Process Guidance Note 3/16 (04)

Secretary of State's Guidance for Mobile Crushing and Screening

defra
Department for Environment
Food and Rural Affairs

SCOTTISH EXECUTIVE

Llywodraeth Cynulliad Cymru
Welsh Assembly Government

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Environment Agency

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1 Introduction

1.1 This note is issued by the Secretary of State, the Welsh Assembly Government (WAG) and the Scottish Ministers ("the Government") to give guidance on the conditions appropriate for the control of emissions into the air from mobile crushing and screening processes/ installations[1]. It supersedes guidance note PG3/16(96) published in May 1996.

1.2 This is one of a series of notes giving guidance on Best Available Techniques (BAT) and Best Available Techniques Not Entailing Excessive Cost (BATNEEC)[2]. The notes are all aimed at providing a strong framework for consistent and transparent regulation of installations.

Site specific BAT/ BATNEEC

1.3 This note is for use under both Local Air Pollution Control (LAPC) established by Part I of the Environmental Protection Act 1990, and Local Air Pollution Prevention and Control (LAPPC) regime established by the Pollution Prevention and Control Act 1999[3]. It constitutes statutory guidance to regulators under regulation 37 of The Pollution Prevention and Control (England and Wales) Regulations 2000, SI 1973[4]. To the extent it provides guidance on techniques, it also constitutes statutory guidance to regulators under section 7(11) of the 1990 Act, and in any event regulators are expected to have regard to it. The note will be treated as one of the material considerations when determining any appeals made against a decision under either the 1990 or 1999 Acts.

1.4 The note also (where appropriate) gives details of any mandatory requirements affecting air emissions which are in force at the time of publication, such as those contained in Directions from the Government.

1.5 All processes are subject to BAT/ BATNEEC. In general terms, what is BAT/ BATNEEC for one process in a sector is likely to be BAT/ BATNEEC for a comparable process; but in each case it is, in practice, for regulators (subject to appeal) to decide what is BAT/ BATNEEC for the individual process and the regulator should take into account variable factors (such as configuration, size and other individual characteristics of the process) and the locality (such as proximity of particularly sensitive receptors[5]). Ultimately, therefore, what constitutes BAT/ BATNEEC is site specific but this guidance note comprises guidance for the generality of processes in the sector and careful regard should be had to it, in order to maximise consistency of permits as appropriate.

Who is affected

1.6 This guidance is for:

- regulators: who must have regard to the guidance when determining applications and reviewing extant authorisations and permits
- operators: who are best advised also to have regard to it when making applications, and in the subsequent operation of their process
- members of the public: who may be interested to know what the Government considers (in accordance with the legislation) amounts to appropriate conditions for controlling air emissions for the generality of processes in this particular industry sector

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1. The term "process (es)" is used in the remainder of the note to mean both "processes" under the Environmental Protection Act 1990 and "installations" under the Pollution Prevention and Control Act 1999.
2. BATNEEC is the formulation used in the Environmental Protection Act 1990 and BAT is used in the Pollution Prevention and Control Act 1999. For the purpose of this guidance note, the two concepts are regarded as having essentially the same effect.
3. In accordance with the Pollution Prevention & Control (England and Wales) (Amendment) Regulations 2002, SI 2002/275, mobile crushing and screening processes transfer from regulation under the 1990 Act to the 1999 Act from 1 April 2003. The relevant date in Scotland under Part 2 of schedule 3 to SSI 2000/323 is 31 December 2002.
4. In Scotland, section 24 of the Pollution Prevention and Control (Scotland) Regulations 2000.
5. Guidance on the relationship between BAT/BATNEEC and air quality objectives is contained in the General Guidance Manual on policy and procedures for A2 and B installations.

1.7 The guidance is based on the state of knowledge and understanding at the time of writing of:

- mobile crushing and screening processes,
- their potential impact on the environment and
- what constitutes BAT/ BATNEEC for preventing and reducing air emissions

1.8 The note may be amended from time to time in order to keep abreast with developments in BAT including improvements in techniques and new understanding of environmental impacts and risks. Such changes may be issued in a complete revision of this document, or in separate additional guidance notes which address specific issues. (It may not always be possible to issue amending guidance quickly enough to keep in absolute step with rapid changes, which is another circumstance where paragraph 1.5 above might apply.)

1.9 Steps will be taken to ensure that those who need to know about changes are informed. Operators (and their advisers) are, however, strongly advised to check with the regulator whether there have been any changes before relying on this note for the purposes of making an application under the 1990 or 1999 Acts or making any other decisions where BAT/ BATNEEC may be a consideration.

Consultation

1.10 This note has been produced in consultation with relevant trade bodies, representatives of regulators including members of the Industrial Pollution Liaison Committee, and other interested organisations.

Publication

1.11 This and the other published guidance in this series is available, free of charge, via Defra at www.defra.gov.uk. There are links to this site from the following web sites:

- Scottish Executive at www.scotland.gov.uk.
- Environment Agency at www.environment-agency.gov.uk.
- Scottish Environment Protection Agency at www.sepa.org.uk.

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1.12 General guidance explaining LAPPC and setting out the policy and procedures, is contained in the "General Guidance Manual on Policy and Procedures for A2 and B Installations" available from www.defra.gov.uk/environment/ppc/index.htm, referred to in this document as the "General Guidance Manual." This is designed for operators and members of the public, as well as for local authority regulators. In Scotland there is the SEPA Practical Guide for Part B activities available from www.sepa.org.uk/ppc/guidance/practicalguidepartbactivities.pdf

1.13 In addition to the General Guidance Manual referred to above, explanation or clarification of certain terms used in this guidance note may be found in a general guidance note issued under Part I of the Environmental Protection Act 1991: 'Interpretation of terms used in process guidance notes', known as General Guidance Note 4 - GG4 - published by HMSO in 1991. Where there is any conflict between GG4 and the guidance issued in this note or in the General Guidance Manual, the latter two documents should prevail, as should any subsequent guidance issued in relation to LAPPC.

2 Timetable for compliance and reviews

Existing processes or activities

2.1 The previous guidance advised that upgrading to that standard should usually have been completed by 1 April 1997. Requirements still outstanding from any existing upgrading programme should be completed.

Upgrading for this note

2.2 The new provisions of this note and the dates by which compliance with these provisions is expected are listed in the table below, together with the paragraph number where the provision is to be found. Compliance with the new provisions should normally be achieved by the dates shown. Authorisations/permits should be varied as necessary, having regard to the changes and the timetable.

