Appendix 4: Mineral Extraction at Eynsham: A Review of the Proposals
MINERAL EXTRACTION AT EYNSHAM: A REVIEW OF THE PROPOSALS

DRAFT

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1 CONTEXT OF THIS REPORT

1.1 RPS Clouston were appointed by P.C. Power to examine the submission of a planning application for mineral extraction and infilling with wastes on land near Eynsham on 24th May 1991. This report has been prepared following an analysis of the planning application submitted on behalf of Smith and Sons, (Blechington) by D.K. Symes Associates on forms dated 10th May, 1991 under County planning Authority Reference 0616/91. The application is described on the applications forms as

"Winning and working of sand and gravel with progressive infilling and restoration to agriculture, together with all ancillary plant and buildings."

The full site area extends to 68 hectares (168 acres), divided into a southern block of 49 hectares (121 acres) comprising 1.2 million tonnes of sand and gravel, and a northern block of 19 hectares (47 acres), comprising 0.6 million tonnes of sand and gravel. A processing plant is proposed to be erected on the southern block of land, with frontage to Cassington lane. Processing of material dug from the northern block of land is to be by a dry screening process, with the resulting Type 2 material sold mainly "as dug".
Minerals Planning Policies

1.2 The planning policy framework for minerals applications of this kind is set out in the minerals policies to the Structure Plan, approved following alterations by the Secretary of State on 12th October, 1990. These policies commit the County Council to providing a reserve of planning permission for minerals workings so as to maintain an adequate supply of minerals. In the case of aggregates, policy M7 provides for the maintenance of a ten year supply of permissions for aggregates extraction at a regionally agreed production rate. However, all minerals are subject to stringent criteria against which their acceptability is to be measured, under policies M9, M10 and M14. Policies M15 and M16 set criteria for the restoration worked land.

1.3 Policy M13 to the Structure Plan accepts the principle of new sand and gravel workings in the general area of Cassington/Yarnton. An allocation in this area has been considered for some time, but there is no statutory Minerals Local Plan which has been through a public inquiry or other public consultation process sufficient to properly scrutinise this allocation in detail. The Minerals Amendment to the First Structure Plan of September, 1977, considered this area, but set no detailed boundaries. The same applies to the Interim Minerals Policy of September, 1978. A Consultation Draft Minerals Local Plan for Oxfordshire was published in May 1988, but this has never been progressed. It is our understanding, due to the elapse of time and development of minerals policies at national and county level, that this Draft Local Plan will be abandoned and replaced by a new
Consultation Draft within the next 6-12 months.

1.4 Although due to be superseded soon, the Draft Minerals Local Plan is used for development control purposes in consideration of minerals applications by the County Council. The Draft Plan indicates boundaries where the extraction of minerals is proposed to be acceptable. It also indicates areas of Areas of Greatest Objection where mineral extraction will not be permitted, and these include areas on the fringe of Eynsham where proposals for extraction are made in the current planning applications.

Waste Disposal Policies

1.5 County Waste Disposal Policies are set out in the Waste Disposal Plan of November 1989, which deals with the period to 1999. The plan sets out to provide for adequate waste disposal facilities for Oxfordshire, distributed evenly throughout the County according to needs. However, void space for Type A waste (inerts) in the County amounts to about five times the forecast demand during the period 1988-2000. The theoretically available landfill space is heavily qualified in the Plan, and includes an allowance for the Cassington/Yarnton area. It is, however, clear that there is no overriding need for the release of Type A void space in the foreseeable future.
1.6 The Waste Disposal Plan also shows that Type B void space (mainly inerts which are slightly soluble in water) is in surplus against the forecast demand for the period to 2000, with something over double the estimated requirement being available. As before, forecast availability includes draft allocations such as the application site, but the strong surplus again indicates there is no pressing need for Type B space to be identified at present.

1.7 The Plan places emphasis on the need for recycling and reclamation of materials wherever possible.

**Aggregates Land Bank**

1.8 Minerals Planning Policy Guidance Note No. 6 (MPG6) indicates the 10 year land bank requirement of permissions for aggregate extraction which Oxfordshire must meet in order to satisfy its regional proportionment. This amounts to a figure of about 2.2 million tonnes (mt). However, the County’s permitted reserves marginally exceed 10 years’ supply. In these circumstances, it is usually undesirable in planning policy terms to commit significant further reserves just in advance of a review of countywide policies. There has been a significant reduction in aggregates consumption recently as a result of the national economic recession, and this factor also tends to reduce the need for new pits in the short term.
2 EXECUTIVE SUMMARY OF ENVIRONMENTAL IMPACTS

2.1 The matrix which follows summarises the main environmental impacts resulting from the planning application, as currently framed. We have indicated in section 1 to this report the context of our investigations, and the matrix needs to be read as an assessment of the planning application with particular reference to our client's property. It does, however, also take into account the principle environmental effects likely to be felt by those living on the eastern edge of Eynsham village in close proximity to the application proposals.

2.2 Whilst it is impossible to attach definitive weightings to the relative importance of these impacts, our investigations have led us to the view that the application proposals as a whole fall below accepted standards in terms of environmental impact and mitigation. Even taking account of the historic proposal to allocate this general area for extraction of minerals, we believe that the planning application should not be approved in its current form. It will be a matter for the County Minerals Planning Authority to consider whether the significant amendments that will need to be made to these proposals would be better considered as part of the wider review of County minerals planning policies in the forthcoming replacement Draft Minerals Local Plan.
## MINERAL EXTRACTION AT EYNSHAM: MATRIX OF PROPOSED ENVIRONMENTAL EFFECTS

<table>
<thead>
<tr>
<th>Topic</th>
<th>Effect</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Buffer zones</td>
<td>Inadequate distances; curtilage boundaries should be used as origin of zones. (see below *)</td>
<td>Reduce Site area</td>
</tr>
<tr>
<td>Access and highways</td>
<td>Insufficient details (road capacities, lorry routing, access design, working arrangements, relationship to A40 improvements).</td>
<td>Applicants to carry out additional work and revise proposals if necessary.</td>
</tr>
<tr>
<td>Plant and processing</td>
<td>Insufficient details (details of plant, working arrangements, noise attenuation, dust control).</td>
<td>As above</td>
</tr>
<tr>
<td>Landscape considerations</td>
<td>Northerly parts of southern site and whole of northern site unduly exposed.</td>
<td>Reduce site area; applicants to reconsider soil bunding and prepare planting proposals.</td>
</tr>
<tr>
<td>Neighbouring Land Uses</td>
<td>Inadequate buffer zones to sensitive uses (see above *).</td>
<td>Reduce site area.</td>
</tr>
<tr>
<td>Ecology</td>
<td>Insufficient details.</td>
<td>Applicants to carry out additional work and revise proposals if necessary.</td>
</tr>
<tr>
<td>Topic</td>
<td>Effect</td>
<td>Remedy</td>
</tr>
<tr>
<td>-------------------------------</td>
<td>------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Water quality</td>
<td>Reduced water table, concentration of any pollutants and effect on licensed abstractions and flood risk (waters entering fill).</td>
<td>Revise application to inert soils fill only.</td>
</tr>
<tr>
<td>Ground and flood-water flows</td>
<td>Impedance to flows by soil bunding during operations, clay cell lining and restoration levels after completion.</td>
<td>Revise application to inert soils fill only; applicants to reconsider soil bunding proposals and restoration scheme.</td>
</tr>
<tr>
<td>Landfill gas and leachate monitoring</td>
<td>Insufficient details of proposals for monitoring and control.</td>
<td>Applicants to carry out additional work and revise proposals if necessary (but note comments above).</td>
</tr>
<tr>
<td>Control of the infilling operations</td>
<td>Insufficient details of measures to prevent litter spread, dust deposition and odour. Inadequate site control methods proposed.</td>
<td>As above.</td>
</tr>
<tr>
<td>Rights of Way</td>
<td>Conflicting proposals concerning bridleway in northern sector; relationship between diverted footpath and proposed A40 culvert conveyor not made clear. Safety conflicts between haul road and bridleway.</td>
<td>Applicants to carry out additional work and revise proposals if necessary.</td>
</tr>
<tr>
<td>Archaeology</td>
<td>Insufficient investigations carried out (trial trenching likely to be necessary).</td>
<td>As above.</td>
</tr>
<tr>
<td>Topic</td>
<td>Effect</td>
<td>Remedy</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Restoration</td>
<td>Insufficient planting and other details; proposed levels will exacerbate flood conditions.</td>
<td>Revise application to inert soils fill only; reconsider reinstatement levels; applicants to carry out additional work on restoration proposals.</td>
</tr>
<tr>
<td>Noise</td>
<td>Insufficient details (background noise levels, plant noise attenuation and bunding, hours of working).</td>
<td>Applicants to carry out additional work and revise proposals if necessary.</td>
</tr>
<tr>
<td>Dust</td>
<td>Insufficient details.</td>
<td>As above.</td>
</tr>
</tbody>
</table>
3. EYNSHAM MILL

3.1 Although privately commissioned, this report draws on our first hand experience in the submission of minerals planning applications with reference only to those matters of concern for planning control purposes. We have addressed comment to those aspects of the scheme which appear to merit attention in planning terms. However, since our client's property at Eynsham Mill is the most notable structure likely to be affected by the proposal, we feel it appropriate in planning terms that our comments are made with particular reference to that property. This section shows why, in historical and heritage terms, particular care should be taken to protect the setting and environment of the various buildings and surroundings of Eynsham Mill. Fuller particulars of the historical setting is set out as APPENDIX A to this report, and the main historical and archaeological features are shown in Figure 1.

3.2 Our client has also taken legal advice on remedies for nuisance and rights of support through civil proceedings. This report is, however, concerned only with those aspects of the proposal relevant to the determination of the planning application.
Historic Buildings and Related Legislation

3.3 The general principle of assessing the environmental impact of developments in relation to interests of acknowledged importance is well established. EC directive 85/377 and the July 1988 UK Environmental Assessment Regulations represent an extension and formalisation of planning control processes under the UK Town and Country Planning Acts, which themselves include provisions for the maintenance of a list of buildings of historic and architectural importance. In addition, Planning Policy Guidance Note No. 16 (PPG 16) requires the careful assessment and protection in some cases of archaeological remains where development is proposed. There are similar policies in the Oxfordshire County Structure Plan, and the West Oxfordshire Rural Areas Review Local Plan of 1988.

