

10.0 NOISE

INTRODUCTION

- 10.1 This assessment considers the potential impact of the development of the Bentinck Site on nearby noise-sensitive locations.
- 10.2 The daytime noise climate in the vicinity of the proposed development was assessed in 1997 by Vibrock Limited as part of the Terry Adams Limited ES for the Void. Figures measured at that time have been utilised for the existing noise levels prevailing around the site. Additional survey work was carried out by SLR in August 2002 measuring noise levels during the evening and morning periods at some of the noise sensitive properties: the results of which tie in with the earlier Vibrock survey work. It is considered that the likely increase in road traffic using the road network in the vicinity of the application site, and in particular the M1 motorway, would give rise to marginally higher background noise levels in the area and, therefore, the 1997 data is conservative.
- 10.3 As the proposals include the provision of a gas utilisation plant to generate electricity from landfill gas at the site, a night-time noise survey has been undertaken to determine the current night-time noise climate in the area.
- 10.4 The nearest noise sensitive properties have been determined to be:
- Kirkby Park Farm to the west,
 - Croft Cottage to the east,
 - Suvla Bay/Boggs Farm to the south,
 - Leedale Mushroom Farm to the south and
 - Two Dale Farm to the south.
- 10.5 In order to assess the environmental impact of the proposed development scheme upon the noise climate in the vicinity of the application site, a prediction of the noise emissions at the nearest noise sensitive properties that would arise as a result of the proposals proceeding has been undertaken.

Government Advice and Standards

BS5228:1997

- 10.6 BS5228:Part 1:1997 “*Noise and vibration control on construction and open sites, Part 1: Code of Practice for Basic Information and Procedures for Noise and Vibration Control*”, sets out a methodology for predicting noise levels arising from a wide variety of construction and related activities. As such, it can be used to predict noise levels arising from operations of proposed minerals and waste management sites. BS5228 also sets out tables of the sound power level (SWL) generated by a wide variety of mobile equipment.

MPS2 – Annex 2: Noise

- 10.7 The Minerals Policy Statement 2 “Controlling and Mitigating the Environmental Effects of Minerals Extraction in England: Annex 2: Noise”, published in March 2005; gives advice on the acceptability of noise levels arising from minerals extraction activities.
- 10.8 Annex 2 complements the general guidance in Planning Policy Guidance Note 24 (PPG24) “Planning and Noise” for minerals operations.
- 10.9 Annex 2 sets out the planning considerations the Government expects to be applied to noise emissions from surface mineral operations. It covers both surface mineral extraction and surface operations associated with underground mineral extraction, including waste disposal and recycling operations that form an integral part of a mineral working operation. It is not framed with direct reference to other waste disposal and recycling operations. However, since these share many operational features with surface mineral operations, waste management operators and waste planning authorities should take account of this Annex.
- 10.10 MPS2 recommends the setting of absolute values for noise limits linked to daytime and night-time periods, defined as 07:00 - 19:00 and 19:00 - 07:00 hours respectively and that these noise limits be set in terms of free-field noise levels.
- 10.11 During the daytime period, MPS2 recommends that free-field noise levels should not exceed 55dB $L_{Aeq,1hr}$. However, MPS2 states in paragraph 2.19:
- “Minerals Planning Authorities should aim to establish a noise limit at the noise-sensitive property that does not exceed the background level by 10dB(A). It is recognised, however, that this will in many circumstances, be difficult to achieve without imposing unreasonable burdens on the minerals operator. In such cases, the limit should be as near that level as practicable during normal working hours (07:00 – 19:00) and should not exceed 55dB(A) $L_{Aeq,1hr}$ (free-field)”.*
- 10.12 MPS2 recognises the long-term benefits of screen mounding and paragraph 2.20 states:
- “All minerals operations will have some particularly noisy short-term activities that cannot meet the limits set for normal operations”.*
- A prime example would be to allow for the construction of screening mounds but there are other activities including soil stripping, removal of spoil heaps and the construction of new permanent landforms, which would merit a temporary higher limit. Accordingly, MPS2 suggests, for periods of up to 8 weeks per year, a 70dB $L_{Aeq,1hr}$ limit should be allowed to facilitate such activities.

