SHARPS REDMORE

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Report

Noise Assessment

Manor Farm, Poyle Road, Slough

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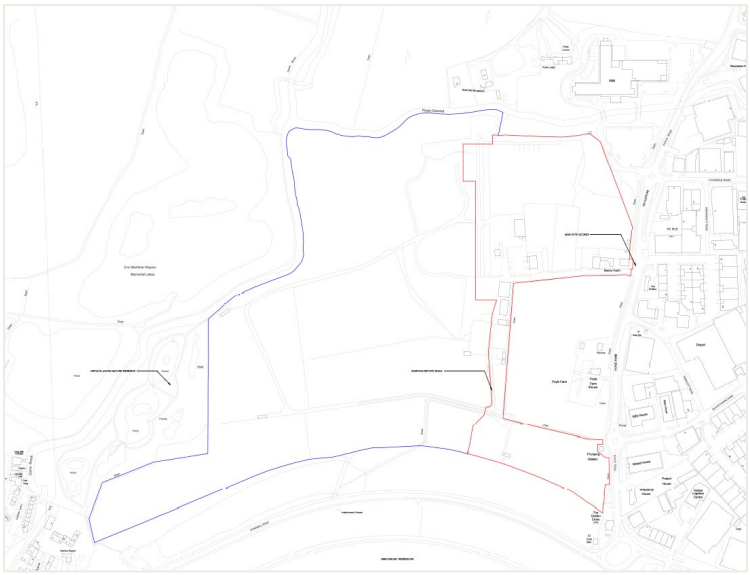
1.0 Introduction

1.1 Sharps Redmore (SR) has been instructed by Manor Farm Propco Limited to undertake a noise assessment in relation to a proposed data centre and battery energy storage facility on land to the west of Poyle Road, Slough. The site location is shown in Figure 1 below:

FIGURE 1: Site Location



1.2 The Site is made up of two separate parcels connected by an access road, as shown above. The northern parcel (Parcel A) is previously developed land, currently in commercial/industrial use, with hardstanding areas used for car parking and a storage service yard. SR understands that this part of the site has extant planning consent[1] for B2 use buildings in the connection with the processing of concrete which was granted on appeal. The southern part of the site (Parcel B) is of arable nature with thick hedgerow boundaries. Both sites are located within the administrative area of Slough Borough Council.

1.3 The character of the surrounding area is largely commercial, with Poyle Trading Estate located on the opposite side of Poyle Road, beyond which is the M25 and London Heathrow Airport. Hilton London Heathrow Airport Hotel is located to the north of the Site. Existing noise levels are dominated from planes taking off and landing at London Heathrow Airport and from distant road traffic on the M25 which is approximately 800m to the east of the site.

1.4 Residential uses are located in the wider area and include Poyle Park Farm to the north, and north-east, Poyle Farm House and Floroma which are located on land to between the northern and southern parcels and the residential accommodation above the Golden Cross Public House to the south east of Parcel B.

[1] Planning application P/10076/006 - Use Class B2 buildings and areas of hardstanding and open land used in connection with the processing of concrete (including concrete crushing and screening) to produce hardcore (the hardstanding and open land that has B2 use covers much of this part of the Site and is licensed to accept 85,000 tonnes per annum and for the storage of circa 80,000 cubic metres on site).

1.5 Planning permission is being sought for a data centre with electrical sub-station (Parcel A) and a Battery Energy Storage System (BESS) on the southern part of the site (Parcel B). Access to the northern parcel will be obtained from an existing access on Poyle Road, with access to the southern parcel provided along an existing track to the rear of the agricultural field in the middle of the sites.

1.6 The purpose of this report is to assess the impact of noise from proposed development on the noise sensitive receptors identified above. This report considers relevant noise policy and guidance (Section 2.0) and existing baseline noise levels (Section 3.0). Noise data used to predict noise from data centre is included in Section 4.0 with the impact of noise from both the data centre and BESS are considered in section 5.0 of this report.

2.0 Assessment methodology and criteria

National Policy

2.1 The National Planning Policy Framework (NPPF), December 2024, sets out the Government's planning policies for England and "these policies articulate the Government's vision of sustainable development." In respect of noise, Paragraph 198 of the NPPF states the following:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and

c) limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation".

2.2 Guidance on the interpretation of the policy aims contained within the NPPF is contained within National Planning Policy Guidance (NPPG). The NPPG introduces the concept of a noise exposure hierarchy based on likely average response. The guidance contained in the NPPG is summarised in the table below:

TABLE 1: Noise Exposure Hierarchy

Response	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level			
Not noticeable	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise.	Observed Adverse Effect	Mitigate ad reduce to a minimum

Response	Examples of Outcomes	Increasing Effect Level	Action
	Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.		
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

2.3 The NPPF and NPPG reinforce the March 2010 DEFRA publication, "Noise Policy Statement for England" (NPSE), which states three policy aims, as follows:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life; and*
- *where possible, contribute to the improvement of health and quality of life."*

2.4 Together, the first two aims require that no significant adverse impact should occur and that, where a noise level which falls between a level which represents the lowest observable adverse effect and a level which represents a significant observed adverse effect, then according to the explanatory notes in the statement:

"… all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life whilst also taking into consideration the guiding principles of sustainable development. This does not mean that such effects cannot occur."

Local Policy

2.5 In terms of local policy regard is had to the Policy EN1 of the Saved Local Plan and Policy 8 of the Slough Local Development Framework Core Strategy (2006 – 2026), which require that developments should be of a high quality of design and not give rise to unacceptable (SR emphasis) level of pollution.

2.6 In reference to unacceptable levels of pollution local policy is consistent with the aims of the NPPF in that the significance of an impact must be taken into account when determining planning applications.

Design Guidance

2.7 Neither national or local policy provide any objective guidance on noise however it is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

i) The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:2014 and World Health Organisation "Guidelines for Community Noise" contain such guidelines.

ii) Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.

iii) Another method is to compare the resultant noise level against the background noise level (L_{A90}) of the area. This is the method employed by BS 4142:2014 to determine the impact of noise of an industrial or industrial type nature. It is best suited to the assessment of steady or pseudo-steady noise.

Guideline noise values

2.8 There are a number of guidance documents that contain recommended guideline noise values. These are discussed below.

2.9 British Standard 8233:2014 is principally intended to assist in the design of new dwellings; however, the Standard does state that it may be used in the assessment of noise from new sources being brought to existing dwellings.

2.10 The original BS 8233 was based on the advice contained in the draft World Health Organisation document "Guidelines for Community Noise". This document was released in final form in 2000. The World Health Organisation guidance is referenced in the NPSE.

2.11 The WHO advice is the most useful, comprehensive, and pertinent advice in this case, because it is not specific to the circumstances of the assessment. Instead, it provides guidance on acceptable limits in, for example, schools, dwellings and offices.

2.12 The WHO guideline values are appropriate to what are termed "critical health effects". This means that the limits are at the lowest noise level that would result in any psychological, physiological or sociological effect. They are, as defined by NPSE, set at the Lowest Observed Adverse Effect Level (LOAEL), but do not define the level above which effects may be considered significant (SOAEL). Compliance with the LOAEL should, therefore, be seen as a robust aim.

2.13 The WHO LOAEL guideline values are summarised in the following table.

TABLE 2: WHO Guidelines

Document	Level	Guidance
World Health Organisation "Community Noise 2000"	L_{AeqT} = 55 dB	Serious annoyance, daytime and evening. (Continuous noise, outdoor living areas)
	L_{AeqT} = 50 dB	Moderate annoyance, daytime and evening. (Continuous noise, outdoor living areas).
	L_{AeqT} = 35 dB	Moderate annoyance, daytime and evening. (Continuous noise, dwellings, indoors)
	L_{AeqT} = 30 dB	Sleep disturbance, night-time (indoors)
	L_{AMAX} = 60 dB	Sleep disturbance, windows open at night. (Noise peaks outside bedrooms, external level).
	L_{AMAX} = 45 dB	Sleep disturbance at night (Noise peaks inside bedrooms, internal level)

2.14 In 2018 the WHO published the "Environmental Noise Guidelines for the European Region" (ENGER). The new WHO Environmental Noise Guidelines (page 28) explain that *"The current environmental noise guidelines for the European Region supersede the CNG from 1999. Nevertheless, the GDG* (Guideline Development Group) *recommends that all CNG indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid"*. Hence the CNG remain relevant to this assessment.

2.15 The WHO ENGER brings together the latest research on the effects of specific types of noise on health in relation to transportation noise sources (road, rail and aircraft noise exposure), wind turbines and leisure noise. Hence in direct relation to the specific proposal that this noise assessment considers, the new WHO ENGER are not of material consideration.

Changes in noise level

2.16 Changes in noise levels of less than 3 dBA are not perceptible under normal conditions and changes of 10 dB are equivalent to a doubling of loudness. This guidance has been accepted by Inspectors, at Inquiry, to encompass changes in noise levels in the index $L_{Aeq,T.}$ in relation to road traffic noise and therefore if of limited use in this case.

2.17 The following table shows the response to changes in noise level (known as the Semantic Scale).

TABLE 3: Change in noise level

Change in noise level L_{AeqT} dB	Response	Impact
<3	Imperceptible	None
3 - 5	Perceptible	Slight
6 - 10	Up to a doubling	Significant
11 – 15	More than a doubling	Substantial
> 15	-	Severe

BS 4142:2014+A1:2019

2.18 As discussed, this BS described a method for rating and assessing sound of industrial and/or commercial nature according to the following summary process:

i) Carry out a numerical assessment of the noise, taking into the character and areas of uncertainty, by comparing the noise against the existing background noise level. The greater the difference between the two, the greater the impact.

ii) By considering the noise impact against the context in which it is placed. There are many contextual points to consider when considering an assessment of sound impact including the following:

- The absolute level of sound.
- The character and level of the specific sound compared to the existing noise climate.
- The sensitivity of the receptors.
- The time and duration that the specific sound occurs. The conclusions of assessments undertaken using alternative assessment methods, for example WHO guideline noise values or change in noise level.
- The ability to mitigate the specific sound through various methods, for example by screening, the selection of quiet plant equipment, the use of attenuators, through the imposition of noise management plans and good practice, façade design and layout/orientation.
- The form and scale and scale of a development. For example, does not the proposed development involve a new industrial/commercial premise or is the proposal the installation of new plant or an extension to an existing premises?

2.19 It is therefore entirely possible that whilst the numerical outcome of a BS 4142 assessment is indicative of adverse or even significant adverse impact, when the proposal is considered in context the significance of the impact is reduced to an acceptable level.

Local Design Guidance

2.20 SR is not aware of any local design guidance; however, reference is made to advice provided by SBC on the data centre on the former Akzonobel Decorative Paints Facility[2], Wexham Road, Slough. Condition 12 of the outline planning application requires that from 'normal' operation of the data centre that rating noise level from plant should not exceed the existing background noise levels by more than 2 dB and that noise levels should not exceed 55dB L_{Aeq1hr} during (0700 -2300hrs) and 45 dB L_{Aeq1hr} during night time 2300 – 0700 hours). It is assumed that a similar approach would be acceptable in this case.

