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THE ASSESSMENT OF NOISE FROM LANDFILL SITES

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1. INTRODUCTION

When landfill sites are proposed for planning permission it is usual to find objections from those living in the immediate area. The Local Planning Authority (LPA) will consider these objections in the light of their planning policies and take a decision to allow or refuse the application. Although it is possible to obtain planning permission for a landfill site without holding a public inquiry, the public inquiry avoids the planners taking a decision which will be unpopular with the immediate residents even though benefits for the wider community may be produced.

This paper discusses the noise aspects of four public inquiries held in 1991 where evidence for the landfill site proposal was presented by Wimpey Environmental. When planning permission is refused, noise is inevitably put forward as one of the many reasons why the landfill site would be unacceptable. Other reasons which have been encountered are:

- Dust
- Odours
- Vermin
- Litter
- Highway Safety
- Highway Access
- Landscape
- Leachate Disposal
- Methane Generation

The need for a landfill site to dispose of waste is therefore balanced against any environmental disadvantages.

2. ASSESSMENT OF NOISE

The operation of a landfill site involves two types of noise:-

- a) The noise produced by plant and vehicles within the confines of the site boundary.
- b) The noise produced by waste delivery vehicles using the public highway system.

These two categories of noise are assessed separately.

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3. NOISE FROM SITE OPERATIONS

There is no formally accepted planning procedure for the assessment of noise from landfill sites. The earth moving operations are similar to a mineral extraction site and the relevant advice from Government and regional sources is discussed below.

3.1 National Guidelines

3.1.1 *Department of the Environment MPG 2/1988 "Applications, Permissions and Conditions" (1)*

Paragraphs 89-92 of this document refer to noise associated with mineral extraction. Paragraph 91 recommends that any noise conditions should stipulate noise levels in terms of dB(A) at the boundaries of the site or outside nearby noise-sensitive buildings. It is also suggested that short term operations such as the construction and removal of earth bunds may need to be excluded from conditions and assessed separately.

However, this document does not give advice on specific criteria and refers to DOE circular 10/73 "Planning and Noise".

3.1.2 *Department of the Environment Circular 10/73 "Planning and Noise" (2).*

A revision of this circular is long awaited. This document offers guidance to planning authorities on the assessment of noise for different types of development. A section is included (para 24-34) which is specific to noise from industrial premises and other fixed installations. This section identifies mineral extraction as a special case. Paragraph 26 states that there will "be times when it is appropriate - or even desirable in order to meet other planning objectives - to allow some form of industrial development near houses etc. Minerals have sometimes to be worked although there are houses nearby".

In circular 10/73 reference is made to British Standard 4142 which is discussed below.

3.1.3 *BS 4142: 1990 "Method of Rating Industrial Noise Affecting Mixed Residential and Industrial Areas" (3)*

This standard has been revised and the new version published in December 1990. It was devised as an aid to assessing the likelihood of complaints about noise from proposed industrial and commercial developments. Although there is useful guidance contained within this document, doubts have often been expressed about its validity under certain circumstances, especially for sites where the noise sources move around and cannot be described as fixed installations.

The comparison of L_{Aeq} with background noise L_{A90} is an indication of the likelihood of complaints. Complaints are likely if noise expressed in L_{Aeq} from a proposed industrial development is predicted to exceed the existing background noise L_{A90} by 10 dB(A). Differences of 5 dB(A) are viewed as being of 'marginal significance'.

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3.1.4 BS 5228 : 1984 "Noise control on construction and open sites". (4)

This standard is a code of practice for assessing noise from construction and open sites. Useful advice on predicting noise levels is given which is appropriate for landfill sites. However, no advice on noise limits is given and the sound power levels quoted are now seriously out of date following recent EEC legislation limiting noise emissions from construction vehicles. In practice, actual noise levels are much lower than those listed in BS 5228.

3.1.5 BS 8233 : 1987 "Sound insulation and noise reduction for buildings". (5)

Daytime internal noise levels of 40 to 45 dBL_{Aeq} are recommended for living rooms. External noise levels are taken into account by reference to the former GLC criterion of 55 dBL_{A10}.

3.1.6 World Health Organisation Environmental Health Criteria 12 - Noise (6)

This reference recommends that general daytime outdoor noise levels of less than 55 dBL_{Aeq} are desirable to prevent any significant community annoyance.

3.1.7 OECD 1986 Fighting Noise - Strengthening Noise Abatement Policies. (7)

This document refers to noise studies in OECD countries and reiterates the 55 dBL_{Aeq} outdoor noise limit.

3.1.8 "The Control of Noise at Surface Mineral Workings" Department of the Environment 1990. (8) (Atkins Report)

(This report has been commissioned from W S Atkins and published by the Department of the Environment, but has not yet been accepted as Government Policy).

This report discusses all relevant standards and guidelines including BS 4142, BS 5228 and Cheshire County Council Guidelines. Community response to noise was investigated via a questionnaire to local authorities. It was concluded that the noise anticipated by residents is somewhat worse than the reality.

