Allegro Acoustics Limited,
C1 South City Business Park,
Tallaght, Dublin 24
Tel: +353 (0) 1 4140485
www.allegroacoustics.ie

Pfizer Grange Castle

Clondalkin, Dublin 22

Noise Impact Assessment

17 June 2022

Report Author: Ciarán Kearney

Report: DC2220-01

Report Control

Document Title:	Noise Impact Assessment
Project:	Pfizer Grange Castle
Client:	Pfizer Ireland Pharmaceuticals
Job Number:	DC2220-01
File Origin:	Z:\Allegro Acoustics\Allegro Acoustics Live\Projects\DC2000 to DC2200\DC2220
Report Author:	Ciarán Kearney BE
Signed:	C. Kearney
Date:	17/06/2022

Issue	Date	Status	Checked By	Signed
1	14/06/2022	Draft	Stephen Kearney BE MIEI MIOA	Stephen Kearney
2	17/06/2022	Final	Stephen Kearney BE MIEI MIOA	Stephen Kearney
3				

Table of Contents

Appendices

1 Introduction

Allegro Acoustics was commissioned by Pfizer Ireland to complete a noise impact assessment as part of a proposal for a new plant area at Pfizer Grange Castle in Clondalkin, Dublin. Pfizer Grange Castle is located adjacent to the regional road R136. The Kilmahuddrick residential area is located east of the facility. The Grange Castle Golf Club is located south of the facility. Similar Industrial facilities are located west of Pfizer Grange Castle. Fields and a large parking area are located to the north of the facility. The location for the Pfizer Grange Castle is shown in Figure 1 below.