2.21 Whilst there are no similar conditions for emergency conditions, reference is made in the noise assessment submitted to discharge Condition 12 of internal noise levels not exceeding the recommended internal guidelines in BS 8233. Based on windows closed with a level difference (inside to outside) of 30dB, this would equate to an external noise level of 65 dB during the day and 60 dB during the night.

2.22 The impact of noise depends on many factors, not just noise level, but also duration and time of day the noise occurs. For testing conditions which will only occur during the day and for short periods of time it is therefore considered a higher noise criteria would apply compared to normal operations that occur 24-hours a day. As advised above the guidance in BS 4142 states that a noise level of 'around 5dB' is an indication of adverse impact and a level difference of 'around 10dB' is an indication of a significant adverse impact. The primary aim of the NPPF is the avoidance of significant adverse impacts, and therefore it is suggested that for testing conditions noise levels should not exceed the background level by more than 5dB.

Suggested Criteria

- Normal Operations (Data Centre and BESS)– Background Level (BL) + 2dB
- Testing Operations (Data Centre only) – Background Level (BL) +5dB
- Emergency Operations (Data Centre only)– External Noise Levels 60 dB L_{AeqT} (night)

[2] Planning Application Reference P/00072/096

3.0 Environmental Noise Survey

3.1 To determine existing baseline sound levels an noise survey was carried out between 9 and 11 July 2024. Measurements were carried out at three locations as shown in Figure 2 below. The locations were chosen to represent the noise sensitive properties identified in Table 4.

FIGURE 1: Monitoring Locations

TABLE 4: Survey Locations details

	Equipment used	Details
1	Norsonic 140 Type 1 sound level meter	Microphone positioned on tripod at boundary of site with Heathrow Hotel. Location considered representative of Hotel (R1) and properties to north east of the site (R2)
2	Norsonic 140 Type 1 sound level meter	Microphone positioned in free-field conditions on northern boundary of Parcel B. Location chosen to be representative of Poyle Farm House (R3) and Florama (R4)
3	Norsonic 118 Type 1 sound level	Microphone positioned in free field conditions on south east corner of Parcel B. Location chosen to be representative of Golden Cross PH (R5) and Poyle Mobile Home Park (R6)
Weather conditions during the survey were dry, warm with light winds		
All SLM's were calibrated before and after the survey with no drift in accuracy found.		

3.2 At location 1 measurements were recorded over from midday on 9th July until 2200 hours on 10th July, at location 2 from 1300 hours on 9th until 1500 hours on 10th July and at location 3 from 1415 hours on 9th until 1100 hours 11th July 2024. Measurements at each location were recorded continuously during the survey period at 5-minute intervals. Survey results are presented in Figures 3 – 5 below.

FIGURE 3: Survey Results – Location 1

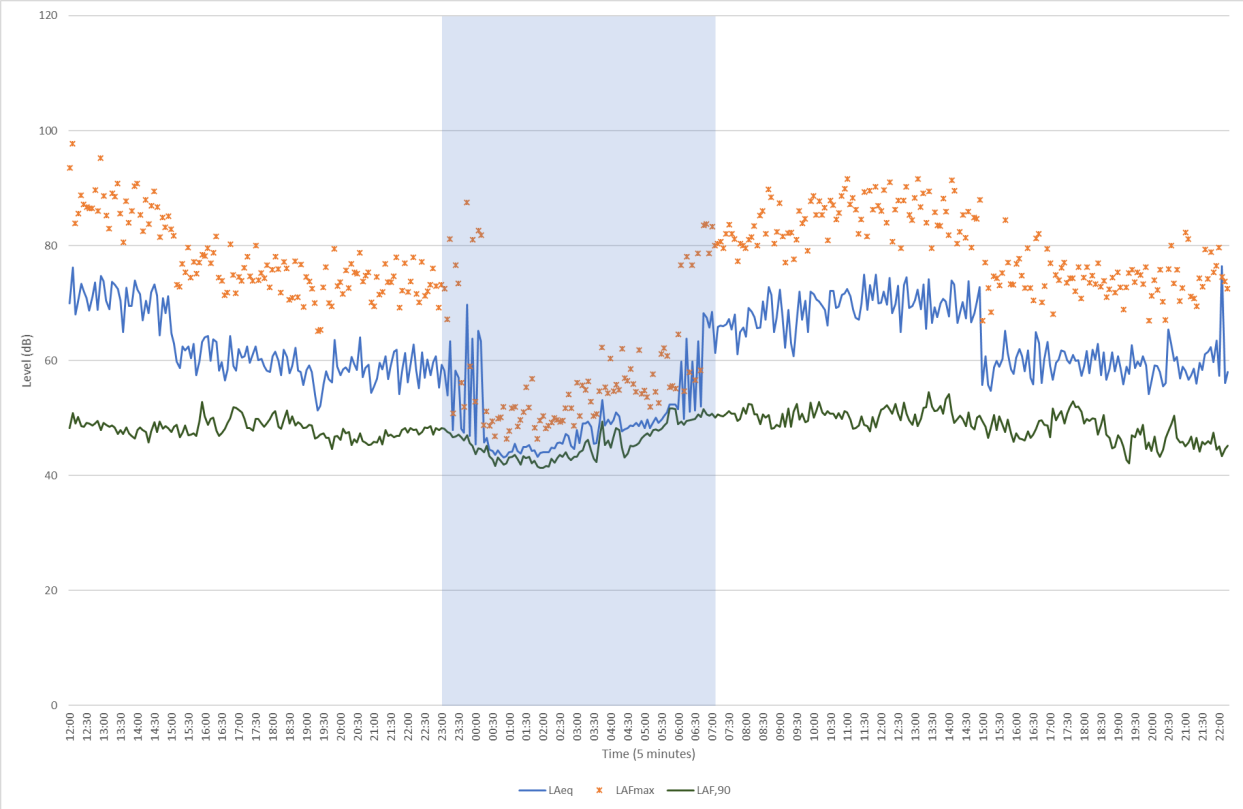


FIGURE 4: Survey Results – Location 2

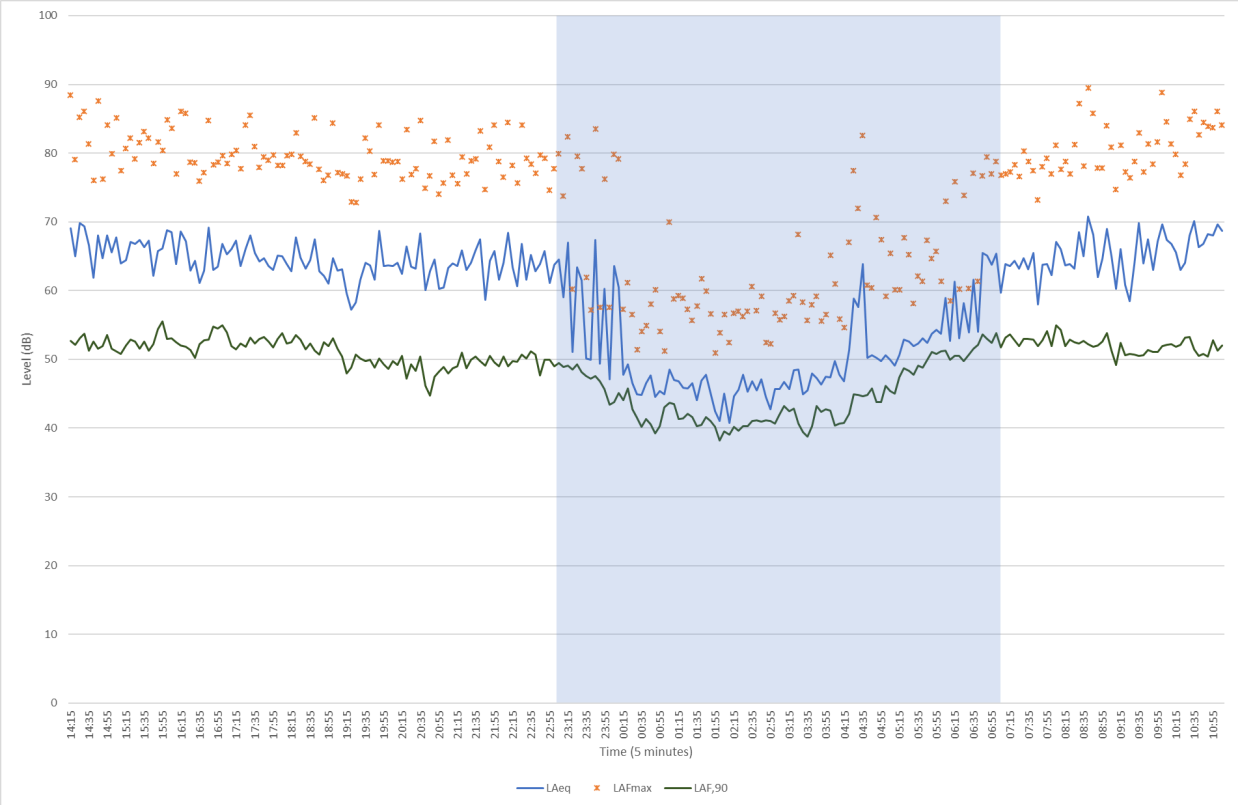
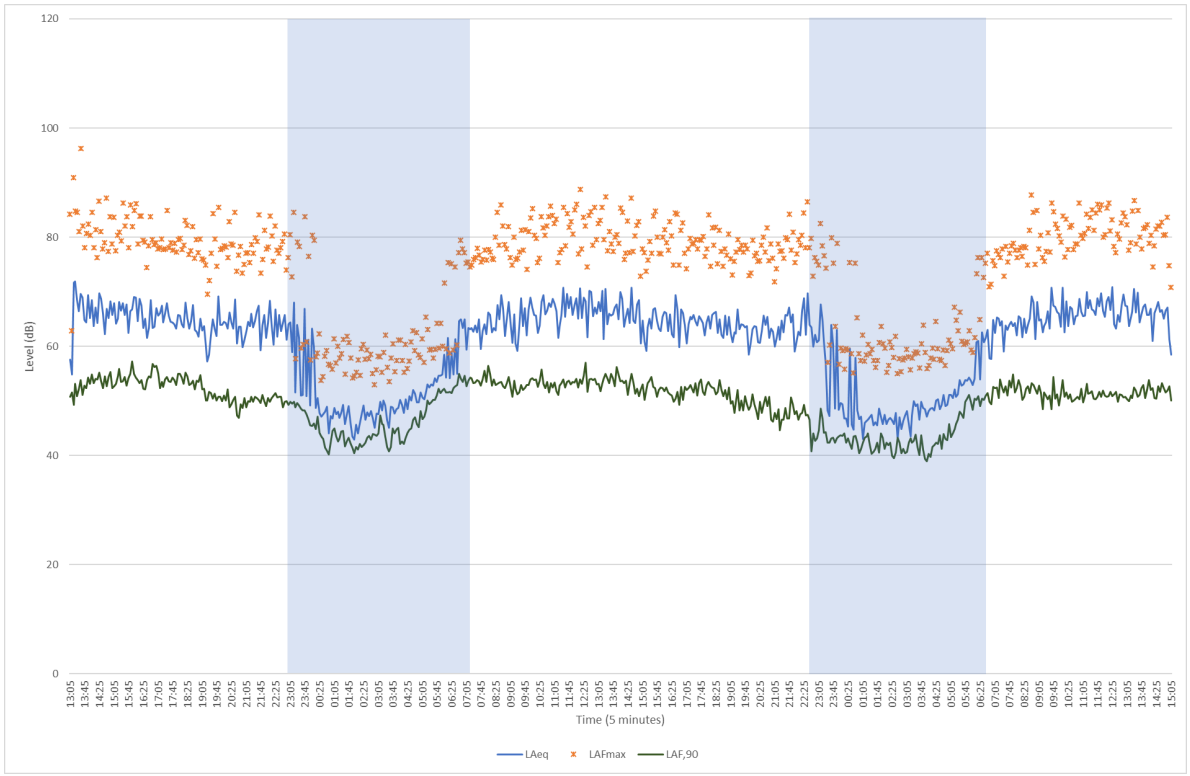


