85	21	97
C2.45 Water Pump 6in @ 1 m	68	73	74	80	82	78	75	61	86
Resultant Noise Level	**81**	**89**	**92**	**94**	**96**	**94**	**92**	**86**	**101**

It should be noted that this resultant noise level is considered a worst case scenario for noise levels expected at the site during construction activities.

Operational Noise

Operational noise at the site would typically be characterised by general motor and noise from air blowers. Occasional noise from agricultural machinery and deliveries would also occur. Large goods vehicles and lorries typically generate noise levels of 78 – 95 dBA, depending on their size.

The following table provides noise levels for the proposed onsite insulated Kaeser Air Blowers, as measured to DIN EN ISO 2151, Figures ± 3dB(A), with sound insulated pipework.

Kaeser Air Blower Operation Noise Levels:

Sound Pressure Level (dBA) @ Octave Band Centre Frequency									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
75kW Blower (Max)	74	69	67	70	74	71	68	66	**80**
45kW Blower (Max)	71	62	63	65	68	68	62	61	**75**

Table 5.3: Maximum Operational Noise Level at the Proposed Development

Sound Pressure Level (dBA) @ Octave Band Centre Frequency									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
C.4.19 Truck (idling)	72	76	77	83	87	88	82	71	**92**
3 x 75kW Blower (Max)	79	74	72	75	79	76	73	71	**85**
3 x 45kW Blower (Max)	76	67	68	70	73	73	67	66	**80**
ETP Background Noise	53	56	59	48	48	50	44	39	**62**
Resultant Noise Level	**77**	**77**	**78**	**83**	**87**	**88**	**82**	**73**	**93**

Octave readings provided from PES Ltd library data are based upon monitoring conducted on similar equipment, machinery or vehicles and locations which would be in place at the proposed development.

It should be noted that this resultant noise level is considered a worst case scenario for noise levels expected at the proposed development. Normal ETP operational noise levels would be expected to be in the region of 62 dBA (ETP Background Noise), as measured at similar developments of this type.

Relevant Formulae

In order to carry out this predictive analysis, the following attenuation characteristics have been taken into account:

Divergence – A_{div}

The geometrical divergence accounts for the spherical spreading in the free field from the point sound source, causing attenuation due to the inverse square law. Divergence is calculated as follows:

$$A_{div} = 20 \log_{10} (d/d_0) + 11$$

Where:

- d is the distance from the source to the receiver (m)
- d_0 is the reference distance (1 m)
- 11 is a constant relating the sound power level to the sound power level at a reference distance d_0 which is 1 meter from an omnidirectional point source.

Barrier Effect – A_{bar}

The barrier effect was calculated using the Anderson and Kurze calculation as follows:

$$D_Z = 20\log10 (\Omega/\tanh \Omega) + 5dB$$

Where: $\Omega = (2\pi N)^{1/2}$

And N is the Fresnel number given by: $N = 2\ d / \lambda$

Where: d = is the differential path length

λ = wavelength of the sound

Ground Effect – A_{gr}

Ground attenuation is mainly the result of sound reflected by the ground surface interfering with the sound propagation directly from the source to the receiver. Porous ground, which includes ground covered by grass, trees or other vegetation or farmland, has the effect of reducing the apparent noise level at the receiver.

Ground Effect has been calculated based upon section 7.3.1 of ISO 9613-2, which calculates the combined effect of ground attenuation in the vicinity of the noise source, receiver and intervening ground.

The ground factor G is a constant representing the porosity of the ground in question. Hard ground (roads, ice, water, tamped ground etc.) is given a ground factor of zero. Soft ground (grass, trees, agricultural crops etc.) is given a ground factor of 1. Mixed ground is given a value of between 0 and 1 which is representative of the fraction of the ground that is soft. The area of influence is taken to be 30 times the source or receiver height, with the intervening ground being the remainder.

Miscellaneous – A_{misc}

As parameters relating to weather and atmospheric conditions are extremely variable and would change throughout the year, these have not been included as part of this assessment.

6.0 NOISE MODELLING RESULTS

In order to determine the impact of noise from the facility during construction activities and normal operation at the proposed treatment plant area, the resultant noise levels at noise sensitive receptors from onsite activities have been calculated.

Table 6.1 below summarises the findings of this predictive noise assessment for the main effluent plant compound area. Detailed calculations may be found in Appendix B of this report.

The source construction noise at the proposed biological plant is based upon the operation of one 22 tonne excavator during site clearing and excavation, and an operating water pump within the proposed construction site area.

Operational Noise (Lorries) assesses noise based upon a single lorry idling at the site.

Maximum operation noise takes into account general equipment noise at the proposed effluent facility, noise from 3 x 75kW and 3x 45kW blowers. It should be noted that blowers operating at their maximum rated output would be a rare occurrence. This is considered to be a worst case scenario for noise which could be generated during operations at the proposed development.

Table 6.1: Predicted Noise Results Summary (dBA) – WWTP

NSL Ref	Location	Construction Noise	Operational Noise - Lorries	Maximum Operational Noise
Source Noise Level (dBA)		**101**	**92**	**86**
NSL1	NSL 500m E	36	24	15
NSL2	NSL 275m N	42	29	21
NSL3	NSL 335m WSW	40	28	20
NSL4	NSL 735m SSE	33	23	15
NSL5	NSL 665m NW	34	19	11

Table 6.2 below summarises maximum noise levels which may be expected at set back distances from the pipeline route. The source construction noise along the pipeline route is based upon the operation of one 22 tonne excavator during site clearing and excavation.

There would be no ongoing noise from the operation of the pipeline along its route. While pipeline integrity testing and washing would occur periodically, these are not inherently noisy activities. Therefore, no operational noise scenario has been included in this assessment.

Table 6.2: Predicted Noise Results Summary (dBA) – PIPELINE ROUTE

NSL Ref	Location	Construction Noise
Source Noise Level (dBA)		101
NR1	NSL @ 5m	76
NR2	NSL @ 10m	70
NR3	NSL @ 20m	64

BS4142:2014 Impact Assessment – WWTP

The methodology outlined in BS4142 requires that predicted noise levels be compared to existing L_{90} figures at noise sensitive locations in order to determine the likely noise impact.

Representative baseline noise levels have been taken as the averages of long term noise monitoring carried out by Dawn Meats (Slane) from the area.

The overall average long term L_{AF90} value for all annual noise monitoring locations has been used to represent the background noise for each noise sensitive location. The overall average long term L_{AF90} value has also been used to represent the baseline noise level for noise sensitive receptors along the pipeline route.

A noise character penalty of +5 has been applied to predicted noise levels containing machine noise. This is to account for distant impulsive noise from operating machinery.

The following table determines the likelihood of construction noise impacts at noise sensitive locations following the BS4142 methodology;

Table 6.3: BS4142 Construction Noise Assessment – WWTP

	Background Noise	**Predicted Noise**			**Difference from Background**
Location	**Average Daytime L_{AF90}**	**Predicted Noise**	**Predicted Penalty**	**Rating Level ($L_{Ar,T}$)**	
NSL1	**45**	36	5	**41**	-4
NSL2	**45**	42	5	**47**	2
NSL3	**45**	40	5	**45**	0
NSL4	**45**	33	5	**38**	-7
NSL5	**45**	34	5	**39**	-6

The following table determines the likelihood of operational noise from lorries onsite causing impacts at noise sensitive locations following the BS4142 methodology;

Table 6.4: Operational Noise Assessment – WWTP Lorries

	Background Noise	**Predicted Noise**			**Difference from Background**
Location	**Average Daytime L_{AF90}**	**Predicted Noise**	**Predicted Penalty**	**Rating Level ($L_{Ar,T}$)**	
NSL1	**45**	24	5	**29**	-16
NSL2	**45**	29	5	**34**	-11
NSL3	**45**	28	5	**33**	-12
NSL4	**45**	23	5	**28**	-17
NSL5	**45**	19	5	**24**	-21

The following table determines the likelihood of maximum operational noise impacts at noise sensitive locations following the BS4142 methodology;

Table 6.5: Maximum Operational Noise Assessment - WWTP

	Background Noise	Predicted Noise			Difference from Background
Location	**Average Daytime L_{AF90}**	**Predicted Noise**	**Predicted Penalty**	**Rating Level ($L_{Ar,T}$)**	
NSL1	**45**	15	5	**20**	-25
NSL2	**45**	21	5	**26**	-19
NSL3	**45**	20	5	**25**	-20
NSL4	**45**	15	5	**20**	-25
NSL5	**45**	11	5	**16**	-29

BS4142:2014 Impact Assessment – PIPELINE ROUTE

The methodology outlined in BS4142 requires that predicted noise levels be compared to existing L_{90} figures at noise sensitive locations in order to determine the likely noise impact.