Table 1: Compliance timetable

Provisions	Relevant Paragraph / Row	Compliance date
Avoidance of airborne visible emission across the site boundary	Table 2 Row 1	In most cases this provision should be met already. Where upgrading is required this should be carried out as soon as practicable
Visual assessments of emissions should be made frequently, and at least three times a day during operations. The time, location and result of these assessments should be recorded	5.4	3 months from the date of publication of this note
All other provisions	-	To be complied with as soon as practicable, which in most cases should be within 12 months of the publication of this note

2.3 Replacement plant should normally be designed to meet the appropriate standards specified for new installations or activities.

Relaxation of conditions

2.4 Where provisions in the preceding guidance note have been deleted or relaxed, authorisations should be varied as necessary as soon as reasonably practicable. Section 7 provides a summary of all changes.

New processes or activities

2.5 For new processes or activities, the authorisation/permit should have regard to the full standards of this guidance from the first day of operation.

Substantially changed processes or activities

2.6 For substantially changed processes or activities, the authorisation/permit should normally have regard to the full standards of this guidance with respect to the parts of the process that have been substantially changed and any part of the process affected by the change, from the first day of operation.

Permit reviews

Reviewing permits

2.7 Under LAPC the requirement is to review conditions in authorisations at least every four years. (Section 6(6) Environmental Protection Act 1990).

2.8 Under LAPPC the legislation requires permits to be reviewed periodically but does not specify a frequency. It is considered for this sector that a frequency of once every six years ought normally to be sufficient for the purposes of Regulation 15(1) Pollution Prevention and Control Regulations 2000.

More frequent review may be necessary in individual cases for the reasons given in Regulation 15(2). Further guidance on permit reviews is contained in chapter 26 of the General Guidance Manual. Regulators should use any opportunities to determine the variations to authorisations/permits necessitated by paragraph 2.2 above in conjunction with these reviews.

2.9 Under both LAPC and LAPPC, conditions should be reviewed where complaint is attributable to the operation of the process and is, in the opinion of the regulator, justified.

3 Process description

3.1 Mobile crushing and screening processes are prescribed for:

- **LAPC**, under section 3.4(a) of Schedule 1 to the Environmental Protection (Prescribed Processes and Substances) Regulations 1991, SI 472 (as amended).
- **LAPPC**, under section 3.1 Part B of Schedule 1 of the Pollution Prevention and Control (England and Wales) Regulations 2000 SI 1973[6].

3.2 This note refers to the crushing, grinding or other size reduction, with machinery designed for that purpose, of bricks, tiles or concrete, and other mineral products as designated by regulation. Also screening of demolition material prior to crushing and any other pretreatment activity and the screening of the product. (Note that screening of demolition material without any crushing is not prescribed)

3.3 The construction of stockpiles of crushed and screened demolition arisings at a recycling centre operated by the same person as the mobile plant used at that site, should normally be regarded as part of the process. On the other hand, the loading of crushed material into vehicles at a demolition site when undertaken by another contractor, would not be part of the process.

3.4 Further guidance on the authorisation of mobile plant is given in Appendix 2.

3.5 Mobile crushing plant is commonly used on demolition sites, at recycling facilities and at quarries.

Mobile crushing plant

3.6 A mobile crusher usually has a stationary steel jaw working with a moving jaw to crush and pulverise material. They are known as jaw crushers. There are also mobile cone crushers where the crushing takes place between a truncated revolving cone and an outer chamber. Free standing mobile crushing plants may be mounted on tracks, although this is not always the case. They tend to be no more than 20 metres in length, so can be used in confined spaces on small sites. These units are usually fed by rubber tyred loaders, back actors or dump trucks. Crushed material may be screened to separate two size ranges of particles, then is carried from the crusher by conveyor to be stockpiled close to the plant.

3.7 The material may be further screened either from the primary conveyor or from the stockpile; the larger material may be transferred to secondary or tertiary crushing units, screened again and stockpiled.

3.8 The screens are large sieves made of grate bars. They vibrate which causes the particles to be moved across the screen thus sorting out the particles by size. Screens can be integrated in the mobile crushing unit or can be free-standing mobile plant. They are commonly used to sort materials before crushing as well as after crushing.

3.9 Mobile crushing plant can be free-standing units or attachments to be fitted to other plant such as an excavator. The vast majority of mobile crushers are now tracked type which means they are delivered to site via low loader and can be put to work within half an hour of arriving on site.

6. In Scotland, section 6.3 Part B of Schedule 1 of the Pollution Prevention and Control, (Scotland) Regulations 2000 (SSI 2000/323).

Pulverisers (munchers)

3.10 Concrete crushing attachments, known as pulverisors, can be fitted to mini excavators or large excavators and lifted high up on large buildings, for example to aid with the processing of waste using long reach equipment. They can also be suspended from a mobile or tower crane to obtain a longer reach. Pulverisors can crush between 5 - 6 tonnes of material every hour.

Demolition waste

3.11 Mobile crushing plant can be used on site to process demolition waste. Where construction is to follow demolition on the site, concrete and steel can be recycled. Once material has been crushed and reduced in size, the arisings can be used on site as piling mats, backfill or for the construction of access roads. Recycling of onsite materials reduces the need to bring in primary aggregate for such applications and reduces the volume of waste material taken away to landfill. However, the option of transferring the demolition material to fixed recycling sites should be considered with regard to the optimisation of its potential and the environmental impact of on site activities.

3.12 With regard to the optimisation of the resources It is not ideal to mix the different materials as crushing a mixture results in a very low quality end product that is suitable only for fill. Separation of the materials leads to products suitable for much higher specification uses.

3.13 It should be noted that under a different regulatory regime, demolition contractors are required to inspect a site. Where the presence of asbestos is suspected then the Environment Agency, in England and Wales, or SEPA, in Scotland, has to be notified and special waste regulations must be complied with. Asbestos contaminated waste is required to be removed to a designated waste management site licensed to take asbestos. A consignment note from the national inspectorate is required for each load and a paper trail of movements of such waste is kept.

Fixed aggregate recycling sites

3.14 Fixed aggregate recycling sites may comprise a range of recycling activities. This PG note addresses the aggregate recycling where mobile crushers are used. Planning conditions address issues relating to traffic flow, noise and emissions to air (including stockpiles and visual impacts). These sites have a waste management licence or a letter of exemption which specifies the types of material allowed on the site.

3.15 All incoming material is visually inspected before acceptance on the recycling site. It is also inspected on tipping. In the event of unwanted material arriving on site it would be immediately returned.

