SCOTTISH EXECUTIVE
Development Department

PLANNING

Proposed EU Directive on the Management of Waste from the Extractive Industries

November 2003

Consultation Paper

PROPOSED EU DIRECTIVE ON THE MANAGEMENT OF WASTE FROM THE EXTRACTIVE INDUSTRIES

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CONSULTATION PAPER

INTRODUCTION

1. On 2 June 2003 the European Commission adopted a proposal for an EU Directive on the management of waste from the extractive industries (i.e. mining and quarrying). The proposal seeks to provide supplementary measures to the Waste Framework Directive (75/442/EC as amended by 91/156/EEC) to prevent or reduce, as far as possible, any adverse effects on the environment, and any resultant risks to human health, brought about as a result of the management of waste from the extractive industries.

The proposed Directive

2. A copy of the proposal is available from the European Commission website at http://europa.eu.int/eur-lex/en/com/pdf/2003/com2003_0319en01.pdf. A brief description is at Annex A. Paragraph 24 summarises the main implications for UK operators.

Consultation

3. The UK Government is responsible for EC negotiations on the implementation of Directives and has, in liaison with the Scottish Executive and other interests (including industry representatives) represented the UK interests in these discussions. Views are now being sought on the implementation of the proposal.

4. ODPM is producing a Regulatory Impact Assessment (RIA) to evaluate the costs and benefits of the Commission's proposals which will inform consideration of the UK's negotiating objectives as the proposal develops. A Partial RIA which makes a provisional assessment of the impact of the proposal, in terms of the costs, benefits and risks of the proposal, is at Annex A. Further copies are available on the Planning Home page of the Executive's website at www.scotland.gov.uk/views/views.asp. ODPM is also making available on its website at www.odpm.gov.uk/stellent/groups/odpm_planning/documents/sectionhomepage/odpm_planning_page.hcsp copies of two research reports[1] commissioned to inform the Partial RIA.

5. We are keen to receive information and comment to help ensure the RIA properly evaluates the costs and benefits of the proposals and, in particular, takes full account of any specifically Scottish issues. We are particularly keen to understand the impact of the proposals on small businesses. There are a number of matters in the Partial RIA on which comments have been specifically invited. These are identified in the text and concern:

[1] (i) GHK and LUC The Costs and Benefits of Financial Guarantees and Securities in the UK Extractive Industry. Report to ODPM 2003 (ii) Colman, T B, with contributions from Highley, D E, Gunn, A G, Cameron, D G and Smith, B. 2003. An assessment of the nature of the waste produced by active mineral workings in the UK. *British Geological Survey Commissioned Report*, CR/03/157C.

- the definition of waste facility, the one-year exclusion period and alternatives;

- selection criteria to determine whether a waste facility requires a major-accident prevention policy;

- the likely number of tips (active, and closed where these are associated with active mines that might re-open) and lagoons which might fall within the provisions of Article 9 and be subject to the major-accident prevention provisions of Article 6 (which will require operators to draw up a major-accident prevention policy for the management of these wastes and put into effect a safety management system to implement it);

- the preparation of waste management plans by operators of spoil tips and lagoons, and likely additional costs of the proposal;

- other implementation costs, and specifically (a) whether it would be necessary to expand the specialist teams established in Mineral Planning Authorities and the Health and Safety Executive in order to meet the Directive's obligations (b) the additional activities for these teams and likely costs associated with them;

- any particular matters that would impact on the operations and profitability of small businesses;

- the effects of the proposal on competition.

Responses

6. We look forward to receiving comments and views concerning these proposals. To ensure that views can help inform the UK Government's negotiating line responses must be submitted by 31 January 2004 to:

Mineralswaste@scotland.gsi.gov.uk **or** Ian Mitchell
Planning Division 4
Scottish Executive Development Department
Area 2-H
Victoria Quay
Edinburgh
EH6 6QQ

7. Information about the Executive's consultation process and a *Respondent Information Form* (which should be completed and returned with responses) is attached to the letter that accompanies this consultation paper.

TITLE OF REGULATORY PROPOSAL

1. This is a Partial Regulatory Impact Assessment (RIA) of a proposal for a Directive of the European Parliament and of the Council on the management of wastes from the extractive industries. For short, the proposed Directive is referred to in this RIA as 'the proposal'. The RIA is accompanied by a Technical Annex.

2. The Commission adopted the proposal on 2 June (COM (2003) 319 FINAL). The Environment Council and European Parliament are yet to consider it.