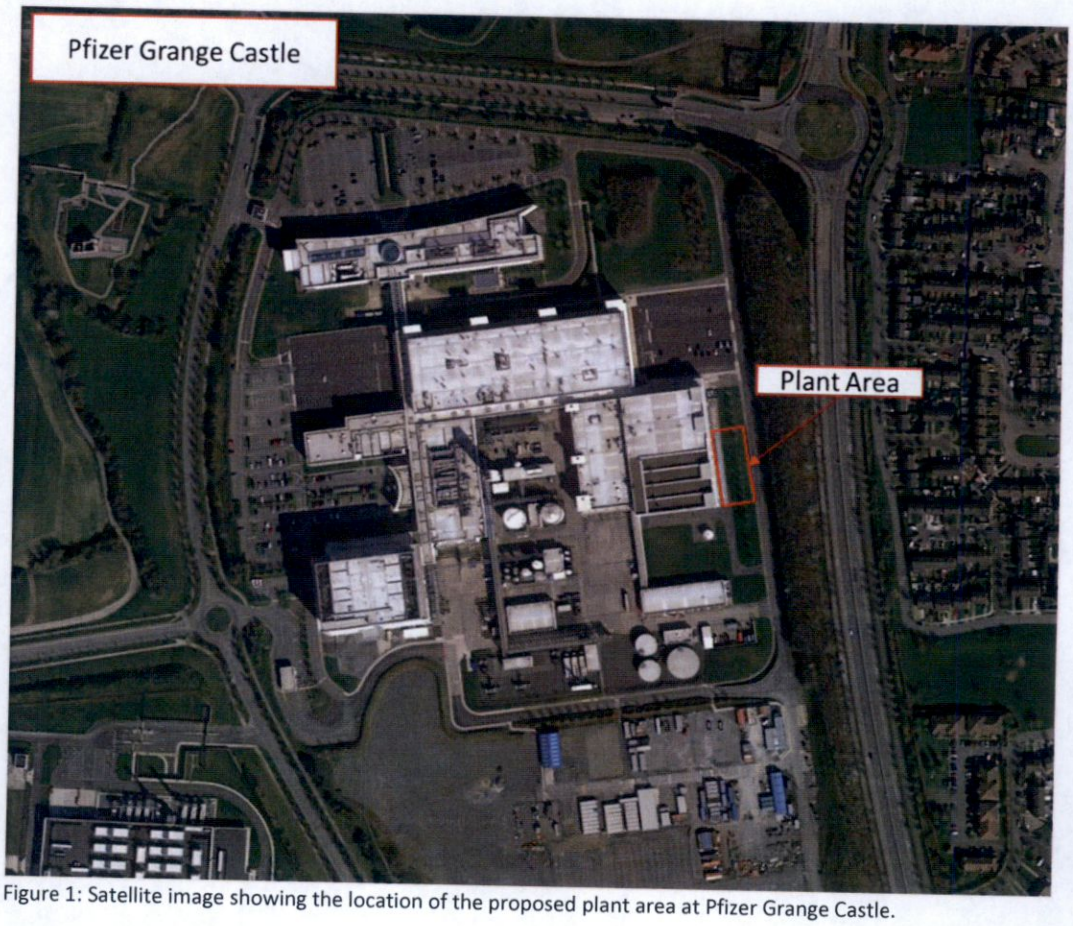

Figure 1: Satellite image showing the location of the proposed plant area at Pfizer Grange Castle.

The proposed works include the construction of a new plant area to be located at the east of the facility. The plant area will be situated on a gantry.

In order to determine the potential noise impact due to the external plant area, a 3D environmental noise model was developed in SoundPLAN V7.3. This model represents all of the noise emitting plant located in this plant area. This noise model was used to predict the noise levels attributable to these plant items at the closest noise sensitive locations to the building.

This report assesses the noise impact associated with the Pfizer Grange Castle Plant Area relative to the recognised noise limits set out by the Environmental Protection Agency [1] for an industrial type facility.

2 Noise Criteria

The Pfizer Grange Castle plant area must achieve the day, evening and night-time noise limits set out by the Environmental Protection Agency in *Guidance Note for Noise (NG4)* [1]. These limits are considered applicable at the nearest noise sensitive locations to the Pfizer Grange Castle (residential, commercial, office, educational, place of worship). The noise emission limit values are displayed in Table 1 below.

Noise Criteria Outlined in Guidance Note for Noise (NG4)	
Period	Noise Emission Limit Value, dB L_{Aeq}
Daytime (07:00 to 19:00hrs)	55
Evening (19:00 to 23:00hrs)	50
Night-time (23:00 to 07:00hrs)	45

Table 1: Environmental Noise Emission Limit Values for noise emanating from the Pfizer facility.

3 Noise Modelling

In order to quantify the impact that the proposed development will have on the surrounding noise environment, Allegro Acoustics developed a 3D Environmental Noise Model of the proposed plant area and of the surrounding area using SoundPLAN Version 7.3 environmental noise modelling software. This software implements the calculation and prediction methodologies outlined in *ISO 9613 Acoustics - Attenuation of sound during propagation outdoors* [2] [3].

The proposed plant area was represented in this model using drawings provided by Pfizer and the M&E consultant. These drawings were supplemented with additional information freely available from Google™ Earth regarding the study area. Using this information, a comprehensive and detailed environmental noise model was developed for the site. This model includes all objects which form barriers for noise, including buildings, foliage and perimeter walls. A graphic from this model is shown in Figure 2 below.