3.16 Once the material is on site it is predominantly stocked in separate incoming stockpiles, wherever possible, to optimise quality of product, e.g. brick, concrete, asphalt/road planings. However, a mixture stockpile is sometimes inevitable for example, contaminated brick/concrete mix.

3.17 The material from the stockpiles will be pre-screened as necessary - then fed to the crusher and screened as described by the flow diagram. Crushers and screens may be moved between stockpiles on site, and between sites (by low loader).

Figure 3.1: Flow Diagram of Crushing and Screening Process

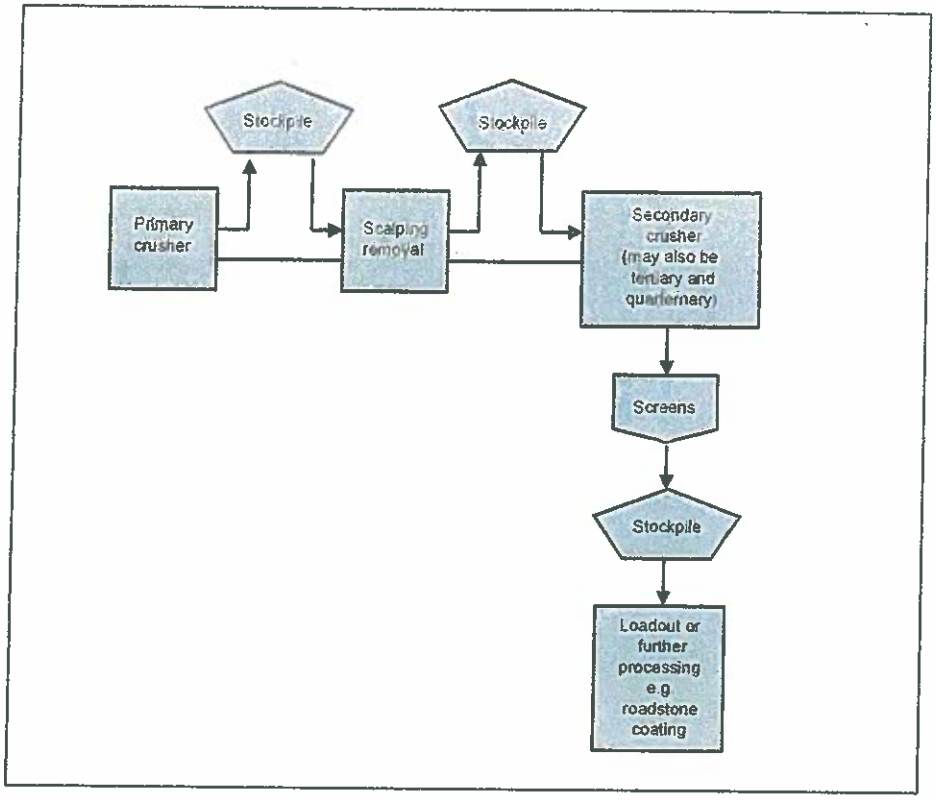
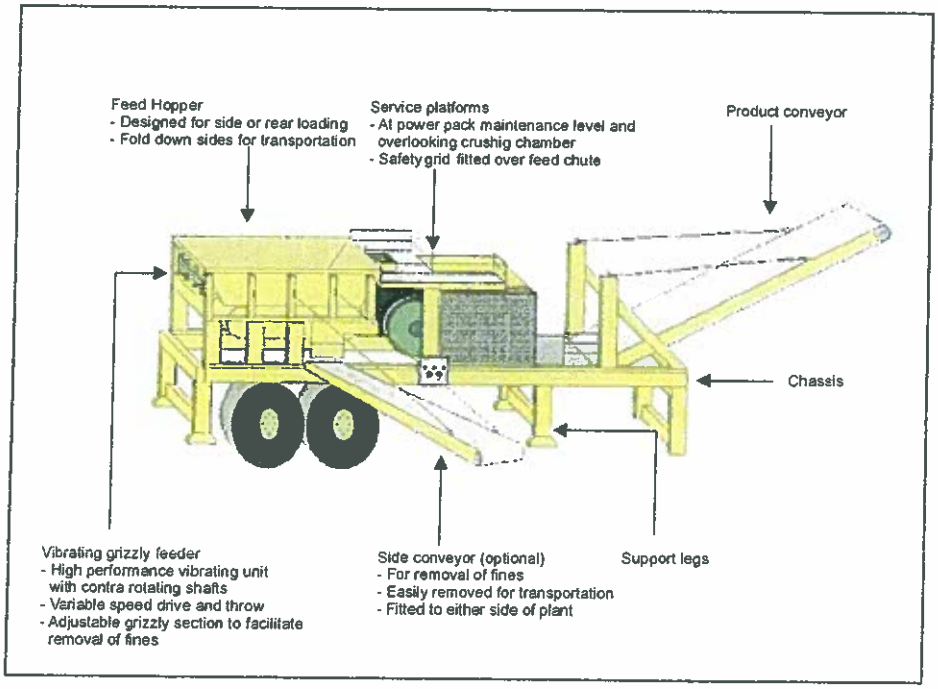


Figure 3.2: Outline diagram of a mobile primary jaw crusher (wheeled type)



4 Potential releases

4.1 The key emissions from these processes that constitute pollution for the purposes of Part I of the Environmental Protection Act 1990 or the Pollution Prevention and Control Regulations 2000 and therefore warrant control are those consisting of particulate matter.

4.2 The following parts of the process may give rise to particulate matter in the form of dust:

- crushing and grinding
- screening
- loading and unloading
- on-site transfer of dusty materials.
- stockpiles
- roadways, including haulage roads.

5 Emission limits, monitoring and other provisions

5.1 The emission limit values and provisions described in this section are achievable using the best available techniques described in Section 6. Monitoring of emissions should be carried out according to the method specified in this section or by an equivalent method agreed by the regulator. (See Ref. (e) (M1) and Ref. (f) (M2))

Table 2: Emission limits, monitoring and other provisions

Row	Substance	Source	Limit/ provision	Type of monitoring	Monitoring frequency
1	Particulate matter	Whole process	Avoidance of visible emissions crossing the site boundary	Recorded operator observations.	On start up and on at least two more occasions each day

5.2 The aim is to prevent an emission from the site which is harmful or offensive. This aim includes all sites, regardless of location. Proper site management and use of environmental controls can create a site that is substantially free from airborne particulate emissions due to the process. It is expected that the process can be controlled such that, even during minor emission incidents that might arise from time to time, there are no visible emissions more than about 10 metres from plant, conveyor or stockpiles. It is expected that any emission incidents will be brought under control as soon as they are observed and will not be allowed to cause an exceedance of the limits. It should be noted that the authorisation only seeks to control emissions from the prescribed process and that other operations on site, not controlled by the operator, such as demolition for example, may be giving rise to emissions which if unacceptable should be regulated using the appropriate regulatory regime.