Representative baseline noise levels have been taken as the averages of long term noise monitoring carried out by Dawn Meats (Slane) from the area.

A noise character penalty of +5 has been applied to predicted noise levels containing machine noise. This is to account for distant impulsive noise from operating machinery.

The following table determines the likelihood of construction noise impacts at noise sensitive locations following the BS4142 methodology;

Table 6.6: BS4142 Construction Noise Assessment – PIPELINE ROUTE

	Background Noise	Predicted Noise			Difference from Background
Location	**Average Daytime L_{AF90}**	**Predicted Noise**	**Predicted Penalty**	**Rating Level ($L_{Ar,T}$)**	
NR1 (5m)	**45**	76	5	**81**	36
NR2 (10m)	**45**	70	5	**75**	30
NR3 (20m)	**45**	64	5	**69**	24

7.0 DISCUSSION

The topography in the area surrounding the proposed development at Greenhills is generally flat, ranging between 80-100m above sea level with a gentle slope rising to the north-east.

The principal factor influencing the mitigation of noise from the proposed effluent treatment operation is its distance from noise sensitive locations. Distance would result in significant attenuation of noise as sound energy reduces by the inverse of the square of distance travelled (inverse square law). The closest noise sensitive location is NSL2, which is 275m from the proposed WWTP plant.

The terrain between the closest noise sensitive locations and the proposed site is composed of mature hedgerows, treelines and grassland. For the purpose of noise attenuation, these surfaces are considered 'porous', whereas made ground would be considered 'reflective'. The combination of these factors would also contribute somewhat to the mitigation of noise from onsite activities.

There are two critical noise control periods of activity associated with the proposed development, construction phase and operational phase, and two critical noise control locations, the proposed main effluent treatment plant compound area and the proposed pipeline route. The potential for noise impact at the closest noise sensitive locations has been discussed below under these headings.

A BS4142 has been completed on the potential noise impacts which may occur as a result of the proposed permission (Planning Ref:191135) from Limerick Co Co to increase the capacity of the piggery from 600 sows to 1000 sows and their progeny and the construction of a new electrical substation.

BS4142 infers that for a given excess of the rating level over the background level, the impacts and potential likelihood of complaints are as follows:

Excess	Likelihood of Complaints	Interpretation of Impact
≥ 10dB	Likely	An indication of a significant adverse impact.
> 5dB	Possible	An indication of an adverse impact.
≤ 5 dB	Unlikely	An indication that it is unlikely that the specific sound source will have an adverse impact or a significant adverse impact.
< 0dB	Very Unlikely	An indication that the specific sound source will have a low impact.

Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact.

7.1 CONSTRUCTION PHASE NOISE IMPACT

Construction noise, while inherently noisy and disruptive, is temporary in duration. It is anticipated that the construction of the pipeline would take 9-10 weeks and WWTP extension would take approximately 9 months to complete. The works involving "heavy machinery" for the purposes of excavation, and the preparation of building foundations usually cause the most disturbances to nearby residents.

Construction HGV movement to and from Dawn Meats (Slane) may result in additional noise at noise sensitive locations in the vicinity due to an increase in frequency of movements, however, this would be in the context of existing frequent HGV traffic on the local roads.

Increased traffic noise would be most apparent on roadways adjacent to the pipeline route, although frequency of HGV traffic would be limited by the lower requirement for materials for pipeline construction.

Temporary noise nuisance may occur when earthmoving or excavation works take place at the main WWTP compound and along the route of the pipeline.

Generally, the type of works involved at this site would include the following:

- Excavation/Levelling: Excavator, dump truck & dozer.
- Foundations: Excavations, cement mixers & concrete vibrators.
- General Construction: Masonry construction, services, drainage and surfacing etc.

For construction noise impact prediction purposes, it can be assumed that at any one stage in the construction of this development, several activities occur together. Therefore, it has been assumed that maximum intermittent noise levels of ~ 101 dB LAeq at 1m from the source may occur during the noisiest phase of the construction schedule.

7.1.1 WWTP Construction Phase Noise Impact

The following graph compares the calculated construction noise rating arising from onsite activities (blue) average existing daytime baseline noise at noise sensitive locations (green) and the NRA weekday daytime noise limit (red line), as summarised in section 6.0 above.

As can be seen in Table 6.3 and Figure 7.1, noise from the construction of the main WWTP compound of the development is predicted to result in noise rating levels at noise sensitive locations of 38 to 47 L_{Ar30}. With average background daytime noise levels of 45 L_{AF90}, construction activities at the proposed biological plant would result in noise ranging from 7 dBA below to 2 dBA above the existing background noise level at noise sensitive locations.

It should be noted that these noise levels are considered a worst case scenario, as it assumes that the noisiest operations (i.e. excavation works) are carried out simultaneously. This event would be anticipated to be a rare occurrence and only for short periods of the construction phase.

According to The National Roads Authority's "*Guidelines for the Treatment of noise and vibration in National Road Schemes*" (2004), noise levels at noise sensitive locations of 70 dB(A) L_{Aeq} between daytime hours (07:00-19:00) and 60 dB(A) L_{Aeq} between evening (19:00-22:00 hours) are considered to be acceptable.

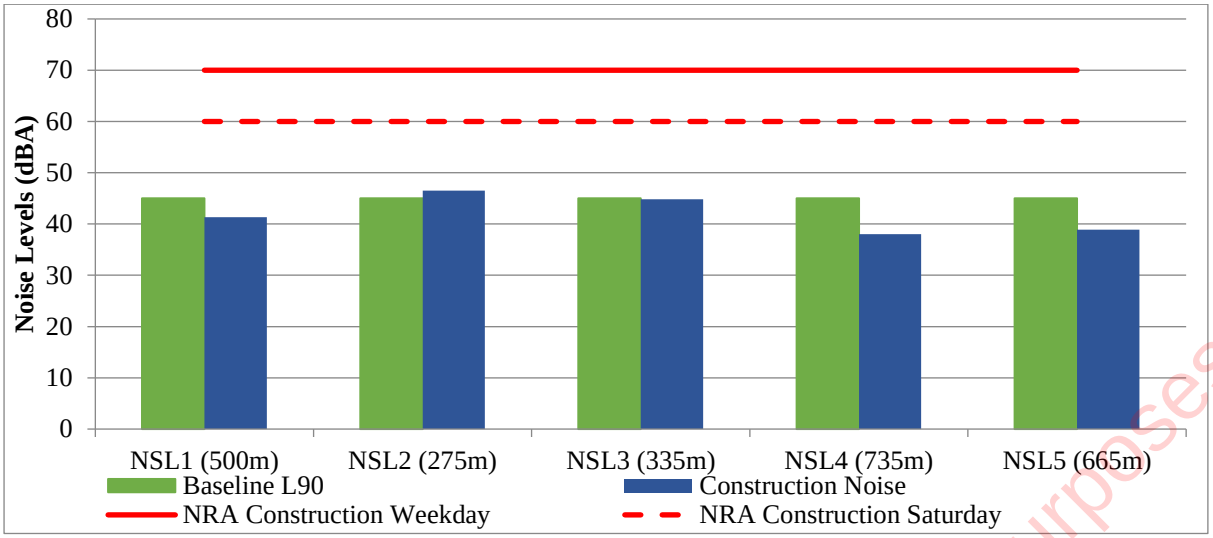


Figure 7.1: *Predicted Construction Noise Rating ($L_{Ar,T}$) vs. Existing Daytime Background Noise (L_{AF90}) – WWTP*

As can be seen above, predicted noise from the construction phase of the main WWTP compound would not exceed the NRA guidance levels for 70 dBA Monday to Friday (07:00 – 19:00hrs) and 65 dBA Saturday (08:00 – 16:30hrs) periods.

Therefore, it is predicted that there would be a low to no significant impact on noise sensitive locations as a result of the WWTP construction phase of the proposed development, due to the predicted noise levels and limited period of time over which the impact would occur.