British Standard 4142:1997

- 10.13 British Standard 4142:1997 *Method for rating industrial noise affecting mixed residential and industrial areas* is intended to be used to assess whether noise from factories, industrial premises or fixed installations and sources of an industrial nature in commercial premises is likely to give rise to complaints from people residing in nearby dwellings.
- 10.14 The procedure contained in BS4142 for assessing the likelihood of complaint, is to compare the measured or predicted noise level from the source in question immediately outside the dwelling, the “specific noise level”, with the background noise level.
- 10.15 The specific noise level is measured in terms of a $L_{Aeq,T}$ value and the background noise level is measured in terms of an L_{A90} value.
- 10.16 Where the specific noise contains a “*distinguishable discrete continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks, clatters or thumps), or if the noise is irregular enough to attract attention*” than a correction of +5dB is added to the specific noise level to obtain the ‘rating level’, or $L_{Ar,T}$.
- 10.17 The likelihood of noise provoking complaints is assessed by subtracting the background noise level from the rating noise level. BS4142 states:

“A difference of around 10dB or higher indicates that complaints are likely. A difference of around 5dB is of marginal significance. A difference of -10dB is a positive indication that complaints are unlikely.”
- 10.18 Day and night are not defined in the standard but it states that night should cover the times when the general adult population are preparing for sleep or are actually sleeping. For the purposes of this assessment it is assumed that the day and night periods reflect those stated in PPG24, i.e. day is 07:00 to 23:00 hours and night 23:00 to 07:00 hours.
- 10.19 BS4142 states that its assessment method is not suitable where the background noise levels and rating noise levels are very low; very low background noise levels are defined as those below 30dB L_{A90} , very low rating noise levels are defined as those below 35dB $L_{Ar,T}$.

World Health Organisation – Guidelines for Community Noise

- 10.20 The World Health Organisation (WHO) published the document *Guidelines for Community Noise* in 2000. The document states that general outdoor noise levels of below 50dB L_{Aeq} during the day (07:00 – 23:00) are desirable to prevent “moderate” annoyance. The guidelines also recommend a noise level in the region of 45dB L_{Aeq} for night time periods (23:00 – 07:00) in order to meet sleep disturbance criteria.

Noise Survey

Methodology

- 10.21 For the 2005 noise survey a Brüel & Kjær 2238 integrating sound level meter (serial number 2414653) was used to measure the existing noise climate at three locations surrounding the site.
- 10.22 The meter was calibrated before and after the monitoring exercise using a Cirrus 531A acoustic calibrator (serial number 036342) and no significant drifts in calibration were observed.
- 10.23 The microphone was placed 1.5m above the ground in free-field conditions at all locations, i.e. at least 3.5m from the nearest vertical, reflecting surface. The sound level meter was programmed to monitor over 15 minute periods at the nearby noise-sensitive properties and 5 minute periods at the on-site locations. The following noise parameters were recorded:
- L_{Aeq} dB, L_{A90} dB, L_{A10} dB, and L_{Amax} dB.

Night-time Baseline Conditions – Noise Survey Results

- 10.24 Personnel from SLR conducted the night-time noise monitoring on Tuesday 6th December 2005. The weather conditions during the survey were acceptable for noise measurement it being dry with little wind.
- 10.25 The results of the noise survey are given in Table 10/1 below.

Table 10/1
Existing night-time noise levels, free-field dB

No.	Location Description	Period	Existing Noise Levels dB(A)			
			$L_{Aeq, T}$	L_{A90}	L_{A10}	L_{Amax}
2	Croft Cottage	Night-time	43.4	40.0	44.0	58.3
4	Leedale Mushroom Farm	Night-time	54.8	47.5	55.5	77.8
3	Suvla Bay/Boggs Farm	Night-time	39.5	35.5	41.0	52.4

Time period T was 15 minutes

Noise levels at locations 1 and 5 are at a similar distance from the M1 motorway as location 4 and therefore the data measured at location 4 has been utilised in night-time assessments at these locations.

- 10.26 The night-time noise climate at all locations is dominated by road traffic using the M1 motorway.

Potential Effects and Significance

- 10.27 MPS2 is the most up to date government advice on noise from minerals extraction sites in England and so its guidance should be accepted. Annex 2 states:

“waste disposal operations share many operational features with surface mineral operations, waste management operators and waste planning authorities should take account of this Annex”

10.28 It is therefore considered that MPS2 is applicable to this development and that the derived free-field criterion for normal day-time operations and 70dB $L_{Aeq,1hr}$ for temporary operations during the working week are relevant as maximum criteria.