Monitoring, investigations and recording

5.3 The need for and scope of testing, and the frequency and time of sampling depend on local circumstances, operational practice and the scale of operation. As part of proper supervision the operator will monitor emissions, make tests and inspections of the process and keep records, in particular:

- The operator should keep records of inspections, tests and monitoring, including all non-continuous monitoring, inspections and visual assessments. The records should be:
  - kept on site
  - kept by the operator for at least two years; and
  - made available for the regulator to examine
- any historical records kept off-site should be made available for inspection within one working week of any request by the regulator.

Visible emissions

5.4 Emissions should be limited and monitored. Site operations likely to be of a long duration n require monitoring stations to be set up around the site, using deposition gauges demonstrate that arrestment techniques are controlling emissions satisfactorily. This wo be a site-specific provision depending upon the nature of the contract being undertak Abnormal emissions require action as described in paragraph 5.5.

- Emissions from combustion processes should in normal operation be free from visible smok and in any case should not exceed the equivalent of Ringelmann Shade 1 as described in B ish Standard BS 2742:1969.
- Visual assessments of emissions should be made frequently, and at least three times a day during operations. The time, location and result of these assessments should be recorded.
- Where, in the opinion of the regulator, there is evidence of airborne dust from the process off the site, corrective action should be taken without delay. If the source of the emission is uncertain the operator should make their own inspection and assessment, and where neces sary undertake ambient monitoring with the aim of identifying those process operations giving rise to the dust. The monitoring may either be by a British Standard method or by a method agreed with the regulator. In these situations, determination of wind direction may be required.
- All releases to air, other than condensed water vapour, should be free from persistent visible emissions.
- All emissions to air should be free from droplets.

Abnormal events

5.5 The regulator needs to be notified about certain events, whether or not there is relate monitoring showing an adverse result, and the operator should respond to problems whic may have an adverse effect on emissions to air.

- In the case of abnormal emissions, malfunction or breakdown leading to abnormal emissions the operator should:
  - investigate and undertake remedial action **immediately**
  - adjust the process or activity to minimise those emissions; and
  - promptly record the events and actions taken
- The **local** regulator in whose area the plant is operating should be informed without delay if there is an emission that is likely to have an effect on the local community, **as well as** the authority that issued the authorisation.

Notifying regulator of operations

5.6 The regulator needs to be notified of mobile crusher activities and requires the operator t respond to problems:

- The Pollution Control or Environmental Health Department of the local authority in whose area the plant is operating in England or Wales, or the local SEPA office in Scotland, should be informed of the operational work plan prior to operations commencing. The local enforcing authority that authorised the mobile crusher operation should also be informed. This should also apply in the event that mobile plant is brought onto a quarry site.

6 Control techniques

Summary of best available techniques

6.1 The following table provides a summary of the best available techniques that can be used control the process in order to meet the emission limits and provisions in Section 5. Provid that it is demonstrated to the satisfaction of the regulator that an equivalent level of control w be achieved, then other techniques may be used.

Table 3: Summary of control techniques

Sources of particulate matter	Control technique
Loading and unloading processes • Transfer of materials	Containment Suppression Reduced drop heights • use of variable height conveyors • use of chutes
Double handling transfer points	Site and process design
Stockpiles	Wind dynamics management • use of fencing, bunding, profiling etc. Reduced drop heights Suppression • water and/or suppressants • sufficient coverage by sprays Covering • below ground or covered stock bins • dust covers • housing
Crushing, grinding, screening and separation	Containment Dust arrestment Suppression
Conveyors, conveyor transfer points	Containment • wind boards Appropriate siting • away from site boundary especially if near residential or other sensitive receptors
Blending, packing processes etc	Containment Reduced drop heights Dust arrestment • bag filters / cartridge filters
Roadways including haulage roads	Suppression • site and process design
External operations • Conveyors • Stockpiles • Roadways	Appropriate siting • away from site boundary especially if near residential or other sensitive receptors Wind dynamics management • use of fencing, bunding, profiling etc
Vehicles - bodies and wheels	Wheel-wash and under-body vehicle wash

Techniques to control emissions from contained sources

6.2 The crushing, grinding and screening plant and the stockpiles of crushed material should designed, set up and operated in such a way that any substances released have the minim impact on the environment. The operator should have reviewed all available techniques, a be able to demonstrate that the selection of process equipment and dust control strateg represent BAT. In addition to technical and technological means the use of BAT sho incorporate adequate training of site operatives and supervision of the process.

6.3 Best available techniques are required to control dust emissions, for example from recepti and storage of potentially dusty materials, internal transportation (whether in vehicles, fr loaders or on conveyors), size reduction operations, stockpiles, loading and unloading. A other potential fugitive emissions, such as roads and other surfaces, need to be controlle The layout, design, construction and maintenance of the process equipment is extrem important to control of emissions and require the attention of experienced, compet personnel.

6.4 The main principles for preventing dust emissions are containment of dusty processes a suppression of dust using water. Suppression techniques need to be properly designed, us and maintained, in order to be effective. For example, where water is used for du suppression, processes require an adequate supply of water and all water suppressio systems need adequate frost protection. For information, discharges from the use of wa suppression will be subject to Environment Agency regulation under Groundwa Regulations 1998.

Stockpiles and ground storage

6.5 Consideration should be given to the siting of potentially dusty stockpiles, based upon su factors as the prevailing winds, proximity of neighbours to the site boundary and s operations. Minimisation of drop height is very important in stockpiling to reduce win whipping of particulates. Wherever possible, loading/unloading should take place at sheltere points around the stockpile to prevent entrainment of dust in the wind.

6.6 When necessary to control dust emissions from stockpiles, methods such as limiting the height of stockpiles or using dust suppressants may be used. Other possible controls include wind-breaks on stock piles, bunding or fencing around the pile and strategic arrangement stockpiles. Periodic conditioning with water, according to weather conditions, may be a appropriate measure. Installation of fixed water sprays should be considered for long term stocking areas if appropriate given the nature of the material stored. If necessary, covers or dust suppressants should be used.