It is recommended that guidance on control of noise, as per The National Roads Authority's "*Guidelines for the Treatment of noise and vibration in National Road Schemes*" (2004) and British Standard 5228-1 "*Code of practice for Noise Control on Construction and Open Sites*" be followed during the construction phase.

It is recommended that compound construction works be conducted between the hours and in compliance with the following limits:

Days / Times	$L_{Aeq\ (1hr)}$ dB
Monday to Friday (07:00 – 19:00hrs)	70
Saturday (08:00 – 16:30hrs)	65

Any works which, by necessity, are required to be carried out outside of these times should notified to relevant bodies, i.e. the local council or the EPA, and any potentially affected local residents in good time and prior to specified works commencing.

7.1.2 Pipe Line Construction Noise Impact

The following graph compares the calculated noise rating arising from pipeline construction activities (blue), average existing daytime baseline noise at noise sensitive locations (green) and the NRA weekday daytime noise limit (red line), as summarised in section 6.0 above.

It is anticipated that the highest noise levels which would be generated during the construction phase of the proposed pipeline would be from the excavation along the route. It is anticipated that pipeline construction works may occur within 5 to 20 metres of residence boundaries.

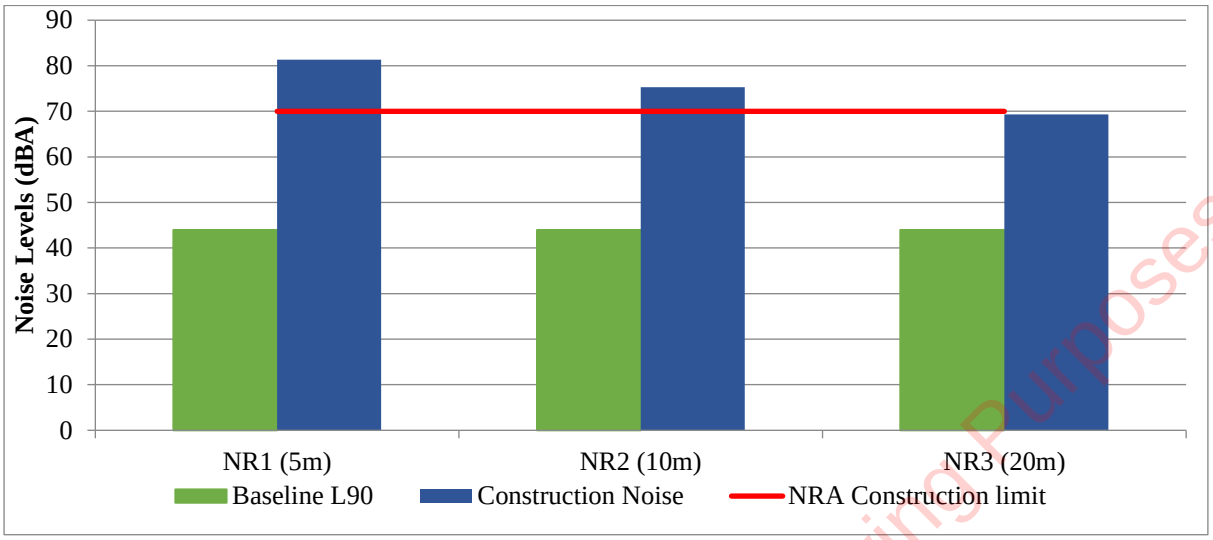


Figure 7.2: *Predicted Construction Noise Rating ($L_{Ar,T}$) vs. Existing Daytime Background Noise (L_{AF90}) – PIPELINE*

As can be seen in Tables 6.6 and figure 7.2 above, noise from the construction of the pipeline phase of the development is predicted to result in noise levels at noise sensitive locations of 81 L_{Ar30} at 5 metres to 69 L_{Ar30} at 20 metres. With an average background noise level of 45 L_{AF90}, construction activities at the proposed pipeline would be 24 to 36 dBA above the existing background noise level at noise sensitive locations.

As stated above, these noise levels are considered to be a worst case scenario and represent the maximum likely noise from excavation activities. However, it is anticipated that the pipeline construction phase would occur over relatively short a 9–10-week period. Therefore, at a pipeline route length of 7.2km, the pipeline works would progress at approximately 145m/day. Therefore, these worst case scenario noise levels would be expected to occur for part of a single day as pipeline works progress.

It is predicted that there would be a major to moderate impact to noise sensitive locations as a result of the pipeline construction phase of the proposed development for a short period of time as works pass close to sensitive receptors. The Pipe Line construction noise is predicted to fall above the NRA Guidelines limits of 70 dBA daytime.

It is recommended that guidance on control of noise, as per The National Roads Authority's "*Guidelines for the Treatment of noise and vibration in National Road Schemes*" (2004) and British Standard 5228-1 "*Code of practice for Noise Control on Construction and Open Sites*" be followed during the construction phase.

It is recommended that pipeline construction works only be conducted at the following times and limit:

Days / Times	$L_{Aeq\ (1hr)}$ dB
Monday to Friday (07:00 – 19:00hrs)	70

Any works which, by necessity, are required to be carried out outside of these times should be notified to relevant bodies, i.e. the local council or the EPA, and any potentially effected local residents in good time and prior to specified works commencing.

Where practical and safe to use, it is recommended that temporary noise barriers are erected around anticipated noisy activities, such as excavation, along the pipeline route. Where houses are likely to be occupied during the day, the use of acoustic screens and huts should be considered during high noise generating activities which are expected to occur over extended periods of the work day.

Therefore, it is predicted that there would be a moderate impact on noise sensitive locations as a result of the pipeline construction phase of the proposed development, due to the limited period of time over which the impact would occur and proposed mitigation.

7.2 OPERATIONAL NOISE IMPACT ASSESSMENT

The following graph compares the calculated noise rating arising from onsite WWTP activities from lorries (light blue), maximum equipment noise (dark blue), average existing daytime (light green), evening (green) and night-time (dark green) baseline noise at noise sensitive locations and the EPA Guidance / IE licence daytime (gold line), evening (blue line) and night-time (black line) noise limits, as summarised in section 6.0 above.

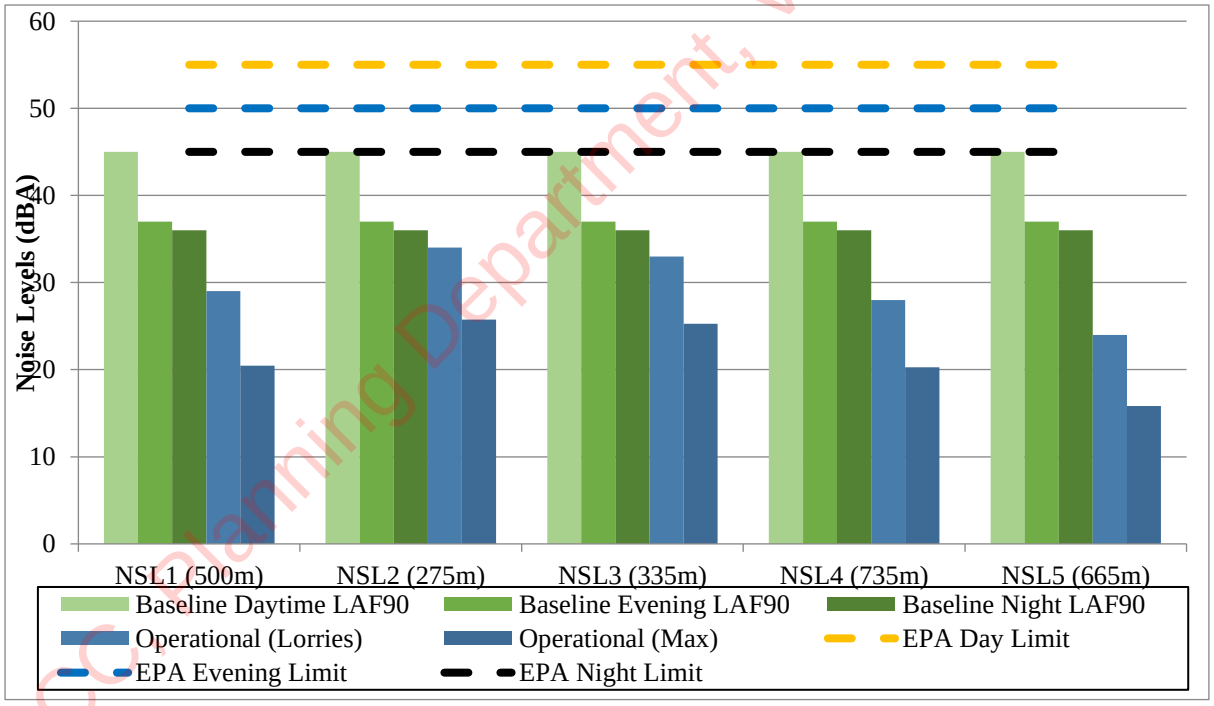


Figure 7.3: *Predicted Operational Noise Rating (LAr,T) vs. Existing Background Noise (LAF90) – WWTP*

Predicted Maximum Operational Noise – WWTP

In order to predict the highest likely risk of impact from the operation of the proposed effluent treatment plant during its operational phase, noise sources likely to contribute to the highest noise levels onsite at any one time were included in this assessment. The mitigation of noise

from the treatment plant compound would principally be by design, including set-back distance from receptors and, in particular, screening of the compound area by the proposed earth berm.