10.29 Thus, based on the above, the following initial noise criteria are recommended:

Temporary Operations - Daytime - 07:00 – 19:00 hrs All locations $L_{Aeq,1hr}$	70.0 dB
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Normal Operations - Day-time - 07:00 – 19:00 hours All locations $L_{Aeq,1hr}$	55.0dB
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10.30 For a number of noise sensitive properties, namely those located close to the M1, it should be noted that the proposed noise limit (derived from MPS2) is below the existing background noise levels by around 5dB(A).

10.31 The application also includes the installation of a gas utilisation plant at the site, a fixed installation that would operate when the remainder of the site is not operational, for example at night. Therefore BS4142:1997 should be used to assess the potential noise impact, *i.e.* the likelihood that the gas plant operations will give rise to complaints from local residents, at the five locations.

Noise Predictions

10.32 Noise levels generated by the development and experienced by local receptors will depend on a number of variables, the most significant of which are:

- The amount of noise generated by the plant or equipment being used on the site, generally expressed as Sound Power Levels (SWL's),
- The periods of operation of the plant on the site, known as it's "on-time",
- The stand off distance between the noise source and the receptor,
- The attenuation due to ground absorption or barrier effects, and
- The reflection of noise due to the presence of hard surfaces such as the sides of a building or quarry faces.

10.33 The prediction methods used in this assessment have been based on those outlined in BS5228, which was updated in 1997 to incorporate guidance on the attenuation of noise due to the effects of barriers, and the absorbing effects of soft ground lying between the noise source and the receptor.

- 10.34 However, accurate determination of barrier attenuation by summation of sound pressure levels at separate frequencies was not possible in the absence of detailed spectral information regarding the sound sources being studied. To more accurately estimate the barrier attenuation in this assessment, the method used in the Calculation of Road Traffic Noise (CRTN) has been employed, to a maximum of 15dB(A).
- 10.35 Noise can also be attenuated by the absorptive capacity of soft ground lying between the noise source and the receptor. BS5228:1997 suggests that these attenuation effects should also be considered, and techniques to determine the magnitude of noise attenuation attributable to soft ground have been utilised in this study where relevant.
- 10.36 BS5228:1997 goes on to suggest that, where both barrier and soft ground attenuation of noise will occur, only the most significant source of attenuation should be considered. This approach has been adopted in this assessment.
- 10.37 With regard to the development of the application site, the following twelve distinct types of activity have the potential to generate noise:
- access road construction operations,
 - culvert construction operations,
 - void preparation operations,
 - soils/overburden handling operations,
 - landfill cell development operations,
 - landfill operations,
 - tip reclamation operations,
 - capping operations,
 - composting operations,
 - restoration operations
 - gas utilisation plant and
 - transportation of materials from the site.
- 10.38 The complement of mobile plant is based on information provided by the applicant and are set out in Appendix 10/1 together with appropriate sound power levels (SWLs). The sound power levels are derived from discussions with the relevant plant manufacturers, monitoring of similar plant in the field or from the tables in BS5228:1997. The noise data available do not include frequency spectra. All measured sound power levels take into consideration, where applicable, the operation of any reversing warning systems fitted to the plant.
- 10.39 Noise prediction calculations have been made with respect to the worst-case scenario in terms of plant location. These scenarios represent situations where mobile plant would be working at the closest approach to the nearby noise-sensitive locations or at elevations where barrier attenuation of noise would be minimal or absent. In reality operations would take place at

greater distances or within the void and therefore additional distance attenuation and barrier attenuation would occur.

- 10.40 A summary of the worse case predicted noise levels at the five representative receptor locations are given in Appendix 10/2. In respect to the landfill and reclamation operations, the worst case scenarios would be when the operations occur at, or close to, original ground level at the closest distance of approach, as barrier attenuation would be minimal.

MPS2 Assessment

Location 1 – Kirkby Park Farm

- 10.41 Kirkby Park Farm is located to the west of the proposed development adjacent to the M1 motorway. From previous noise data measured at the site, the average weekday day-time background noise level, L_{90} at this location is around 60.5dB. The corresponding average weekday day-time $L_{Aeq,1hr}$ is in the region of 63.5dB. The closest that any of the operations would approach the property would be approximately 160m during the reclamation of the tip area.