- Loading to and from stockpiles, and construction and management of stockpiles should be carried out in such a manner as to minimise wind-borne dust, e.g. taking place at sheltered points.
- No material should be stored in the open except for:
  (a) material that has been screened to remove material 3 mm and under;
  (b) sand;
  (c) scalpings;
  (d) material used for road sub-bases (commonly known as "MOT material", or "type 1" or "type 2" material) that has been conditioned before deposition;
  (e) crusher run material that has been conditioned before deposition;
  (f) material under 3 mm where the volume is in excess of the internal storage capacity (th internal storage capacity should be approved by the local enforcing authority).
- Where the only practicable option for the storage of material under 3mm is external stock-piles, particularly careful consideration should be given to the guidance outlined in this guid-ance note.
- Storage areas where there is vehicular movement should either have a consolidated surface which should be kept clean and in good repair, or should be kept wet. Sweeping, wetting or sealing are all techniques that may be used to reduce dust emissions from roads. The tech-nique that should be used depends upon the type of road under consideration.

- To control dust emissions from stockpiles, storage bays should be used. If necessary, covers or dust suppressants should be used.
- When using storage bays, storage height should be lower than external walls of the bays unless suppression is provided to control emissions. Stock should not be piled forward of the bay.
- Where dusty materials are stored, stockpiles should be wetted where necessary to minimise dust emissions. Fixed water sprays should be installed for long term stocking areas if appropriate.
- Conditioning with water or proprietary conditioning agents should take place at or before the point of discharge from the conveyor.
- Stockpiles should be suitably profiled and conditioned with water or proprietary conditioning agents, according to weather conditions.
- All processed materials that have not been screened to remove material under 3mm should be conditioned with water or proprietary conditioning agents at or before the point of discharge onto the stockpile.
- Storage areas should be kept in a condition that does not give rise to visible dust emissions.
- Unused stocking areas should also be controlled to prevent visible dust emissions.

Process operations

Crusher processes

6.7 The control of dust emissions from these processes is mainly by the use of suppression and appropriate siting of equipment. Crushers can be inter-linked with water flow detectors so that they cannot operate unless a water supply is operational. High pressure, low volume water sprays over the feed area should provide adequate dust control if operated correctly.

Where the pressure of the water on site is not adequate to maintain the dust suppression then extra pumps can be used to increase the water pressure. Extra pumps can sometimes be necessary both in the event that water is delivered by bowser and where it is delivered by mains supply.

Material with an inherent moisture content greater than 3% e.g. sand or gravel, would not be expected to give rise to emissions of dust, so the following controls would probably not be necessary when such materials are being handled. In winter materials may not require the same degree of suppression in order to achieve the emission limits.

It is unlikely that screens give rise to significant quantities of airborne dust as the top screen handles larger material and the lower screens handling the finer material are enclosed. Materials should be deposited carefully onto screens to minimise dust emissions.

Total containment might be an option. Crushers should be totally contained or fitted with a water suppression system over the crusher aperture.

- Crushers should be totally contained or fitted with a water suppression system over the crusher aperture.
- Where the use of water as a method of dust suppression is necessary in order to meet the emission limits, it should be used. In such circumstances, if water of the required pressure is not available for use on the suppression system, then the process should not operate.
- Where water suppression does not provide adequate dust control to comply with the emission limits then the process should be carried out under cover. If necessary dust extraction and arrestment should be employed.

- Where water suppression does not provide adequate dust control to comply with the emissi limits then the process should be carried out under cover. If necessary dust extraction and arrestment should be employed.
- If dust extraction and arrestment plant is required to meet the emission limits then this shoul be operational.
- The discharge from crushers and screens onto conveyors or into other equipment should b enclosed as far as is practicable.
- Deposits of dust on external parts of the plant should be cleaned off at the end of each work ing day in order to minimise the potential for wind entrainment.

Techniques to control fugitive emissions

6.8 Fugitive dust emissions should be prevented whenever practicable. When this is n practicable emissions should be controlled at source by measures agreed between th regulator and the operator. Examples include correct storage of raw materials, organising th process in such a way that spillage is avoided, and maintaining high standards housekeeping. Attention should be paid to preventing and cleaning up deposits of dust external support structures, in order to minimise wind entrainment of deposited dust.

Conveying

6.9 All new conveyors should be designed to minimise dust emissions at discharge points. material has already been screened to remove material under 3mm size then it might not considered as dusty. Operational experience on site would enable decisions to be made with regard to the dustiness of conveyed material. In any case, equipment should be available to enable operations to comply with the authorised emission limits. Regard should be had how material cleaned from conveyors is dealt with.

- Conveyors should be of sufficient capacity to handle maximum loads without spillage.
- Where dusty materials are conveyed, the conveyor and any transfer points should be provided with adequate protection against wind whipping.
- The conveyors should be fitted with means for keeping the belt clean.
- Where chevron belts are used, catch plates should be fitted to contain dust falling from the underside of the belt at the turning point.
- Conveyor belts should not be overloaded.
- Where the design of the conveyor allows free fall of material to occur, techniques should be used at the point of discharge to minimise this, for example the use of a chute or similar equipment.
- Where water is available it should be used at conveyor discharge points for dust suppression. (This may not be necessary where the material has already been screened to remove material under 3mm size.)
- The last metre of any final size discharge conveyor or stockpile discharge conveyor and the first 0.5 metre of the free fall of materials from conveyors carrying material of a consistent size and shape, should be fitted with a full hood. (The hood ensures that the application of water from spray bars at this point is most effective.)

Loading/unloading

6.10 The principle is that loading and unloading processes should be carried out so as to minimi the generation of airborne dust.

- Vehicles should be loaded in such a way as to minimise airborne dust emissions, for example by loading with wet materials, or by using a load out area protected by enclosure or a dus suppression system.
- The vehicle should be sheeted or otherwise totally enclosed as soon as possible after loadin and before leaving the site. This need not be applied to the loading of crushed material greater than 75 mm.
- Loading and unloading of rail vehicles should be as agreed between the operator and the reg ulator.

Roadways and Transportation

6.11 Transport of dusty materials should be carried out so as to prevent or minimise airborne du emissions. When setting up on a new site, consideration should be given to a site layo minimising vehicle movement. It is preferable that potentially dusty material being delivered t the site should be sheeted or held in closed containers before being admitted to the site.

6.12 On some sites wheel-cleaning facilities may be useful to prevent dust being carried off the sit should be provided and used by vehicles before leaving the site. Where the plant is co located with a quarry which is not a prescribed process, it may not be appropriate.