PURPOSE AND INTENDED EFFECT

Objective

3. The objective of the proposal is to provide supplementary measures to the Waste Framework Directive[2] (WFD) to prevent or reduce, as far as possible, any adverse effects on the environment, and any resultant risks to human health, brought about as a result of the management of waste from the extractive industries.

Main provisions

4. The proposal assumes that the WFD and the Landfill Directive[3] apply to this waste stream. Existing sites should therefore already only be operating if the Competent Authority has issued a permit under Article 9 of the WFD (or an exemption under Article 11), and the provisions of the Landfill Directive should be applied to sites dealing with hazardous and non-hazardous wastes[4].

5. The proposal acknowledges that the Landfill Directive is not an appropriate instrument for dealing with mineral wastes, and seeks to lay down specific rules under Article 2(2) of the WFD which are better suited. Article 2 (4) of the proposal excludes waste which falls within its scope from the scope of the Landfill Directive.

6. The main provisions are directed at the management of 'waste facilities' which are defined in Article 3 (13) of the proposal as:

   "any area designated for the accumulation or deposit of waste, whether in a solid or liquid state or in a solution or suspension, for a period of more than one year, and being deemed to include any dam or other structure serving to contain, retain, confine or otherwise support such a facility, and also to include, but not be limited to, heaps and ponds, but excluding excavation voids into which waste is replaced after extraction of the mineral".

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[2] (75/442/EC as amended by 91/156/EEC)

[3] (1999/31/EC)

[4] However, since adoption of the proposal, a judgement in the ECJ has determined that this waste stream can be excluded from the scope of the WFD (and hence the Landfill Directive) where there is national legislation that results in a level of protection of the environment at least equivalent to that aimed at by the WFD (see Annex 1).

7. The proposal provides minimum requirements to achieve its objective, and proposes that facilities should be managed on the basis of best available techniques (BAT), recognising the need to take account of the nature of the waste, technical characteristics of different waste facilities, their geographical location, and local environmental conditions[5].

8. These minimum supplementary requirements include:

   - conditions to be attached to the permits to impose environmental and safety measures to protect the environment and prevent accidents;

   - operators to consider, prior to operations beginning, the amount of waste likely to be generated, its characteristics, and its methods of management;

   - for waste facilities which present a significant accident hazard, the development of a major-accident prevention policy (similar to the provisions in the Seveso II Directive) to minimise the risk of an accident and to plan for its clean-up in the event that one occurs;

   - the drawing up of closure plans to ensure that facilities are brought into long term beneficial use; and

   - operators to provide a financial guarantee (or equivalent) to ensure that sufficient funds are available to rehabilitate sites to a satisfactory state in the event that an operator defaults on its closure obligations.

9. The proposal will affect all UK on-shore sectors of the mining and quarrying industry. These can broadly be divided into the construction (e.g. sand and gravel, limestone, sandstone), energy (coal, lignite, oil and gas), metalliferous (e.g. copper, lead, and gold) and industrial mineral (e.g. china clay, silica sand), sectors. Off-shore extraction (e.g. marine dredged sand and gravel) is excluded from the scope of the proposal. Waste from the offshore extractive industries is excluded from the proposal because the nature of the operations, which are designed for the land-based industry, makes the technical measures contained in the proposal impractical to apply.

10. The main impacts will be on those waste facilities considered most likely to cause significant environmental or health hazards, or have the greatest risk of a major accident. The Commission's Explanatory Memorandum refers in particular to metalliferous mining, which can result in the exposure of the environment to a range of heavy metals, and in the case of mining for gold and some other mineral types, dangerous substances used during processing operations (e.g. cyanide and xanthates). In addition it is also likely to impact significantly on those sectors of the industry which have to manage mineral wastes which contain elevated levels of pyrites (iron sulphide), which on exposure to air and water oxidise to form

[5] The Commission's Joint Research Centre based in Seville, Spain, is preparing a BAT guidance document on the management of waste rock and tailings within the extractive industry. It is proposed that Competent Authorities and the industry should have regard to the document when planning, permitting, operating and closing a waste facility.

acidic drainage waters, and which, if inappropriately controlled, can cause serious soil and water pollution.

11. Waste facilities which meet criteria set out in Annex III of the proposal and are classified under Article 9 as presenting a significant accident hazard are subject to the major-accident prevention provisions of Article 6. This will require operators to draw up a major-accident prevention policy for the management of these wastes and put into effect a safety management system to implement it. The operator will be required to draw up an internal emergency plan of the measures to be taken on-site in the event of an accident, while the Competent Authority will be required to draw up an external emergency plan for the measures to be taken off-site.