Taking all the available information into account, a daytime limit of typically 55 to 60 dBL_{Aeq} (1 hour) is proposed for noise sensitive property or an area of open space used for quiet relaxation, provided that the open space is important in planning terms. Isolated footpaths are not regarded as noise sensitive.

Assessment methods which take the background noise level L_{A90} into account are not advocated. The findings in this report are to form the basis of a minerals planning guidance note on noise.

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For offsite road traffic, it is suggested that predictions are made using "Calculation of Road Traffic Noise" Department of Transport 1988, and that a change of 3 dB(A) is generally accepted as not significant.

3.2 Regional Guidelines

Several Planning Authorities have published noise guidelines for proposed industrial developments. Some of these guidelines such as those of Surrey County Council and Hertfordshire County Council specifically refer to mineral extraction and landfill sites. These guidelines together with the Cheshire County Council noise guide-line, which is of a more general nature, are outlined below.

3.2.1 Surrey County Council "Guidelines for Noise Control" 1987 (9)

This is a comprehensive document which includes a section specifically concerned with mineral extraction and waste disposal sites. L_{A90} is considered by Surrey to be the most appropriate noise index. Noise from plant and machinery used on mineral extraction sites is normally limited to the existing L_{A90} plus 5dB at the nearest residential properties during day time operations. Noise limits for plant and machinery expressed in terms of L_{Aeq} are based on 10 dB above the existing L_{A90} . Allowances are made for noise of short term duration. Surrey County Council recognise that it is often necessary to relax these limits during the construction of bunds, stripping of soils and similar operations.

Thus site preparation activities are viewed as short term construction operations and are therefore treated separately. Site preparation should not exceed 75 dBL $_{Aeq}$ (1 hour), Mondays to Fridays 0730 to 1830 and 65 dBL $_{Aeq}$ (1 hour), Saturdays 0730 to 1300. These limits are to be applied to the facade of the nearest residential building or the site boundary.

3.2.2 Hertfordshire County Council "Waste Disposal Criteria for the Assessment of applications for planning permission and Waste Disposal Licences 1987. (10)

Hertfordshire County Council consider both boundary noise levels and noise levels at relevant noise-sensitive facades. A distinction is made between normal mineral extraction activities and short term operations such as bund formation and site preparation. These short term operations should not exceed a peak noise level of 75 dB(A) at the site boundary. Normal operations should not exceed 70 dBL(A) peak. An L_{Aeq} value of 65 dBL $_{Aeq}$ (12 hour) should not be exceeded. The background L_{A90} should not increase by more than 5 dB at the nearest noise sensitive position.

3.2.3 Cheshire County Council "Cheshire Planning Noise Guidelines" 1980. (11)

Part 2 of the above publication contains guidelines for new industrial and commercial development. Mineral workings and landfill sites are not mentioned specifically.

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Rural areas with scattered housing and low existing noise climate are defined as 'Category B' areas, where increases of noise of marginal significance are acceptable. According to the guidelines, the new noise level must not be more than 5 dB(A) above the existing background level in order to contain increases to a marginal level. This criteria is in line with BS 4142 and the Hertfordshire County Council guidelines but is more stringent than the Surrey County Council guidelines which allow a 10 dB(A) increase.

3.3 "The Report on the Noise Review Working Party, 1990" Department of the Environment (The Batho Report) (12)

The Government has recently (October 1990) published the report of the "Noise Review Working Party, 1990" (The Batho Report). In the foreword, the Parliamentary Under Secretary of State for the Department of the Environment says that the report will play a most important part in influencing future development in noise policy.

It is suggested that three "Action Levels" of noise would be readily usable by planning authorities when assessing proposals for noise sensitive development. At a daytime noise level of 55 dBL_{Aeq} between 0700 and 1900, noise would not normally be material consideration in determining an application for planning permission.

In Section 2.11 of the report, waste disposal sites are specifically mentioned. It is recommended that noise from these sites should be assessed in the same way as construction sites rather than a BS4142 background noise comparison.

3.4 Recent Planning Decision, Hawkhurst Moor, Coventry (13)

A recent planning decision relating to the establishment of a mine in a rural area to the west of Coventry (Hawkhurst Moor) heard considerable evidence on noise criteria. The Inspector concluded that the following noise limits were appropriate:

Daytime site operations	55 dBL _{Aeq}
Construction	65 dBL _{Aeq}

The Inspector reached his decision on day time site noise after balancing the merits of an absolute criterion with a background noise comparison.

3.5 Summary of Site Noise Assessment

Many local authorities have used a noise rating system which is based on the measured background noise L_{A90}. Either a strict BS4142 comparison (sometimes even with a +5dB(A) penalty for a tonal correction) has been used, or simple L_{Aeq} vs L_{A90} comparison.

The Atkins Report (8) the Batho Report (12) and recent planning decisions (13) all opt for an absolute criterion in the range of 55 to 60 dBL_{Aeq} (1 hour). This recommendation will be contained in a Minerals Planning Guidance paper, shortly to be issued for public comment.