- Where necessary, wheel-cleaning facilities should be provided and used by vehicles before leaving the site.
- Processed materials likely to generate dust should be conditioned with water prior to internal transfer.
- Roadways in normal use and any other area where there is regular movement of vehicles should have a consolidated surface capable of being cleaned. They should be kept clean in order to prevent or minimise dust emissions. They should be kept in good repair.

Air quality

Ambient air quality management

6.13 In areas where air quality standards or objectives are being breached or are in serious risk o breach and it is clear from the detailed review and assessment work under Local Air Quality Management that the Part B process itself is a significant contributor to the problem, it may be necessary to impose tighter emission limits. If the standard that is in danger of being exceeded is not an EC Directive requirement, then industry is not expected to go beyond BAT to meet it. Decisions should be taken in the context of a local authority's Local Air Quality Management action plan. For example, where a Part B process is only responsible to a very small extent for an air quality problem, the authority should not unduly penalise the operator o the process by requiring disproportionate emissions reductions. More guidance on this is provided in paragraph 360 of the Air Quality Strategy which gives the following advice:

"The approach from local authorities to tackling air quality should be an integrated one, involving all strands of local authority activity which impact on air quality and underpinned by a series of principles in which local authorities should aim to secure improvements in the most cost-effective manner, with regard to local environmental needs while avoiding unnecessary regulation. Their approach should seek an appropriate balance between controls on emissions from domestic, industrial and transport sources and draw on a combination and interaction of public, private and voluntary effort."

Management

Management techniques

6.14 Important elements for effective control of emissions include:

- proper management, supervision and training for process operations;
- proper use of equipment;
- effective preventative maintenance on all plant and equipment concerned with the contr of emissions to the air; and
- it is good practice to ensure that spares and consumables are available at short notice in order to rectify breakdowns rapidly. This is important with respect to arrestment plant an other necessary environmental controls. It is useful to have an audited list of essential items.

▸ Spares and consumables - in particular, those subject to continual wear - should be held on site, or should be available at short notice from guaranteed local suppliers, so that plant breakdowns can be rectified rapidly.

Appropriate management systems

6.15 Effective management is central to environmental performance; it is an important compone of BAT and of achieving compliance with permit conditions. It requires a commitment establishing objectives, setting targets, measuring progress and revising the objective according to results. This includes managing risks under normal operating conditions and accidents and emergencies. It is therefore desirable that processes put in place some form structured environmental management approach, whether by adopting published standar (ISO 14001 or the EU Eco Management and Audit Scheme [EMAS]) or by setting up ar environmental management system (EMS) tailored to the nature and size of the particul process. Operators may also find that an EMS will help identify business savings.

Regulators should use their discretion, in consultation with individual operators, in agreeing the appropriate level of environmental management. Simple systems which ensure th LAPC considerations are taken account of in the day-to-day running of a process may w suffice, especially for small and medium-sized enterprises. While authorities may wish to encourage wider adoption of EMS, it is outside the legal scope of an LAPC authorisation/LA-PPC permit to require an EMS for purposes other than LAPC/LA-PPC compliance. For furth information/advice on EMS refer to EMS Additional Information in Section 8.

Training

6.16 Staff at all levels need the necessary training and instruction in their duties relating to control of the process and emissions to air. In order to minimise risk of emissions, particul emphasis should be given to control procedures during start-up, shut down and abnorm conditions.

Training may often sensibly be addressed in the EMS referred to above.

▸ Training of all staff with responsibility for operating the process should include:

- awareness of their responsibilities under the permit, for example;
- minimising emissions on start up and shut down
- action to minimise emissions during abnormal conditions

▸ The operator should maintain a statement of training requirements for each operational post and keep a record of the training received by each person whose actions may have an impac on the environment. These documents should be made available to the regulator on request.

Maintenance

6.17 Effective preventative maintenance should be employed on all aspects of the proces including all plant, buildings and the equipment concerned with the control of emissions to ai In particular:

▸ A written maintenance programme should be provided to the regulator with respect to pollution control equipment; and

▸ A record of such maintenance should be made available for inspection.

7 Summary of changes

Reasons for the main changes are summarised below.

Table 4: Summary of changes

Section and paragraph	Change	Reason	Comment
Emission limits, monitoring and other provisions			
Table 2 Row 1 Particulate matter	Avoidance of visible airborne emissions across the site boundary. Recorded operator observations	Demonstrable provision	Proper control of the process should ensure that this is achieved
5.5	Visual assessments of emissions should be made frequently, and at least three times a day during operations. The time, location and result of these assessments should be recorded	Better control	Requirement used to be at least daily
Control techniques			
6.16	The operator should maintain a statement of training requirements for each operational post and keep a record of the training received by each person whose actions may have an impact on the environment. These documents should be made available to the regulator on request.	Good management practice.	
6.17	A written maintenance programme should be provided to the regulator with respect to pollution control equipment	Good management practice which should ensure preventative maintenance is properly considered and planned. Preventative maintenance protects against incidents due to plant failure.	

8 Definitions and further information

This guidance	Process Guidance Note 3/16(04)
Previous guidance	Process Guidance Note 3/16(96) which in its turn replaced PG3/16(91)
LAPC	explained in the Introduction of this guidance
LAPPC	explained in the Introduction of this guidance
Permit	the written permission to operate an installation prescribed for LAPPC – (the replacement for authorisation under LAPC)
Authorisation	the written authority to operate a process prescribed for LAPC - (will be replaced by permit under LAPPC)
Local enforcing authority	is replaced by the word 'regulator' in LAPPC
Regulator	replaces the phrase 'local enforcing authority' from LAPC
Existing process	should be taken to have the following meaning (which is based on paragraph 14 of Schedule 3 to SI 1991 /472): • a process which was being carried on at some time in the 12 months immediately preceding the first day of the month following publication of this guidance note; • a process which is to be carried on at a works, plant or factory or by means of mobile plant which was under construction or in the course of manufacture or in the course of commission on the first day of the month following publication of this guidance note, or the construction or supply of which was the subject of a contract entered into before that date.
New process	not an existing process.
Authorised person	under section 108 of the Environment Act 1995, "authorised person" has replaced the term "inspector".
Installation	should be interpreted in accordance with the guidance contained in the the General Guidance Manual on Policy and Procedures for A2 and B Installations. www.defra.gov.uk/environment/ppc/manual/index.htm
Process	the term "process has been used in this guidance note to refer to both "processes" under the Environmental Protection Act 1990 and "installations" under the Pollution Prevention and Control Act 1999.