As can be seen in Tables 6.4 and 6.5 above, the principal noise sources which would account for the maximum noise levels at the facility would be vehicles onsite, general background noise from pumps and particularly aeration blowers operating at maximum output.

These are considered the worst case scenario for noise as a result of the operation of the proposed development. Vehicles would only be operating within the treatment plant area for limited periods of the day and aeration blowers are selected and designed to operate within the centre of their power range (rather than maximum output).

It should also be noted that the frequency of vehicles operating in the vicinity of the proposed effluent plant would be significantly reduced from the existing daily removal of effluent tankers 7 to 8 times per day. Collection of a maximum of 15 tonnes of dewatered sludge would be expected to occur once per day.

Under the BS4142 criteria, a rated noise level from the proposed development, which is greater than 10 dBA below the existing background noise level, would to be masked by other dominant local noise sources and would be inaudible at the exterior of the closest noise sensitive locations.

As can be seen in Table 6.4 and Figure 7.2 above, noise from lorries operating within the WWTP area are predicted to result in noise levels ranging from 24 to 34 L_{Ar30} at noise sensitive locations. Noise levels would range from 11 to 21 dBA below existing baseline daytime noise levels, and therefore would not be anticipated to cause a significant nuisance under the BS4142 criteria.

However, it should be noted that during evening and night time periods, lorry noise levels would be anticipated to range from 3-4 dBA below background at NSL2 (275m) and NSL3 (335m). Therefore, there would be potential for a low impact at these locations should lorry activities occur outside of daytime hours.

It is recommended that all lorry operators be informed of site noise controls as part of the existing environmental management system, to keep high revs to a minimum and to keep to the onsite speed limits.

As can be seen in Table 6.5 and Figure 7.2 above, at maximum operational noise levels, it is predicted that resulting noise levels at noise sensitive locations would range from 14 L_{Ar30} to 24 L_{Ar30} at sensitive receptor locations

With average daytime background noise levels of 45 L_{AF90}, Maximum Operational Noise at the proposed biological plant would be between 19 to 29 dBA below the existing background noise level at noise sensitive locations. Maximum equipment noise would also be greater than 10 dBA below the existing evening and night-time background noise levels at receptors.

The operation of blowers at maximum output is considered to be an unlikely event, as the equipment would be sized to ensure operation at normal, mid-range outputs. However, this assessment has determined that maximum noise from the air blowers would not cause an impact at noise sensitive locations when operating at maximum power.

As onsite equipment would normally operate at noise levels well below these predicted levels, it is anticipated that normal operations at the facility would be unlikely to cause a noise impact at local receptors.

The EPA "*Guidance Note on Noise (NG4)*" (2016) recommends the following limits for noise from facilities at noise sensitive locations;

Divisions	Times	dB(A)
Day	(07:00 to 19:00hrs)	55dB LAr,T
Evening	(19:00 to 23:00hrs)	50dB LAr,T
Night	(23:00 to 07:00hrs)	45dB LAeq,T

The Dawn Meats (Slane) facility operates under licence limits for noise which are based upon these NG4 guidance limits.

In this worst case scenario, it is predicted that maximum noise arising from the proposed development would be in compliance with daytime, evening and night time guidance limits at the nearest noise sensitive locations and existing facility EPA IE licence limits.

Therefore, it is predicted that in the worst case scenario for operational noise at the proposed development, there would be no impact at these noise sensitive locations. The proposed development noise would result in no additional noise impact in the surrounding area.

8.0 CONCLUSIONS

- There are two critical noise control periods of activity associated with the proposed development, construction phase and operational phase, and two critical noise control locations, the proposed main effluent treatment plant compound area and the proposed pipeline route.

- It is the main conclusion of this report that no significant alteration to the existing noise environment would occur as a result of the proposed development at Greenhills, Beauparc, Co. Meath.

- Maximum construction noise at the proposed WWTP compound has been predicted to result in noise levels of 38 to 47 dBA L_{Ar30} at the nearest noise sensitive locations, ranging from 7 dBA below to 2 dBA above the existing day-time background noise levels.

- It is predicted that there would be a low to no significant impact on noise sensitive locations as a result of the WWTP construction.

- All construction noise at the at the proposed WWTP compound has been predicted to be in compliance with NRA Guidelines limits for construction works.

- Maximum construction noise along the proposed pipeline route has been predicted to result in noise levels of L_{Ar30} 81dB at 5m to L_{Ar30} 75dB at 20m, ranging from 24 to 36 dBA above the existing day-time background noise levels.

- Depending on distance from works, it is predicted that there would be a major to moderate impact to noise sensitive locations as a result of the pipeline construction and noise mitigation should be implemented.

- At a pipeline route length of 7.2km and construction period of 10 weeks, the pipeline works would progress at approximately 145m/day. Therefore, these worst case scenario noise levels would be expected to occur for part of a single day as pipeline works progress.

- As construction noise would occur over a short period, would be managed through appropriate mitigation measures and would result in no permanent change to the existing noise environment of the area, it is considered that there would be a moderate noise impact as a result of proposed construction works along the pipeline route.

- Maximum noise during the operation of the effluent plant would occur as a result of lorries at the site, which has been predicted to result in noise levels of 24 to 34 dBA L_{Ar30}, ranging from 11 to 21 dBA below existing baseline daytime noise level at the nearest noise sensitive locations.

- Therefore, lorries operating within the effluent plant area would not be anticipated to cause a noise nuisance under the BS4142 criteria.

- The operation of onsite aeration equipment at maximum has been predicted to result in noise levels of 16 to 26 dBA L_{Ar30}, ranging from 19 to 29 dBA below existing day-time background noise levels.

- There would be anticipated to be no significant noise impact as a result of maximum equipment noise at the proposed effluent plant.

- All operational noise from the proposed development has been predicted to be in compliance with the EPA (NG4) daytime, evening and night-time guidance limits.

- It is also concluded that Dawn Meats (Slane) would remain in compliance with their EPA IE licenced noise limits.

9.0 RECOMMENDATIONS

- It is recommended that guidance on control of noise, as per The National Roads Authority's "*Guidelines for the Treatment of noise and vibration in National Road Schemes*" (2004) and British Standard 5228-1 "*Code of practice for Noise Control on Construction and Open Sites*" be followed during the construction phase.

- It is recommended that ETP compound construction works be conducted within the following times and in compliance with the following limits:

Days / Times	$L_{Aeq\ (1hr)}$ dB
Monday to Friday (07:00 – 19:00hrs)	70
Saturday (08:00 – 16:30hrs)	65

- It is recommended that pipeline construction works be conducted within the following times and in compliance with the following limit:

Days / Times	$L_{Aeq\ (1hr)}$ dB
Monday to Friday (07:00 – 19:00hrs)	70

- Where residences are likely to be occupied during the day, the use of acoustic screens and huts should be considered during high noise generating activities which may be expected to occur over extended periods of the work day.

- It is recommended that considerations with regard to noise be included in a Construction Environmental Management Plan (CEMP) to be prepared by the construction firm prior to beginning works.

- In order to ensure continued good practice in relation to the management of noise at the Dawn Meats (Slane) facility, it is recommended that the existing site Noise Management Programme be updated prior to commissioning of the proposed effluent treatment plant. The draft programme outlined in Appendix C may be used as a starting point, subject to site specific review.

10.0 REFERENCES

ISO 9613-2:1996 "*Attenuation of Sound during Propagation Outdoors*".