3.4 In addition to legislation designed to protect historical features, the CBI Mineral Operators Code of Practice advises on good practice in connection with minerals extraction. This recommends prior consultation on the need for investigation and identification of archaeological remains prior to the submission of an application.
Historical Features at Eynsham Mill

3.5 There are three listed structures on the site of Eynsham Mill. These are:

- Eynsham Mill (ref 4/136);
- Bridge and attached weir wall (ref 4/137);
- Bridge (ref 4/138);

All are statutorily listed Grade II, with the latter two structures included for their group value. Any works which affect Listed Buildings or their settings will need Listed Building Consent. Even in cases where the buildings themselves are judged not to be directly affected by development, their historical and architectural value remains a significant material consideration in the treatment of any planning applications in the area.

Local History

3.6 The history of the local area, is set out in the archaeological and historical report reproduced as Appendix A to this report. It will be seen that the area as a whole has a long history of settlement,
and is comparatively rich in archaeological remains.

3.7 At about the turn of the first millennium B.C., climatic changes and increased farming contributed to the formation of flood plains in the Thames Valley and its tributaries. A large enclosure at Cassington is thought to have been a late Iron Age settlement of some complexity. Under Roman occupation, the first terrace gravels were probably intensively farmed for cereals, with the floodplain used for pasture. The Saxons later introduced strategic control point in the form of small settlement by the mid 5th century A.D., including one at New Wintles Farm and one at Purwell. In the Pre-conquest period to 1066, Eynsham was a small market town, probably surrounded by small farmsteads whose location is still unknown.

3.8 By the Domesday Survey of 1086, Eynsham was held by the Bishop of Lincoln, with a Benedictine Abbey dating from A.D. 1005 within the present village, and a mill where Eynsham Mill stands today. During the Medieval period, the Abbots of Eynsham Abbey continued to own the mill, and carried out engineering work to ward off water from the Evenlode. There were three small crofts occupying the riverside from the mill-house up to the Hanborough Parish boundary.

3.9 In the post-medieval period from about 1530 to 1800, the mill changed from grinding corn to making white paper, used in the printing of bibles in Oxford. There was a fire in 1756, and the mill house was rebuilt, although part still bears the date 1691. The construction of a canal from the
Thames to Cassington provided improved transport efficiency in this period.

3.10 In the modern period from about 1800 onwards, the main house block was added to the earlier building, and new machinery placed Eynsham Mill in the forefront of technical innovation at the time. In 1881, over 100 people were employed here. The 1913 Ordnance Survey edition shows the close relationship between Eynsham and the mill via Mill Lane/Mill Street.

3.11 It was not until the competition from coal powered industrial plants began to marginalise such sites that Eynsham Mill lost its important position in the local economy. Paper making gave way to board manufacture in the late 19th century, and the mill had ceased manufacture in 1918. In 1919 it was acquired by J.A. Shankland Ltd and used for glue and grease manufacture. The company was subsequently bankrupt, and the Mill was sold by the receivers in 1926. The machinery is thought to have stood derelict until the Second World War, when it was cannibalised, and the demolition rubble used in building work at RAF Brize Norton.

3.12 Although previously in residential use, the vast majority of the restoration visible today has been carried out over a long period by the present owner Mr P.C. Power. Traditional methods and good quality stone used in the restoration work have largely retained the aesthetic quality of all the major buildings on the site, and extensive planting in and around the grounds have contributed to a site of outstanding quality. Figure 2 shows views within the garden of Eynsham Mill. The building and
nearby features were only listed after restoration work was substantially complete. This underlines the sensitivity with which the work has been approached.

3.13 Although trees and hedgerow vegetation obscure distant views during the summer months, the landscape setting of Eynsham Mill is generally quite level and open. The Listed Buildings are reached by the tree-lined Mill Lane, which is itself bounded by arable fields on either side. These aspects are discussed in more detail in section 5 to this report.

3.14 It will be clear that every effort should be made to safeguard the setting of these Listed Buildings from any new development which is unnecessarily damaging to their character.
Figure 2: The gardens at Eynsham Mill
4 ISIS FISH FARM

4.1 In addition to the historic building in the vicinity of Eynsham Mill itself, Isis Fish Farm on the south side of Mill Lane also imposes a significant constraint on the application proposals because of its relative sensitivity. Figure 3 is a diagram showing the layout of the Fish Farm.

4.2 The Fish Farm consists of a series of rearing tanks situated to the north east of Eynsham Mill, taking water on a licensed abstraction from the River Evenlode before returning it via a licensed discharge. The water takes two routes. One route follows a substantial concrete raceway where fish are held during the growing process. This part of the rearing tanks makes for easier sorting because the tanks are able to be divided by movable screens. The second part of the rearing tanks are circular, 10.67m (35 ft) in diameter and 1m (3ft 3ins) deep. There are eight of these tanks, and water flows through them by a partially underground pipe system before discharging to the river together with the discharge from the adjoining rearing tanks. The fish reared here are rainbow trout.

4.3 Fish farming has been carried on from this site since 1976, and a considerable reputation has been built up in the region. During the early 1980's when turnover achieved the highest level yet, as much as 100,000 fish at various stages of growth were stocked at the farm. The farm gate sales have carried on for much of this time, and the whole operation is clearly viewed as something of an
institution in the local area. As well as supplying a considerable number of retail customers, Isis supplies many local restaurants, Oxford Colleges and other institutions.

4.4 As a producer of food, conditions at the Fish Farm and the farm shop are regulated by Environmental Health officers from West Oxfordshire District Council. Because the flavour of the fish meat is particularly sensitive to disturbance in water quality, the health and hygiene controls need to be especially stringent. Although we are not aware of any research on the matter, we understand that factors such as dust and vibration could affect the grow rates and fish meat quality.

4.5 In the circumstances, we believe that the existence of the Fish Farm amounts to an unusually sensitive neighbouring land use for which account needs to be taken in the application proposals.
5  AN ASSESSMENT OF THE PLANNING APPLICATION

5.1 This section of the report results from our examination of the planning application proposals, both in general terms, and specifically in relation to the need to protect the character and setting of Eynsham Mill. The more general aspects are dealt with first.

The Form of Submission

5.2 The application submission which we have examined consists of a bound application statement, incorporating application forms and ownership certificates, together with borehole logs and application drawings. In general terms, the Application Statement is superficial and lacking in detail. As such, it falls significantly short of the evaluation of environmental effects which would have been necessary if the application had been accompanied by an Environmental Statement under the 1988 Regulations.

5.3 We believe that a mineral extraction application of this kind in such close proximity to dwellings and other sensitive features should have been accompanied by an Environmental Statement (ES). We further take the view that the County Council should now request an ES to be prepared and submitted to them.
5.4 Our own investigations have led us to believe that there are significant areas of deficiency or lack of analysis in connection with the proposals. We believe that the following matters should be the subject of significant additional work before the application is determined:

- Plant siting and proposals
- Landscape considerations
- Effects on the floodplain
- Effects on ground water
- Effects on ecology
- Archaeological implications
- Effects on Rights of Way
- Noise Implications
- Dust deposition
- Odour
- Restoration proposals.

We also believe that the proposed site operation, sub-phases of workings, highway access and presence of adjoining dwellings have not been satisfactorily addressed in the planning submission.
5.5 The resolution of all these matters will require some months of additional work on the part of the applicants’ agents. Since the present planning submission is inadequately detailed, no decision can legitimately be made on the current proposals until such further work is completed. In view of the imminence of revised Consultation Draft Minerals Local Plan, it would in our view be inappropriate for the County Council to contemplate the granting of permission in detail at this site outside the Local Plan process. To do so would be to pre-empt a proper examination of this site at a public local inquiry at the context of a wider review of allocations in the County, at a time when the existence of an adequate aggregates landbank removes all urgency for the release of further allocations.

5.6 Arising from these conclusions with regard to the planning application, we looked at the proposals from a number of different viewpoints. The following comments summarise our findings under the principal topic headings.

Buffer Zones

5.7 Approved Structure Plan Policy M14 provides for "the protection of local residential... amenities", and Draft Mineral Local Plan Policy GM2 proposes buffer zones of at least 350m (865 ft) from the edge of settlements, and 100m (323ft) from individual dwellings and other sensitive buildings. Draft Minerals Local Plan Policy 2 also provides for "particular attention" to be paid to the "special
character of isolated buildings and their immediate surroundings...". There are recommended minima and cannot be prescriptive. In the case of sensitive uses falling within either category, there is therefore clearly justification for other buffer zones to be applied. Draft Policy GM3 indicates that care will be taken to protect the landscape setting of all settlements, including single dwellings.

5.8 The application on behalf of Smith & Son deals inadequately with buffer zones in two important respects. Firstly, the north eastern fringes of the village of Eynsham fall well within the 350m settlement buffer zone, particularly in respect of the parts of the site north of the A40 trunk road. The Application Statement suggests that the presence of main roads and hedgerows on the edge of Eynsham here makes the 350m buffer zone unnecessary. We believe that this is an unacceptable interpretation of the qualifications in the Draft Minerals Local Plan Policy. In this case, the mainly level land, absence of tree screening, openness to adjoining roads and general outlook of the dwellings on this side of Eynsham make it essential to observe the minimum 350m buffer zone proposed by the County Council.

5.9 The issue of buffer zones is also inadequately addressed by the appeal application insofar as the proposals relate to the Eynsham Mill buildings, and to the fish farm adjoining Mill Lane. These are particularly sensitive land uses. Both the group of listed buildings with their notable gardens, and the Fish Farm and breeding grounds fed by the River Evenlode to the north justify special treatment with regard to buffer zones.
5.10 In our view, these uses justify the imposition of at least 250m (820ft) buffer zone in order to protect their environment from unacceptable damage and disturbance. The recommended minimum buffer zones are shown on Figure 4. Distances are taken from the property curtilages, because the need to protect these uses extends also to the unbuilt parts of their sites.

Access and Highway Considerations

5.11 Heavy lorry traffic associated with mineral extraction and infilling is potentially the most environmentally damaging aspect of this form of development. The Application Statement nevertheless only accords a few paragraphs to this aspect of the proposals. There is no assessment of the capacity and existing loading of local roads, no evaluation of past personal injury accident records, and no description of proposed routing arrangements to ensure that heavy lorries are kept away from village roads. The weight of lorries and likely movement patterns operated by the company are inadequately described. There is insufficient detail with regard to access design.