FIGURE 5: Survey Results – Location 3



3.2 Based on the survey results measured the ambient (L_{AeqT}) and background ($L_{A90,T}$) at each location has been determined during the day time (0700 and 2300 hours) and night time period (2300 – 0700 hrs) periods has been determined. The representative background sound levels have been determined by a modal analysis of the measurements carried out at each location. The modal analysis is included in Appendix B to this report.

TABLE 5: Survey Results

Location	Day time (0700 – 2300 hours)			Night Time (2300 – 0700 hours)		
	$L_{Aeq16hr}$ dB	L_{A90T} dB	$L_{Afmax\ (range)}$	L_{Aeq8hr} dB	L_{A90T} dB	$L_{Afmax\ (range)}$
1	67	51	65 - 95	57	44	46 - 88
2	66	53	72 – 88	57	44	51 – 84
3	66	54	71 - 88	56	44	55 - 83

3.3 During the day existing noise levels are dominated by noise from London Heathrow airport with planes flying over the site at regular intervals. Flights continue into the night time period up to 23:30 and start again around 0600 hours. This is evident from the survey results shown in Figures 3-5 above. Background noise levels across all three locations were around 44 dB.

4.0 Noise Input Assumptions and Predicted Noise Levels

4.1 The main noise consideration from the proposed development is noise from operation of plant, including chillers and standby generators serving the data centre and plant at the BESS. To determine noise levels from site activity SR has used SoundPLAN computer modelling software. SoundPLAN calculates the overall L_{Aeq} at defined receptors in accordance with relevant standards including BS 4142:2014. This calculation is based on a number of input parameters, including noise source data, barriers, topography, intervening ground conditions and other buildings in the area.

4.2 The physical elements of the following models such as location, layout, topography and location of noise sources have been taken directly from the planning application drawings and site observations. For the noise source data SR has used manufacturer's data (where available) and where this is not available i.e. where plant selection has not been confirmed, noise data from SR own library from similar sites. The noise source input data used in the assessment is summarised below. Full details of the plant are included in Appendix C.

Input Assumptions

Data Centre

Chillers (x 90)

Generators (x45) – 3 banks of 15

For the purpose of assessment, it has been assumed that exhaust is above height of gantry screen.

BESS

PowerTitan 2.0 Energy Storage System – Number of units 48

Inverter, LV voltage panel, transformer – Number of units 24

*Daytime - Assumed all plant operating 100% capacity at ambient temperature up to 35^{o}C

*Night time – LV Voltage Panel, 100%, PowerTitan 2 units – 50% at ambient temperature up to 25^{o}C.

*Based on information from BESS at Bustleholme, West Midlands

4.3 Daytime receptors are model at 1m above ground level, with night time models based on upper floor receptors, with following exceptions:

R2, R4 and R6 – Ground Level (day and night)

R1 – Upper floor of hotel (day and night)

R5 – Upper Floor (day and night)

4.4 Based on the above approach the following scenarios have been modelled:

Data Centre

- Normal operation (Day and Night) – All chillers operating – No generators
- Emergency Operation Night Time – All chillers and all standby generators operating
- Testing Operation Daytime – All chillers and 3 generators on test

BESS

- Normal Operations – Day and Night

Combined

- Normal Operations – Data Centre + BESS (Day and Night)

4.5 Noise from ancillary plant, including electrical sub-station located on the southern side of the data centre, has not been included as there is insufficient information available to enable a detailed assessment to be carried out. However, based on experience of similar sites noise from this type of plant (including the sub-station) is insignificant compared to the plant assessed and therefore unlikely to change the predicted noise levels.

4.6 Noise levels have been predicted at the following receptors as identified in Figure 2. Acoustic models showing the predicted noise levels are shown in Appendix D and are summarised in the Table below.

TABLE 6: Predicted Noise levels L_{AeqT}

			Receptors – Predicted Noise Level dB					
			R1	R2	R3	R4	R5	R6
Data Centre	Normal	Day	44	39	37	38	32	30
	Normal	Night	44	39	38	38	32	30
	Emergency	Night	60	55	46	46	43	40
	Testing	Day	54	47	40	42	37	34
BESS	Normal	Day	36	33	49	49	51	40
	Normal	Night	30	26	43	35	46	35
Combined		Day	45	40	49	49	51	40
Combined		Night	44	39	44	40	46	46

Uncertainty

4.7 The above predicted noise levels are based on manufacturer's noise data and where the final details of the plant are not known (as in the case of the data centre) on noise data determined from similar developments. There is, therefore, a degree of uncertainty in the assessment results. To minimise impact of any uncertainty, the development has been designed with screening around both the data centre chillers and generator gantry. If required this screening, which is currently a louvred weather screen could be replaced with an acoustic louvred screen. The acoustic performance of the screen (if required) will depend on the final selection of the plant.

5.0 Noise Assessment

5.1 To determine the impact of noise from the proposed development, SR has considered the following scenarios. In case an assessment has been carried out in accordance with the guidance in BS 4142. Taking into account the existing high ambient noise levels it is not considered that noise from plant would have any notable features likely to attract attention and therefore the specific levels calculated in section 4.0 of this report can be considered to be the rating level. The noise criteria used is based on BS 4142 and as set out in section 2.0 of this report

- Data Centre – Normal Operation – Chillers only (day and night)
- Data Centre – Testing Operations – Daytime only
- Data Centre – Emergency Operations – Night time
- BESS – Normal Operation – (day and night)
- Overall (Data Centre + BESS) – Normal Operation – (day and night)

Data Centre - Normal Operations

TABLE 7: Daytime (0700 – 2300 hours)

Receptor Ref	Rating Level dB (Table 6)	Background Level (BL) dB	Noise Criteria (BL+2dB)	Meets Criteria Yes/No
1	44	51	53	Yes
2	39	51	53	Yes
3	37	53	55	Yes
4	38	53	55	Yes
5	32	54	56	Yes
6	30	54	56	Yes

TABLE 8 : Night time (2300 – 0700 hours)

Receptor Ref	Rating Level dB (Table 6)	Background Level (BL) dB	Noise Criteria (BL+2dB)	Meets Criteria Yes/No
1	44	44	46	Yes
2	39	44	46	Yes
3	38	44	46	Yes
4	38	44	46	Yes
5	32	44	46	Yes
6	30	44	46	Yes

5.2 During both daytime and night time periods predicted noise levels from normal operation of the data centre will be no greater than existing background noise levels and no additional mitigation measures are required.

Data Centre - Testing Operations

5.3 As part of the normal operations of the completed development, it will be necessary to routinely test the emergency generators. The specific testing regime will depend on the data centre operator requirements however testing will be limited to daytime periods only, with only a select number of generators tested each time. For the purposes of the assessment it has been assumed that the three closest generators to the Hilton Hotel will be tested to represent a reasonable worst case scenario.

TABLE 9: Day Time (0700 - 2300 hours)

Receptor Ref	Rating Level dB (Table 6)	Background Level (BL) dB	Noise Criteria (BL+5dB)	Meets Criteria Yes/No
1	47	51	56	Yes
2	54	51	56	Yes
3	40	53	58	Yes
4	42	53	58	Yes
5	37	54	59	Yes
6	34	54	59	Yes

5.4 Predicted noise levels during routine testing of emergency generators will be within the recommended noise criteria and also significantly below the existing ambient noise levels. Therefore, taking into account that testing will only occur for a relatively short period of time and limited to daytime hours only, it is not considered that noise during testing operations will cause significant adverse impact.

Data Centre – Emergency Operations

5.5 In the event of a power failure, all generators will operate simultaneously to support the demand alongside all normal cooling and ventilation plant. A power failure may occur at any time. Therefore, predicted rating levels from emergency operations have been assessed against night time background noise levels to represent a worst case scenario.

TABLE 10: Emergency Operations – Night time only (2300 – 0700 hours)

Receptor Ref	Rating Level dB (Table 6)	Recommended Noise Criteria	Meets Criteria Yes/No
1	60	60	Yes
2	55	60	Yes
3	46	60	Yes
4	46	60	Yes
5	43	60	Yes
6	40	60	Yes

5.6 The above criteria is based on windows being closed with a minimum difference of 30 dB (inside to outside) assumed. Based on this approach internal noise levels at all receptors will be no greater than 30 dB L_{AeqT} and within the internal guideline in BS 8233. SR is aware that the Hilton Hotel (R1) has been designed to take into account noise from air craft noise at London Heathrow airport and the acoustic performance of the building is far greater than 30 dB. It is also noted that all rooms at the hotel have air conditioning. It is therefore not considered that noise during emergency operations will cause significant adverse impacts in line with policy aims of NPPF.

BESS – Normal Operations

5.7 For the BESS on the southern parcel of land (Parcel B), it has been considered that all plant will operate at 100% capacity and 50% capacity at night. This based on information provided from a similar BESS at Bustleholme.

TABLE 11: BESS daytime (0700 – 2300 hours)

Receptor Ref	Rating Level dB (Table 6)	Background Level (BL) dB	Noise Criteria (BL+2dB)	Meets Criteria Yes/No
1	36	51	46	Yes
2	33	51	46	Yes
3	49	53	46	Yes
4	49	53	46	Yes
5	51	54	46	Yes
6	40	54	46	Yes

TABLE 12: BESS night time (2300 - 0700 hours)

Receptor Ref	Rating Level dB (Table 6)	Background Level (BL) dB	Noise Criteria (BL+2dB)	Meets Criteria Yes/No
1	30	44	46	Yes
2	26	44	46	Yes
3	43	44	46	Yes
4	35	44	46	Yes
5	46	44	46	Yes
6	35	44	46	Yes

5.8 Noise from the operation of BESS will be within the recommended daytime and night time criteria.

Overall (Data Centre + BESS)

5.9 Noise effects are generally localised and individual noise sources only have a cumulative effect if they are in close proximity. In relation to the development, the receptors to the north (R1 and R2) are not impacted by noise from BESS and similarly the impact of the data centre on properties to the south (R5 and R6) is considered negligible. Therefore, in terms of cumulative impact the main consideration are Poyle Farm House (R3) and Floroma (R4). Table 13 presents the cumulative noise level from normal operation of the data centre and BESS on these properties. The predicted levels take into account the noise reduction from screening the BESS.