12. Figure 1 below provides a flow chart summarising how the main requirements of the proposal (and the WFD) impact on the different types of waste.

Background

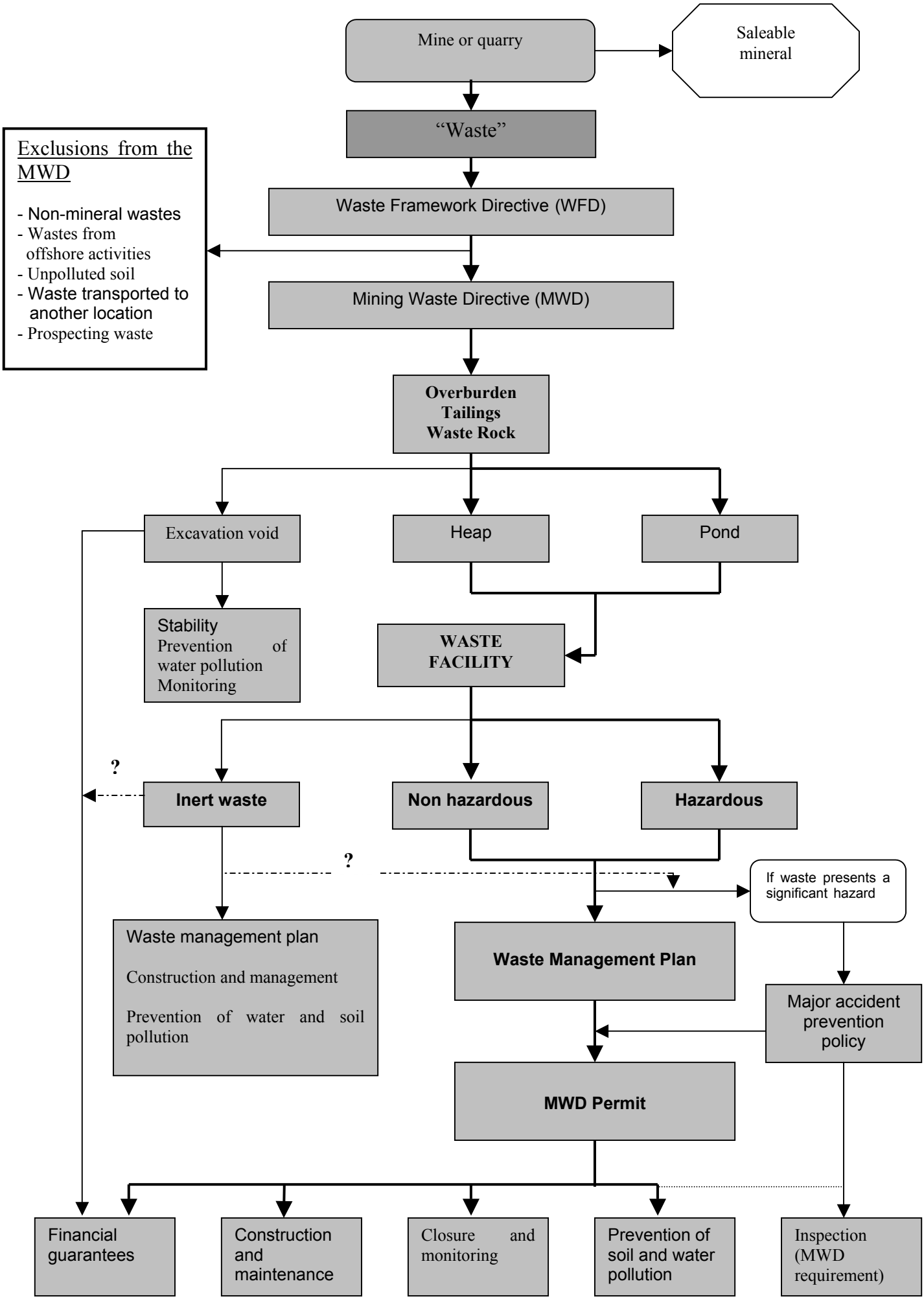
13. Waste from the extractive industry is one of the largest waste streams in the EU, estimated to exceed 400 million tonnes a year. It consists of geological materials which are removed to gain access to mineral resources (e.g. soil and overburden), and wastes from the processing of such materials to obtain a saleable product (e.g. waste rock and tailings).