5.12 Even the vehicle movement patterns forecast in the Application Statement will prove unrealistic if the proposed conveyor using the culvert under the A40 trunk road is not accepted by both the NRA and the DTp. The necessary consents with regard to the conveyor will take some time to achieve, and no decision should be made until the implications in heavy lorry traffic on the local roads can be properly evaluated.
5.13 Parts of the application fall within the area affected by the proposed road improvement to the A40 trunk road by the DTp. It is understood that the current timing of these improvements envisages a start in 1993. The Application Statement ignores the existence of this scheme completely. There are clearly potential conflicts which should be resolved before any decision is made on the application.

**Plant and Processing**

5.14 The details of proposed plant are wholly inadequate for the purposes of a detailed planning application. Drawing no 9006/1/4 is described as "plant detail", but it is annotated as "illustrative only". The siting of the proposed weighbridge, office and wheel cleaning facilities within the northern sector of land on Drawing 8846/2 cannot be adequately represented at the 1:2500 scale used. The same applies to the southern sector, as shown on Drawing 9006/1/2.

5.15 There are no proposals for noise suppression measures in connection with the operation of the processing plant or field conveyors. No dust sheeting or covering of plant is indicated. There is no commitment to the use of quieter electric motors, and no reference to measures such as rubberised conveyor rollers. Muffling of the barrel washer and dry screens, and the lorry reversing hooters on the site is not mentioned. We believe that both the main plant itself, and the dry screening process which is proposed for the northern sector could each produce significant effects in terms of noise and dust. Conveyor drive heads and rollers are potential noise generators wherever field conveyors
are set up, and the implications of all these potential noise sources should be fully addressed and mitigated wherever possible.

Landscape Considerations

5.16 We note that there are wider landscape implications for the southern block of land, with particular reference to the village of Eynsham and views from the adjoining main roads. However, for the purposes of this report, we have concentrated on the landscape implications of the site north of the A40. Some views from Hanborough Road are shown on Figure 5, but it should be noted that these show early summer vegetation, when the maximum screening effect is provided. A photo-location map is at Figure 6.

5.17 Whilst views to and from Eynsham Mill are effectively screened in the summer months by trees and other vegetation, the close proximity of the proposed workings means that glimpsed views of the workings from Eynsham Mill when foliage is absent could still be disruptive to the environment of the Listed Buildings and of the Fish Farm shop and dwelling. The only entrance, which is via the tree lined Mill Lane, would be completely isolated by bunding on either side towards its entrance. The bund to the north of Mill Lane is unspecified, but is assumed to be a 3m (10 ft) topsoil bund, as on the south side of the lane. The outlook from the bridleway from Hanborough Road to Mill Lane, would be transformed during the life of the workings, with a subsoil bund of 5m (16 ft)
height to the north. No bund at all is proposed to the south.

5.18 Hanborough Road itself presently enjoys open views across an agricultural landscape, as shown on the photographs at Figure 5. This shows that the only means of enclosure between Hanborough Road and the proposed northern sector workings at present is a low hedgerow, which is intermittent in places and permits views throughout the northern section of the site.

5.19 Since the landscape character of the area is comparatively flat and open, the potential visual disruption caused by mineral workings and the construction of soil mounds is significant. New barriers to visibility in the form of vegetation will take some years to establish effectively, and artificially created built forms would be alien and disruptive in visual terms. These are circumstances in which the recommended buffer zones should not be compromised, and where physical separation from dwellings and other sensitive uses must be adequate.

**Neighbouring Land Uses**

5.20 Neighbouring land uses would be affected to a greater or lesser degree by the proposed mineral working and infill operations. As already mentioned, remedies for certain damage lie in Property Law, but this report is concerned with the planning aspects of the proposals. The application details estimate a 15 year life for the southern block of land, including both extraction and infill. The
Figure 5: Views from Hanborough Road
equivalent for the northern block of land is at 12 years, and in each case restoration work would extend the period during which activity occurs. The effect on sensitive neighbouring land uses will therefore be prolonged, and it is essential that proper account is taken of the need to protect their environment and amenity during this period.

5.21 We note the presence of a bungalow and roadside service restaurant on the south side of the A40 trunk road. Whilst we have no instructions with regard to these properties, we draw attention to the need to safeguard their environments. There are, in fact, situated only just beyond concentrated development on this side of the village of Eynsham. The whole of this area is subject to significant disturbance in visual and other terms by the planning application as currently framed. The applicants have chosen not to apply the County Council's recommended minimum 350m buffer zone between mineral workings and settlement boundaries. We believe that this approach is unacceptable, and advise that every effort is made to achieve modification of the planning application before it is considered by the County Council.

5.22 To the north of the A40, there are a number of properties in the vicinity of our client's interest whose environments will be damaged significantly by the current proposal. These are:

- New Wintles Farm, Hanborough Road;
- Isis Farm gate shop;
- Isis Fish Farm, Mill Lane;
- Bridge Cottage, Eynsham Mill;
- Eynsham Mill Cottage; and
- Eynsham Mill.

Whilst a nominal 100m (323 ft) zone has been provided around New Wintles Farm in the application, this is only achieved through the introduction of an alien form of 3m topsoil earth bunding which describes an arc through the field opposite to the farm. A similar 100m zone is provided around Eynsham Mill, but the point of origin of the arc is taken from the wrong part of the building, and ignores the presence of both Eynsham Mill Cottage and Bridge Cottage, which are separately occupied. In order of the status of this site the architectural and heritage terms, we believe that the buffer zone should be measured from the site boundary.

5.23 Isis Fish Farm has been ignored, and is entitled at least to a minimal 100m buffer zone because of the long standing farm manager's dwelling which exists there. Open tanks will be easily
contaminated by the deposition of airborne dust, and the need to protect food supplies in terms of priority and hygiene must be paramount. We have already indicated that we believe a 250m (650 ft) minimum buffer zone should be provided around the fish farm. The recommended buffer zones are shown on the map at Figure 4.

5.24 The existence of adequate areas to protect sensitive land uses is a fundamental principal of minerals planning policy. We are aware that civil law offers an alternative recourse for property owners where their interests are severely compromised by the unreasonable acts of adjoining landowners, and note that our client is separately advised in this respect. However, one of the main purposes of the planning system is to exert control over the activities of developers and others in order to achieve acceptable environmental and other effects. We therefore believe that the County Planning Authority should be in a position to ensure that adequate buffer zones are achieved between this particularly disruptive form of development and the most sensitive neighbouring land uses.

Ecology

5.25 Ecology is one of the matters that needs to be addressed in some detail in order to evaluate the effects of mineral extraction. The reason for this is that, in carrying out deep excavation and infilling with waste over a long period of time, the whole process can prove destructive to the ecology of the site in the short term. Our own investigations have confirmed that the arable fields which form
the main part of the application site are of little ecological value in terms of species diversity. However, the many well established hedgerows and trees in and around the application site provide cover for birds and small mammals, and it is not clear from the application to what extent this will be retained. In particular, the hedgerow on the east side of Hanborough Road could be damaged by construction of the proposed soil bunding, and a commitment to protect this at all times should be provided by the applicants.

5.26 Our discussions with local residents have led us to a report of possible sightings of newts in the pond which is situated in the field boundary just to the north of the A40 roundabout, and within the application site. We have not been able to confirm these reports, but the description we have been given fits that of the Great Crested Newt. This is a protected species. The present state of the pond, which is shaded by trees, might be consistent with the loss of this species from the site. Nevertheless, our view, the Application Statement should have made reference to the existence of this pond, and examined its ability to support aquatic species.

5.27 The vicinity of the application site includes a number of streams and ditches which mainly flow into the River Evenlode. The river is very clear, and will certainly support trout and other fish. This is in addition to the fish farm breeding tanks, which use water from the river itself. Trout are a species which is particularly sensitive to pollution, and great care will need to be taken to ensure that water quality is not harmed by de-watering, or as a result of the infill process. These aspects are discussed
further in the following section.

5.28 We also note that our client has carried out significant new tree planting on the property. Prominent amongst the plantings is an area to the south east of Mill Lane, where a number of introduced tree species are in the early stages of growth. Significant variations in the watertable are likely to threaten the survival of these trees. Whilst a degree of natural variation occurs anyway, the effects of mineral extraction and aftercare could exacerbate extreme conditions, adding to the risk of their loss.

Water Quality

5.29 The northern section of the application site and the northerly parts of the remainder of the site falls within or adjoining the floodplain of the River Evenlode. Ground water levels are therefore typically high, and there are considerable risks to the present ground water regime in connection with dewatering during workings and infilling with bio-degradable wastes. Because of the importance of this issue, we have carried out an individual study of these matters, and this is set out in APPENDIX B to this report. A map showing hydrological features is shown at Figure 7. The analysis at Appendix B also deals with the effects of the reinstatement proposals on the floodplain.
5.30 The de-watering process in connection with excavation of the mineral deposits will reduce groundwater levels in the vicinity of the site. The flow in the Evenlode is already extremely low during drought periods, as, for example, in 1975 to 1976. The combination of deep excavation, dewatering and drought conditions could therefore bring about a virtual drying up of the Evenlode and its tributaries, with attendant catastrophic effects on aquatic wildlife. Even a significant reduction of the flow of the River and its tributaries during dry periods could be significantly damaging to local ecology, because of a reduced ability to dilute any accidentally occurring pollutants resulting from surface water run-off or operations on the application site.

5.31 As well as pollution considerations, there are licensed abstraction and discharge points at Eynsham Mill, as well as abstraction points at Isis Fish Farm, Orchard Farm and New Wintles Farm which could suffer from both declining water quality and reduced availability. The operation of the Fish Farm in particular is, of course, completely depending on the quality and quantity of its water supplies. The ground waters in this area are believed to be capable of designated as "specified underground waters" for the purposes of the Control of Pollution Act 1974. If so defined, there will be a statutory obligation to protect these ground waters from interference and pollution.