Temporary Operations

- 10.42 The construction of the access road between the M1 motorway at Junction 27 and the site would produce noise levels of approximately 44dB $L_{Aeq,1hr}$ at its closest approach. This noise level is well below both the existing background noise level and the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.43 The reinstatement of Cuttail Brook would produce noise levels of about 40.5dB $L_{Aeq,1hr}$ at the closest approach to the property. Again, this noise level is well below both the existing background noise level and the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.44 The preparation of the landfill void would produce noise levels of about 42.5dB $L_{Aeq,1hr}$ at the closest approach to the property. Again, this noise level is well below both the existing background noise level and the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.45 The maximum noise levels for soil and overburden handling would be in the region of 44.5dB $L_{Aeq,1hr}$ at closest approach to Kirkby Park Farm. This noise level is again well below the existing background noise level and the criterion from MPS2 of 70dB $L_{Aeq,1hr}$ for temporary operations.

Normal Operations

- 10.46 The maximum noise levels for cell development operations occur when operations are undertaken at the most exposed elevation where barrier attenuation is minimal. The operations would produce noise levels of

approximately 42dB $L_{Aeq,1hr}$ which is well below the 55dB $L_{Aeq,1hr}$ for normal operations from MPS2.

- 10.47 Landfill operations, at closest approach to the property, will produce maximum noise levels in the region of 45.5dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations. This noise level is produced when operations are taking place at the most exposed elevation when barrier attenuation would be at a minimum; for the majority of the life of the proposed development, landfill operations would take place at greater distances and/or within the void and thus greater attenuation would be achieved.
- 10.48 Tip reclamation operations, at closest approach, would produce noise levels in the region of 51dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ criterion for normal operations from MPS2. This noise level would be produced when the reclamation operations are being undertaken at exposed elevations; at other times the operation would take place at a greater distance or within the void.
- 10.49 The capping of the landfill void would produce noise levels of about 45dB $L_{Aeq,1hr}$ at the closest approach to the property. This noise level is well below both the existing background noise level and the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations.
- 10.50 Composting operations would produce noise levels in the region of 40dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations, this is also well below the existing background noise level.
- 10.51 The operation of the gas utilisation plant would produce noise levels of 16.5dB $L_{Aeq,1hr}$ at this location, this is well below the MPS2 criterion.
- 10.52 At this location the worst case cumulative noise level would be in the region of 52.5dB $L_{Aeq,1hr}$, below the 55dB criterion from MPS2.

Location 2 – Croft Cottage

- 10.53 Croft Cottage is located to the east of the proposed development. From previous work undertaken at the site, the average weekday day-time background noise level, L_{90} at this location is about 50.5dB. The corresponding average weekday day-time $L_{Aeq,1hr}$ is in the region of 55dB. The closest that any of the operations would approach the property would be approximately 250m during landfill and capping operations.

Temporary Operations

- 10.54 The construction of the access road between the M1 motorway at Junction 27 and the site would produce noise levels of approximately 42dB $L_{Aeq,1hr}$ at its closest approach. This noise level is well below both the existing background noise level and the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.

- 10.55 The reinstatement of Cuttail Brook would produce noise levels of about 52dB $L_{Aeq,1hr}$ at the closest approach to the property. This noise level is below the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.56 The preparation of the landfill void would produce noise levels of about 51.5dB $L_{Aeq,1hr}$ at the closest approach to the property. Again, this noise level is below the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.57 The maximum noise levels for soil and overburden handling would be in the region of 49.5dB $L_{Aeq,1hr}$ at closest approach to Croft Cottage. This noise level is again below the existing background noise level and the criterion from MPS2 of 70dB $L_{Aeq,1hr}$ for temporary operations.
- 10.58 The maximum noise levels for cell development operations occur when operations are undertaken at the most exposed elevation where barrier attenuation is minimal. The operations would produce noise levels of approximately 50dB $L_{Aeq,1hr}$ which is well below the 55dB $L_{Aeq,1hr}$ for normal operations from MPS2.