EN BS 4142:2014 "*Method for Rating Industrial Noise Affecting Mixed Residential and Industrial Areas*".

The National Roads Authority's "*Guidelines for the Treatment of noise and vibration in National Road Schemes*" (2004)

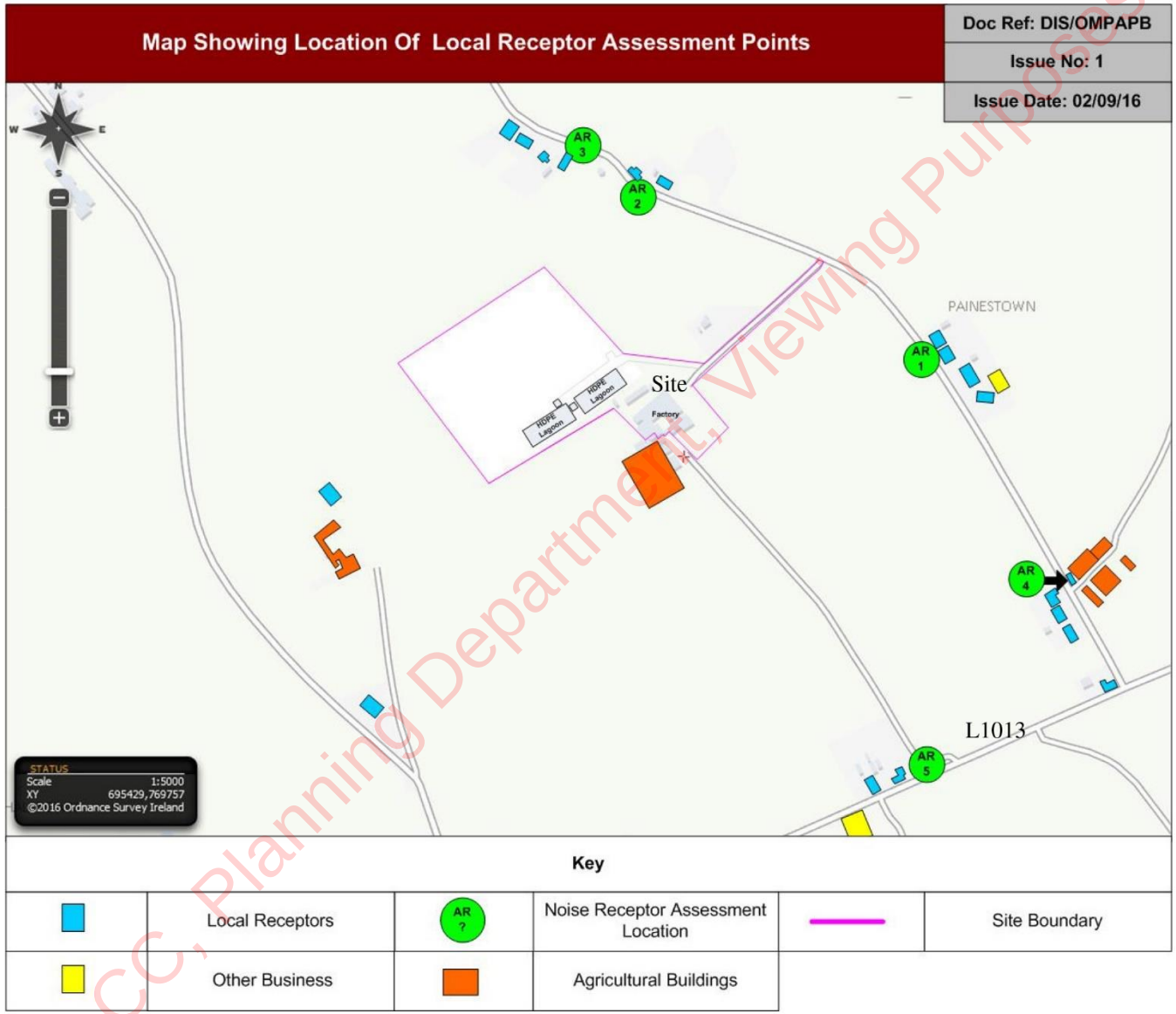
EN BS 5228-1:2009 "*Code of practice for noise and vibration control on construction and open sites*"

Grant S. Anderson and Ulrich J. Kurze, "*Outdoor Sound Propagation*," Chpt. 5 in Noise and Vibration Control Engineering – Principals and Applications, edited by L.L. Beranek and I.L. Vér, (John Wiley & Sons, NY, NY 1992).

APPENDIX A

- SITE BOUNDARY AND NOISE SENSITIVE LOCATIONS -

Appendix A.1: Annual Noise Monitoirng Locations Map



Appendix A.2: Predictive Noise Sensitive Receptor Map - WWTP

Notes:
Site Location
Site Ownership

Noise Sensitive Locations

NSL1 – 525m East

NSL2 – 300m North-East

NSL3 – 320m West-South-West

NSL4 – 700m South-South-East

NSL5 – 660m North-West

DAWN MEATS IRELAND, CO. MEATH

MONITORING LOCATIONS

PANTHER ENVIRONMENTAL SOLUTIONS LTD
UNIT 4
INNOVATION CENTRE
GREEN ROAD
CARLOW
R93 W248
TELEPHONE: 059 91 34222
MOBILE: 087 851 9284
EMAIL: info@pantherwms.com
WEB: www.pantherwms.com

File location:		scale: NTS	A4
drawing status: REPORT		datum: BING	
		drawn: PES	
drawing no.	rev	checked: MF	
NAP_19_9317-01	A	approved: -	
		date: 06-03-19	

Appendix A.3: Predictive Noise Sensitive Receptor Map – Pipeline Route

Notes:

Proposed Pipe Line

DAWN MEATS IRELAND, CO. MEATH

PIPE LINE NOISE MONITORING LOCATIONS

PANTHER ENVIRONMENTAL SOLUTIONS LTD

UNIT 4
INNOVATION CENTRE
GREEN ROAD
CARLOW
R93 W248

TELEPHONE: 059 91 34222
MOBILE: 087 851 9284
EMAIL: info@pantherwms.com
WEB: www.pantherwms.com

File location:		scale: NTS	A4
drawing status:	REPORT	datum:	BING
		drawn:	PES
drawing no.	rev	checked:	MF
NAP_19_9317-02	A	approved:	-
		date:	06-03-19

Appendix A.4: Noise Sensitive Receptor Map (1km) - WWTP

Notes:

Site Location
Site Ownership

Noise Sensitive Receptors Within 1km

DAWN MEATS IRELAND
CO. MEATH

NOISE SENSITIVE RECEPTORS

PANTHER ENVIRONMENTAL SOLUTIONS LTD
UNIT 4
INNOVATION CENTRE
GREEN ROAD
CARLOW
R93 W248
TELEPHONE: 059 91 34222
MOBILE: 087 851 9284
EMAIL: info@pantherwms.com
WEB: www.pantherwms.com

File location:		scale:	NTS
drawing status:	REPORT	datum:	BING
		drawn:	PES
drawing no.	rev	checked:	MF
NAP_19_9317-03	A	approved:	-
		date:	06-03-18

APPENDIX B

- NOISE PREDICTION CALCULATIONS -

B1: Noise Attenuation Calculations WWTP

B1.1 Divergence Attenuation WWTP

Divergence Calculation - NSL1									
d		**500**		**d_0**		**1**			
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dB**
A_{div}	65	65	65	65	65	65	65	65	74
Where:	Adiv = the attenuation due to divergence (Adiv = 20 log10 (d/d_0))+11)								
	d = the distance from the source to the receiver (m)								
	d_0 = the reference distance (1 m)								
	d_0 which is 1 meter from an omnidirectional point source.								

Divergence Calculation - NSL2									
d		**275**		**d_0**		**1**			
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dB**
A_{div}	60	60	60	60	60	60	60	60	69
Where:	Adiv = the attenuation due to divergence (Adiv = 20 log10 (d/d_0))+11)								
	d = the distance from the source to the receiver (m)								
	d_0 = the reference distance (1 m)								

Divergence Calculation - NSL3									
d		**335**		**d_0**		**1**			
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dB**
A_{div}	62	62	62	62	62	62	62	62	71
Where:	Adiv = the attenuation due to divergence (Adiv = 20 log10 (d/d_0))+11)								
	d = the distance from the source to the receiver (m)								
	d_0 = the reference distance (1 m)								

Divergence Calculation - NSL4									
d		**735**		**d_0**		**1**			
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dB**
A_{div}	68	68	68	68	68	68	68	68	77
Where:	Adiv = the attenuation due to divergence (Adiv = 20 log10 (d/d_0))+11)								
	d = the distance from the source to the receiver (m)								
	d_0 = the reference distance (1 m)								
	d_0 which is 1 meter from an omnidirectional point source.								