5.32 Water quality is also at risk from the application proposals as soon as the infilling process commences. Since the application falls within the river floodplain, it is likely that floodwaters will enter the workings during the process of infilling, but prior to their sealing by clay and other means.
On return to local watercourses these floodwaters will then be polluted by contact with fill material, possibly over a period of days or even weeks. The Application Statement ignores this risk and makes no proposals to deal with such an eventuality.

**Ground and Floodwater Flows**

5.33 Since the River Thames deposits are not generally overlain by more than about 1m of topsoil and alluvium, groundwater flows are generally unconfined in the vicinity of the application site. Groundwater levels are generally between 1 and 3m below ground level, and may on occasions be close to ground level, without flood conditions being present. After construction and infilling of the lined cells, the pattern of groundwater flows could be significantly changed in the area, and there is likely to be an increased risk of flooding to adjoining properties. This issue is not addressed in the Application Statement.

5.34 The restoration details shown on Drawing nos 90061/3 and 8846/3 show only very generalised proposals, and deal with land form alone. The former plan appears to be based on relative ground levels locally. The latter, whilst labelled in the same way, appears to show values Above Ordnance Datum. The proposed land form shows domed areas in accordance with established landfill practice, but again there are floodwaters implications which are not dealt with. Areas to be extracted and infilled to the north of A40 trunk road are to be raised at least 4m above existing ground level in
the centre of individual fields. This will have the effect of reducing storage capacity in the
floodplain, exacerbating conditions already worsened by introduction of clay lined cells below
ground, and causing increased risk of flooding to adjoining properties. We believe that this situation
is quite unacceptable in planning terms, and we would expect adjoining property owners to be
extremely concerned at this aspect of the proposals.

5.35 We would expect the National River Authority to require significant assurances of both engineering
and working practices in connection with these proposals. We think it feasible that the NRA might
enter an outright objection in principle to these proposals, for the reason outlined in this report, and
at Appendix B.

Landfill Gas and Leachate Monitoring

5.36 Only the briefest of detail of the proposed landfill gas and leachate monitoring system are given in
the Application Statement. These matters, together with the detail of the proposed lining of the cells
with Oxford Clay are to be put forward with the Waste Disposal Licensing application. We do not
believe this is satisfactory in the case of this site, because of its presence with the Evenlode
floodplain, the nearness of the water abstraction points and the proximity to dwellings.
5.37 Waste Management Paper No. 26 explains the relationship between the Waste Disposal Licensing and Planning Control and makes it clear that engineering considerations may be relevant considerations for the planning control system. In this case, the ability of the site to accept the development proposed without unacceptable environmental effects is doubtful. It is therefore essential that detailed engineering proposals which would normally be put forward as part of the Waste Disposal Licensing process needs to be set out in full, in order that they may be evaluated in the context of the planning discussion. In the absence of such additional details, the proposals will clearly carry a degree of risk which may prove to be unacceptable.

5.38 Even the broad outline of measures indicated in the Application Statement seem to us to be inadequate. Within the River Evenlode floodplain, lining with Oxford Clay may prove to be an inadequate precaution against water pollution, and it may be necessary to add a High Density Polythene, that's an addition to clay lining. Furthermore, the proposals for leachate collection and landfill gas monitoring are inadequate. At this stage, only a general description of monitoring methods is offered. This is not specific to the special characteristics and sensitivities of the application site, and there is no description of the procedures to be followed in the event of gas or leachate being discovered beyond the application site. Frequency and monitoring should also be identified at this stage.
Control of the Infilling Operations

5.39 The infilling of land with non-inert wastes is potentially one of the most unneighbourly of land uses. Sites used for these purposes are generally located well away from villages and dwellings, and preferably given further screening by topography, woodland, and other landscape features. This site is, however, relatively exposed. In addition, the proximity of the range of carefully restored listed buildings at Bynsham Mill, together with the fish farming operations at Isis Farm and occupied residential properties nearby will undoubtedly make the infilling proposals of this application particularly alarming to local people because of the risk of windblown fill material and odours emanating from the tipping operation. For these reasons, we believe that no Type B waste or other bio-degradable material should be accepted in any of the north westerly parts of the application site i.e. over the whole of the northern section and the north westerly parts of the southern section as described in the Application Statement.

5.40 We are aware of the need for frequent road sweeping around the sites at Stanton Harcourt and elsewhere. Site operators are often pleased to co-operate with local authorities in mitigating the effects if mineral workings and landfill. However, since the effects of waste infilling always extend beyond the site boundaries, we believe it is incumbent upon applicants to incorporate measures for amelioration of off-site effects in planning applications of this kind. There are no such measures in the Application Statement. The issue of dust is dealt with later in this report. Measures for control
of windborne litter via netting and fencing should also be included in the application.

5.41 Since it is becoming increasingly difficult and costly to dispose of the more polluting wastes, every effort needs to be taken to ensure that landfill sites not suitable for such wastes are carefully monitored. There is no information in the Application Statement sufficient to reassure local people that this matter will be adequately dealt with by the applicants. In particular, the proposals for the northern sector provide only for infilling lorries to:

"... report to the tipping face where material will be tipped and inspected by site personnel to ensure that they are acceptable and comply with the license. Any suitable material will be selected either by hand or by using mechanical equipment and stockpiled for removal from site to an approved landfill."

This approach is inadequate to control the risk of unsuitable materials being tipped at the site since it depends entirely on the vigilance of unspecified site personnel, where commercial and other pressures will make it unlikely that any unsuitable wastes will actually be taken from the site. This demonstrates the need to prevent any wastes other than totally inert soils from being tipped at this sensitive site.
Rights of Way

5.42 The presence of a public footpath leading in a southerly direction from Eynsham Mill, and a public bridleway running in a westerly direction is referred to in the Application Statement. However, the only reference in this description to diversion is at paragraph 4.6.4 where it is indicated that:

"In working... (the north eastern quadrant)... the existing footpath will be diverted to run parallel to the existing drain, the footpath being securely fenced from any area of working. Should it be deemed beneficial to ensure that the footpath is screened from the operations a small screening bund can be constructed along the eastern margin of the diverted footpath should this be required."

This proposed diversion is not shown in detail on the application plan, and it is not clear how the diverted route will relate to proposals for field conveyors passing under the A40 trunk road. However, unless this relationship is addressed, disruption to users of the footpath and the enjoyment which they derive from it will of course be significantly undermined for the life of the workings.

5.43 The bridleway crossing the northern section of the application site between Hanborough Road and Eynsham Mill is indicated to be proposed for a diversion on Working Plan no 8846/2. However, paragraph 4.1.3 to the Application Statement indicates that the division of working of the northern
section into two halves along the middle field boundary

"... will enable the bridleway and ditch system to remain unchanged."

This conflict needs to be resolved satisfactorily.

5.44 In its present position, enjoyment of the existing bridleway will be heavily undermined by the application proposals, and worsened by the proposed use of Type B infill material. There is furthermore no explanation of how the proposed haul road adjoining Hanborough Road is to cross the bridleway. At this point, the haul road is straight, and heavy lorries could be travelling at some speed at a point where the view of pedestrians and horse riders will be obstructed by topsoil and subsoil bunding adjoining the bridleway. The safety aspects of this potential conflict should be addressed in the application.

5.45 Whatever technical solutions are proposed to resolve safety and amenity issues as far as possible, the environment and amenity of the bridleway adjoining Eynsham Mill will be severely damaged for a considerable period of time. The effect on this right of way as it approaches Eynsham Mill will contribute to a significant degradation of the landscape setting of Listed Buildings there for this period.
5.46 References have already been made in section 3 to this report to the historic and heritage aspects of Eynsham Mill. Appendix A provides a fuller explanation of the national, county and local policy context, as well as setting out the historical development of the area in more detail.

5.47 The significance of archaeological remains, their investigation and recording has become increasingly accepted in recent years. PPG16, referred to in Appendix A, introduced the need for effective archaeological investigation prior to the grant of planning permission for mineral extraction. As such, the Application Statement should have provided evidence of investigations on behalf of the applicants. Such investigations will need to be carried out and considered by the County Council before a decision is made on the planning application. Our desk-based research show the area as a whole to be comparatively rich in archaeological remains. Other deposits of this kind often yield evidence of earlier settlement and there is consequently a particular need for archaeological investigation to be carried out, probably including both further desk-based research and 2% trial excavations throughout the application site area. The presence of an Abbey on the site of the village of Eynsham and a long standing mill at Eynsham Mill suggests comparatively recent evidence of settlement could exist in the vicinity of the application site. Appendix A also indicates evidence of settlement in this area reaching back into prehistory. In our view, the planning application is incomplete as a matter of policy because it fails to deal with archaeological matters
satisfactorily.

Restoration

5.48 The restoration proposals provide insufficient detail to judge the quality of the scheme being proposed. The Application Statement provides only the briefest description of proposals for soil movement and placement. Subsoil drainage is certain to be necessary in view of the high water table in the area, and details of the drainage scheme should be included in the application proposals before any decision is reached. In view of the need to move soil in drier conditions, dust suppression measures will be needed. This is referred to in more detail elsewhere in this report.

5.49 The application details only provide the absolute minimum information on levels to indicate restoration proposals. The opportunity to provide increased tree and hedgerow planting has not been taken. After a period of severe disruption in the local area, residents may feel justified in expecting a gesture of goodwill in the form of positive restoration proposals submitted as part of the application.

5.50 The increased risk of flooding which will be caused by the proposed restoration levels has already been mentioned.
5.51 The intrusion as a result of plant and vehicles on the site, and activities at the processing plant are likely to be damaging in relation to the environment of the edge of Eynsham village, and of the isolated dwellings beyond. This is particularly true in areas where the applications seeks to reduce the buffer zones below those used in the County Council’s Draft Minerals Local Plan. It is therefore remarkable that the topic of noise is completely absent for the Application Statement in either the northern section or the southern section of the site.

5.52 Given the absence of detailed proposals for the processing plant, and the lack of detailed site planning in the plant areas of the site, it is likely to be difficult to accurately forecast noise level. However, it is essential to this application that the noise implication are addressed adequately. Ambient noise levels should be established at sensitive points along the site boundary, and defined limits should be set for maximum acceptable noise levels at these points throughout the course of workings. In the absence of such controls, it will be impossible to judge the environmental effects on nearby dwellings to be acceptable.