14. The vast majority of these materials are inert, and are managed by the operator at the place of production. In the UK, most are returned to the void from which they are extracted to facilitate the landscaping and restoration of the site to bring it back into beneficial use. However, this is not always possible for technical reasons, in which case the coarser waste rock is tipped onto spoil tips (heaps) near the mine or quarry, while the fine-grained materials (tailings) are deposited, in the form of a slurry, into lagoons (ponds) behind specially constructed tailings dams. It is often not technically, economically or environmentally feasible to return such material to the original void, and such facilities usually remain, following re-vegetation, as permanent features in the landscape.

15. The quantity of mineral waste produced by the extractive industry in the UK fluctuates yearly, depending on the level of activity in the various sectors. The most recent estimates for the most extensively worked minerals, for the period 1990-2000 are provided in Table 1 in the Technical Annex. The figures are based on estimated ratios for the amount of waste produced per tonne of saleable mineral (see footnotes to table). There is currently no requirement for operators to directly measure and report the amount of mineral waste they produce.

16. If properly managed and maintained, tips and lagoons are safe structures, while the wastes contained within, should not cause adverse environmental effects. However, these facilities need to be constructed to high standards on suitable ground and periodic inspections are required to make sure that the structures are integrally stable and that the ground on which they are placed remains stable. There also needs to be a guaranteed mechanism to ensure that precautionary works, if necessary, are carried out.

Figure 1. Flowchart illustrating the main requirements of the Mine Waste Directive



17. Recent failures of dams at metalliferous mining sites at Baia Mare and Baia Borsa (Romania, 2000) and Aznalcóllar (Spain,1998) caused widespread pollution of the environment and demonstrated that not all sites in Europe are being regulated or operated to an appropriate standard. Following the accident at Baia Mare, a Task Force was set up to investigate the causes of the accident, to assess the damage and to propose actions for remediation. The Commission issued a Communication in October 2000 'Safe operation of mining activities: a follow-up to recent mining accidents'[6], which reported on the accidents at Aznalcóllar and Baia Mare. It reviewed existing Community environmental legislation and questioned the effectiveness of Community policies to prevent such accidents. It recommended three key actions:

    (i) amendment of the Seveso II Directive (96/82/EC on the control of major-accident hazards involving dangerous substances) to include the mineral processing of ores and, in particular, tailings ponds and dams used in connection with such mineral processing within its scope;
    (ii) preparation of a proposal for a Directive on the management of mining waste;
    (iii) the preparation of a Best Available Techniques (BAT) reference document under the IPPC Directive.

18. A separate partial Regulatory Impact Assessment for the amendment of the Seveso II Directive has been prepared by the Health and Safety Executive (HSE), and is not considered further here, other than to note that it is intended to bring the largest and most hazardous mineral waste facilities within its scope.

Risk assessment

19. The proposal was developed and adopted as a result of a number of failures of tailings dams at metalliferous mining sites in Europe, which led to significant environmental damage, including, in the case of Baia Mare, in the territory of another Member State. The Commission has identified that some fractions of the industry's waste, in particular that generated by the non-ferrous metal mining industry, may be hazardous or contain dangerous substances (such as heavy metals and cyanide). Even inert waste has the potential to smother river beds, result in a loss of land productivity, generate dust, effect ecosystems and lead to erosion.

20. The Commission's Explanatory Memorandum focuses in particular on water pollution and stability. Water pollution can be caused by the inappropriate management of water on and off a site. The acidic waters produced by pyritic wastes can directly affect surface and ground water, but can also cause the mobilisation of heavy metals in the waste, where they are present. The Commission also identify the potential risk to human life of mud flows if the fined grained tailings are not properly contained.

[6] COMM(2000) 664 final

21. However, the greatest concern identified is the failure of tailings storage facilities. The Commission state that since 1975, such failures have accounted for about three quarters of all major mining-related environmental incidents worldwide. They suggest that accidents occur on average about once a year globally.

22. However, in the UK, which tightly regulates the extractive industry through Health and Safety and Town and Country Planning legislation, the incidence of significant operational failure of waste facilities leading to major damage is very rare – with no specific cases since the Aberfan disaster in 1966. The HSE report two dangerous tip failures since 1988, leading to limited environmental damage. Incidences of operational failure of waste tip and pond facilities leading to significant environmental damage are also rare, with no more than 1 or 2 cases on average per decade in the extractive sector in the UK[7].

23. Many of the proposals in the proposal reflect existing good practice in the UK and much of the detail on the construction, maintenance, closure and long-term monitoring will be left to the Competent Authority to determine whether the operator's site-specific plans would achieve the aims of the proposal.