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4. HIGHWAY NOISE

The generation of heavy waste delivery vehicle movements using a landfill site can arouse public opposition. Public reaction centres on grounds of safety, dust and smell as well as noise and vibration.

The standard means of assessing traffic noise is in terms of L_{A10} (18 hour). The "Calculation of Road Traffic Noise" procedure allows the prediction of before and after noise levels. The change is usually evaluated in terms of 3 dB(A) increase being the smallest noticeable change, although doubts have been expressed about the situation where the increase occurs from the addition of heavy vehicles on a lightly trafficked road.

5. SITE NOISE PREDICTIONS

Site noise levels can be calculated as shown in BS5228. It is usual to adopt the sound power levels provided by the manufacturer, but some makers of earth moving plant will only confirm that their plant meets the requirements of the Construction Plant and Equipment Regulations, 1988.

In an environmental impact assessment, it is usual to take a worst case and the use of the highest sound power levels may be appropriate. Percentage on times are usually taken at 50% operation at full load for a bulldozer or a compactor as a worst case.

The incorporation of ground attenuation should be included in the noise prediction process, although this is not specifically shown in BS 5228.

Wimpey Environmental has a computer based prediction system for which the final output is a set of contours at intervals of 5 dB(A).

6. CASE HISTORIES

Wimpey Environmental has presented evidence at four public inquiries in 1991. The noise aspects of these inquiries will be discussed and the factors involved are as shown below.

A) Greenfield Site in Woodland on South Coast

A landfill site was proposed in open space surrounded by woodland. A distant view of the operations could be obtained from an area of public open space on raised land. Existing background noise levels were 35 to 40 dB_{LA90} and predicted noise levels were 50 to 55 dB_{LAeq} (The LPA evidence was 55 dB_{LAeq} on a background of 35 dB_{LAeq} and the Wimpey Environmental evidence was 50 dB_{LAeq} on a background of 40 dB_{LA90}). There was no dispute over any noise effects on residential property or the noise from delivery vehicles.

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B) Extension of Existing Site in Greater Manchester

An existing landfill site was proposed to be extended to allow a further period of operation. The existing operations were judged to be detrimental to local amenity and the extended operation was refused by the LPA. Site noise was not in dispute. The noise and vibration caused by delivery vehicles at 10 properties on the access road with L_{Aeq} (1 hour) noise levels of 65 dB was in dispute.

C) Extension of Existing Landfill Site in Rural Sussex

An existing landfill site had ceased operation and had been partially restored. An extension to the site had been proposed. The use of narrow country lanes by delivery vehicles was in dispute as well as the noise from site operations. The inhabitants of the surrounding area had been promised that the landfill operations would cease and not be renewed. The LPA consultant carried out a BS4142 assessment for site operations while Wimpey Environmental adopted a 55 dBL $_{Aeq}$ (1 hour) criterion.

D) Reactivation of Unused Landfill Site Near Sheffield

An unused landfill site surrounded by open grassland was proposed to be reactivated. Site access was onto a major highway and the nearest dwellings were exposed to relatively high background noise levels of 45 to 55 dBL $_{A90}$. Even with a BS4142 assessment, no problems with site noise would have been indicated.

7. CONCLUSION

There is substantial uncertainty concerning the assessment of landfill noise. For the examples discussed above, Wimpey Environmental has advocated the adoption of a 55 to 60 dBL $_{Aeq}$ (1 hour) criterion in line with the Atkins Report (8), the Batho Report (12), the Hawkhurst Moor Inspectors Report (13), the World Health Organisation (6) the forthcoming Mineral Planning Guidance Note. Other projects would have to be examined on their individual merits. The publication of the Mineral Planning Guidance Note should clarify matters.

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REFERENCES

1. Department of the Environment, Mineral Planning Guidance Note MPG2, issued 1988.
2. Department of the Environment Circular 10/73 "Planning and Noise".
3. British Standard BS4142, 1990 "Method of Rating Industrial Noise Affecting Mixed Residential and Industrial Areas".
4. British Standard BS5228, 1984 "Noise Control on Construction and Open Sites".
5. British Standard BS 8233:1987 "Sound Insulation and Noise Reduction for Buildings".
6. World Health Organisation 1980
Environmental Health Criteria 12 - Noise
7. OECD 1986 Fighting Noise - Strengthening Noise Abatement Policies
8. Department of the Environment "The control of noise at Surface Mineral Workings", 1990. (Atkins Report)
9. Surrey County Council "Guidelines for Noise Control", 1987.
10. Hertfordshire County Council "Waste Disposal Criteria for the assessment of applications for planning permission and waste disposal licences". December, 1987.
11. Cheshire County Council "Cheshire Planning Noise Guidelines", 1980.
12. "Report on the Noise Review Working Party, 1990"
Department of the Environment, 1990 (Batho Report)
13. Hawkhurst Moor Deep Mine
Planning Decision, Inspectors Report