TABLE 13: Cumulative Impact (Data Centre +BESS) night time (2300 - 0700 hours)

Receptor Ref	Rating Level dB (Table 6)	Background Level (BL) dB	Noise Criteria (BL+2dB)	Meets Criteria Yes/No
3	44	44	46	Yes
4	40	44	46	Yes

5.10 Taking into account the mitigation cumulative noise levels from both data centre and BESS will be within the recommended night time criteria.

6.0 Summary and Conclusion

6.1 SR has carried out an noise assessment of a proposed development at Manor Farm, Poyle Road, in the administrative area of Slough Borough Council. The development will include a data centre on the northern part of the site (Parcel A) and Battery Energy Storage Site (BESS) on the southern part (Parcel B).

6.2 A survey of existing noise levels has been carried out to establish the level and character of existing noise levels. Noise levels are dominated during the day by air craft noise at Heathrow airport which is approximately 1.7km to the east of the site. During periods when no flights take place background noise levels are dictated by road traffic on the M25. Based on measured background noise levels and advice provided by SBC on similar developments within the area, noise criteria have been determined taking into account the advice in BS 4142:2014.

6.3 Noise levels from site operations have been predicted using SoundPLAN computer modelling and the following concluded:

- Noise from operation of the data centre, during normal, testing and emergency operations will be within recommended criteria;
- Noise from BESS during daytime and night hours will be within the recommended criteria; and
- Nosie from combined operation of BESS and Data Centre will be within the recommended noise criteria

6.4 It is therefore concluded noise from proposed development in line with policy aims of the NPPF and SBC Local Plan noise from proposed development will not cause a significant or unacceptable impact of noise sensitive properties in the area,

APPENDIX A

ACOUSTIC TERMINOLOGY

Acoustic Terminology

A1 Noise, defined as unwanted sound, is measured in units of decibels, dB. The range of audible sounds is from 0 dB to 140 dB. Two equal sources of sound, if added together will result in an increase in level of 3 dB, i.e. 50 dB + 50 dB = 53 dB. Increases in continuous sound are perceived in the following manner:

1 dB increase - barely perceptible.

3 dB increase - just noticeable.

10 dB increase - perceived as twice as loud.

A2 Frequency (or pitch) of sound is measured in units of Hertz. 1 Hertz (Hz) = 1 cycle/second. The range of frequencies audible to the human ear is around 20Hz to 18000Hz (or 18kHz). The capability of a person to hear higher frequencies will reduce with age. The ear is more sensitive to medium frequency than high or low frequencies.

A3 To take account of the varying sensitivity of people to different frequencies a weighting scale has been universally adopted called "A-weighting". The measuring equipment has the ability automatically to weight (or filter) a sound to this A scale so that the sound level it measures best correlates to the subjective response of a person. The unit of measurement thus becomes dBA (decibel, A-weighted).

A4 The second important characteristic of sound is amplitude or level. Two units are used to express level, a) sound power level - L_w and b) sound pressure level - L_p. Sound power level is an inherent property of a source whilst sound pressure level is dependent on surroundings/distance/directivity, etc. The sound level that is measured on a meter is the sound pressure level, L_p.

A5 External sound levels are rarely steady but rise or fall in response to the activity in the area - cars, voices, planes, birdsong, etc. A person's subjective response to different noises has been found to vary dependent on the type and temporal distribution of a particular type of noise. A set of statistical indices have been developed for the subjective response to these different noise sources.

A6 The main noise indices in use in the UK are:

L_{A90}: The sound level (in dBA) exceeded for 90% of the time. This level gives an indication of the sound level during the quieter periods of time in any given sample. It is used to describe the "background sound level" of an area.

L_{Aeq}: The equivalent continuous sound level in dBA. This unit may be described as "the notional steady noise level that would provide, over a period, the same energy as the intermittent noise". In other words, the energy average level. This unit is now used to measure a wide variety of different types of noise of an industrial or commercial nature, as well as aircraft and trains.

L_{A10}: The sound level (in dBA) exceeded for 10% of the time. This level gives an indication of the sound level during the noisier periods of time in any given sample. It has been used over many years to measure and assess road traffic noise.

L_{AMAX}: The maximum level of sound measured in any given period. This unit is used to measure and assess transient noises, i.e. gun shots, individual vehicles, etc.

A7 The sound energy of a transient event may be described by a term SEL - Sound Exposure Level. This is the L_{Aeq} level normalised to one second. That is the constant level in dBA which lasting for one second has the same amount of acoustic energy as a given A weighted noise event lasting for a period of time. The use of this unit allows the prediction of the L_{Aeq} level over any period and for any number of events using the equation;

$$L_{AeqT} = SEL + 10 \log n - 10 \log T \text{ dB}.$$

Where

n = Number of events in time period T.

T = Total sample period in seconds.

A8 In the open, known as free field, sound attenuates at a rate of 6 dB per each doubling of distance. This is known as geometric spreading or sometimes referred to as the Inverse Square Law. As noise is measured on a Logarithmic scale, this attenuation in distance = 20 Log (ratio of distances), e.g. for a noise level of 60 dB at ten metres, the corresponding level at 160 metres is:

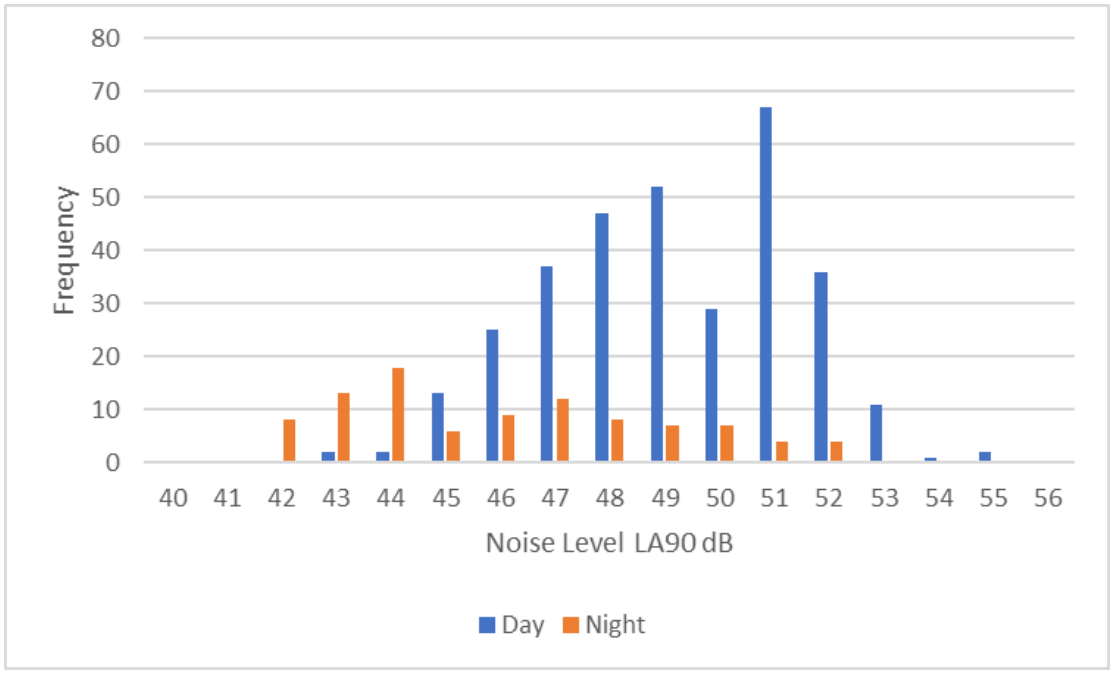
$$60 - 20 \text{ Log } {}^{160}/_{10} = 60 - 24 = 36 \text{ dB}.$$