24. However, there are some provisions which go beyond existing practice in the UK. These include:

- preparation of waste management plans. The purpose of the waste management plan is to provide a means by which the operator can inform the Competent Authority of the quantity and nature of the waste to be produced during mineral operations, to provide a description of the potential effects on the environment and human health, and proposed control and monitoring procedures to be implemented. It would only be required at sites where waste was to be disposed of to spoil tips and lagoons. It would not be required at sites where the waste material is returned to the excavation void.

- the introduction of major-accident prevention policies. This Article only applies to sites which present a significant accident hazard, including those that contain hazardous wastes or dangerous substances above a certain threshold. For such sites, the operator will be required to draw up a 'major-accident prevention policy' for waste and to put into effect a safety management system implementing it. The operator would also be required to prepare an internal emergency plan of the measures to be taken on the site in the event of an accident. The Competent Authority would be required to draw up an external emergency plan covering measures to be taken off-site.

- a requirement for financial guarantees. The proposal would require the operator to provide the Competent Authority with a financial guarantee to cover the cost of rehabilitating the site, in case of default by the operator. The proposal would allow the Competent Authority to accept industry-sponsored guarantee funds. Financial guarantees are increasingly being used, particularly

[7] Source: GHK and LUC (need to identify web addressin press) The Costs and Benefits of Financial Guarantees and Securities in the UK Extractive Industry. Report to ODPM.

in Scotland, Wales and Northern Ireland. They are not generally used in England except in the opencast coal extraction sector.

25. The main risk of the proposal is that it could lead to additional and unnecessary regulation of some waste facilities, which based on recent experience in the UK, is not justified. The main problem would be if the threshold for inclusion of a facility within the 'significant hazard category' is set at too low a level. The requirement for a financial guarantee could affect some of the smaller companies in particular, which are unable to take advantage of industry-led mutual schemes.

26. There are a number of aspects of the proposal which could lead to uncertainty if not clarified including on whether some of the key provisions apply to inert waste.

27. The main risk, if the proposal were not implemented, would be that accidents would continue to occur within the EU.

OPTIONS

Option 1

28. This is the base case or 'do nothing option'. The aim would be to seek to prevent the adoption of the proposal.

Option 2

29. Option 2 would be to support the Commission proposal as currently drafted.

Option 3

30. Option 3 would be to negotiate for amendments to improve the proposal. Improvements would include (i) an appropriate threshold for inclusion of facilities within the category subject to the major-accident prevention policy; and (ii) the definitions in Article 3 being sufficiently clear to minimise risks of misinterpretation of the intended provisions.

Business sectors affected

31. The proposal will affect all sectors of the on-shore extractive industry. The most recent data (British Geological Survey, August 2003) indicates there are 2303 active mines and quarries in the UK[8]. Overall employment in the UK in 2001 was in the order of 38, 000, mostly involved with the extraction of coal, sand and gravel, limestone and igneous rock[9].

32. Most active mines and quarries are associated with the construction aggregates sector (i.e. sand & gravel, limestone, chalk, igneous and metamorphic rock) and are widely distributed throughout the UK. There are also significant numbers associated with the energy industry (e.g. coal, oil and gas) and industrial minerals

[8] See Table 2 in the Technical Annex
[9] See Table 3 in the Technical Annex

(e.g. china clay and silica sand). These tend to have a more localised distribution. There is currently no commercial metalliferous mining activity in the UK, although very small amounts are produced as by-products of a number of other types of extractive operations.

Size distribution of firms

33. Information on the number of operating sites and the number of employees at each is available for Great Britain (but not the UK), from the Annual Business Inquiry[10]. There is a predominance of sites with workforces smaller than 50 people but the available information does not give an indication of the size of the work force within different companies.

34. Consultation with the aggregates industry indicates that there are between 250-320 individual companies, of which 12 account for 75% of the volume output, another 4-5 companies a further 5%. The remaining 230-330 companies are SMEs accounting for 20% of the market.

The number of waste management facilities at active mineral sites

35. ODPM commissioned consultants[11] to assess the costs and benefits of financial guarantees and securities in the UK extractive industry. As part of their study a postal survey was sent to all Mineral Planning Authorities (MPAs)[12] in the UK to collect information about waste management issues. A total of 42 (37%) replies were received. Table 5 in the Technical Annex provides details about the number of active mineral workings recorded in the responses to the questionnaire and the number that have discrete waste management facilities. Of the 835 sites recorded, 450 (54%) had some form of waste management facility at a site. In many cases, a site will have more than one type of facility.