Divergence Calculation - NSL5

d		**665**		**d_0**		**1**			
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dB**
A_{div}	67	67	67	67	67	67	67	67	76
Where:	Adiv = the attenuation due to divergence (Adiv = 20 log10 (d/d_0))+11)								
	d = the distance from the source to the receiver (m)								
	d_0 = the reference distance (1 m)								
	d_0 which is 1 meter from an omnidirectional point source.								

B1.2 Barrier Attenuation WWTP

Barrier Attenuation Calculation - NSL1							
dss (m)	16	**dsr (m)**	485	**d_{direct} (m)**	500	**h (m)**	3
f(Hz)	63	125	250	500	1000	2000	4000	8000
λ (m)	5.46	2.75	1.38	0.69	0.34	0.17	0.09	0.04
d	0.53	0.53	0.53	0.53	0.53	0.53	0.53	0.53
N	5.84	2.94	1.48	0.74	0.36	0.18	0.09	0.05
Ω	6.05	4.30	3.04	2.15	1.51	1.07	0.76	0.54
Dz/Abar	16	13	10	7	4	3	1	1
Where:	dss = distance from noise source to top of barrier (m)							
	dsr = distance from noise receiver to top of barrier (m)							
	d_{direct} = shortest distance between source and receiver (m)							
	h = height of barrier							
	f(Hz) = centre of third octave band frequency							
	λ (m) = wavelength at centre of third octave band frequency							
	d = differential path length (dss+dsr-d_{direct})							
	N = the Fresnel Number (N = 2 d / λ)							
	Ω = is the coefficient of attenuation due to the sound barrier							
	Dz / A_{bar} = is the attenuation due to the barrier							

Barrier Attenuation Calculation - NSL2

dss (m)	16	**dsr (m)**	260	**d_{direct} (m)**	275	**h (m)**	3	
f(Hz)	63	125	250	500	1000	2000	4000	8000
λ (m)	5.46	2.75	1.38	0.69	0.34	0.17	0.09	0.04
d	0.51	0.51	0.51	0.51	0.51	0.51	0.51	0.51
N	5.60	2.82	1.41	0.71	0.35	0.17	0.09	0.04
Ω	5.93	4.21	2.98	2.11	1.48	1.05	0.74	0.53
Dz/Abar	15	12	10	7	4	3	1.41	1

Where:	
	dss = distance from noise source to top of barrier (m)
	dsr = distance from noise receiver to top of barrier (m)
	d_{direct} = shortest distance between source and receiver (m)
	h = height of barrier
	f(Hz) = centre of third octave band frequency
	λ (m) = wavelength at centre of third octave band frequency
	d = differential path length (dss+dsr-d_{direct})
	N = the Fresnel Number (N = 2 d / λ)
	Ω = is the coefficient of attenuation due to the sound barrier
	Dz / A_{bar} = is the attenuation due to the barrier

Barrier Attenuation Calculation - NSL3								
dss (m)	30	**dsr (m)**	305	**d_{direct} (m)**	335	**h (m)**	3	
f(Hz)	63	125	250	500	1000	2000	4000	8000
λ (m)	5.46	2.75	1.38	0.69	0.34	0.17	0.09	0.04
d	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28
N	3.10	1.56	0.78	0.39	0.19	0.10	0.05	0.02
Ω	4.41	3.13	2.22	1.57	1.10	0.78	0.55	0.39
Dz/Abar	13	10	7	5	3	2	0.82	0

Where:	
	dss = distance from noise source to top of barrier (m)
	dsr = distance from noise receiver to top of barrier (m)
	d_{direct} = shortest distance between source and receiver (m)
	h = height of barrier
	f(Hz) = centre of third octave band frequency
	λ (m) = wavelength at centre of third octave band frequency
	d = differential path length (dss+dsr-d_{direct})
	N = the Fresnel Number (N = 2 d / λ)
	Ω = is the coefficient of attenuation due to the sound barrier
	Dz / A_{bar} = is the attenuation due to the barrier

Barrier Attenuation Calculation - NSL4								
dss (m)	30	**dsr (m)**	705	**d_{direct} (m)**	735	**h (m)**	1	

f(Hz)	63	125	250	500	1000	2000	4000	8000
λ (m)	5.46	2.75	1.38	0.69	0.34	0.17	0.09	0.04
d	0.08	0.08	0.08	0.08	0.08	0.08	0.08	0.08
N	0.91	0.46	0.23	0.12	0.06	0.03	0.01	0.01
Ω	2.39	1.70	1.20	0.85	0.60	0.42	0.30	0.21
Dz/Abar	8	5	3	2	1	0	0.25	0
Where:	dss = distance from noise source to top of barrier (m)							
	dsr = distance from noise receiver to top of barrier (m)							
	d_{direct} = shortest distance between source and receiver (m)							
	h = height of barrier							
	f(Hz) = centre of third octave band frequency							
	λ (m) = wavelength at centre of third octave band frequency							
	d = differential path length (dss+dsr-d_{direct})							
	N = the Fresnel Number (N = 2 d / λ)							
	Ω = is the coefficient of attenuation due to the sound barrier							
	Dz / A_{bar} = is the attenuation due to the barrier							

Barrier Attenuation Calculation - NSL5								
dss (m)	7	**dsr (m)**	659	**d_{direct} (m)**	665	**h (m)**	3	
f(Hz)	63	125	250	500	1000	2000	4000	8000
λ (m)	5.46	2.75	1.38	0.69	0.34	0.17	0.09	0.04
d	1.23	1.23	1.23	1.23	1.23	1.23	1.23	1.23
N	13.46	6.78	3.40	1.70	0.84	0.42	0.21	0.11
Ω	9.19	6.52	4.62	3.27	2.29	1.62	1.15	0.82
Dz/Abar	15*	15*	13	10	7	5	2.95	2
Where:	dss = distance from noise source to top of barrier (m)							
	dsr = distance from noise receiver to top of barrier (m)							
	d_{direct} = shortest distance between source and receiver (m)							
	h = height of barrier							
	f(Hz) = centre of third octave band frequency							
	λ (m) = wavelength at centre of third octave band frequency							
	d = differential path length (dss+dsr-d_{direct})							
	N = the Fresnel Number (N = 2 d / λ)							
	Ω = is the coefficient of attenuation due to the sound barrier							
	Dz / A_{bar} = is the attenuation due to the barrier							

B2: Predicted Noise Levels WWTP

B2.1: Predicted Construction Noise Calculation WWTP

Predicted Noise Calculation - NSL1									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	81	89	92	94	96	94	92	86	101
A_{div}	65	65	65	65	65	65	65	65	
A	65	65	65	65	65	65	65	65	
NSL dBA	**16**	**24**	**27**	**29**	**31**	**29**	**27**	**21**	**36**
								Result	**36**

Predicted Noise Calculation - NSL2									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	81	89	92	94	96	94	92	86	101
A_{div}	60	60	60	60	60	60	60	60	
A	60	60	60	60	60	60	60	60	
NSL dBA	**21**	**29**	**32**	**34**	**36**	**35**	**32**	**26**	**42**
								Result	**42**

Predicted Noise Calculation - NSL3									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	81	89	92	94	96	94	92	86	101
A_{div}	62	62	62	62	62	62	62	62	
A	62	62	62	62	62	62	62	62	
NSL dBA	**20**	**28**	**31**	**32**	**34**	**33**	**31**	**24**	**40**
								Result	**40**

Predicted Noise Calculation - NSL4									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	81	89	92	94	96	94	92	86	101
A_{div}	68	68	68	68	68	68	68	68	
A	68	68	68	68	68	68	68	68	
NSL dBA	**13**	**21**	**24**	**26**	**27**	**26**	**24**	**18**	**33**
								Result	**33**

Predicted Noise Calculation - NSL5									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**