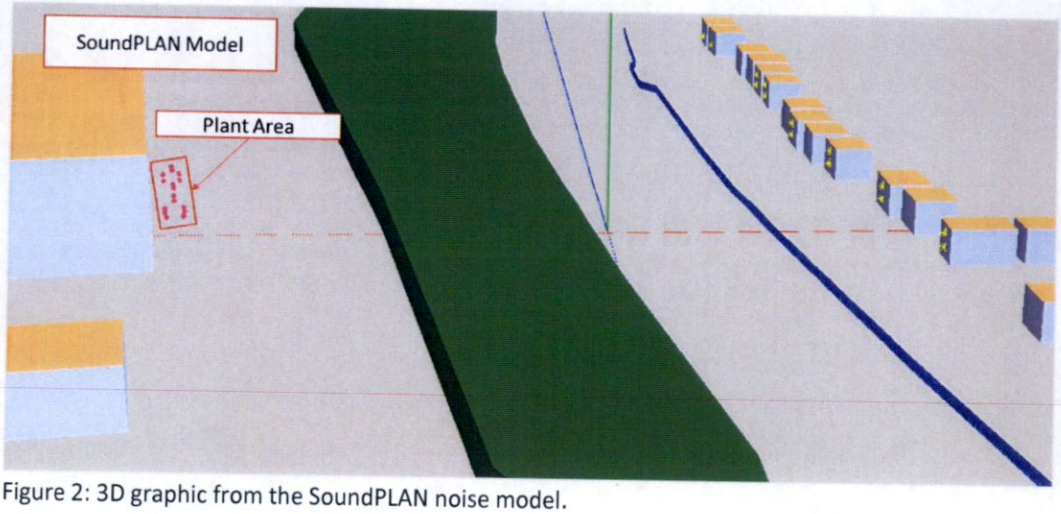

Figure 2: 3D graphic from the SoundPLAN noise model.

3.1 Noise Source Representation

The plant included in the noise model below is indicative of the final design. The finalised plant selection is subject to the final design and procurement being completed. It is advised

that any substituted plant unit is to be of a similar sound power to the units as listed in Table 2 below. Data sheets for each of these plant items are included in Appendix A.

Sound Power Levels of M&E Plant included in the Noise Model		
Product (Make/Model)	Quantity (Units on a duty standby arrangement)	Sound Power Level dB L_{wA} (See Appendix B for Data Sheets and Plant Locations)
-20° Units (With heavy insulation)	6	81
-40° Units (With heavy insulation)	4	76
Chill Units (With heavy insulation)	6	72

Table 2: List of indicative plant items used in external noise assessment.

3.2 Model Assumptions / Notes

The following assumptions and notes were made when developing the noise model:

- The predicted noise levels presented in this report are based on the sound power data provided by the respective plant manufacturers.
- The noise data provided is noted to be calculated noise levels and not tested noise data, therefore the plant data sheet provided is inherently less accurate than tested data.
- For the majority of plant items included in Table 2 above, the plant manufacturers provided sound power data in single figure format only. It is recommended that Allegro Acoustics are asked to update the noise model if full octave or third octave sound power data becomes available for these plant items or if the type or location of any plant items change as the project progresses.
- The plant identified above is indicative pending final design. Any substituted plant items must have equivalent or lower noise levels to those outlined in Table 2 above. If a substitute plant item exceeds the sound power levels as listed in Table 2 above, Allegro Acoustics must be notified as the mitigation recommendations outlined below may need to be re-assessed for any potential noise issues.
- Where sound pressure data was the only data available for a plant item, the equivalent sound power level was calculated using the SoundPLAN V7.3 built in noise emissions calculator.

3.3 Receivers

Noise sensitive locations (NSLs) in the vicinity of the Pfizer Grange Castle are included as receivers in the noise model.

Modelled Receivers			
Reference	Description	Reference	Description
R01	Residential	R06	Residential
R02	Residential	R07	Residential
R03	Residential	R08	Residential
R04	Residential	R09	Residential
R05	Residential		

Table 3: Modelled receivers.