Nature of the mineral waste produced by each sector

36. An assessment of the nature of mineral waste produced at active mineral workings in the UK was undertaken by the British Geological Survey[13] on behalf of ODPM[14]. This suggests that the deep-mine coal industry produces most of the waste which is likely to be classified as 'hazardous' because a significant proportion of it contains relatively high concentrations of iron sulphide (pyrites). Hazardous wastes are also likely in relation to the extraction of Fluorspar, Barytes and Calcite where the materials contain fluorite or sulphides. However, the amount of waste produced in these latter cases is small.

[10] A summary of the distribution of the size of the workforce at different sites, for different mineral types is provided in Table 4 in the Technical Annex.
[11] GHK with Land Use Consulting
[12] Local planning authorities responsible for planning control of mineral workings
[13] Colman, T B, with contributions from Highley, D E, Gunn, A G, Cameron, D G and Smith, B. 2003. An assessment of the nature of the waste produced by active mineral workings in the UK. *British Geological Survey Commissioned Report*, CR/03/157C. 49pp. ned to identify web adress
[14] The results are summarised in Table 6 in the Technical Annex.

BENEFITS AND COSTS

BENEFITS

Option 1

37. The minerals industry in the UK is already required to operate to a high standard, through regulation under Health and Safety and Town and Country Planning legislation. There have been no reported cases of significant accidents of waste facilities in recent years, and only a limited number of examples of operators failing to rehabilitate sites on the cessation of working.

Option 2

38. The direct benefits to the UK of introducing a consistent set of rules across the EU relate to the establishment of a level playing field in this area across Europe and the effect this may have on competitiveness (particularly for those minerals that are traded internationally), than necessarily in relation to significant additional safeguards to the UK environment.

39. A reduction in frequency or severity of accidents in Europe should enhance the general image of the industry, even if the main improvements were outside of the UK.

40. Article 14 requires that prior to an operator commencing any operations involving the deposit of waste into or onto land, a financial guarantee or equivalent is made available to the Competent Authority to ensure that all obligations under the permit are discharged and there are funds readily available at any given time for the rehabilitation of the land affected by the waste facility. The guarantee can include industry-sponsored mutual funds.

41. The main benefit of restoration guarantees within the relatively well controlled regulatory system that operates in the UK, is ensuring the full implementation of the Polluter Pays Principle. Research for ODPM[15] concluded, however, that the small number of cases where the costs of site rehabilitation (arising from insolvency) led to sites remaining derelict and unrestored would mean that the actual environmental benefits of guarantees, although important in the specific local context of sites, were likely to be modest.

Option 3

42. There would be similar benefits to Option 2, but with a greater degree of certainty about the requirements of the Directive. Amendments could be sought to address the following areas.

<u>Major-accident prevention policy</u>

43. The major accident prevention policy (Article 6) seeks to ensure that the waste

[15] GHK and LUC (in press) web address

facilities which present the greatest risk to human health or the environment are designed, constructed, operated and maintained in such a way as to prevent accidents and to limit their consequences. Annex III provides a list of criteria for determining whether a waste facility presents a significant accident hazard[16]. As all facilities have the potential to cause a loss of life (albeit extremely remote), there is a risk that they could all be caught by the existing criteria.

44. A better approach would be for the Competent Authority to decide when a major-accident policy is necessary, taking account of the size and potential hazard of the facility. Annex III should set size criteria and advise on matters that might influence the risk, as triggers for the need for the operator to undertake a risk assessment, the results of which would enable the competent authority to come to a considered view on the need or otherwise for the major-accident policy.

45. Appropriate size criteria for triggering a risk assessment might be:

- heaps with a storage capacity of more than 500,000 m³ and a height greater than 15m; or
- engineered ponds which are more than 5m above the level of the surrounding land with a storage capacity greater than 250,000 m³.

46. As the risk of failure increases with the steepness of the underlying land, it might be appropriate to use a smaller size threshold where the average gradient of the underlying land exceeds 1 in 12.

[Views are sought on these proposed thresholds. Where alternative thresholds are proposed in responses, it would be helpful if the response also included the justification for the alternative threshold].

47. Many of the provisions within Article 6 are consistent with text from Article 11 of the Seveso II Directive, although there are some differences. It would be appropriate to also include the equivalent of Article 11 (6) of Seveso II which states "The competent authority may decide, giving reasons for its decision, in view of the information contained within the safety report, that the requirements to produce an external emergency plan to paragraph 1 shall not apply". This would provide for situations where the effects of an accident would be limited to the site.