Health and safety

Operators of processes and installations must protect people at work as well as th environment:

- requirements of a permit or authorisation should not put at risk the health, safety or welfare of people at work
- equally, the permit or authorisation must not contain conditions whose only purpose is to secure the health of people at work. That is the job of the health and safety enforcing authorities

Where emission limits quoted in this guidance conflict with health and safety limits, the tighte limit should prevail because:

- emission limits under the Environment Protection Act 1990 or Pollution Prevention and Control Act 1999 relate to the concentration of pollutant released into the air from prescribed activities
- exposure limits under health and safety legislation relate to the concentration of pollutant in the air breathed by workers
- these limits may differ since they are set according to different criteria. It will normally be quite appropriate to have different standards for the same pollutant, but in some cases they may be in conflict (for example, where air discharged from a process is breathed by workers). In such cases, the tighter limit should be applied to prevent a relaxation of control

EMS additional information

Further information/advice on EMS may be found from the following:

- Envirowise at www.envirowise.gov.uk and www.energy-efficiency.gov.uk and Environment and Energy Helpline freephone 0800 585794
- ISO 14001 www.bsi.org.uk or telephone BSI information centre (020 8966 7022)
- EU Eco Management and Audit Scheme (EMAS) www.emas.co.uk or telephone the Institute of Environmental Management and Assessment (01522 540069)

Regulators and process operators may also like to be aware of:

BS 8555: a new standard to help SMEs implement an EMS, by offering a five-phase approach, is contained in BS 8555 which was published in 2003 following on from work undertaken by the Acorn Trust. The Institute of Environmental Management and Assessment, which has taken over the Trust's activities, is developing a scheme of accredited recognition for companies achieving different phases of BS 8555. BS 8555 can be used to achieve ISO 14001 and registration to the higher standard, EMAS.

Some of the **High Street banks**, such as NatWest and the Coop, now offer preferential loan rates to organisations that can demonstrate they are committed to improving their environmental performance. The NatWest also produce a self help guide for SMEs, 'The Better Business Pack', focusing on waste, utilities, transport and supply chain issues. It gives tools, guidance and examples. Contact: WWF-UK on 01483 426444.

References

(a) Secretary of State's Guidance (England and Wales): General Guidance Manual on Policy and Procedures for A2 and B Installations , March 2003 - available from the Defra web-site and, in hard copy, from the Defra Publications line 08459 556000 www.defra.gov.uk/environment/ppc/index.htm

(b) DOE/WO Additional Guidance AQ17(94), issued to local authorities by the Air and Environment Quality Division of DEFRA and by the Welsh Office, provides further advice on the assessment of odour. The Scottish equivalent of AQ17(94) is SN 11(94)

(c) Current air quality objectives are specified in:
- The Air Quality (England) Regulations 2000 SI 928
- The Air Quality (Wales) Regulations 2000 SI 1940
- The Air Quality (Scotland) Regulations 2000 SI 97

(d) HMIP Technical Guidance Note D1: "Guidelines on Discharge Stack Heights for Polluting Emissions", published by The Stationery Office, ISBN 0-11-752794-7.

(e) M1 Sampling requirements for monitoring stack emissions to air from industrial installations, Environment Agency July 2002 (EA website)

(f) M2 Monitoring of stack emissions to air. Environment Agency May 2003 (EA website)

(g) BS 2742:1969: "Notes on the use of Ringelmann and miniature smoke charts".

(h) BS 3405:1983: "Method for measurement of particulate emission including grit and dust (simplified method)".

(i) BS ISO 9096:2003: Stationary source emissions. Manual determination of mass concentration of particulate matter.

Web addresses

The final consultation drafts and final published versions of all guidance notes in this serie can be found on www.defra.gov.uk/environment/index.htm.

Welsh Assembly Government web-site www.wales.gov.uk.

Local Authority Unit of the Environment Agency for England and Wales. www.environment-agency.gov.uk.

Scottish Environment Protection Agency (SEPA) www.sepa.org.uk.

Energy saving and environmental management measures can increase industry profits Envirowise (formerly ETBPP) show how at www.envirowise.gov.uk (or freephone 080-585794).

Appendix 1: Extract from Pollution Prevention and Control (England and Wales)[7] Regulations 2000 SI 1973[8]

(The processes for local air pollution prevention and control are listed under "Part B". The "Par A1" processes are for national regulatory control. The "Part A2" processes are subject to local authority integrated pollution prevention and control.)

Section 3.5 Other Mineral Activities

Part A (1)

Nil

Part A (2)

Nil

Part B

(a) Unless falling within Part A(1) or Part A(2) of any Section in this Schedule, the crushing, grinding or other size reduction, other than the cutting of stone, or the grading, screening or heating of any designated mineral or mineral product except where the operation of the activity is unlikely to result in the release into the air of particulate matter.

(b) Any of the following activities unless carried on at an exempt location -

(i) crushing, grinding or otherwise breaking up coal, coke or any other coal product;

(ii) screening, grading or mixing coal, coke or any other coal product;

(iii) loading or unloading petroleum coke, coal, coke or any other coal product except unloading on retail sale.

(c) The crushing, grinding or other size reduction, with machinery designed for that purpose, of bricks, tiles or concrete.

(d) Screening the product of any activity as is described in paragraph (c).

(e) Coating roadstone with tar or bitumen.

(f) Loading, unloading or storing pulverised fuel ash in bulk prior to further transportation in bulk.

(g) The fusion of calcined bauxite for the production of artificial corundum.

7. For activities carried out in Scotland the PPC (Scotland) Regulations should be referred to. For activities carried out in Ireland the PPC (Ireland) Regulations should be referred to.
8. Every effort has been taken to ensure that this Appendix is correct at the date of publication, but readers should note that the Regulations are likely to be subject to periodic amendment, and this Appendix should not therefore be relied upon as representing the up-to-date position after the publication date.

Interpretation of Part B

1. In this part -

"coal" includes lignite;

"designated mineral or mineral product" means -

(i) clay, sand and any other naturally occurring mineral other than coal or lignite;

(ii) metallurgical slag;

(iii) boiler or furnace ash produced from the burning of coal, coke or any other coal product;

(iv) gypsum which is a by-product of any activity;

"exempt location" means-

(i) any premises used for the sale of petroleum coke, coal, coke or any coal produc where the throughput of such substances at those premises in any period of 12 months is in aggregate likely to be less than 10,000 tonnes; or

(ii) any premises to which petroleum coke, coal, coke or any coal product is supplie only for use there;

"retail sale" means sale to the final customer

2. Nothing in this Part applies to any activity carried out underground.

Appendix 2: Guidance on the authorisation of mobile plant

8.1 Section 4(3) of the Act specifies that the local enforcing authority responsible for exercisir the control functions in relation to mobile plant will be the authority in whose area the operat has his principal place of business. "Mobile plant" is defined in section 1(6) of the Act a "plant which is designed to move or to be moved whether on roads or otherwise".