Normal Operations

- 10.59 Landfill operations, at closest approach to the property, will produce maximum noise levels in the region of 53dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations. This noise level is produced when operations are taking place at the most exposed elevation when barrier attenuation would be at a minimum; for the majority of the life of the proposed development, landfill operations would take place at greater distances and/or within the void and thus greater attenuation would be achieved.
- 10.60 Tip reclamation operations, at closest approach, would produce noise levels in the region of 48dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ criterion for normal operations from MPS2. This noise level would be produced when the reclamation operations are being undertaken at exposed elevations; at other times the operation would take place at a greater distance or within the void.
- 10.61 The capping of the landfill void would produce noise levels of about 54dB $L_{Aeq,1hr}$ at the closest approach to the property. This noise level is below the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations.
- 10.62 Composting operations would produce noise levels in the region of 35dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations.
- 10.63 The operation of the gas utilisation plant would produce noise levels of 21dB $L_{Aeq,1hr}$ at this location, this is well below the MPS2 criterion.

- 10.64 At this location the worst case cumulative noise level would be in the region of 54.5dB $L_{Aeq,1hr}$ which is below the 55dB criterion from MPS2.

Location 3 – Suvla Bay/Boggs Farm

- 10.65 Suvla Bay/Boggs Farm is located to the south of the proposed development. The average weekday day-time background noise level, L_{90} at this location is about 49.5dB. The corresponding average weekday day-time $L_{Aeq,1hr}$ is in the region of 52.5dB.

Temporary Operations

- 10.66 The construction of the access road between the M1 motorway at Junction 27 and the site would produce noise levels of approximately 55dB $L_{Aeq,1hr}$ at its closest approach. This noise level is well below both the existing background noise level and the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.67 The reinstatement of Cuttail Brook would produce noise levels of about 44dB $L_{Aeq,1hr}$ at the closest approach to the property. This noise level is below the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.68 The preparation of the landfill void would produce noise levels of about 51.5dB $L_{Aeq,1hr}$ at the closest approach to the property. Again, this noise level is below the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.69 The maximum noise levels for soil and overburden handling would be in the region of 56dB $L_{Aeq,1hr}$ at closest approach to Suvla Bay. This noise level is again below the existing background noise level and the criterion from MPS2 of 70dB $L_{Aeq,1hr}$ for temporary operations.
- 10.70 The maximum noise levels for cell development operations occur when operations are undertaken at the most exposed elevation where barrier attenuation is minimal. The operations would produce noise levels of approximately 47dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ for normal operations from MPS2.

Normal Operations

- 10.71 Landfill operations, at closest approach to the property, will produce maximum noise levels in the region of 49dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations. This noise level is produced when operations are taking place at the most exposed elevation when barrier attenuation would be at a minimum; for the majority of the life of the proposed development, landfill operations would take place at greater distances and/or within the void and thus greater attenuation would be achieved.
- 10.72 Tip reclamation operations, at closest approach, would produce noise levels in the region of 46.5dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ criterion for

normal operations from MPS2. This noise level would be produced when the reclamation operations are being undertaken at exposed elevations; at other times the operation would take place at a greater distance or within the void.

- 10.73 The capping of the landfill void would produce noise levels of about 50dB $L_{Aeq,1hr}$ at the closest approach to the property. This noise level is below the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations. This noise level is produced when operations are taking place at the most exposed elevation when barrier attenuation would be at a minimum; for the majority of the life of the proposed development, landfill operations would take place at greater distances and/or within the void and thus greater attenuation would be achieved.
- 10.74 Composting operations would produce noise levels of about 39.5dB $L_{Aeq,1hr}$ at Suvla Bay, which is below the 55dB $L_{Aeq,1hr}$ criterion for normal operations derived from MPS2.
- 10.75 The operation of the gas utilisation plant would produce noise levels of 30dB $L_{Aeq,1hr}$ at this location, this is well below the MPS2 criterion.
- 10.76 At this location the worst case cumulative noise level would be in the region of 51.5dB $L_{Aeq,1hr}$ which is below to the 55dB criterion from MPS2.

Location 4 – Leedale Mushroom Farm

- 10.77 Leedale Mushroom Farm is located to the southwest of the proposed development. The average weekday day-time background noise level, L_{90} at this location is about 61dB. The corresponding average weekday day-time $L_{Aeq,1hr}$ is in the region of 64dB.