APPENDIX B

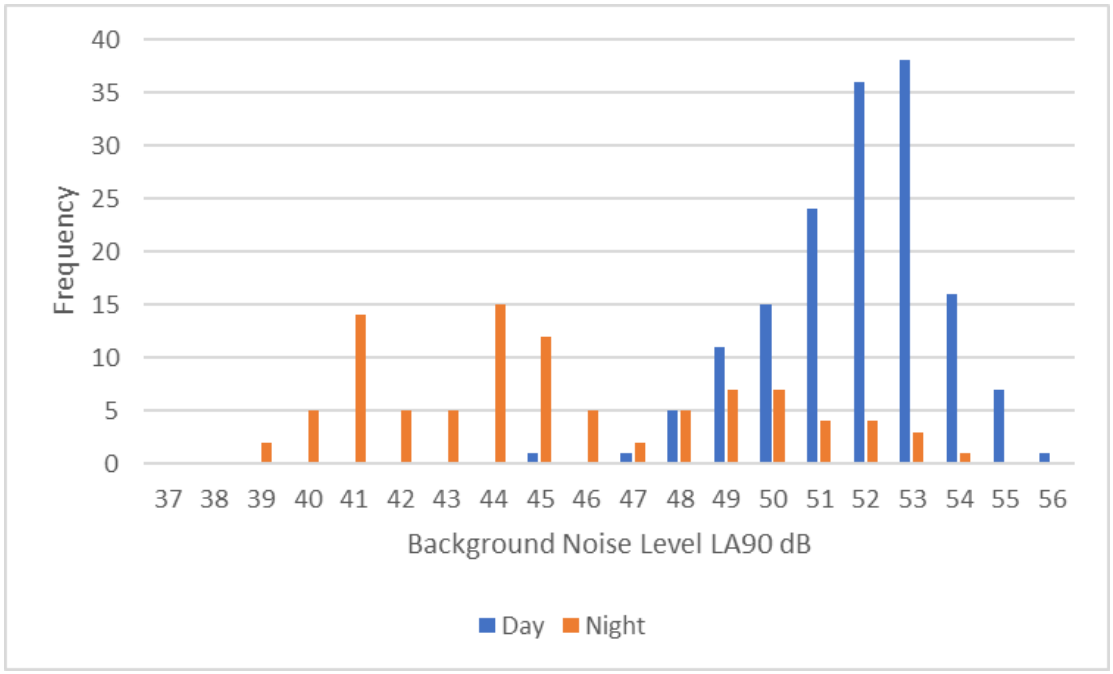
BACKGROUND NOISE LEVELS

Appendix B – Background Sound Levels – Modal Analysis

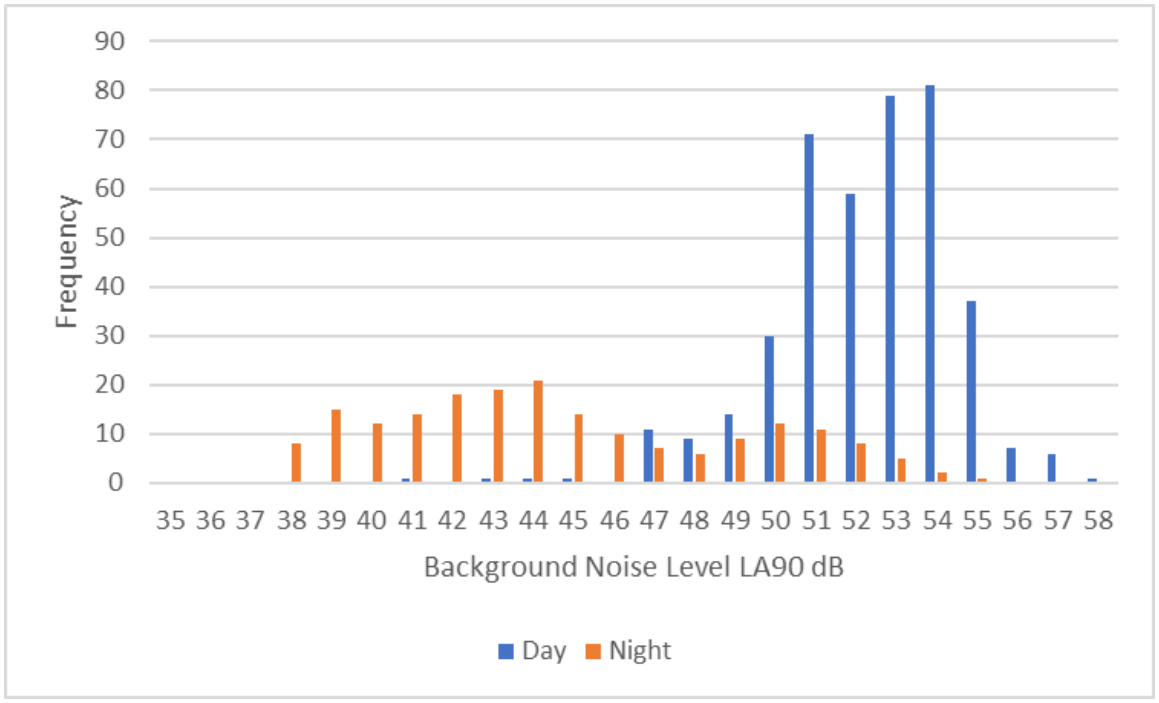
B1: Location 1



B2: Location 2



B3: Location 3



APPENDIX C

NOISE DATA – INPUT ASSUMPTIONS

Appendix C – Plant Input Assumptions

Data Centre

Chillers (No. units 90)

Source	Lw	63Hz dB(A)	125Hz dB(A)	250Hz dB(A)	500Hz dB(A)	1kHz dB(A)	2kHz dB(A)	4kHz dB(A)	8kHz dB(A)
AIR COOLED CHILLER-CHILLER END	69	49	59	61	62	65	60	56	49
AIR COOLED CHILLER-CHILLER SIDE	75	54	65	67	67	71	66	62	55
AIR COOLED CHILLER-CHILLER END	69	49	59	61	62	65	60	56	49
AIR COOLED CHILLER-CHILLER SIDE	75	54	65	67	67	71	66	62	55
AIR COOLED CHILLER-CHILLER TOP	74	54	64	66	67	70	65	61	54
Total	**80**	**60**	**70**	**72**	**73**	**76**	**71**	**67**	**60**

Generators (No. units 45) – 3 banks of 15

Generator acoustic data:	Hz		63	125	250	500	1000	2000	4000	8000	LwA dB(A)
Radiating surface of motor compartment:	m2										
Lp(A) roof (minus air inlet roof cover)	32		53	68	68	65	55	51	48	59	72
Lp(A) left side wall	58.5		52	68	67	64	55	50	47	59	72
Lp(A) right side wall	58.5		52	68	67	64	55	50	47	59	72
Lp(A) front wall @ air inlet side	15.6		49	63	61	58	48	42	39	51	66
Radiating surface of air inlet ducting:	m2										
Lp(A) inlet attenuator LHS	7.8		52	62	61	58	52	49	43	45	66
Lp(A) inlet attenuator RHS	7.8										
Lp(A) inlet attenuator Top	24										
Lp(A) inlet opening	20.8		68	78	72	66	65	64	66	81	83
Radiating surface of air discharge ducting:	m2										
Lp(A) discharge duct Front	62		57	60	60	58	52	49	43	45	66
Lp(A) discharge duct LHS	38.75		57	60	60	58	52	49	43	45	66
Lp(A) discharge duct RHS	38.75		57	60	60	58	52	49	43	45	66
Lp(A) discharge duct Rear	62		57	60	60	58	52	49	43	45	66
Lp(A) discharge opening vertical	10		71	78	78	70	66	64	64	76	83
Exhaust silencer at 1m	Point	Lp1m	127	136	136	128	130	127	118	118	
		Attenuator	-20	-41	-54	-51	-58	-58	-57	-57	
		dBA	-26	-16	-9	-3	0	1	1	-1	
		LpA at 1m	81	79	73	74	72	70	62	60	84.5
		1m	8	8	8	8	8	8	8	8	
		LwA	**89**	**87**	**81**	**82**	**80**	**78**	**70**	**68**	92.5

Battery Energy Storage Site (BESS)

PowerTitan 2.0 Energy Storage System – (No. units 48)

Sound Pressure Level (1m) – (Extract from Manufacturer's Noise Data)

测点 Test Point	正 Front	右 Right	后 Rear	左 Left
时间平均声压级 $L_{p,T}$/dBA	74.9	67.9	68.9	70.0

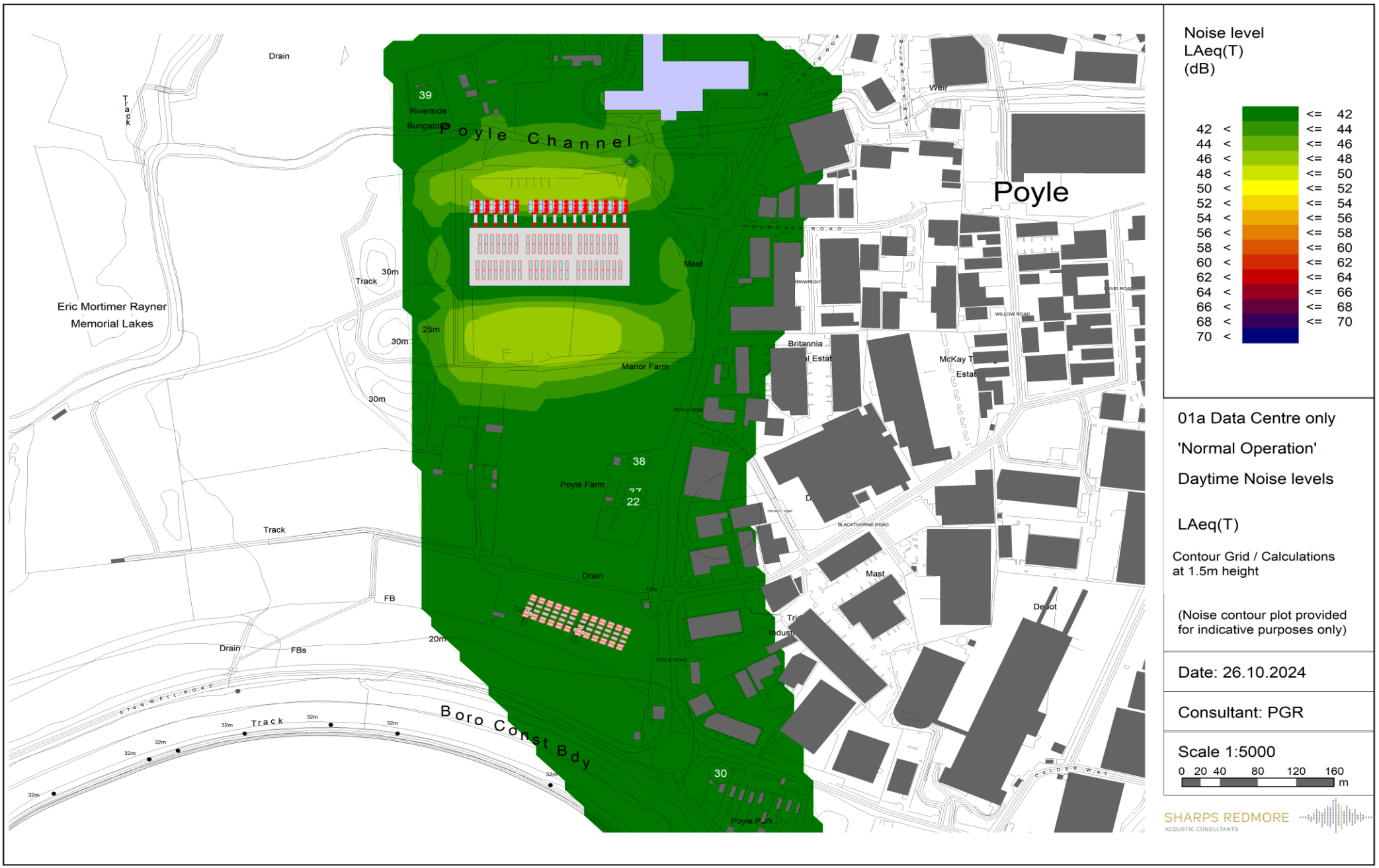
Inverter, LV voltage panel, transformer – (No, units 24)