5.53 There is also no reference to hours of work in the application proposals. As experienced operators, the applicants should have been able to anticipate controls on hours of working, and no doubt their sites elsewhere in the County are so controlled. Subject to the carrying out of a noise survey to
determine ambient levels, we believe that there should be no weekend working at all in any of the areas within the recommended minimum buffer zones, and it may also be necessary to reduce the usual working day in those areas to prevent early morning working. We nevertheless take the view that workings should be entirely excluded from the buffer zone, as indicated elsewhere in this report.

5.54 The Application Statement puts forward no proposals for noise suppression. Although screening by soil bunds will clearly have an effect in terms of noise reduction, there are no sections through the bunds showing how their geometry will be effective in this regard. Reference has already been made to the noise aspect of plant and processing.

**Dust**

5.55 We have carried out an analysis of the likely effects of the proposals in terms of dust generation, with particular reference to our client’s interests. Our conclusions are set out at APPENDIX C to this report.

5.56 We conclude that, in terms of potential damage to human health and the ecosystem, and with reference to statutory nuisance there are no potential dust implications, which can be determined. However, additional dust deposition is certain to occur as a result of the workings during dry periods, and this is likely to be noticeable to those living near to the site.
6 RECOMMENDATIONS

6.1 We are aware of the strength of opinion against these proposals in and around Eynsham. We believe that the majority of local people feel that this site is unsuitable for mineral extraction and infilling, and seek the refusal of the application altogether. We do not contradict that approach. It has been our intention in this report to identify any aspects of the application proposals which fall below acceptable environmental standards. These have been described in the previous sections.

6.2 As a whole, our analysis lead us to the view that there is a concentration of anticipated and potential environmental impacts resulting from the northern section application proposals. This concentration calls into question the practicality and viability of mineral extraction in the northern section altogether. Nevertheless the decision as to whether to pursue this part of the proposals will be for the applicants to consider.

6.3 Our principal recommendations are as follows:-

* The County Council's minimum buffer zone distances from Eynsham and adjoining dwellings should be observed in full, with a 250m zone (820 ft) being preserved around the Isis Fish Farm and the concentration of dwellings at Eynsham Mill in order to protect both the dwellings and the food production operations there from dust and
other disturbance.

* The whole of the northern section and the westerly part of the site to the north of the A40 trunk road should be infilled with inert soils only because of the nuisance, hydrological and floodplain risks that will inevitably be attached to any bio-degradable infill.

* Reinstatement levels should be reduced as close as possible to existing ground levels in accordance with revised requirements for inert fill, in order to minimise intrusion into the flood water storage area.

* Full details of site dewatering proposals, with particular reference to discharge to watercourses and streams should be prepared prior to the consideration of the planning application, and careful monitoring should be carried out on site by officers of the County Planning Authority throughout the workings.

* Measures for dust suppression and noise reduction should be set out in detail, and should include silencing and covering of plant, conveyor belts and vehicles throughout the site.

* Archaeological investigations should be carried out across the whole application site in accordance with PPG 16 prior to determination of the application by the County Planning Authority.

* Further ecological investigations should be carried out, with particular reference to the pond to the north of the A40 roundabout.

* Proposals for the control of wind blown litter, to include fencing and netting of the site and all infill vehicles should be set out to the satisfaction of the County Planning Authority, and any such measures will need to be carefully monitored on site by
officers of the County Planning Authority.

6.4 Other effects shown in the matrix at section 2 to this report also need to be taken into account, and may require amendment or modification to the application proposals. These amendments should be put into effect in full before the County Minerals Planning Authority considers the application.

6.5 In our view, few of these problems would have arisen if the County planning Authority had required the submission of An Environmental Statement as part of the application. In view of the site's location within the Evenlode floodplain, and as a result of the close proximity to Eynsham and outlying properties, we believe there is a strong case for an Environmental Statement to be prepared. Whether or not a Statement is formally requested by the County Planning Authority, all the matters which we have identified require attention in order to comply with generally accepted good working practices.
APPENDIX A

ARCHAEOLOGICAL AND HISTORICAL STUDY
1. Brief

* To establish the archaeological situation in relation to the gravel extraction proposal in the vicinity of Eynsham Mill.

* To investigate the history of Eynsham Mill and its associated buildings and features.

* To advise on the implications of these factors on the gravel extraction proposal.

2. Geology and Topography

The area is on the gravels of X-Radley Terrace of the River Thames. These were laid down in two phases - in the cold Wolstonian glacial period and the warm Ipswichian interglacial 100,000 years ago. The gravels contain palaeolithic flint artifacts transported by the river or through solifluction in cold conditions. The valley floor is covered with alluvium over the gravel, constituting the flood plain of the river, probably formed over the last 3,000 years.

The river Evenlode flows roughly south from the Cotswolds to join the Thames north west of Oxford. The wide valley floor is quite flat, with ground rising from around 62m OD to 94m OD to the north of Cassington and to over 80m OD west of Eynsham. To the south of the confluence Wytham Hill rises to 164m OD. The area has
attracted settlement from prehistory times onward. There are several islands in the course of the Evenlode, formed as it meanders over the flat valley bottom.

Eynsham Mill is sited on the Evenlode about 2.5km north west of its confluence with the Thames, at a point where the flood plain is about 1km wide. There is no mill pond, but a leet is led off from the river 250m upstream to produce the head required to drive the wheel. The river is somewhat braided and there are four streams, drains or leets virtually parallel on the valley floor at this point.

3. European Policy Background

A 1985 European Community Directive (85/377) required that member states enacted legislation to ensure that certain types of development proposals were accompanied by an Environmental Statement (E.S.). In July 1988 the UK government passed the **Town and County (Assessment of Environmental Effects) Act**, which set out the types of development for which an E.S. would be required, and the scope of E.S. study.

Schedule 2 of the Act lists the types of extractive operation for which an E.S. may be required, and subsection 2(C) lists:

2.2c: extracting minerals (other than metalliferous and energy producing minerals) such as marble, sand, gravel, chalk, salt, phosphates and potash (my underline).
The Schedule 2 categories require an E.S. at the discretion of the planning authority (in this case West Oxfordshire District Council), who decide if the proposal

"would be likely to have a significant effect on the environment by virtue of factors such as its nature, size or location".

The Secretary of State in circular 15/88 highlighted situations which would trigger a Schedule 2 E.S. They are:

(a) where a project has more than local significance.
(b) where the location is particularly sensitive or vulnerable, e.g. an SSSI.
(c) where there may be an unusually complex and potential adverse environmental effect.

The scope of E.S studies may include studies of the effect of the proposals on people, flora, fauna, soil, water, air, climatic, landscape, material assets and the cultural heritage. This latter category includes archaeological sites, historical buildings and historic landscapes. It is possible that the adverse effects of this proposal may trigger the need for an E.S.

4. National Policies

Statutory protection for archaeology is principally enshrined in the Ancient Monuments and Archaeological Areas
Act of 1979, amended in 1983 by the National Heritage Act. Nationally important sites are listed in a Schedule of Ancient Monuments which is maintained by the Secretary of State for the Environment. Extensive areas of archaeological importance are designated as Archaeological Areas. Neither designation applies to the proposed application area.

Listed Buildings are protected under the provisions of the Planning (Listed Buildings and Conservation Areas) Act 1990, which empowers the Secretary of State for the Environment to maintain a list of built structures of historic or architectural significance. The criteria for listing are:

* all buildings built before 1700
* most buildings built between 1700 and 1840
* buildings of definite quality and character built between 1840 and 1914
* buildings built after 1914 are included only if they are of outstanding interest.

Particular attention is paid to design, formal layout, significance for social or economic history, technological innovation or association with historic persons or events. Group value is also considered.

Listed Buildings are graded I, II* and II. A previous category III has been abandoned, although a current review of the lists is reinstating some of these as Grade II. Some authorities retain a "local interest" category which has no statutory force, but which may be taken into account in planning decisions. Only 4% of Listed Buildings are
Grade I.

There are three listed structures on the site of Eynsham Mill. They are:

4/136 Eynsham Mill. (Grade II).
4/137 Bridge and attached weir wall. (Grade II).
4/138 Bridge. (Grade II).

The latter two structures are included for their group value.

Any works which would affect these, or their settings, would need Listed Building consent from West Oxfordshire District Council.

English Heritage.

English Heritage is the official body incorporated by the National Heritage Act 1983 with responsibility

"so far as is practicable to secure the preservation of ancient monuments and historic buildings in England".

It also has powers under the 1979 Ancient Monuments and Archaeological Areas Act to undertake archaeological
investigations and related work in pursuance of that objective, usually carried out by other bodies grant-aided by English Heritage. Its principal role in the current study would be advisory.

5. The DoE Planning Policy Guidance on Archaeology and Planning (PPG 16)

Non-statutory responsibility for archaeological sites is given by local authorities through county or district plans and policies. The Planning Policy Guidance (PPG 16) published by the DoE in November 1990 consolidates advice to local authorities on the treatment of archaeology in the planning process.

PPG 16 emphasises the importance of archaeology (paras 3-14) particularly in terms of the irreplaceability of the archaeological resource and its variety:

"Where nationally important archaeological remains, whether scheduled or not, and their settings, are affected by proposed development there should be a presumption in favour of their physical preservation".

PPG 16 also outlines the role of central government, English Heritage and local authorities, the importance of the latter is reiterated:

"... the key to the future of the great majority of archaeological sites and historic landscape lies with
local authorities .... appropriate planning policies in development plans and their implementation
through development control will be especially important"

Advice on the handling of archaeological matters in the planning process is given in paras 15-31. This section
identifies development plans as providing the policy framework for the protection, enhancement and preservation
of sites of archaeological interest and their settings. The Sites and Monuments Record (SMR), held usually by
county councils, is the primary source of data on such constraints. Applicants for planning permission are advised
to consult the SMR and county archaeological officer at the earliest opportunity to make an assessment of the
archaeological impact and put forward proposals for its mitigation prior to the determination of the application.

The need to understand the archaeological implications of proposals may require that an evaluation be undertaken
in advance of the determination of the application, if there is insufficient information available to assess the impact
(paragraphs 21-22). Sites with no known archaeology, but in areas of high potential may be expected to require
an evaluation. Failure to provide such information may result in the refusal of the application.

In our opinion the site of the proposal near Eynsham Mill would qualify as an area of high archaeological potential,
about which there is insufficient information to enable a reasonable assessment of the impact to be made and so
an evaluation should be required.