Temporary Operations

- 10.78 The construction of the access road between the M1 motorway at Junction 27 and the site would produce noise levels of approximately 54.0dB $L_{Aeq,1hr}$ at its closest approach. This noise level is well below both the existing background noise level and the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.79 The reinstatement of Cuttail Brook would produce noise levels of about 44dB $L_{Aeq,1hr}$ at the closest approach to the property. Again, this noise level is below both the existing background noise level and the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.80 The preparation of the landfill void would produce noise levels of about 39dB $L_{Aeq,1hr}$ at the closest approach to the property. Again, this noise level is below both the existing background noise level and the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.

- 10.81 The maximum noise levels for soil and overburden handling would be in the region of 50dB $L_{Aeq,1hr}$ at closest approach to the farm. This noise level is again below the existing background noise level and the criterion from MPS2 of 70dB $L_{Aeq,1hr}$ for temporary operations.
- 10.82 The maximum noise levels for cell development operations occur when operations are undertaken at the most exposed elevation where barrier attenuation is minimal. The operations would produce noise levels of approximately 44dB $L_{Aeq,1hr}$ which is below both the existing background noise level and the 55dB $L_{Aeq,1hr}$ for normal operations from MPS2.

Normal Operations

- 10.83 Landfill operations, at closest approach to the property, will produce maximum noise levels in the region of 48.5dB $L_{Aeq,1hr}$ which is below the existing background noise level and the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations.
- 10.84 Tip reclamation operations, at closest approach, would produce noise levels in the region of 48dB $L_{Aeq,1hr}$ which is below both the existing noise level and the 55dB $L_{Aeq,1hr}$ criterion for normal operations from MPS2.
- 10.85 The capping of the landfill void would produce noise levels of about 46.5dB $L_{Aeq,1hr}$ at the closest approach to the property. This noise level is below both the existing background noise level and the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations.
- 10.86 Composting operations would produce noise levels of about 41.5dB $L_{Aeq,1hr}$ at this property, this is below the 55dB $L_{Aeq,1hr}$ criterion for normal operations derived from MPS2 and well below the existing background noise level.
- 10.87 The operation of the gas utilisation plant would produce noise levels of 30dB $L_{Aeq,1hr}$ at this location, this is well below the MPS2 criterion.
- 10.88 At this location the worst case cumulative noise level would be in the region of 51.5dB $L_{Aeq,1hr}$ which is below to the 55dB criterion from MPS2.

Location 5 – Two Dales Farm

- 10.89 Two Dales Farm is located to the south of the proposed development. The average weekday day-time background noise level, L_{90} at this location is about 60.5dB. The corresponding average weekday day-time $L_{Aeq,1hr}$ is in the region of 63.5dB.

Temporary Operations

- 10.90 The construction of the access road between the M1 motorway at Junction 27 and the site would produce noise levels of approximately 67.5dB $L_{Aeq,1hr}$ at its closest approach assuming that there is a 3m screening mound located

between the construction area and the property. This noise level is the below the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.

- 10.91 The reinstatement of Cuttail Brook would produce noise levels of about 46dB $L_{Aeq,1hr}$ at the closest approach to the property. This noise level is below both the existing background noise level and the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.92 The preparation of the landfill void would produce noise levels of about 37dB $L_{Aeq,1hr}$ at the closest approach to the property. Again, this noise level is well below both the existing background noise level and the 70dB $L_{Aeq,1hr}$ criterion from MPS2 for temporary operations.
- 10.93 The maximum noise levels for soil and overburden handling would be in the region of 52.5dB $L_{Aeq,1hr}$ at closest approach to the farm. This noise level is again below the existing background noise level and the criterion from MPS2 of 70dB $L_{Aeq,1hr}$ for temporary operations.
- 10.94 The maximum noise levels for cell development operations occur when operations are undertaken at the most exposed elevation where barrier attenuation is minimal. The operations would produce noise levels of approximately 40dB $L_{Aeq,1hr}$ which is below both the existing background noise level and the 55dB $L_{Aeq,1hr}$ for normal operations from MPS2.