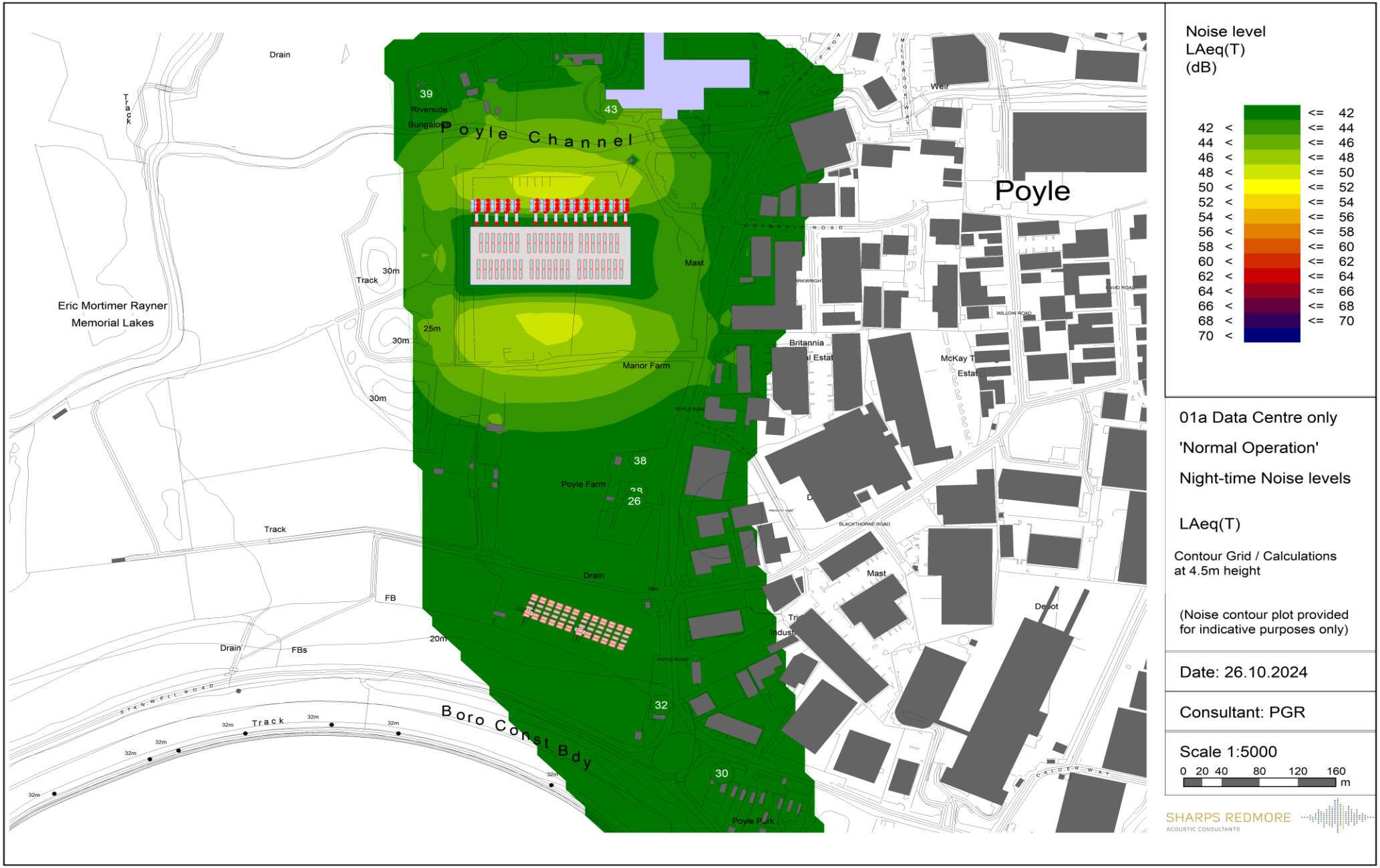
Sound Pressure Level (1m) – (Extract from Manufacturer's Noise Data)

No.	Operating condition	Front/dBA	Right/dBA	Back/dBA	Left/dBA	Top/dBA	Expanded uncertainty/dBA
1	MVS SCC operates at full power	58.8	51.5*	70.9	61.3	62.0	2.5

APPENDIX D

SOUNDPLAN NOISE MODELS


Noise level
LAeq(T)
(dB)
42 < <= 42
44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
70 <
01a Data Centre only
'Normal Operation'
Daytime Noise levels
LAeq(T)
Contour Grid / Calculations at 1.5m height
(Noise contour plot provided for indicative purposes only)
Date: 26.10.2024
Consultant: PGR
Scale 1:5000
0 20 40 80 120 160 m
SHARPS REDMORE
ACOUSTIC CONSULTANTS
Poyle Channel
Poyle
Eric Mortimer Rayner Memorial Lakes
Riverside Bungalow
Manor Farm
Poyle Farm
Britannia
McKay Trading Estate
Boro Const Bdy
Poyle Park
Track
Drain
FB
FBs
Mast
Weir
Depot
STANWELL ROAD
POYLE ROAD
COLNDALE ROAD
BLACKTHORNE ROAD
WILLOW ROAD
CALDER WAY
39
38
30
22
30m
25m
20m
32m
21m
19m


Noise level
LAeq(T)
(dB)
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44 < <= 44
46 < <= 46
48 < <= 48
50 < <= 52
52 < <= 54
54 < <= 56
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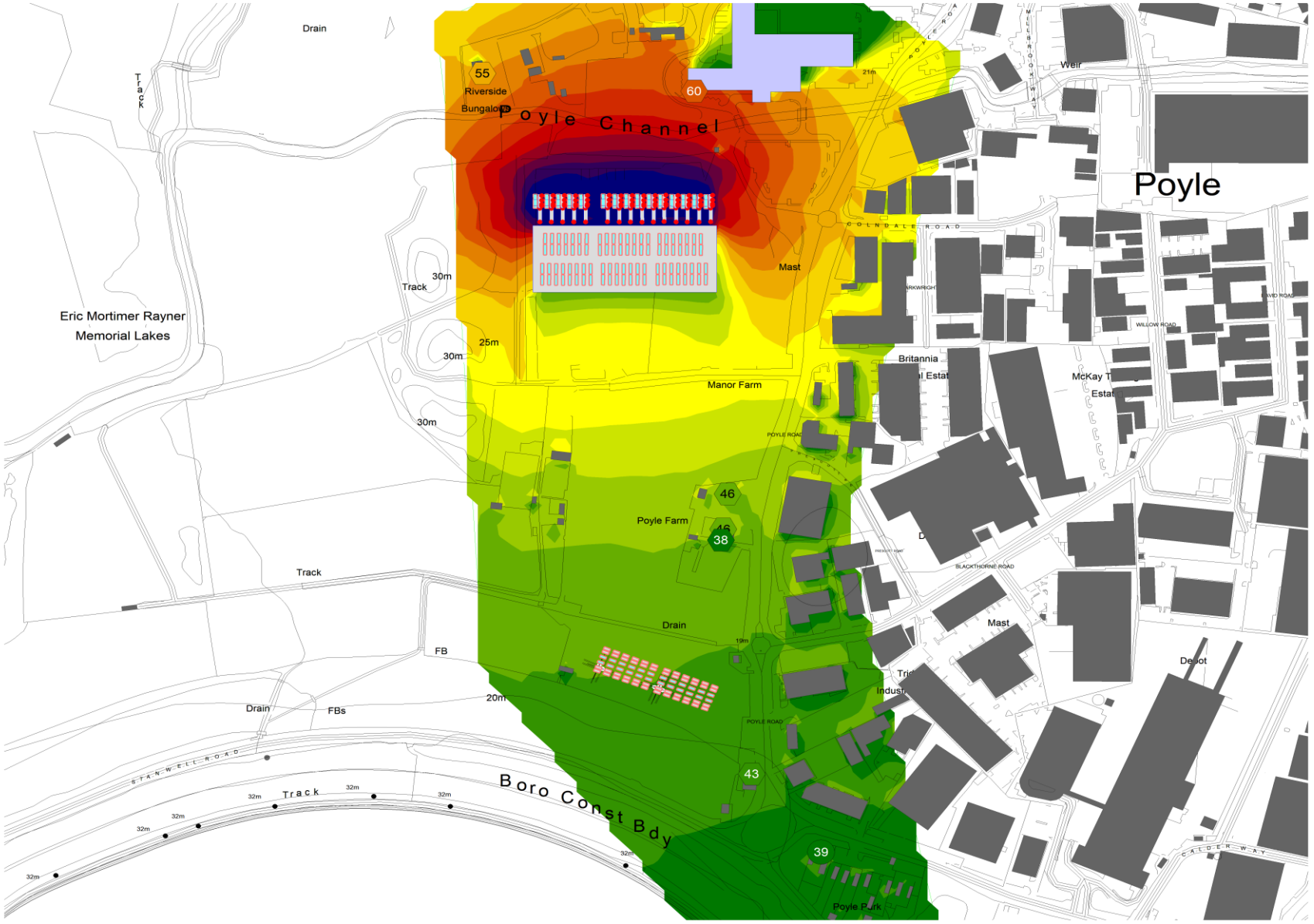
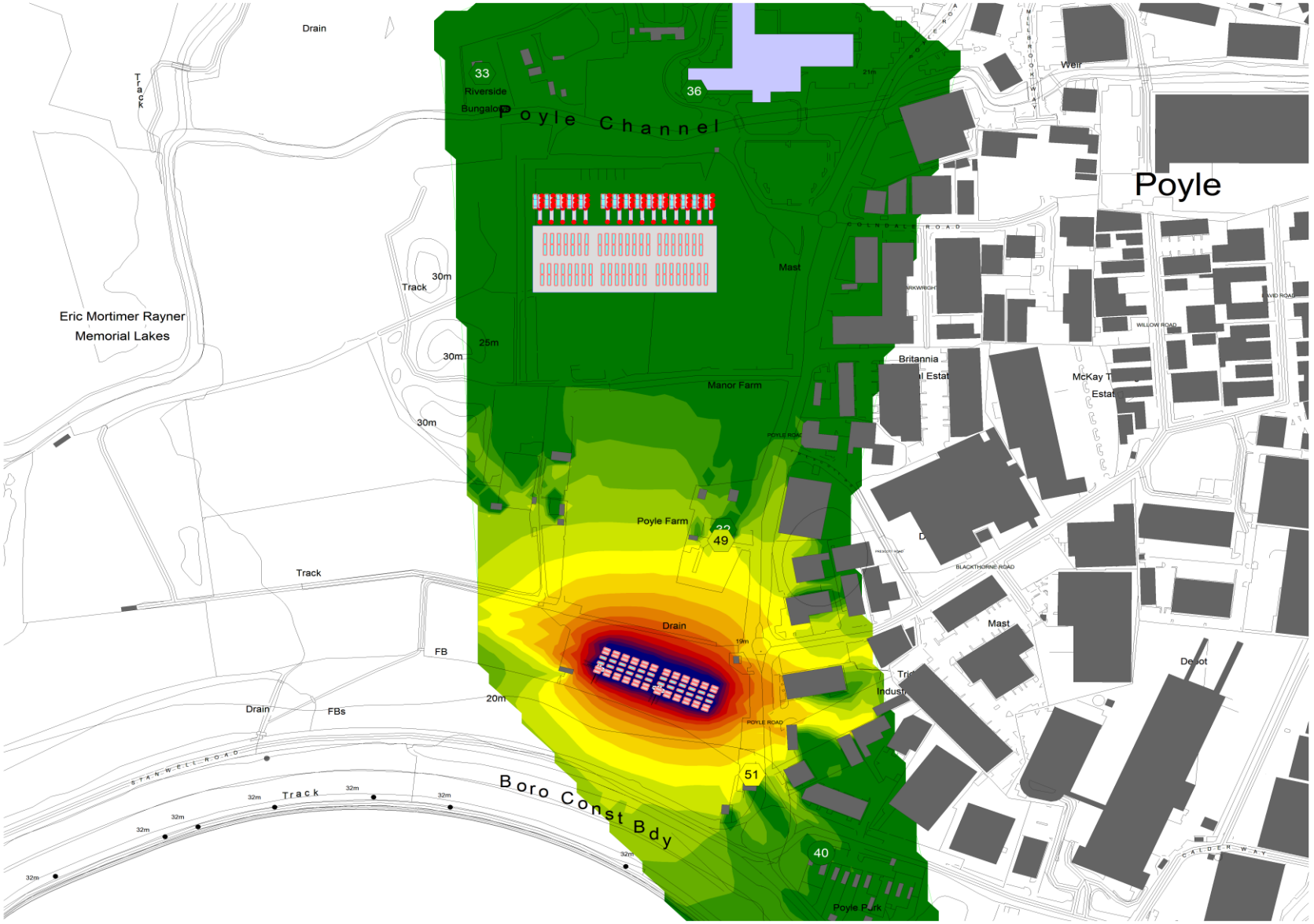
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
70 <
Poyle
Poyle Channel
Drain
Track
39
Riverside
Bungalow
43
Eric Mortimer Rayner
Memorial Lakes
30m
25m
Mast
Manor Farm
Britannia
McKay
Estate
38
Poyle Farm
26
Track
Drain
FB
FBs
20m
Boro Const Bdy
Track
32
30
Poyle Park
Weir
01a Data Centre only
'Normal Operation'
Night-time Noise levels
LAeq(T)
Contour Grid / Calculations
at 4.5m height
(Noise contour plot provided
for indicative purposes only)
Date: 26.10.2024
Consultant: PGR
Scale 1:5000
0 20 40 80 120 160
m
SHARPS REDMORE
ACOUSTIC CONSULTANTS