Source dBA	81	89	92	94	96	94	92	86	101
A_{div}	67	67	67	67	67	67	67	67	
A	67	67	67	67	67	67	67	67	
NSL dBA	**14**	**22**	**25**	**27**	**28**	**27**	**25**	**18**	**34**
								Result	**34**

B2.2: Predicted Maximum Operational Noise Calculation - Lorries WWTP

Predicted Noise Calculation - NSL1									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	72	76	77	83	87	88	82	71	92
A_{div}	65	65	65	65	65	65	65	65	
A_{bar}	16	13	10	7	4	3	1	1	
A	81	78	75	72	69	68	66	66	
NSL dBA	**-9**	**-2**	**3**	**11**	**18**	**21**	**16**	**5**	**24**
								Result	**24**

Predicted Noise Calculation - NSL2									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	72	76	77	83	87	88	82	71	92
A_{div}	60	60	60	60	60	60	60	60	
A_{bar}	15	12	10	7	4	3	1	1	
A	75	72	69	67	64	62	61	61	
NSL dBA	**-3**	**4**	**8**	**16**	**23**	**26**	**21**	**10**	**29**
								Result	**29**

Predicted Noise Calculation - NSL3									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	72	76	77	83	87	88	82	71	92
A_{div}	62	62	62	62	62	62	62	62	
A_{bar}	13	10	7	5	3	2	1	0	
A	74	71	69	66	64	63	62	62	
NSL dBA	**-3**	**4**	**9**	**17**	**23**	**25**	**20**	**9**	**28**
								Result	**28**

Predicted Noise Calculation - NSL4									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**

Source dBA	72	76	77	83	87	88	82	71	92
A_{div}	68	68	68	68	68	68	68	68	
A_{bar}	8	5	3	2	1	0	0	0	
A	76	74	72	70	69	69	69	68	
NSL dBA	**-4**	**2**	**6**	**13**	**18**	**19**	**13**	**2**	**23**
								Result	**23**

Predicted Noise Calculation - NSL5									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	72	76	77	83	87	88	82	71	92
A_{div}	67	67	67	67	67	67	67	67	
A_{bar}	15	15	13	10	7	5	3	2	
A	82	82	81	78	75	72	70	69	
NSL dBA	**-11**	**-7**	**-3**	**5**	**12**	**16**	**12**	**2**	**19**
								Result	**19**

B2.3: Predicted Maximum Equipment Noise Calculation WWTP

Predicted Noise Calculation - NSL1									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	81	75	73	76	80	78	74	72	86
A_{div}	65	65	65	65	65	65	65	65	
A_{bar}	16	13	10	7	4	3	1	1	
A	81	78	75	72	69	68	66	66	
NSL dBA	**0**	**-3**	**-1**	**4**	**10**	**10**	**7**	**6**	**15**
								Result	**15**

Predicted Noise Calculation - NSL2									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	81	75	73	76	80	78	74	72	86
A_{div}	60	60	60	60	60	60	60	60	
A_{bar}	15	12	10	7	4	3	1	1	
A	75	72	69	67	64	62	61	61	
NSL dBA	**5**	**2**	**4**	**9**	**16**	**15**	**13**	**11**	**21**
								Result	**21**

Predicted Noise Calculation - NSL3									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**

Source dBA	81	75	73	76	80	78	74	72	86
A_{div}	62	62	62	62	62	62	62	62	
A_{bar}	13	10	7	5	3	2	1	0	
A	74	71	69	66	64	63	62	62	
NSL dBA	**6**	**3**	**5**	**10**	**15**	**15**	**11**	**10**	**20**
								Result	**20**

Predicted Noise Calculation - NSL4									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	81	75	73	76	80	78	74	72	86
A_{div}	68	68	68	68	68	68	68	68	
A_{bar}	8	5	3	2	1	0	0	0	
A	76	74	72	70	69	69	69	68	
NSL dBA	**4**	**1**	**2**	**6**	**10**	**9**	**5**	**4**	**15**
								Result	**15**

Predicted Noise Calculation - NSL5									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	81	75	73	76	80	78	74	72	86
A_{div}	67	67	67	67	67	67	67	67	
A_{bar}	15	15	13	10	7	5	3	2	
A	82	82	81	78	75	72	70	69	
NSL dBA	**-2**	**-8**	**-7**	**-2**	**5**	**5**	**3**	**3**	**11**
								Result	**11**

B3: Noise Attenuation Calculations PIPELINE

B3.1 Divergence Attenuation PIPELINE

Divergence Calculation - NR1									
d		**5**		**d_0**		**1**			
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dB**
A_{div}	25	25	25	25	25	25	25	25	34
Where:	Adiv = the attenuation due to divergence (Adiv = 20 log10 (d/d_0))+11)								
	d = the distance from the source to the receiver (m)								
	d_0 = the reference distance (1 m)								

Divergence Calculation - NR2									
d		**10**		**d_0**		**1**			
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dB**
A_{div}	31	31	31	31	31	31	31	31	40
Where:	Adiv = the attenuation due to divergence (Adiv = 20 log10 (d/d_0))+11)								
	d = the distance from the source to the receiver (m)								
	d_0 = the reference distance (1 m)								

Divergence Calculation - NR3									
d		**20**		**d_0**		**1**			
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dB**
A_{div}	37	37	37	37	37	37	37	37	46
Where:	Adiv = the attenuation due to divergence (Adiv = 20 log10 (d/d_0))+11)								
	d = the distance from the source to the receiver (m)								
	d_0 = the reference distance (1 m)								

B4: Predicted Noise Levels PIPELINE

B4.1: Predicted Construction Noise Calculation PIPELINE

Predicted Noise Calculation - NR1									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	81	89	92	94	96	94	92	86	101
A_{div}	25	25	25	25	25	25	25	25	
A	25	25	25	25	25	25	25	25	
NSL dBA	**56**	**64**	**67**	**69**	**71**	**69**	**67**	**61**	**76**
								Result	**76**

Predicted Noise Calculation - NR2

Frequency (Hz)	63	125	250	500	1k	2k	4k	8k	dBA
Source dBA	81	89	92	94	96	94	92	86	101
A_{div}	31	31	31	31	31	31	31	31	
A	31	31	31	31	31	31	31	31	
NSL dBA	**50**	**58**	**61**	**63**	**65**	**63**	**61**	**55**	**70**
								Result	**70**

Predicted Noise Calculation - NR3									
Frequency (Hz)	**63**	**125**	**250**	**500**	**1k**	**2k**	**4k**	**8k**	**dBA**
Source dBA	81	89	92	94	96	94	92	86	101
A_{div}	37	37	37	37	37	37	37	37	
A	37	37	37	37	37	37	37	37	
NSL dBA	**44**	**52**	**55**	**57**	**59**	**57**	**55**	**49**	**64**
								Result	**64**

APPENDIX C

- NOISE MANAGEMENT PROGRAMME -

D1 NOISE MANAGEMENT

D1.1 BACKGROUND

The following section addresses the potential impact of noise emanating from the proposed development.

Noise sources at the proposed effluent treatment plant would be similar to other similar plants. The noise from the plant would predominantly be limited to that arising from aerators/blowers and transfer pumps.

The proposed noise mitigation measures, as per **Table D1** below, would minimise potential noise from the operation of the activity at noise sensitive locations surrounding the premises due to the inclusion of landscaped barriers, low noise rated equipment and noise mitigation materials. The new structures would be well integrated into the existing complex.

The applicant is required to remain in compliance with the existing IE licence requirements for noise.

D1.2 STANDARD OF CONTROL

In the case of noise, pollution is considered in terms of causing environmental harm or offence to the sense of hearing, i.e. causing annoyance to people who live in the area or are there for some other reason, through exposure to noise.

The point at which 'pollution' in the form of offence to the sense of hearing is occurring, is taken to be the point at which there is 'reasonable cause for annoyance'.

The need to "prevent" noise emissions is, in certain situations, less relevant for noise than for some other pollutants. Noise does not accumulate on the installation or in the environment permanently like some pollutants. In other words, when the installation ceases operations, the original noise climate may be restored.

The aim should be, wherever feasible, to ensure that proposed additions to existing plant or activities do not significantly add to the overall ambient level. In some cases, however, this may be unreasonable or beyond BAT (best available technology).

The aim of planning conditions is to achieve 'no reasonable cause for annoyance' to persons beyond the boundary of the premises, i.e. sensitive receptors, in so far as is possible. For many businesses, environmental noise will not be an issue but for others it will need to be considered and controlled.