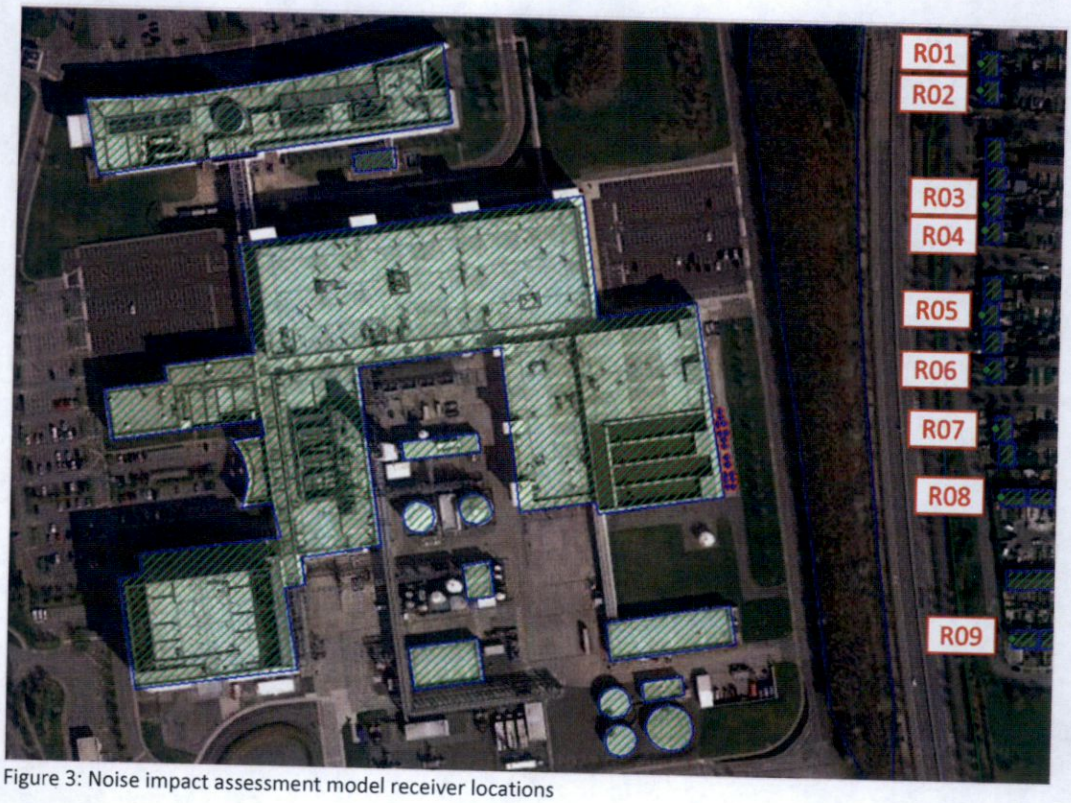

Figure 3: Noise impact assessment model receiver locations

4 Predicted Noise Levels

The predicted noise levels are presented in Table 4 below and in Appendix B.

Pfizer Grange Castle Environmental Impact Assessment Results				
Type	Predicted Noise Level dB L_{Aeq}	Noise Limits Set Out in Guidance Note for Noise (NG4)		
		Day Time ≤55dB L_{Aeq}	Evening Time ≤50dB L_{Aeq}	Night Time ≤45dB L_{Aeq}
R01	26.7	Yes	Yes	Yes
R02	27.0	Yes	Yes	Yes
R03	31.4	Yes	Yes	Yes
R04	31.6	Yes	Yes	Yes
R05	32.8	Yes	Yes	Yes
R06	33.2	Yes	Yes	Yes
R07	33.4	Yes	Yes	Yes
R08	33.2	Yes	Yes	Yes
R09	31.5	Yes	Yes	Yes

Table 4: Modelled noise levels from the proposed plant area.

5 Discussion

The modelled noise levels presented in Table 4 above meet the day, evening and night time noise criteria outlined by the Environmental Protection Agency in Guidance Note for Noise (NG4) [1].

Note on Tonality / Impulsivity:

Due to the absence of 1/3rd Octave data from plant manufactures, it is not possible to carry out a detailed tonal assessment at this stage of the project. However, it is proposed that noise a noise monitoring survey is carried out once the plant is installed to ensure that there are no tonal or impulsive noise emissions attributable to this facility audible at the nearest noise sensitive locations to the site.

Note on Existing Background Noise Levels:

Table 5 below shows the effect the new plant area will have on existing background noise levels. The existing noise levels are sourced from Allegro Acoustics report DC2194-01 Pfizer IEL Grange Castle IEL Noise Survey 14.04.2022 [5]. NSL1 from Allegro Acoustics' IEL report [5] was deemed appropriate to represent the residential area along the R136 regional road.

Location	Period	Background Noise Levels	Predicted Noise Level (NSL1≈R03)	Combined Noise Level	Difference
		L_{A90} dB	L_{Aeq} dB	dB	dB
NSL1	Day 1	54.42	31.40	54.44	+0.02
NSL1	Day 2	53.40	31.40	53.43	+0.03
NSL1	Day 3	55.06	31.40	55.08	+0.02
NSL1	Eve	46.50	31.40	46.63	+0.13
NSL1	Night 1	42.43	31.40	42.76	+0.33
NSL1	Night 2	42.90	31.40	43.20	+0.30

Table 5: The combined existing and predicted noise levels.

