
Client	Gorst Energy
Address	Oil Mill Lane, Clyst St Mary, Exeter, EX5 1AF
Contact	Chris Roberts
Email address	[REDACTED]
From	Matthieu Folzan
Date	8 March 2022
Report Number	10047D1

Background noise assessment - Clyst St Mary

The **Industrial Noise and Vibration Centre (INVC)** has been appointed by Gorst Energy Ltd to measure the background and residual levels at several noise sensitive locations around the Gorst Energy plant at Clyst St Mary. **INVC** have responded to direction from the Gorst Energy representative, Mr Chris Roberts of AM Project Services. This report summarises the findings of the assessment following a site visit on Friday 14 January 2022. Some noise monitors were also left running between Friday 14 January and Wednesday 19 January 2022.

1.0 Background and objectives

The background and residual levels around the plant at Clyst St Mary were last assessed in 2015 by Atkins. Since this date, several changes are likely to have occurred in the vicinity of the plant and the levels would need to be reassessed to reflect this, as they are essential to determine the impact of the site using the standard BS 4142:2014.

2.0 Site overview and weather conditions

Measurements were performed during the day and night time at positions A (in the field facing the garden of Cox Farm), B (Enfield Bungalow) and C (Two Oaks) shown in Figure 1. Monitors were also left at these locations between Friday 14 January and Wednesday 19 January 2022.

Position D is also shown in the figure and has been used in previous assessment to characterise the noise emission to the north-east of the site, towards the Cat and Fiddle. It is considered that the

background and residual levels will be similar at position A and D, and the results from the assessment at position A will also be used for this location. This allowed to minimise the shutdown period and also to solve the practical issue of leaving an unattended noise monitor in a very exposed and unsecure location for a few days.

The weather was dry for the whole duration of the manned assessment, with a clear sky. During the night time assessment, the temperature was 5°C and the maximum average wind speed was 0.7mph, from a westerly direction, as recorded by the plant weather station. Hence precipitation and wind had no influence to the measured noise level.

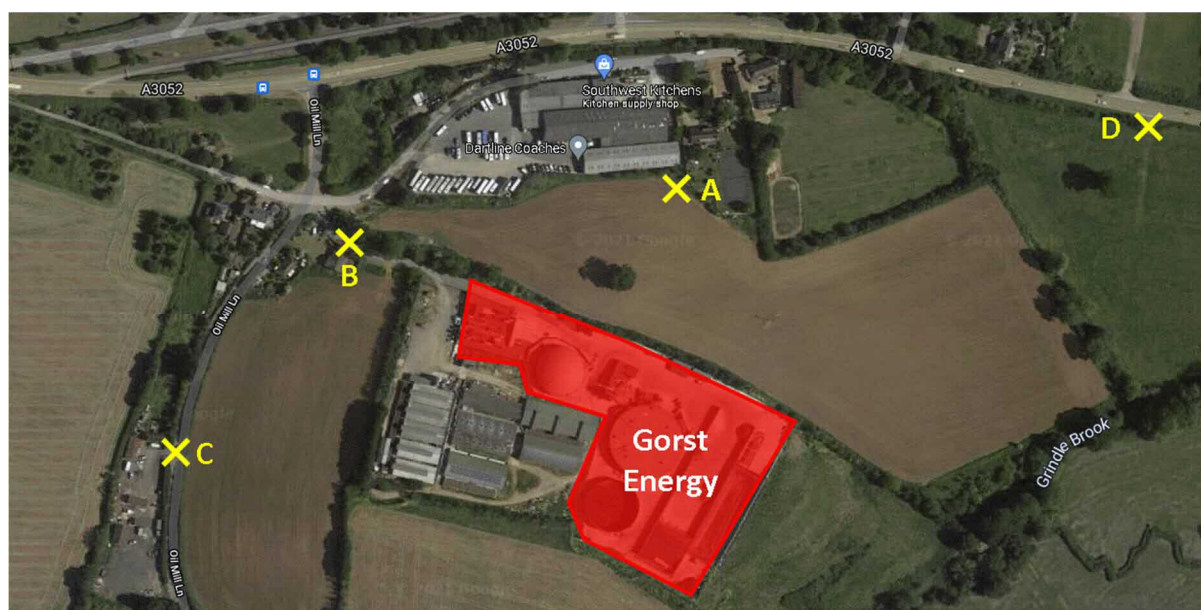


Figure 1 Aerial view with measurement locations

0 HWKRG RORJ \

The methodology described in BS 4142:2014 was followed to measure the background noise.

The monitors were set up to record L_{Aeq} , L_{A90} and L_{Amax} for 15 minute intervals through the whole duration of the assessment.

The site was fully shutdown for three periods as detailed below. For the rest of the time, it was operating normally:

- between 13.25 hours and 14.40 hours on Friday 14 January
- between 00.35 hours and 01.40hours on Saturday 15 January
- between 03.15hours and 04.00 hours on Sunday 16 January.

Manned measurements were performed during the shutdowns on Friday 14 and Saturday 15 January 2022 early morning. The monitors were left to run through the Sunday to obtain additional data and allow a comparative analysis.

The L_{A90} and L_{Aeq} obtained are considered to be representative of the background and residual levels respectively, as described in BS 4142:2014.

(T X L S P H Q W

0 D Q Q H G P H D V X U H P H Q W V

All the measurements were performed with a Brüel & Kjær sound level meter type 2238, serial number 2522502, placed at 1.6m from the ground and fitted with an effective windshield. The meter was calibrated using a Brüel & Kjær calibrator type 4231, serial number 2574189, with no significant drift.

Audio recordings of the measurements were performed on an Olympus LS-5 linear PCM recorder, serial number 200133455, connected to the sound level meter.