Normal Operations

- 10.95 Landfill operations, at closest approach to the property, will produce maximum noise levels in the region of 54.5dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations but below the existing background noise level at the property. The actual landfill operations produce a noise level in the region of about 43dB, the higher noise level of 58dB is attributable to the waste import lorries passing the farm on the access road.
- 10.96 Tip reclamation operations, at closest approach, would produce noise levels in the region of 54.5dB $L_{Aeq,1hr}$ which is below the 55dB $L_{Aeq,1hr}$ criterion for normal operations from MPS2 but below the existing background noise level at the farm. The actual reclamation operations produce a noise level in the region of about 42.5dB, the higher noise level of 58dB is attributable to the materials import lorries passing the farm on the access road.
- 10.97 The capping of the landfill void would produce noise levels of about 43dB $L_{Aeq,1hr}$ at the closest approach to the property. This noise level is below both the existing background noise level and the 55dB $L_{Aeq,1hr}$ criterion from MPS2 for normal operations.
- 10.98 Composting operations would produce noise levels of about 39dB $L_{Aeq,1hr}$ at this property, this is below the 55dB $L_{Aeq,1hr}$ criterion for normal operations derived from MPS2 and well below the existing background noise level.

- 10.99 The operation of the gas utilisation plant would produce noise levels of 32.5dB $L_{Aeq,1hr}$ at this location, this is well below the MPS2 criterion.
- 10.100 At this location the worst case cumulative noise level would be in the region of 57.5dB $L_{Aeq,1hr}$ which is slightly above to the 55dB criterion from MPS2. This high level is mainly attributable to lorry traffic using the newly built access road which will run adjacent to the property. This level is also below the existing high background noise level of 60.5dB which is attributable to the road traffic using the adjacent M1 motorway.

BS4142 Assessment

- 10.101 An assessment has been carried out in accordance with BS4142, to determine whether the predicted operational noise levels from the landfill gas utilisation plant are likely to give rise to complaints from the occupants of the nearby sensitive receptors. Tables 10/2 and 10/3 below set out assessments for the daytime and night periods respectively.

Table 10/2
Daytime BS4142 Assessment of the Landfill Gas Utilisation Plant

Location	Background Noise Level, L_{A90} dB	*Predicted Rating Level, $L_{A,T}$ dB	Difference
Kirkby Park Farm	60.5	31.7	-28.8
Croft Cottage	50.5	30.0	-20.5
Suvla Bay/Boggs Farm	49.5	27.7	-21.8
Leedale Mushroom Farm	61.0	32.8	-28.2
Two Dale Farm	60.5	24.7	-35.8

* includes a +5dB acoustic feature correction

- 10.102 Table 10/2 indicates that noise levels produced by the Gas Utilisation Plant would be unlikely to cause complaint during the day.

Table 10/3
Night-time BS4142 Assessment of the Landfill Gas Utilisation Plant

Location	Background Noise Level, L_{A90} dB	*Predicted Rating Level, $L_{A,T}$ dB	Difference
Kirkby Park Farm	47.5	31.7	-15.8
Croft Cottage	40.0	30.0	-10.0
Suvla Bay/Boggs Farm	35.5	27.7	-7.8
Leedale Mushroom Farm	47.5	32.8	-14.7
Two Dale Farm	47.5	24.7	-22.8

* includes a +5dB acoustic feature correction

- 10.103 Table 10/3 indicates that noise levels produced by the landfill gas utilisation plant would be unlikely to cause complaint during the night at all locations except Suvla Bay/Boggs Farm where noise levels would be between unlikely to cause complaint and marginally significant.

Site Generated Road Traffic

- 10.104 The proposed development includes the construction of a purpose built access road linking the site directly to Junction 27 of the M1 motorway and therefore there would be no increase in the flow of traffic on the existing local roads.
- 10.105 The noise levels generated by road lorries on the access road adjacent to Two Dales Farm would be in the region of 60.5dB $L_{Aeq,1hr}$, which is equal to the existing background noise level.