8.2 Mobile plant may either be operated by the owner of the plant or alternatively it may be hire out. When it is hired out, it may be with or without operators. Also, mobile plant may or ma not be operated as part of another prescribed process, for example, in conjunction with static mineral process. The following offers guidance on approaches to authorising mobil processes in different situations.

8.3 The general principle is that the person who will be carrying on the process must apply fc authorisation.

(Section 4(3) of the Act refers to the carrying on of a prescribed process by means of mobil plant. It is therefore the process involving the use of mobile plant that is authorised. For th sake of simplicity, however, paragraphs a) - e) below refer to authorisation of the plant).

8.4 There are five main situations:

(a) *A mineral company owns and operates mobile plant.* This is perhaps the most straightforward case. The mineral company should apply for authorisation. (The company will need to decide whether to seek authorisation of the mobile plant or to seek to include the mobile plant in an authorisation for a mineral process (or processes) at one (or more) specified locations, see cases b) and c) below). There could be cases where a mobile plant, with its own authorisation, was operated as part of another process which was authorised to include the operation of such mobile plant. In the event of the conditions applying to the mobile plant being different, the more stringent should generally prevail. It would be open to the operator, in such cases, to seek a variation in order to reconcile any differences between the authorisations.

(b) *An equipment hire firm hires out mobile plant (from time to time) to a mineral company, which operates it only as part of one or more authorised processes.* In this case, it is suggested that the mineral company should ensure that its authorisation(s) for the associated (static) process(es) provides for the periodic use of mobile plant. The authorisation could allow one or more different types of plant, as appropriate. If this is done, and the plant is not used other than at a location with an appropriate authorisation which permits the use of the plant there, there would be no need to authorise the mobile plant itself.

(c) *An equipment hire firm owns mobile plant which is used (from time to time) at a quarry which does not require an authorisation or at a demolition site.* Hire companies typically hire out crushing plant, screening plant and ancillary equipment such as conveyors. Screens are sometimes used without associated crushing plant. The crushers and screens can be operated in one of three ways:

(i) the machinery is hired and the hirer is fully responsible for operation;
(ii) the machinery is hired with a driver/ operator;
(iii) the hire company is contracted to undertake a job.

Any grouping of individual crushers and screens owned by the hire company can be used for any given job and operated in any of the above three ways. Therefore, any individual crusher or screen can sometimes be operated by the hirer (and in such a case it will be for the hirer to ensure that the authorisation he holds covers him to operate the machinery) and sometimes be operated by the hire company.

It should be acceptable for hire companies to apply only for sufficient authorisations to co the number of individual pieces or "sets" of equipment (i.e. number of processes) that th intend to operate at any one time. This is best explained by way of example:

Example: hire company H has 10 crushing plant, 20 screens and 35 pieces of ancill equipment. Each of the 30 crushers and screens is, from time to time, hired out on contra work on a price per tonne basis under the owner's control, in which case company H operating the plant. However, company H does not expect to be operating more tha individual plant or sets of plant at any one time. The remainder of the plant will either be id or be operated by the hirer. Therefore, company H could apply for 7 authorisations. company H subsequently expects to operate 9 plant (or sets of plant) at the same time, it need to apply for two more authorisations.

It is envisaged, under these arrangements, that each authorisation would allow for th operation of any combination of crushers, screens and ancillary equipment to be used. It m therefore, be necessary to include conditions such as "If crusher type-A is used, conditions b, c and d apply; if crusher type-B is used, conditions c, d, e, f and g apply". It is als recommended that each authorisation is given a separate number and that it is a condition each authorisation that the local enforcing authority which has granted the authorisation notified when that authorisation is "activated" and what crushers, screens and oth equipment are to be used for the particular job (see also paragraph 29 of General Guidanc Note 2).

A further issue is the determination of who is the operator of the plant, and consequently th person who requires an authorisation, in cases where the plant is hired out with a drive operator. In these cases, is the hirer or the hire company the "person" carrying on t process? Having consulted with various interested parties, the Departments are of t opinion that the hirer should normally be regarded as the operator in these circumstances.

(a) *An equipment hire firm's plant is used at some times by the hire firm and at some times by the hirer.* If both the hire firm and the hirer will at times operate the same plant, both will require authorisation to do so.

(b) *An equipment hire firm owns plant which they hire out (from time to time) to a construction company for use at a motorway construction or demolition site. The construction company provides the operator for the machine.* It is assumed that the construction company will know that it needs (say) between 3 and 6 crushing plant (each of which may be one of a number of different types) at any one time in order to carry out its business in England and Wales. It will not, however, know in advance the locations where the plant will be used. The construction company can apply for 6 separate authorisations (the maximum number of plant it expects to use at any one time). Each authorisation would allow the construction company to operate a crushing machine of a specified description, maintain the authorisations by paying the annual fee, and activate them as and when it needs to use one of the plant. If this option was adopted, the hire firm would not need to authorise the plant (unless the plant were to be used as described in item iii) of case c) above). If the type of crushing plant the construction company wanted to use changed, it could seek a variation to the original authorisation.

8.5 Guidance on the authorisation of mobile processes is contained in paragraph 29 ar Appendix 2 of General Guidance Note 2, as follows:

"In order to keep track of processes which move outside its area, the controlling authority* advised to include in authorisations for all mobile plant a condition requiring prior notification an intention to relocate the plant, including details of the intended new location. Where practicable, it is suggested that at least one week's notice is given. (See also specimen condition 73 in Appendix 2.) The controlling authority should then advise the receivin authority when and where to expect the process to start operating in their area."

The specimen condition in Appendix 2 is:

"The local authority shall be notified no less than 1 week before the [mobile] process is to b moved to another location. Such notification shall include details of the intended ne location."

8.6 This appendix updates and replaces the guidance in paragraphs 59-61 of General Guidanc Note 1, paragraph 29 of General Guidance Note 2, and additional guidance note AQ9(92 (The additional guidance note was issued to all local enforcing authorities and to releva trade associations in August 1992 but was not published by HMSO).

* i.e. the authority in whose area the process operator has his principal place of business