\$ X W R P D W L F P R Q L W R U L Q J

The measurements were performed with the following meters:

- position A: Rion sound level meter type NL-32, serial number 513543
- position B: Rion sound level meter type NL-32, serial number 513545
- position C: Rion sound level meter type NL-52, serial number 710464

All the meters were calibrated using a Brüel & Kjær calibrator type 4231, serial number 2574189, with no significant drift. They were placed at 1.6m from the ground and fitted with an effective rain and windshield.

5 HVX OW

3 RV LWR Q \$

Results are summarised in Table 1.

Table 1 Results obtained at position A				
Date	Starting measurement time	L _{Aeq} [dB]	L _{A90} [dB]	L _{Amax} [dB]
Manned measurements				
14/01	13.20	50	48	66
15/01	00:38	46	37	58
Automated monitor				
14/01	13.22	52	49	59
	13.37	53	49	67
	13.52	54	49	70
15/01	00.42	45	37	57
	00.57	42	35	53
	01.12	48	37	60
16/01	03.07	48	47	56
	03.22	48	46	56
	03.37	47	45	55
	03.52	48	47	58

The main sources at position A when the site is not operating are wildlife and traffic during the night, with added human activity during the day.

There is a good match between the results from the manned measurement and the automatic monitor. On the Sunday morning, the L_{Aeq} and L_{A90} were considerably higher than on the Saturday morning. In addition, the difference between the L_{Aeq} and the L_{A90} is smaller (approximately 2 dB) rather than between 7 and 11 dB. This seems to indicate that a constant noise source was operating at this particular time. Since the monitor was not manned, it is not possible to know what is the cause of the constant level. It has been noticed in previous assessments that a fan was operating in the nearby bus depot, so it could be related to the other industrial units.

The levels considered representative of the background and residual noise at this position are summarised in Table 2. The day time values are based on the manned measurement and the night time values are based on a logarithmic average of the manned and monitored measurements, but not taking into account the period on Sunday morning.

Table 2. Representative values		
	Residual level [dB(A)]	Background level [dB(A)]
Day time	50	48
Night time	46	37

3 R V L W L R Q %

Results are summarised in Table 3.

Table 3 Results obtained at position B				
Date	Starting measurement time	L _{Aeq} [dB]	L _{A90} [dB]	L _{Amax} [dB]
Manned measurements				
14/01	13.45	51	47	66
15/01	01.00	41	35	58
Automated monitor				
14/01	13.30	51	46	70
	13.45	51	47	67
	14.00	52	67	48
15/01	00.30	43	37	55
	00.45	43	36	65
	01.00	42	35	60
16/01	03.00	44	40	56
	03.15	45	41	56
	03.30	44	40	58
	03.45	43	40	53

The main sources at position B when the site is not operating are wildlife and traffic during the night, with also added human activity and aircraft during the day.

There is a good match between the results from the manned measurements and the automatic monitor. However, the L_{A90} values are still higher on the Sunday morning.

The levels considered representative of the background and residual noise at this position are summarised in Table 4. The day time values are based on the manned measurement and the night time values are based on a logarithmic average of the manned and monitored measurements, but not taking into account the period on Sunday morning with higher background noise.

Table 4. Representative values		
	Residual level [dB(A)]	Background level [dB(A)]
Day time	51	47
Night time	43	36

3 REVIEW Q &

Results are summarised in **Table 5**.

Table 5 Results obtained at position C				
Date	Starting measurement time	L_{Aeq} [dB]	L_{A90} [dB]	L_{Amax} [dB]
Manned measurements				
14/01	14.05	58	42	78
15/01	01.18	40	34	51
Automated monitor				
14/01	13.27	63	40	83
	13.42	61	41	82
	13.57	58	41	79

Date	Starting measurement time	L _{Aeq} [dB]	L _{A90} [dB]	L _{Amax} [dB]
15/01	00.42	53	36	81
	00.57	40	34	54
	01.12	48	34	76
16/01	02.57	38	34	51
	03.12	57	34	84
	03.27	52	34	82
	03.42	38	34	48

The main sources at position C when the site is not operating are wildlife, traffic (from the distant A3052 and also from single vehicles travelling along Oil Mill Lane) during the night, with also added human activity and aircraft during the day.

There is a very good match between the results from the manned measurements and the automatic monitor for the L_{A90}. Regarding L_{Aeq}, there is an 8 dB difference between the two simultaneous L_{Aeq} at around 1.15 hours on 15 January. Nevertheless, the results from the manned measurements do match with other periods.

The levels considered representative of the background and residual noise at this position are summarised in Table 6. Rather than performing an average over the results from the automatic monitor, it is considered that the results from the manned measurements are more suitable: they match to some of the levels obtained from the monitors, and they were actually witnessed by the consultant.

Table 6. Representative values		
	Residual level [dB(A)]	Background level [dB(A)]
Day time	58	42
Night time	40	34

5.4 Position D

As mentioned, it is considered that the background and residual noise are the same at positions A and D.

	Residual level [dB(A)]	Background level [dB(A)]
Day time	50	48
Night time	46	37

Author: 

Matthieu Folzan

INVC IN CONFIDENCE

This is a document prepared for the client by **INVC**. Recipients may not pass this document to any persons outside the client's business without written consent from the **INVC**. Neither **INVC**, nor any person acting on its behalf, makes any warranty, express or implied with respect to the use of any information, method or process disclosed in this document or that such use may not infringe the rights of any third party or assumes any liabilities with respect to the use of, or for damages resulting in any way from the use of any information, apparatus, method or process disclosed in the document.

© INVC 2022

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means electronic, mechanical, photocopying, recording or otherwise without the written permission of the Industrial Noise & Vibration Centre Limited, 889 Plymouth Road, Slough, Berkshire, SL1 4LP.

Registered in England No 1981938