Drain
Track
55
Riverside
Bungalow
60
Poyle Channel
21m
Weir
Poyle
Mast
30m
Track
Eric Mortimer Rayner
Memorial Lakes
25m
30m
30m
Manor Farm
Britannia
McKay T
Estat
46
Poyle Farm
38
Track
Drain
19m
Mast
Depot
FB
20m
Drain
FBs
Boro Const Bdy
Track
32m
43
39
Poyle Park
Noise level
LAeq(T)
(dB)
42 < <= 42
44 < <= 44
46 < <= 46
48 < <= 48
50 < <= 50
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
01b Data Centre only
'Emergency Operation'
Night-time Noise levels
LAeq(T)
Contour Grid / Calculations
at 4.5m height
(Noise contour plot provided
for indicative purposes only)
Date: 26.10.2024
Consultant: PGR
Scale 1:5000
0 20 40 80 120 160
m
SHARPS REDMORE
ACOUSTIC CONSULTANTS



Noise level
LAeq(T)
(dB)

		<=	42
42	<	<=	44
44	<	<=	46
46	<	<=	48
48	<	<=	50
50	<	<=	52
52	<	<=	54
54	<	<=	56
56	<	<=	58
58	<	<=	60
60	<	<=	62
62	<	<=	64
64	<	<=	66
66	<	<=	68
68	<	<=	70
70	<		

02 BSF only

Daytime Noise levels

LAeq(T)

Contour Grid / Calculations
at 1.5m height

(Noise contour plot provided
for indicative purposes only)

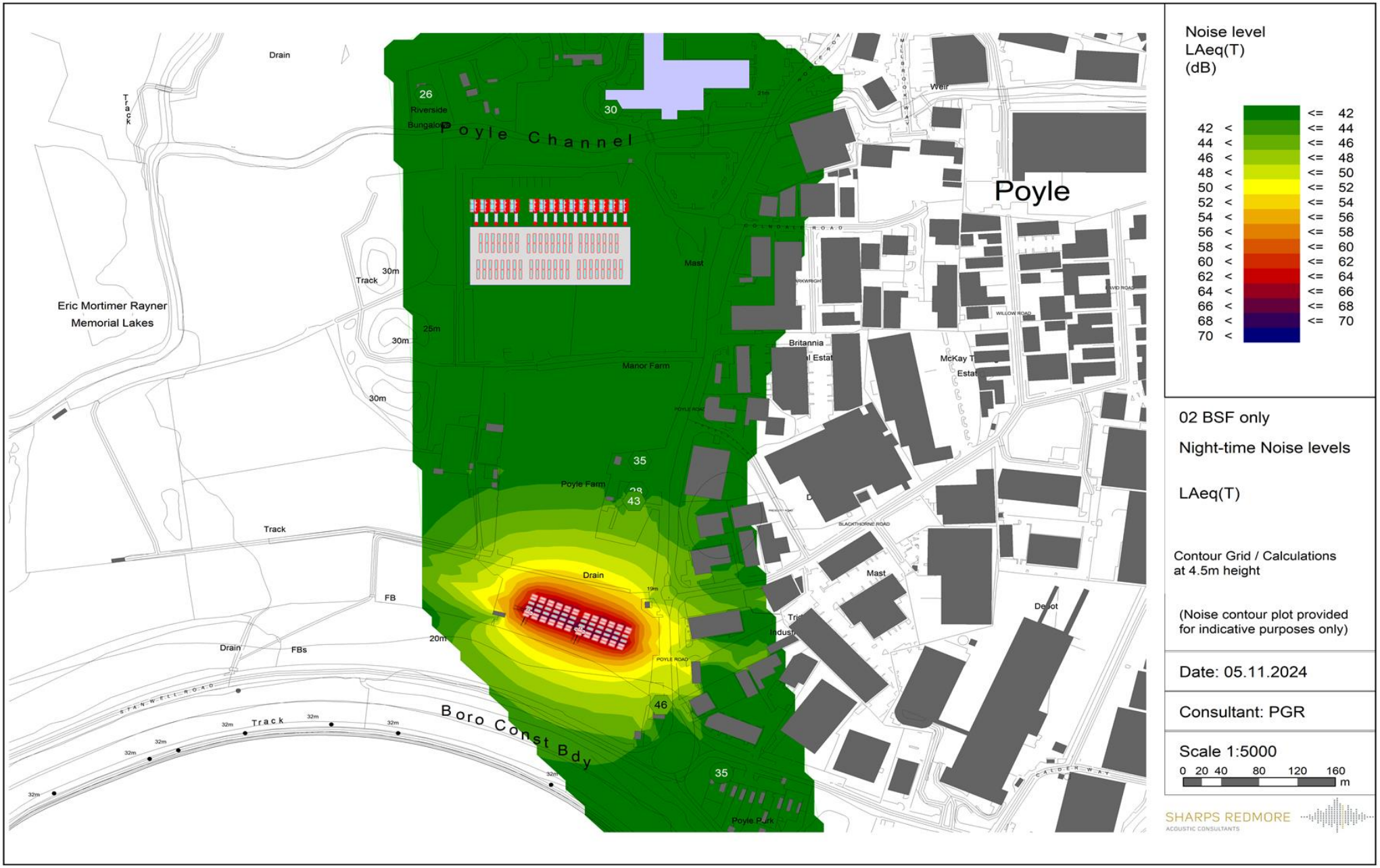
Date: 26.10.2024

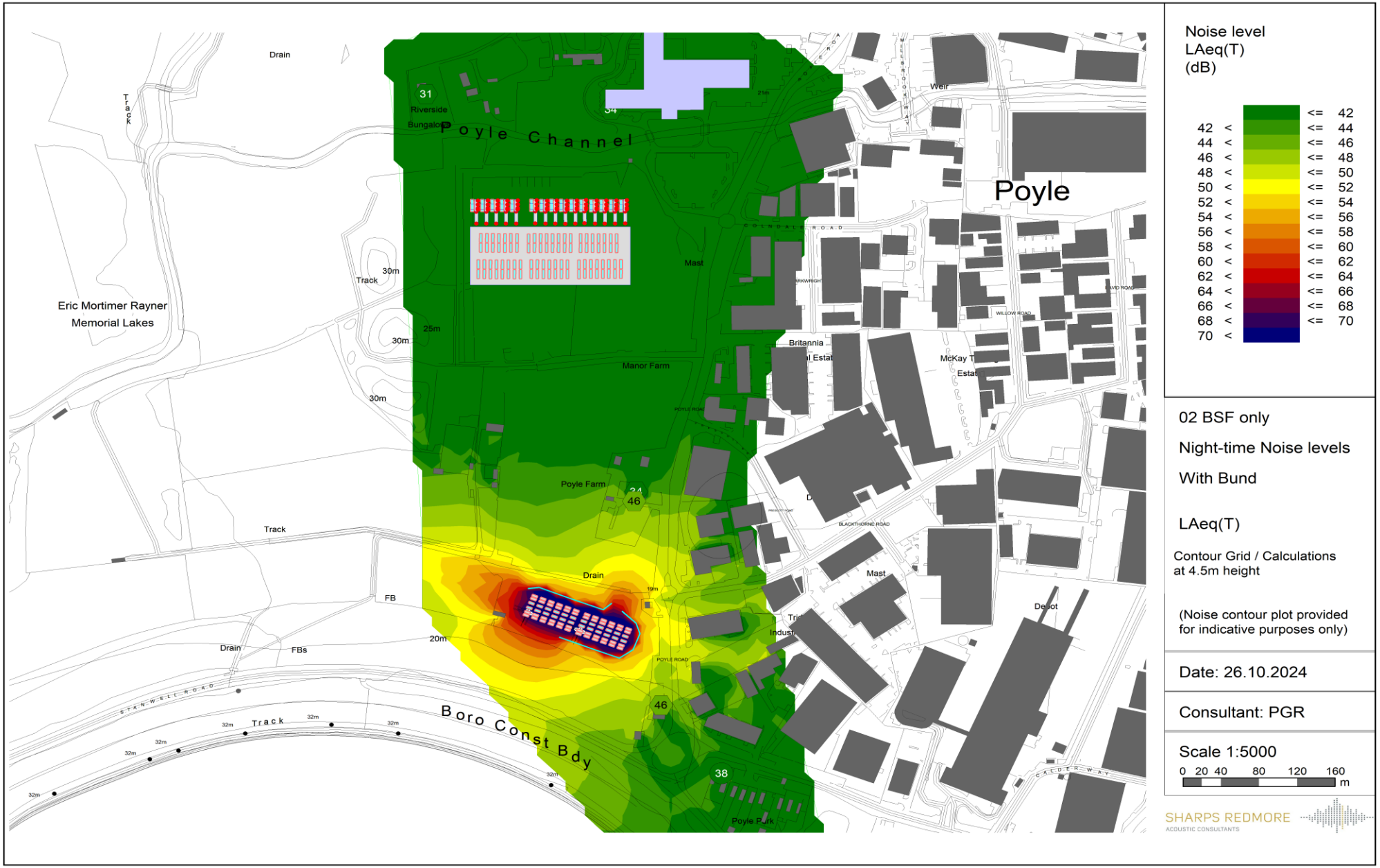
Consultant: PGR

Scale 1:5000

0 20 40 80 120 160 m

SHARPS REDMORE
ACOUSTIC CONSULTANTS


Noise level
LAeq(T)
(dB)
42 < <= 42
44 < <= 46
46 < <= 48
48 < <= 50
50 < <= 52
52 < <= 54
54 < <= 56
56 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
02 BSF only
Night-time Noise levels
LAeq(T)
Contour Grid / Calculations at 4.5m height
(Noise contour plot provided for indicative purposes only)
Date: 05.11.2024
Consultant: PGR
Scale 1:5000
0 20 40 80 120 160 m
SHARPS REDMORE
ACOUSTIC CONSULTANTS
Poyle Channel
Poyle
Eric Mortimer Rayner Memorial Lakes
Riverside Bungalow
Manor Farm
Poyle Farm
Britannia
Mast
Track
Drain
FB
FBs
Boro Const Bdy
Poyle Park
Depot
Weir
30m
25m
20m
26
30
35
43
46