6. Local Policies
Oxfordshire Structure Plan Policies EN3 and EN6 to provide protection for archaeological, historic and other sites from the harmful effects of new development.

Minerals policies in the Structure Plan also provide specifically for the protection of historic and archaeological sites.

The 1988 Draft Minerals Local Plan is more specific about procedures, stating:-

**GM8** Before determining an application the Council will require an archaeological assessment which indicates:-

1) the character and state of preservation of any significant archaeological monuments, remains or buildings in, or immediately adjacent to, an application area (if any);

2) the likely impact of the proposal on such features; and

3) the means for mitigating the effect of the proposal through preservation or prior recording of the monument or building.

The map of the Cassington-Yarnton Area, while proposing the release of land for sand and gravel working,
identifies Eynsham Mill and its environs as an "Area of Greatest Objection".

The Cassington-Yarnton Sand and Gravel Plan, 1980 was prepared before the DoE advice in PPG 16 (1990). However, Map No. 7 shows Eynsham Mill surrounded by archaeological sites designated as "sites recommended for permanent preservation" or "sites where preservation is desirable and where excavation is essential before any development" and Eynsham Mill itself is designated as an "other site of interest". The known concentration of significant archaeology immediately adjacent to the proposal area would now, in the light of PPG 16, indicate the need for further work in the "gaps".

No specific reference has been made in the application to the proximity of three Statutory Listed Buildings, nor to the likelihood of archaeological remains which may require assessment, as set out in GM8.

West Oxfordshire District Council. The Rural Areas Review Local Plan (1988) contains policies to protect listed buildings and archaeological sites in amplification of Structure Plan policies.

All these development plans were written before the DoE published PPG 16 in November 1990, which advises that in areas of potential archaeological significance, where insufficient evidence is available, an evaluation should be carried out prior to the determination of an application. Although the development and mineral plans do not identify the proposal site as containing major archaeological features, they do show the importance of the Cassington-Yarnton area, and, by inference, the potential of the application site.
The proposals do not address the impact on the setting of the three Listed Buildings at Eynsham Mill, nor is there sufficient information to enable decisions to be reached regarding the investigation and recording of potential archaeological features prior to the commencement of development.

7. Non Statutory Agreements

The CBI Mineral Operators Code of Practice, 1983, advises on rules of conduct for operators and archaeologists in the consideration of archaeological remains. Article 1 states:

1. The operator will notify the relevant Archaeological Body as early as practicable of his intention to extend existing operations or to apply for planning permission for new development. Wherever possible he will give or procure rights of access for reconnaissance.

Article 4 states:

4. In the case of new development the operator will consult as necessary with the Archaeological Body concerning:

1. Time-table for a) stripping of topsoil, b) archaeological excavation and c) extraction.
2. Method of topsoil stripping, method of disposing of soil from archaeological excavation, and requirement (if any) for backfilling by Archaeological Body.

3. Definition of safe areas and access routes for the Archaeological Body during excavation. Legal liability for third parties.

4. Arrangements for access for watching brief by the Archaeological Body during topsoil stripping and mineral extraction.

5. Emergency procedures for dealing with unexpected discoveries made during stripping and/or extraction.

6. Procedure for deciding on deposition of artifacts recovered during stripping, excavation and extraction.

[The operator will send the Archaeological Body] details of the application for planning permission when submitted.

It is understood that none of these procedures have been considered or implemented.
A new Code of practice has recently been published, and is more stringent in its requirements with regard to archaeology and related procedures.

8. Archaeological and Historical Background

The Eynsham/Cassington area has been an important location for human settlement and activity for about 10,000 years. The combination of well-drained light soils adjacent to a navigable river and a natural overland routeway with a rich and varied hinterland has attracted relatively dense occupation.

Palaeolithic (up to c. 8,000 BC). The formation of the X-Radley Terrace gravels in the Wolstonian/Ipswichian periods marks the earliest period from which human remains may survive - about 100,000 years ago. A single axe has been found in the Evenlode just below Eynsham mill and another in Cassington, but such stray finds from the gravel beds cannot be used to argue for nearby settlement.

Mesolithic (c. 8,000 BC - c. 4,000 BC). In this period hunter-gatherer groups followed game and collected natural produce, probably utilising regular campsites within a wide territory. The early evidence for this period in the region includes sites interpreted as flint collecting camps on the high ground and finds associated with the River Thames - a likely focus of hunting and camping activities. Later mesolithic finds have also indicated riverside activities, and several microlithic cores have been found just north of Eynsham Mill. It is reckoned that in the latter part of the period human groups were beginning to modify the forest cover through fire-setting. This may
have begun to open up the riverside landscape; making it attractive both to game and human settlement.

Neolithic (c. 4,000 BC - c. 2,000 BC). This period saw the introduction of mixed farming and permanent settlement. There is very little evidence for the earliest phase of this economic transformation, but by the 3rd millennium BC major communal monuments such as long barrows, causewayed enclosures and settlement enclosures were being constructed. On the terrace gravels most features have been ploughed flat, but aerial photography can reveal the filled-in ditches and pits which mark their sites. At New Wintles Farm, Eynsham, a small cemetery was excavated, while another find of multiple burials was made a little to the east of Cassington. As in the mesolithic, it has been generally accepted that early and middle neolithic activity was concentrated around the rivers, spreading to the higher ground in the late neolithic. There have been many finds of neolithic flintwork and pottery in the Eynsham/Cassington area, and the accumulated evidence points to an as yet undiscovered settlement in the area, probably close to the cemetery.

Bronze Age (c. 2,000 BC - c. 800 BC). There is essentially a continuity between the late neolithic, beaker and early bronze age periods. The rich Wessex Culture, centred on upland resources, generated considerable wealth and prestige, and settlements along the Thames and its tributaries may well have serviced the dominant settlements on Salisbury Plain. Settlement evidence on the gravels is difficult to locate, but the presence of ploughed out burial complexes like those at Abingdon and Stanton Harcourt argue for a reasonable density of occupation. Aerial photography has shown several ring ditch clusters at City Farm and New Wintles Farm to the west of Eynsham Mill, and others on the east bank near Cassington. It is probable that the flood plain did not develop until the later
bronze age or the iron age, so the riverside gravels would have been dry and available for settlement or cereal production. Later in the bronze age the political and economic focus changed from Wessex to the lower Thames region, with a corresponding rise in the fortunes of riverside settlements.

Iron Age (c. 800 BC- c. AD 43). There is a general acceptance that at the turn of the 1st millennium BC there was a climatic deterioration, the temperature falling as much as 2°C coupled with increased rainfall. Together with human interference, through farming activities, this made some upland areas marginal and to made water tables higher. The flood plains of the Thames and its tributaries appear to have begun to form at this period, fed by silt brought down from the fields on the hills. The most prominent and characteristic settlement is the "hill fort", a development possibly related to increased population pressure and the emergence of tribal hierarchies. In the lowlands and on the gravel terraces settlements can be located through aerial photography. The houses were round huts and there appear to be many pits associated with these centres. A large (5.5 ha) enclosure at Cassington seems to have been a late iron-age defended settlement of considerable complexity.

The Romans (AD 43 - c. AD 410). Oxfordshire in this period was dominated by two main towns, Dorchester and Alchester, and by the economic requirement to supply the four largest towns in Britain - London, St Albans, Silchester and Cirencester. The first terrace gravels were probably intensively farmed for cereals, with the flood plains utilised for pasture. Settlement on the gravels seems to have been principally peasant based, although there are two possible villas north east of Cassington. The late iron-age defended settlement at Cassington probably continued in use into the Roman period. At the end of the Roman period there seems to have been another
climatic deterioration, which would have confirmed the pastoral tradition for the flood plain.

Saxon (c. AD 400-c. AD 700). Saxon mercenaries and soldiers serving in the Roman army are inferred from German style objects found at Dorchester and Shakenoake. Saxon occupation alongside or replacing the British population never seems to have been in large numbers, but by the mid 5th century small Saxon settlements were being established. At Purwell Farm and New Wintles Farm settlement and cemetery evidence for small, single family groups have been excavated. These seem to have formed part of a deliberate policy of local Saxon control of strategic points extending up the Thames and its tributaries from Dorchester. There are four distinct Saxon settlements in the Eynsham area; Eynsham itself, a major settlement mentioned the Anglo Saxon Chronicle under the year AD 571; New Wintles Farm, probably a sheep farming family; Purwell Farm, a "middle-class" establishment and Cassington, as yet undefined.

Pre-Conquest (c AD 700-1066). With the establishment of settled Saxon control the divisions of the administrative regions and the outlines of the feudal system began to emerge. Major towns took on renewed responsibilities as religious, economic, defensive and political centres, with Oxford gradually becoming pre-eminent. Eynsham grew into a small market town, no doubt surrounded by small farmsteads. The location of these is still unknown. By the time of the Domesday Survey of 1086 Eynsham was held by the Bishop of Lincoln, with a monk called Columbanus as his tenant. There was a mill with 12s and 450 eels. The Benedictine abbey, founded in the AD 1005 owned a church and 13 dwellings. It was one of 2 new Benedictine foundations in the county, the other was at Abingdon.
Medieval (c 1066-c 1530). The Abbots of Eynsham Abbey owned the mill in the medieval period and there was a dispute in 1295 between the abbey and the inhabitants of Cassington downstream, who broke down the mill pool bank to draw off the water. The meadow on the east bank - the Wersey (Worsey, Wyreshe) Meadow - was desmesne land. The land below the mill on the west bank is called Dovehouse Close, indicating the likely whereabouts of the medieval Dovecote. The black death in 1348-9 led to the abandonment of the hamlet of Tilgarsley in Eynsham parish, since lost. There were three small crofts occupying the riverside from the mill house up to the Hanborough parish boundary.

Post-medieval (c AD 1530-c 1800). The mill changed from grinding corn to making white paper by about 1682. By 1720 Thomas Meale, the master paper maker, was supplying paper for bibles printed at Oxford. In 1761 it was owned by John Brown, who insured his stock and the mill, possibly motivated by the fire of 1756 when it was "reduced to a heap of rubbish". The efficiency of the trade was increased by the construction of canals such as the spur canal to the Thames from Cassington. Part of the present Mill House belongs to this period.