At NSL1 the largest change in noise level attributable to the plant is 0.3dB. It is concluded that the effect of the proposed plant area on existing background noise levels is negligible. Additionally, as noted in Allegro Acoustics IEL report [5] the primary noise source near NSL1 is traffic.

6 Conclusion

Allegro Acoustics carried out a noise impact assessment of the proposed plant area at Pfizer Grange Castle in Clondalkin, Dublin. It has been concluded that the proposed design is predicted to comply with the recommended noise limits.

7 References

[1] Environmental Protection Agency, "Guidance Note for Noise: License Applications, Surveys and Assessments in Relation to Scheduled Activities," 2016.

[2] International Standards Organisation, "ISO 9613-1 Acoustics - Attenuation of sound during propagation outdoors - Part 1: Calculation of the absorption of sound by the atmosphere," 1993.

[3] International Standards Organisation, "ISO 9613-2 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation," 1996.

[4] International Standards Organisation, "ISO 1996-1 Acoustics - Description and measurent of environmental noise - Part 1: Basic quantities and assessment procedures," 2016.

[5] Allegro Acoustics, "DC2194-01 Pfizer IEL Grange Castle IEL Noise Survey 14.04.2022," 2022.

Appendix A

Plant Data Sheets

SOUND PRESSURE LEVEL

1) -40 Freezers GC 522V2 / S6H-20.2Y-40P (-48°C/+40°C)

	1m dB(A)	10m dB(A)
Compressor S6H-20.2Y (50Hz)	78*	58*
Condenser GC 522V2(50Hz)	67	47
Total Condensing unit	**78,5**	**58,5**

*values estimated

Calculated noise levels - Sound pressure level, in free field conditions, without reflections - for complete unit at:

	Standard Design	With heavy insulation
1m	73 dB(A) ~	**68 dB(A) ~**
10m	53 dB(A) ~	**48 dB(A) ~**

2) -20 Freezer GC 1044V4 / 6FE-44Y-40P (-28°C/+40°C)

	1m dB(A)	10m dB(A)
Compressor 6FE-44Y (50Hz)	82,5	62,5
Condenser GC 1044VA (50Hz)	70	50
Total Condensing Unit	**83**	**63**

Calculated noise levels - Sound pressure level, in free field conditions, without reflections - for complete unit at:

	Standard Design	With heavy insulation
1m	78 dB(A) ~	**73 dB(A) ~**
10m	58 dB(A) ~	**53dB(A) ~**

Note

These values are approximate

Heavy Insulation Selected

SOUND PRESSURE LEVEL

1) CK/EC 291/172 / 1x 4JE-22Y-40P (70Hz) + 1x 4JE-22Y-40P (-6°C/+40°C)

	1m dB(A)	10m dB(A)
CK/EC 291/172	67	47
4JE-22Y-40P (70Hz)	71*	51*
4JE-22Y-40P (50Hz)	67,5	47,5
Total	**≈ 74**	**≈ 54**

*values estimated

Calculated noise levels - Sound pressure level, in free field conditions, without reflections - for both options at:

	With standard Insulation	With heavy insulation
1m	≈ 69 dB(A)	≈ 64 dB(A)
10m	≈ 49 dB(A)	≈ 44 dB(A)

Note

These values are approximate, depending on:

- Number and dimensions of holes in the housing;
- Type of insulation (supplier);

Appendix B

SoundPLAN Predicted Noise Levels

DC2220 Pfizer
Assessed receiver levels
"Situation1.sit"

Receiver	Fl	Ld dB(A)
R01	GF	26.7
R02	GF	27.0
R03	GF F 1	29.4 31.4
R04	GF F 1	30.0 31.6
R05	GF F 1	31.9 32.8
R06	GF F 1	32.6 33.2
R07	GF F 1	32.7 33.4
R08	GF F 1	32.4 33.2
R09	GF F 1	30.2 31.5