In the case of effluent treatment plants, it should be remembered that it is not only the level of noise that can cause annoyance, but sometimes the source itself or the time of day or night, as illustrated in the examples below:

- Clattering, banging or knocking;
- Tonal noise, with distinctive notes, hums or whines from fans, motors etc.;
- The time the noise occurs (noise is often more annoying at night or during leisure times);

- Noise that is perceived as unnecessary.

Many noise problems can be prevented by good management, consideration and ensuring a good standard of maintenance of any equipment. The hierarchy for control should be to:

1. ***Prevent*** generation of noise at source by good design and maintenance.
1. ***Minimize or contain noise at source*** by observing good operational techniques and management practice.
2. ***Increase the distance*** between the source and receiver if possible.
3. ***Use physical barriers or enclosures*** to prevent transmission to sensitive receptors.
4. ***Sympathetic timing and control*** of unavoidably noisy operations.

Prevention and minimization

Good design and management can prevent the generation of noise. This can include:

- Selection of plant and equipment that produce less noise;
- Suitable timing of noisy operations;
- Appropriate siting of noisy operations and noise sources at the design stage.

It is far easier to deal with potential noise problems at the design stage of a new installation or extension than an alteration to an existing one. When new equipment is purchased, it is often more effective to purchase quieter equipment, that is slightly more expensive, rather than have to modify it at a later date. Many manufacturers now provide detailed noise information on their products.

D1.4 NOISE MANAGEMENT IN EFFLUENT TREATMENT PLANTS

This section identifies the more common noise problems arising in effluent treatment plants that have the potential to affect people nearby, and offers suggestions for preventing or reducing noise in each case.

In many cases, restricting noisy operations to reasonable times may be sufficient to overcome environmental noise problems. Reasonable times are generally considered to be the normal working day, however, it is understood that certain activities may have to be undertaken outside the normal working day, in which case, additional measures may be required in order to achieve a satisfactory noise climate.

The noise emitted by activities can be reduced considerably by enclosure within insulated structures, such as aerator blowers which are designed with an acoustic enclosure as standard. However, it should be remembered that the effectiveness of any form of building or enclosure as a means of reducing noise can be severely compromised by leaving doors or unguarded vents open.

D1.4.1 Good Operational Practices to Reduce Noise

A written noise policy/ management programme can be helpful in maintaining standards and demonstrating a commitment to good noise management. Such a programme can also be an important tool in staff training.

All staff should be trained on the content of the programme to ensure a commitment to good noise management. A record should be kept of the date and name of person trained and made available for inspection by the licensing authority or environmental health responsible authority.

Methods for monitoring noise should be included in a noise policy i.e. annual noise assessment and site perimeter checks following complaints.

A log book should be kept of any noise monitoring carried out, the findings and any remedial action taken. The log should indicate whether it was routine noise monitoring or the result of a complaint.

Dawn Meats (Slane) have an existing Noise Action Programme operating at the facility.

Location

- Any plant and equipment should be sited, as far as is practicable, to benefit from the noise screening effects of local barriers, such as the lie of the land and buildings, to achieve optimum benefit. Acoustic barriers to absorb noise should also be installed where deemed necessary e.g. the proposed earth berm.

- Orientate noisy equipment in one direction so that noise is directed away from noise-sensitive areas.

- Regular maintenance should be carried out on all equipment and machinery to ensure that noise disturbance from such sources is kept to a minimum.

Operation

Staff, contractors and visitors should be instructed not to raise voices or play radios unnecessarily at night. Pagers or mobile phones may need to be considered for on-site communications.

Hard materials should be lowered on to hard surfaces rather than dropped. The drop height of any bulk material should be reduced as much as possible.

Care should be taken to prevent unnecessary movements of forklifts during unsociable hours. Ensure forklifts and vehicles etc. are well maintained especially exhaust systems and silencers. Site roads/tracks should be maintained in a state of good repair to reduce any noise from the passage of vehicles.

Avoid idling of machines between work periods and revving of engines.

Reduce noise caused by vibrating machinery with rotating parts by proper servicing, balancing and regular maintenance. Lack of maintenance may lead to overheating, resulting in engine covers having to be left open.

Aerator blowers may need to be placed inside buildings, purpose built or proprietary acoustic enclosures. The manufacturer or supplier should be consulted before enclosing any plant since suitable ventilation may be required to prevent overheating.

Reduce noise caused by friction in conveyor rollers, trolleys and other machines by proper lubrication and regular maintenance.

Any testing of emergency generators and alarms should be carried out during the daytime of the normal working week and preferably between 09.00 and 17.00.

The noise level emitted by the alarms must not exceed that required to alert persons working within the site. However, to ensure the response given by call centres is 100%, alarms may also be tested at weekends. The disturbance caused by their testing can be minimized by testing at the same time and day of the week or month etc. If there are problems, local residents should be consulted and timings of testing discussed with them.

Testing should be in accordance with manufacturer or supplier instructions.

Timing of operations

Delivery and collection of chemicals and waste sludge should take place at reasonable times, i.e. during the normal working day, as far as is practicable. Drivers should comply with any speed limits on site and avoid taking empty vehicles over rough ground wherever possible.

D2 NOISE MANAGEMENT PROGRAMME

The Noise Management Programme (NMP) is a core document that is intended to detail operational and control measures appropriate to management and control of noise at the site. The format of the NMP should provide sufficient detail to allow operators and maintenance staff to clearly understand the operational procedures for both normal and abnormal conditions.

A Noise Management Programme (NMP) should be prepared for all processes. The NMP should also include sufficient feedback data to allow site management (and local authority inspectors) to audit site operations. An example of some of the issues to be considered is summarised as follows. More detailed guidance is provided with this document.

- A summary of the site, noise sources and the location of receptors.
- Details of the site management responsibilities and procedures for reporting faults, identifying maintenance needs and complaints procedure.
- Noise critical plant operation and management procedures (e.g. correct use of plant, process, materials, and checks on plant performance, maintenance and inspection).
- Operator training.
- Housekeeping.
- Maintenance and inspection of plant (both routine and emergency response).
- Record keeping – format, responsibility for completion and location of records.
- Emergency breakdown and incident response planning including responsibilities and mechanisms for liaison with the relevant bodies.
- Public relations.

The Noise Management Programme is a living document and should be reviewed following the first annual onsite monitoring assessment occurring after commissioning of the proposed treatment plant, and reviewed as part of the site management system going forward.

The Noise Management System documentation should define the roles of the Effluent Plant Operator / Caretaker and set out templates in relation to the operating of the facility and reporting procedures to be employed.

Relevant requirements of the amended Noise Management Plan should be implemented throughout the site with the existing branched management system in order to share responsibility around the site. The head manager should ensure all works are performed in accordance with the NMP.

Table D1 – Construction & Effluent Plant Commissioning Noise Action Plan Status Table

	NOISE SOURCE	SOURCE	ACTION PLAN	MONITORING REQUIRED	REVIEW AND COMMENTS
1	Construction	Construction equipment and machinery	Considerations with regard to noise should be included in a Construction Environmental Management Plan (CEMP) to be prepared by the construction firm prior to beginning works.	Construction Firm to prepare CEMP	As per standard construction noise guidance (Ref. Chapter 11 above)
2	Equipment	Equipment	Consult with supplier regarding noise levels before buying any equipment	As equipment is being purchased	
3	Equipment	Equipment	Maintain equipment to ensure high efficiency.	As per preventative maintenance schedule	
4	Machinery	Machinery	Operate machinery and plant during day-time hours.	Monitor during operation	
5	Employees	Employees/visitors	Inform all employees and visitors of noise awareness.	Monitor on-going, awareness is continuous	
6	Vehicles	Delivery machinery	Delivery and collection times to take place at normal working day hours.	On-going	
7	Vehicles	Vehicles entering and leaving site	Maintain site roads in good condition.	As per preventative maintenance schedule	
8	Site	All areas	Carry out noise monitoring as required under the site IE licence.	As required	
9	Site	All areas	Consult with neighbours as necessary regarding any potential forthcoming noise impact from the proposed facility.	On-going	
10	Site	Effluent Plant	Assess environmental noise once upgraded Effluent Plant is operational during annual noise monitoring	As part of annual noise assessment	
11	All areas	All areas	Update existing Noise Management Plan and associated documentation as required.	As part of annual noise assessment	