Modern (c. 1800 onwards). Eynsham Mill was in the forefront of technical innovation in the 19th century. It was granted one of only 7 licenses to operate the new Fourdrinier machines in England in 1807. In 1856 Thomas Routledge was using esparto grass at Eynsham Mill. The main house block was added to the earlier building c 1800. The competition with coal powered industrial complexes proved too much for the most remote mills and Eynsham ceased paper making before 1880. In 1893 it was still owned by a firm called Eynsham Paper Mill Co. Ltd, but by 1919 it had been acquired by G.A. Shankland Ltd, a firm of glue and grease manufacturers. This
company became bankrupt and the mill was sold by the receivers in 1926. The machinery seems to have stood derelict until the second World War, when it was dismantled in aid of the War effort. Since 1977 it has been a private house and grounds, the centre of a fish farming enterprise.

9. Conclusions

Archaeology. Although there is no known archaeology on site, the archaeological potential is high. Virtually all the considerable prehistoric evidence in the general area is derived from aerial photographs or finds from gravel pits, but the application area is in the flood plain covered with alluvium, which masks aerial photographic traces. The density of nearby prehistoric remains would suggest that similar features may be expected on the proposal site.

The archaeological potential of the Eynsham-Cassington area is more than might be expected in other gravel terrace areas in the Upper Thames basin, as distribution maps of finds and sites demonstrates. The confluence of the Evenlode and the Thames attracted prehistoric settlers, post-Roman strategists and medieval merchants.

Policy statements from the County Council (para 6.3) indicate that where potential archaeology may be expected an evaluation should be carried out prior to the determination of the application, in order that appropriate mitigation procedures may be made the subject of agreement or conditions. PPG 16 points out that failure to produce such an evaluation may be cause for refusal (PPG 16, para. 22).
There may also be a case for an Environmental Statement, under Schedule 2/2c of the 1988 Act (see para 3), if significant environmental impact is expected from the proposed scheme. Such a statement would include the results of an archaeological evaluation.

An archaeological evaluation would normally assess existing sources of information, e.g. the County Council Sites and Monuments Records (SMR), aerial photographs, published records, archives, etc; and may also involve trial trenching (typically 2% of the threatened area), test-pits, field walking; and geophysical survey to establish what the archaeological potential may be.

The Listed Buildings. There is unlikely to be any direct physical effect on the Mill House Listed Building. The visual intrusion on the house is mitigated by the belt of trees screening them to the west, but the overall setting of the mill, on the valley floor, with its streams and leets will be seriously affected. The western bridge (Listed Building 4/138) may be affected visually. If the site is reinstated as agricultural land then these may be temporary effects.

10. Recommendations

The planning authority’s attention should be drawn to the potential archaeological threat posed by these proposals and a request made that the application should be refused on the grounds that no evaluation or assessment of the archaeology has been carried out, in contravention of national (PPG 16) county (GM8) and local (C010) policies,
as well as voluntary codes of conduct agreed with the CBI (para 7).
APPENDIX B

REPORT ON HYDROLOGICAL MATTERS
APPENDIX B REPORT ON HYDROLOGICAL MATTERS

1. The Surface Water System

Eynsham Mill lies within the floodplain of the River Evenlode. Just downstream of Eynsham Mill, the Evenlode had a catchment area of 430km² and a mean discharge of 3.37 cumecs. The Evenlode is characterised by a considerable variation in discharge owing to the varied geology of the catchment. During drought periods, as in 1975-76, the mean daily discharge fell as low as 0.17 cumecs. However, of greater concern is the potential for flooding, which occurs on a regular basis. Water quality in the Evenlode is good.

A tributary stream with a catchment area of about 8km² joins the Evenlode at Eynsham Mill. The water quality of this stream is poorer than in the Evenlode because of a sewage treatment works 2km upstream.

Eynsham Mill has a licence to abstract 3,300,000m³/year from the Evenlode. The take-off point is controlled by a system of sluices. This water is fed back into the Evenlode just downstream of Eynsham Mill.
2. The Groundwater System

Geology

The geological sequence in the Eynsham area is as follows:

- Alluvium - up to 1.5m of sand, silt and clay (recent age)
- River Terrace Deposits - up to 3m of stratified gravels with varying proportions of sand, silt and clay (Quaternary age)
- Oxford Clay - up to 20m of mudstones (upper Jurassic age)
- Sands, clays and limestones up to 110m thick (middle Jurassic age)

3. Hydrology

The available hydrogeological data indicates that two formations beneath the site area, the River Terrace Deposits and the middle Jurassic Limestones have good aquifer characteristics. In the Eynsham area, the limestones are present at a depth of 20-30m below ground level. In the vicinity of Eynsham Mill, there is only one borehole, at
New Wintles Farm, which is licensed to abstract 1800m$^3$/yr from the limestones. All other abstractions in and around the vicinity of Eynsham Mill are from a number of shallow large diameter wells. There are three unlicensed wells used for domestic purposes close to Eynsham Mill. Another well is located at what was known as Orchard Farm. Although now disused, this well has an abstraction licence for 160m$^3$/yr. There is also believed to be a shallow well at City Farm. The location of these wells and boreholes is shown on Figure ...

As the River Terrace Deposits are not generally overlain by more than about 1m of topsoil and alluvium, groundwater within these deposits is under unconfined conditions of flow. Groundwater levels are below the upper surface of the River Terrace deposits, with the water table generally lying between 1 and 3m below ground level. The water table fluctuates in response to changes in storage due to natural recharge and discharge. At times of high flows in the River Evenlode, the groundwater levels would be expected to rise close to ground level.

Water contained within the River Terrace Deposits is of good quality, with the water being a calcium bicarbonate-type water. Physio-chemical water quality measurements made at all the wells and boreholes in the vicinity of Eynsham Mill are given in Table 1. The groundwater in the River Terrace Deposits may have raised levels of nitrates as a result of local farming practices.
4. Implications of Gravel Extraction

Flooding

Prior to the gravel being worked in the northern block of land it is planned that bunds of topsoil and subsoil will be constructed around the periphery of the area. Since this area lies within the floodplain of the Evenlode, these bunds will have the effect of restricting the width of the floodplain, leading to an increase in the depth of flooding when the Evenlode overtops its banks.

Disturbance to the Water Table

Whilst gravel extraction is taking place, there will be a large excavation extending beneath the water table. The presence of a large excavation will have the effect of improving the groundwater levels in adjacent areas. There is a possibility that the yield of the nearby abstraction wells could be adversely affected.

Water Quality

If flood waters are able to enter the workings, water quality in the nearby abstraction wells may be adversely affected. In addition to this constraint, there is also the question of whether the Evenlode has the capacity to accept water pumped out of the excavation without exacerbating flooding problems. The wells in the vicinity of Eynsham
Mill are also particularly vulnerable to contamination from such events as oil spillages from equipment operating in the adjacent workings.

5. Implications of the Reinstatement Proposals

The restoration scheme for the gravel workings will eventually result in ground levels about 3m higher than at present in places. This will have the effect of restricting the width of the floodplain, leading to an increase in the depth of flooding when the Evenlode tops its banks.

Disturbance to Water Table

Unless the infill materials are strictly inert, the void will have to be dewatered before filling can take place. Dewatering, even in the short term, is likely to have a drastic effect on groundwater levels in the nearby abstraction wells and may even result in their becoming dry. The flow of nearby watercourses is also likely to be adversely affected.

Water Quality Implications

The use of anything other than inert infill materials could result in contamination of both the nearby abstraction wells and the fish farm, as well as leading to polluted waters entering the River Evenlode.
In addition, unless inert materials are used to infill the gravel workings, flood waters entering the excavation could become contaminated. These waters would have to be discharged to a nearby watercourse.

6. **Deficiencies in the Application for Gravel Working at Eynsham**

The scheme is deficient from the hydrological point of view in the following respects:

- The application is not sufficiently detailed to allow proper consideration of the proposed working methods;

- Backfilling will eventually result in ground levels being up to about 3m higher than at present; this is likely to exacerbate flooding around Eynsham Mill;

- Mineral extraction and processing may result in a decline in groundwater levels and a deterioration in groundwater quality in the wells abstracting water from the River Terrace Deposits. (The ground water in these strata would probably be defined as "specified underground waters" for the purposes of the Control of Pollution Act, 1974. If so, there would be a statutory obligation to protect groundwater quality, within these strata.)

- The application proposes that the excavations should be backfilled with materials that will produce leachate; this is clearly unacceptable given the close proximity of abstraction wells, watercourses and a fish farm.
<table>
<thead>
<tr>
<th>Sampling Location</th>
<th>Type of Sampling Point</th>
<th>Depth (m)</th>
<th>To Waterlevel (m)</th>
<th>EC (μS/cm)</th>
<th>T (°C)</th>
<th>pH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Eynsham Mill</td>
<td>Well</td>
<td>2.3</td>
<td>1.0</td>
<td>650</td>
<td>14.8</td>
<td>7.3</td>
</tr>
<tr>
<td>2. Bridge Cottage</td>
<td>Well</td>
<td>2.25</td>
<td>1.65</td>
<td>940</td>
<td>12.2</td>
<td>7.3</td>
</tr>
<tr>
<td>3. Isis Fish Farm</td>
<td>Well</td>
<td>2.40</td>
<td>1.4</td>
<td>800</td>
<td>11.8</td>
<td>7.6</td>
</tr>
<tr>
<td>4. New Wintles Farm</td>
<td>Borehole</td>
<td>24.0</td>
<td>(Access not possible)</td>
<td>1520</td>
<td>12.3</td>
<td>7.8</td>
</tr>
<tr>
<td>5. Orchard Farm Well</td>
<td>Well</td>
<td>2.50</td>
<td>1.9</td>
<td>870</td>
<td>12.5</td>
<td>7.7</td>
</tr>
</tbody>
</table>
I trust this application will not be determined until these details have been submitted and given appropriate consideration by the National Rivers Authority. Please do not hesitate to contact me should you require further details.

Yours faithfully,

[Signature]

for Technical Planning Manager

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Minerals Officer,
Oxfordshire County Council,
Speedwell House,
Speedwell Street,
Oxford,
OX1 1SD.