48. Subject to the above clarification, it would also seem appropriate to provide similar provisions to Articles 11 (4) and 11(5) of Seveso II, which provide for the review and testing of the emergency plan, and a requirement for the plan to be put into effect without delay in the event of a major accident.

[16] As follows:
- "in the event of a breach or failure the loss of human life cannot reasonably be excluded on the basis of a risk assessment taking into account factors such as the size, the location and the environmental impact of the waste facility;
- it contains waste classified as hazardous under Directive 91/689/EEC above a certain threshold, or
- it contains substances or preparations classified as dangerous under Directives 67/548/EEC or 1999/45/EC above a certain threshold."

INSPECTIONS BY THE COMPETENT AUTHORITY

49. It is not clear how the inspection obligation imposed by Article 16 fits with Article 13 of the WFD which requires that "Establishments or undertakings which carry out the operations referred to in Articles 9 to 12 shall be subject to appropriate periodic inspections by the competent authorities." A reference to the requirements of Article 13 WFD applying to facilities subject to the supplementary requirements of the MWD may be all that is necessary.

50. The approach to inspections required by Seveso II[17] would seem appropriate for those facilities which fall within the scope of Article 6.

Inert waste

51. Article 2(3) [scope] states that "the deposit of non-hazardous inert waste shall only be subject to the provisions of Article 5 paragraphs 1 and 2, Article 11(2) points (a) to (e) and Article 13(1) points (a) to (c) of this Directive". These Articles deal with the preparation of a Waste Management Plan, the construction and management of waste facilities and the protection of water and soil pollution, respectively. This suggests that inert waste is excluded from some key provisions of the proposal, including Article 6 (major accident prevention), Article 7 (application and permit) and Article 14 (financial guarantees). However, for example:

- Article 6 of the proposal and the risk based criteria set out in Annex III would appear to be just as applicable to waste facilities used for the disposal of inert waste, as to non-hazardous and hazardous;

- Article 14(1) states that "The competent authority shall, prior to the commencement of any operations involving the deposit into or onto land of waste, require a guarantee, in the form of a financial deposit ….". The use of the words 'any operations' would appear to imply that all waste facilities (including those just taking inert waste) and excavation voids fall within the scope of this Article.

Financial Guarantees

52. The requirement for financial guarantees appears to include both waste facilities and excavation voids (see Article 14(1)). Further clarification is needed to reduce the risk of one site having to have more than one guarantee in place (e.g. where there is more than one waste facility). There may be benefits in either extending the requirement to cover the whole site (as is already normally the case for those sites in the UK where financial guarantees are in place), or restrict the requirement to permanent facilities which will be rehabilitated outside the area directly affected by mineral extraction (i.e. exclude excavation voids).

[17] "Unless the Competent Authority has established a programme of inspections based upon a systematic appraisal of major-accident hazards of the particular establishments concerned, the programme shall entail at least one on-site inspection by the competent authority every 12 months".

Waste facilities within excavation voids

53. The current text of the proposal excludes from many of the provisions waste which is returned to the excavation void, while spoil tips and lagoons are subject to more stringent requirements. However, in many cases tips and lagoons may be contained within the excavation void during the operational life of the site before being incorporated into the eventual rehabilitation scheme. In most cases, facilities located within the void should pose no more of a threat to the environment than if the waste had been placed into the void for rehabilitation purposes.

Timescales

54. The proposal defines a 'waste facility' as any area designated for the accumulation or deposit of waste for a period of more than one year. This timescale has been taken from the Landfill Directive. It is good practice in the minerals industry to work and rehabilitate sites in a number of planned phases. Soils and overburden from the first phase is usually stored in a number of separate bunds/tips throughout the life of the site and is often placed in locations which screen the site from housing, roads etc. Overburden and soil from later phases is then used directly, or following a limited period of temporary storage, to infill the previous phases. This practice reduces the area of land affected by mineral working at any one time, and limits the potential for loss or damage to the soil resource.

55. A one year exclusion will often be too short a period to provide a useful distinction between an area of land being used for the long term storage or disposal of mineral waste, and land being used for the temporary storage of material as part of a phased programme of working and rehabilitation. A longer period, of up to perhaps five years might be more appropriate. A suitable approach might be for the exact period to be subject to agreement with the Competent Authority, and clearly stated in the site permit.

[Views are sought on the definition of waste facility, the one year exclusion period and on alternatives.]