Noise level
LAeq(T)
(dB)
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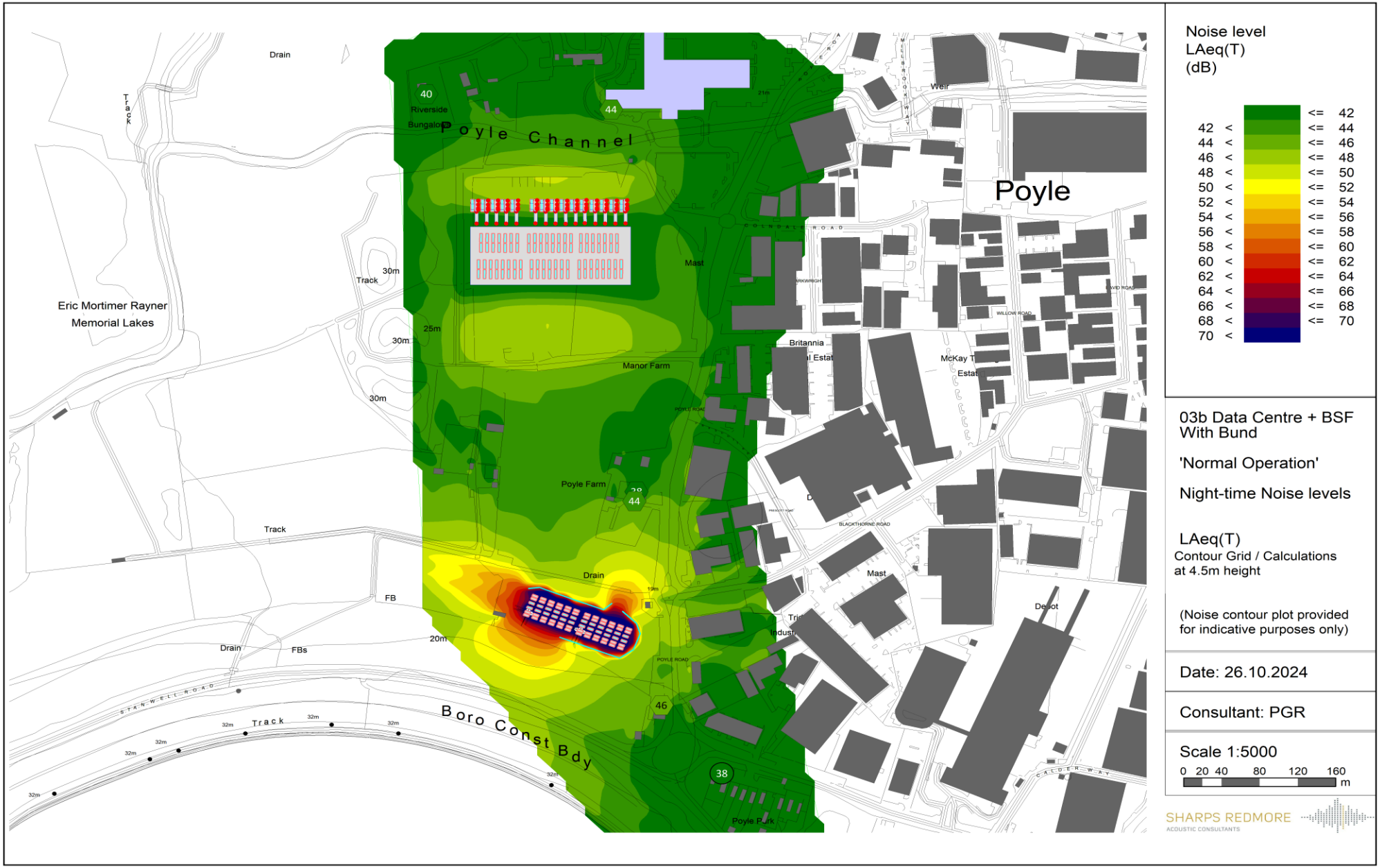
44 < <= 44
46 < <= 46
48 < <= 48
50 < <= 50
52 < <= 52
54 < <= 54
56 < <= 58
58 < <= 60
60 < <= 62
62 < <= 64
64 < <= 66
66 < <= 68
68 < <= 70
70 < <= 70
02 BSF only
Night-time Noise levels
With Bund
LAeq(T)
Contour Grid / Calculations at 4.5m height
(Noise contour plot provided for indicative purposes only)
Date: 26.10.2024
Consultant: PGR
Scale 1:5000
0 20 40 80 120 160 m
SHARPS REDMORE
ACOUSTIC CONSULTANTS
Poyle Channel
Poyle
Eric Mortimer Rayner Memorial Lakes
Riverside Bungalow
Manor Farm
Poyle Farm
Boro Const Bdy
Poyle Park
Drain
Track
FB
FBs
Mast
Depot
Weir
Britannia
McKay Trading Estate
Industrial Estate
POYLE ROAD
COLNBROOK BYPASS
COLNDALE ROAD
WILLOW ROAD
BLACKTHORNE ROAD
CALDERWAY
STANWELL ROAD
30m
25m
20m
19m
21m
32m
31
34
46
38


Noise level
LAeq(T)
(dB)
42 < <= 42
42 < <= 44
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46 < <= 48
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56 < <= 58
58 < <= 60
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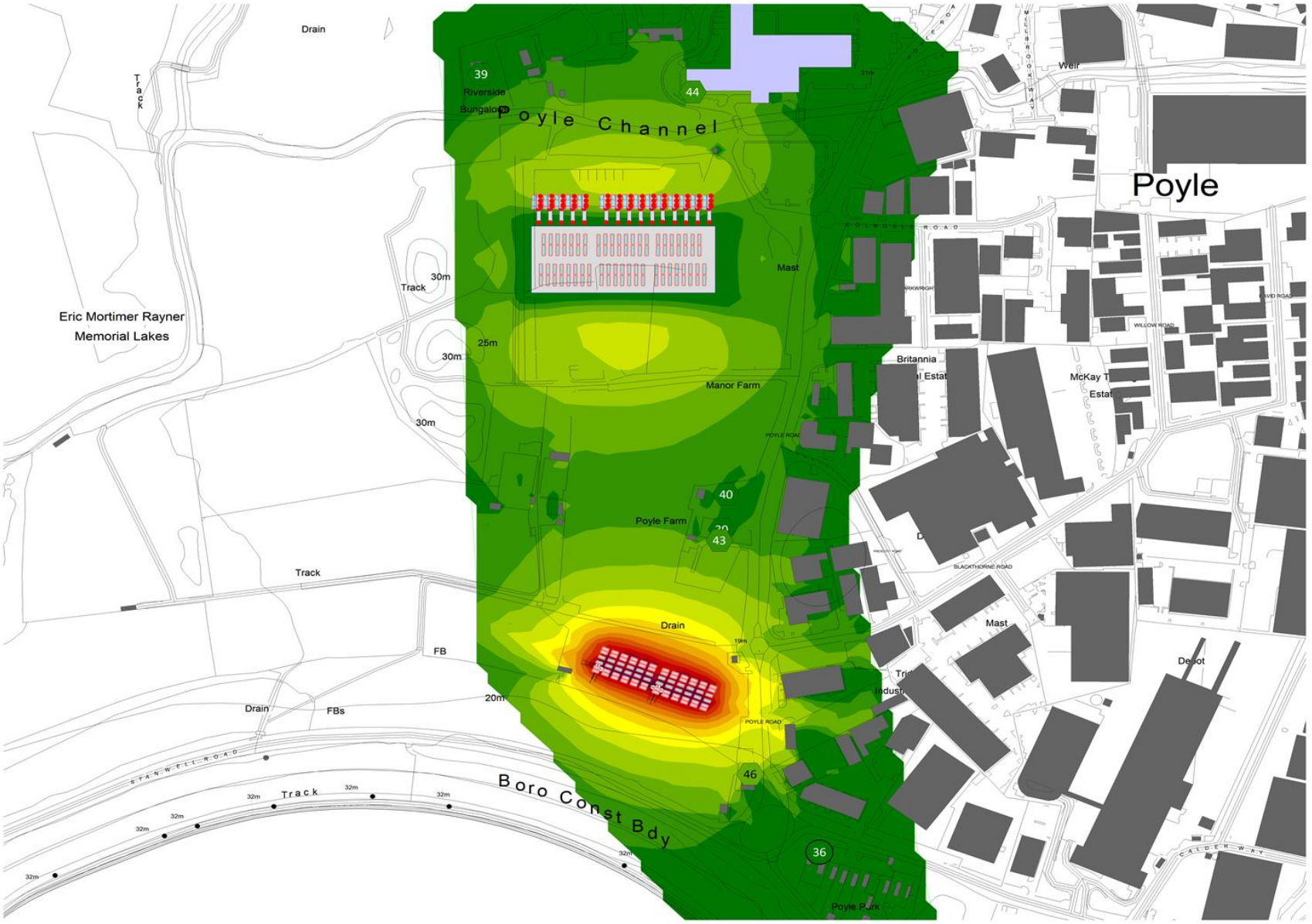
64 < <= 66
66 < <= 68
68 < <= 70
70 <
Poyle Channel
Poyle
Eric Mortimer Rayner
Memorial Lakes
Riverside
Bungalow
Manor Farm
Poyle Farm
Britannia
Mast
Weir
Depot
Drain
Track
FB
FBs
Boro Const Bdy
Poyle Park
30m
25m
20m
32m
40
44
46
38
03b Data Centre + BSF
With Bund
'Normal Operation'
Night-time Noise levels
LAeq(T)
Contour Grid / Calculations
at 4.5m height
(Noise contour plot provided
for indicative purposes only)
Date: 26.10.2024
Consultant: PGR
Scale 1:5000
0 20 40 80 120 160
m
SHARPS REDMORE
ACOUSTIC CONSULTANTS



Noise level
LAeq(T)
(dB)

42	<	<=	42
44	<	<=	44
46	<	<=	46
48	<	<=	48
50	<	<=	50
52	<	<=	52
54	<	<=	54
56	<	<=	56
58	<	<=	58
60	<	<=	60
62	<	<=	62
64	<	<=	64
66	<	<=	66
68	<	<=	68
70	<		

01a Data Centre only

'Normal Operation'

Night-time Noise levels

LAeq(T)

Contour Grid / Calculations at 4.5m height

(Noise contour plot provided for indicative purposes only)

Date: 05.11.2024

Consultant: PGR

Scale 1:5000

0 20 40 80 120 160 m

SHARPS REDMORE
ACOUSTIC CONSULTANTS