21st June 1991

Dear Sir,

PROPOSED: EXTRATION AND PROCESSING OF SAND AND GRAVEL INFILLING RESTORATION TO AGRICULTURE
LOCATION: LAND BETWEEN EYNSHAM AND CASSINGTON
APPLICANT: SMITH AND SONS (BLETHINGDON) LIMITED

Thank you for your letter of 20th May 1991.

Further to the telephone call between Sarah Turley and Mr. Lightbody of 14th June 1991, I confirm that the National Rivers Authority - Thames Region requires additional information regarding the above proposal in order to satisfactorily assess the impact on the water environment. Additional information is required as follows.

(1) The Water Resources section cannot comment on this application due to the lack of the following information.

(a) It is not stated whether the site is to be worked wet or dry by
dewatering.
(b) If dry by dewatering, which is the likely method, then the effects
of groundwater lowering on the surrounding streams and ditches have
not been addressed.
(c) The protection of the River Evenlode is not mentioned.
(d) The use of the dewatering water to mitigate the effects of
dewatering is not addressed.
(e) In short - no consideration of the effect of this large proposal on
the groundwater and surface water environment has been given the
slightest thought.

(2) Existing ground levels are required to determine the impact that the
proposal will have upon the flood plain and flood flows across the site.
I therefore recommend a ground level survey is carried out.
APPENDIX C REPORT ON DUST IMPACTS

1. Introduction

Smith & Sons (Bletchington) Ltd have submitted a planning application for the winning of sand and gravel. The application covers two areas of land to the north and south of the A40.

RPS Clouston have been asked to consider aspects of the potential environmental effects of the proposed scheme. This document considers the potential effects of dust from the proposed working of the northern section of land, and the potential environmental effects of restoration by controlled waste disposal.

2. The scheme

The northern site could be operated independently from the southern site. However the perceived need for screening and blending of some of the material present in the northern area creates an operational link with the proposed processing plant, which would be located to the south of the A40.

It is proposed to excavate 60 000 tonnes per year from the site for exportation by road. This will generate approximately 58 lorry movements per day, comprising 28 mineral lorry movements and 30 landfill lorry movements.
The planning application drawings show a 100m exclusion zone around some of the properties adjacent to the site. For this assessment we have assumed a similar zone should be shown for Eynsham Mill.

3. Dust Issues

There are two aspects of potential dust production which require consideration.

i. The potential for damage to human health and the ecosystem.

ii. The possibility of future occurrences of statutory nuisance for dust.

Mineral extraction produces dust with a wide range of particle sizes. Particles below 100 µm diameter may be captured in local airflow. Particles below 30 µm diameter are carried for significant distances before deposition. Guidelines for human exposure to particulate matter are currently under review by the World Health Organisation. Past recommendations have been based on limited information from the health effects of dust from coal burning. Further epidemiological studies should provide information on the effects of respirable dust. From the information available the WHO suggests effects on human health may be observed from long term exposure to concentrations above 180 µg/m³.

The River Evenlode is believed to support trout (Salmonid spp) and the fish farm at Eynsham Mill is stocked with trout. Salmonid species are most sensitive to pollution and changes in water quality. At the time of writing, no information
was available on the transfer of particulates across the air-water interface.

Section 79 of the Environmental Protection Act 1990 defines matters which constitute a statutory nuisance, including

"(d) any dust, steam, smell or other effluvia arising on industrial, trade, or business premises and being prejudicial to health or a nuisance;".

There is however no statutory description of the deposition rate which may be considered to constitute a nuisance. From experience, deposition of dust at and above the rate of 200 mg/m²/day results in complaints. Given a typical background dust deposition rate of 40 mg/m²/day this suggests an additional deposition of dust from the quarry of up to 160 mg/m²/day could be tolerated without causing a significant impact on quality of life.

4. The Assessment Methodology

The planning application and supporting statements have been reviewed. From this documentation it is clear that there is a high water table below the proposed site, but it is not clear whether a dry or wet working methodology will be adopted. Wet working will reduce the amount of dust produced by excavation activities, but will have no significant effect on dust production from haul roads.

In order to obtain a feel for the potential for dust production by the proposed activities, a mathematical modelling
exercise was undertaken. A scenario based on the planning application was developed, assuming haul roads located on top of the exposed gravel.

A number of models of atmospheric behaviour have been developed. The most widely used and accepted for contaminant dispersal studies is the Gaussian Plume model. This semi-empirical model assumes a Gaussian distribution of contaminants vertically and horizontally through the plume. The concentrations within a plume are related to the physical nature of the surface boundary layer. The standard method is to consider each of the stability classes as defined by Pasquill.

The Gaussian Plume model can easily be adapted for computer based calculation. For this study a programme developed for the United States Environmental Protection Agency (USEPA) called CALINE 3 was used (Benson, 1979). The programme can be used for the dispersion of any airborne contaminant, although in this study we have restricted our attention to suspended particulate material. As typically over 70% of all dust emissions from mineral extraction sites arise from haulage traffic, the modelling exercise has concentrated on these sources.

Two haul roads have been considered, one at the western boundary and one at the eastern boundary of the site, with a 100m exclusion zone around Eynsham Mill. The dispersion of dust from these roads to Eynsham Mill has been modelled for a range of wind speeds and directions. For a more detailed analysis, the meteorological conditions can be broken into Pasquill-Gifford classes. In this study we have considered a stability class of D, which typically accounts for 60% of annual observations in the UK.
The annual distribution of wind speeds and directions for the site is illustrated in Figure C1, which shows an annual wind rose for Brize Norton, the nearest weather station to the site. The dominant wind direction for the site is West-South-West.

Output from the modelling exercise gives airborne concentration of particulates, in µg/m³. In order to consider potential for nuisance, the daily deposition rates are then calculated, based on the given concentrations. Results of the modelling exercise are presented in the following section.

5. Conclusions on Dust Nuisance

For the modelled scenario, the predicted air concentrations and deposition rates do not represent a problem in terms of the guidelines given above in section 3 to this appendix. Certain operations on site may involve more intensive activity than that considered, for example during soil stripping an bund formation. However these occur for relatively short periods at any given location. The proposed method of soil handling does not use box scrapers which can give rise to large amounts of dust.

6. Waste Disposal

The proposal includes for the disposal of silt and clay processing wastes arising on the site, and imported dry commercial and industrial wastes. Industrial wastes is defined in the Control of Pollution Act 1974 (30(3)(a)) as
consisting "of waste from any factory within the meaning of the Factories Act etc.". This may include any non-
hazardous materials which nevertheless have the capacity to cause significant pollution. Biodegradable materials such
as paper and packaging, vegetable matter and building wastes such as plasterboard could be covered by these
classifications. Such materials could give rise to deoxygenating leachates and sulphate pollution.

It is stated that due to the nature of the proposed fill, the faces of the excavation will be lined with clay to form an
impermeable seal. The proposed fill materials will have the potential to pollute groundwater and surface waters
depending upon their exact composition and the speed of water ingress and egress.

The shallow groundwater abstractions located around the site are very likely to be influenced in physical and chemical
terms. Physical effects could result from the clay liner acting as a dam to natural groundwater movements. Chemical
effects could arise either from the disturbance to the present groundwater regime and due to contamination by leachates
from the tip. The extent of effect from leachate will largely depend upon the effectiveness of the tip liner. No
specification for the permeability and thickness of the liner have been supplied in the planning application, and therefore
the adequacy of the containment cannot be assessed.

At some time in the future, sufficient water will accumulate within the fill material that seepage occurs through the
walls of the tip into the surrounding environment unless the measure of leachate collection and removal is taken. This
is not proposed, and therefore the long-term consequences of leachate escape from the site should be addressed. There
may be little potential for the improvement of pollution as a result of dilution between the landfill and drinking water
abstractions due to the proximity of these to the site. Again, detailed predictions cannot be made due to the absence of information concerning groundwater flows around the site at present and under the proposed scheme.

Waste Management Paper Number 26, DoE, para 3.20 reads as follows:

_The protection of groundwaters is more difficult than that of surface waters and calls for a thorough investigation of the hydrogeological characteristics of the site to establish the fate of any leachate._

The local hydrogeology is not sufficiently well described to be able to assess impacts of pollution on the local water resources or the adequacy of the proposed pollution controls. Under these circumstances, the proposals present an unknown but possible significant effect upon the quality of the groundwater and surface water resources. Such impacts would contravene the Control of Pollution and Water Acts, and the National Rivers Authority, as statutory consultees to the planning application, is required to advise upon the sufficiency of the information and suitability of the proposals. The NRA is charged with the duty to maintain and improve the quality of classified waters, which will include the shallow gravel aquifer and the River Evenlode.
Appendix 5: EA Survey Flood Defence
River Evenlode

Levels on Flood Defence Wall around Eynsham Mill
Surveyed with VRS GPS

SURVEYED BY: Environment Agency
DATE: Oct 11
DATUM: ODN
DRN: KLH
CHKD: KLH

SCALE: NTG
GRID: National
DATE: Oct 11
DATE: Oct 11

CAD FILENAME: SURV11203
DRAWING NO. 11203
REV. —
Appendix 6: Cassington “A” Weir CWG
Cassington "A" Weir Daily Mean Levels over 10 Years starting 1-Sep-05

Flood Events:

The 2013/2014 flooding was continuous for 73 days and would have disrupted operations for about 87 days with surface water intervals.

The 2012/2013 had 4 high peaks causing disruption over 100 days disrupting operations for about 79 days with continuous flooding.

NB: July 2007 was a devastating "Flash Flood" over the red line for only two days.

- **Purple**: Level 0.84 M - Flow 23.1 M3/S - Near to or above this level 10 "High Flood" Events to contour 0.65 M (1 in 20)
- **Red**: Level 0.79 M - Flow 19.5 M3/S - Near to or above this level 20 "Substantially Flooded Fields" events (1 in 10)
- **Green**: Level 0.69 M - Flow 13.1 M3/S Even leaks regularly overflows its banks North of EMS
Appendix 7: Flood Map for Planning
Appendix 8: EA Risk of Surface Water Flooding Map
Risk of Flooding from Surface Water

Surface water flooding happens when rainwater does not drain away through the normal drainage systems or soak into the ground, but lies on or flows over the ground instead.

The shading on the map shows the risk of flooding from surface water in this particular area.

Click on the map for a more detailed explanation.

Map of OX28 4EJ at scale 1:10,000

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