Mitigation Measures

Integral to the Proposed Development

- 10.106 All landfill, reclamation, composting and other operations have the potential to generate noise due to the use of heavy machinery. During the proposed development of the Bentinck Site the potential risk of noise would vary according to the type of activities being undertaken at the time, and the effectiveness of any noise control measures. The site design incorporates several features that would provide mitigation against potential noise nuisance. These features include:
- The development has been designed to enable activities to be undertaken behind the working face wherever possible. The direction of working has been planned so that noise attenuation would be maximised to the nearest noise sensitive properties at all times,
 - Temporary local screening mounds would be used, if necessary, when operations are being undertaken at elevations that would not be screened by the working area,
 - The internal haul roads would, wherever possible, be generally routed to allow maximum acoustic screening to all directions from the site,
 - In general the haul roads would also be routed such that separation distances to the nearest noise sensitive properties would be maximized at all times,
 - All mobile plant used on the proposed development would have noise emission levels that comply with the limiting levels defined in EC Directive 86/662/EEC and any subsequent amendments,
 - Plant would be operated in a proper manner with respect to minimising noise emissions, for example the minimisation of drop heights, no unnecessary engine revving, etc.
 - Plant would be subject to regular maintenance. All vehicles and mechanical plant used for the purpose of the proposed development

would be fitted with effective exhaust silencers and would be maintained in good working order to meet the manufacturers' noise rating levels. Any silencers which become defective would be replaced as soon as possible.

10.107 In addition to the noise mitigation measures incorporated in the site design, good site management practices and other specific measures would also provide additional noise mitigation. These measures would include:

- All haul roads and access roads would be regularly graded and maintained in a good state of repair to avoid unwanted rattle and “body slap” from vehicles.
- The generation and level of noise emissions from any reversing beepers fitted to any loading shovel or other mobile plant would be minimised, as far as is reasonably practicable and subject to maintaining safety. This would involve the use of reverse warning systems incorporating broadband noise.
- Wherever practically possible, vehicles fitted with reversing alarms would reverse in a direction away from the nearest noise sensitive properties. In addition, vehicles would, wherever possible, manoeuvre in a circular manner to avoid the use of reversing alarms.
- Inherently quiet plant would be used where appropriate, such machines may be fitted with properly lined and sealed acoustic covers which would be kept closed whenever the machines are in use.
- Machines that are intermittently used would be shut down or throttle back in the intervening working periods.
- Wherever possible, pumps, generators and/or compressors would be located within the void and be electrically powered. Acoustic enclosures would be used where necessary, but particularly if pumps were to operate 24 hours per day.

Residual Effects

10.108 Noise levels from the individual operations, with the exception of lorry movements at Two Dales Farm, would be within the relevant criteria derived from MPS2 at all times.

10.109 Noise levels produced by the lorry movements at Two Dales Farm would be below the existing background noise level at all times.

Conclusions

10.110 A series of noise predictions based upon BS5228:1997 and MPS2 has been made to the five nearest noise sensitive properties around the proposed

development at the Bentinck Site and have been assessed against criteria derived from MPS2.

- 10.111 It should be noted that all the predicted noise levels in this Section refer to worst case scenarios when operations are undertaken at their closest distance to the noise sensitive properties and therefore have the greatest influence on the noise climate at these locations. The worst case noise predictions may only last intermittently for a few days or even a few hours throughout the envisaged working life of the proposed development.
- 10.112 At no time would the 70dB $L_{Aeq,1hr}$ criterion for temporary operations derived from MPS2 be exceeded, assuming that a 3m high screening mound is introduced between the access road and Two Dales Farm. From the results discussed in earlier sections it is apparent that, with the exception of lorry movements past Two Dales Farm, that noise levels generated by the proposed development would be within the respective criteria for normal operations at all times.
- 10.113 Noise levels produced by lorry movements past Two Dales Farm would be below the existing background noise levels at the property.
- 10.114 Noise levels produced by the landfill gas utilisation plant, when assessed against BS4142, would be unlikely to cause complaint at all locations during the day. The same was found for the night-time period with the exception of Suvla Bay/Boggs Farm where noise levels were between unlikely to cause complaint and marginally significant.
- 10.115 As a general policy, operations would be planned to ensure that periods when plant is working in exposed areas or elevations at the site and without the benefit of screening, are kept to a minimum. Where necessary a 2m high temporary screening mound will be used to afford maximum attenuation when plant is working in exposed areas.
- 10.116 In addition, site operations would be planned such that when a particular operation approached the minimum separation distance to a given noise sensitive location, that other operations are either undertaken well within the void or at large separation distances from the noise sensitive locations.
- 10.117 With normal, careful site planning and management these operations could be undertaken so that machines were afforded additional screening most of the time. Such planning of sensitive operations would reduce further their impact as perceived outside the site boundary.