COSTS

Option 1

56. This maintains the status quo and there would be no cost implications.

Options 2 and 3

57. In general, the proposal will impact particularly on those sectors of the industry which produce non-inert waste (i.e. non-hazardous or hazardous), and at sites where the waste is disposed of to spoil tips or tailings lagoons (termed ‘heaps’ and ‘ponds’, respectively in the proposal). At the EU level this will have most effect on the metalliferous, coal and some industrial minerals sectors[18].

[18] Table 7 provides data on the main mineral activities of the EU15 Member States

58. As existing sites in the UK are already required to operate to high environmental and health and safety standards, it is considered unlikely that many would be significantly affected by the proposed measures. However, as identified above, there are some provisions which would introduce additional requirements. It is not possible at this stage to identify the cost of all the additional requirements, as some would be subject to further consideration, by expert technical groups after the introduction of the proposal. Article 20, for example, would require the Commission to adopt, within three years of entry into force of the proposal:

    - technical guidelines for site inspections
    - technical requirements for waste characterisation
    - definition of the criteria for the classification of waste facilities, including threshold concentrations for hazardous waste and dangerous substances

59. The following initial assessment focuses in particular, therefore, on the three additional provisions identified earlier:

    - waste management plans
    - major-accident prevention policy
    - financial guarantee.

    Waste Management Plans

60. It would be necessary for operators of all spoil tips and lagoons to prepare a waste management plan to inform the Competent Authority of relevant site waste management operations, including: the quantity and nature of waste being produced; a description of the operations generating such wastes; a description of the potential environmental and health effects, and measures taken to prevent such effects; and plans for eventual site closure. Existing sites would need to comply within four years of the date of transposition.

61. From the data in Table 5 that approximately 17% (143 out of 835 sites) of active mineral workings have spoil tips, and 10% (89 sites) have lagoons with dams. A further 22% (143 sites) have lagoons below ground level which do not need dams. Assuming these figures are representative of the whole UK industry, approximately half of all sites (i.e. 1150 sites), would be required to prepare a waste management plan.

62. Operators of these sites should be able to estimate the amount of waste they generate with little difficulty. In most cases they should also be able to characterise the waste based on the geology of the mineral worked (see for example the general information in Table 6), and the proposed methods of processing it. Description of the potential environmental and health effects of the waste, the measures taken to prevent such effects and plans for site closure should already be available, as a requirement of the planning application process, particularly for sites which required an environmental impact assessment. Significant costs are therefore not anticipated.

    [Comment is sought on whether these are reasonable assumptions. It would also be helpful if responses provided a view on the likely cost of preparing a

waste management plan].

63. However, it is not normal practice to undertake detailed chemical and radiological analysis of mineral wastes, and there could be additional costs if it is necessary to characterise in detail and monitor the composition of wastes .

64. Therefore while this is unlikely to be an onerous task, there will be a small compliance cost to both the company in preparing the plan, and the Competent Authority in approving it. As it is the type of information required by a Mineral Planning Authority when considering a planning application, there should be no significant effects on future sites.

Major-Accident Prevention Policy

65. It is possible that some of the larger colliery spoil tips which contain relatively high levels of pyrites (iron sulphide), some industrial mineral sites (e.g. china clay) and slate workings may fall within the higher risk category introduced by Article 9. In such cases it would be necessary for the operator to prepare internal emergency plans, and for the Competent Authority to prepare an external emergency plan.

66. The compliance costs (to companies and the Competent Authority of preparing such plans, and for consultation with the public) will depend on the number and nature of sites which fall within its scope. The proposal requires the Commission to define the relevant criteria for selection within 3 years of the date of entry of the Directive.

67. The Partial RIA for the implementation of the Seveso II Directive which introduced the concept of such policies identified the preparation of the policies to be largely a one-off cost with a recurring element because of the need for their revisions as circumstances change. It was estimated in that RIA, on the basis of consultation with industry, that the average cost of preparing a policy was £25,500. Preliminary HSE estimates are that there may be up to 50 active and closed (tips associated with active mines that might re-open) tips, and possibly 30 lagoons which might fall within the provisions of this Article (ie overall costs in the order of £2,000,000).

[Views are sought in particular from the industry on the estimated cost of preparing a policy and the estimate of tips and lagoons that might fall within the provisions of Article 9. It would be helpful if responses provided relevant information to allow the estimate to be firmed up.]

Financial guarantee

68. Financial guarantees to cover the cost of site rehabilitation in the case of default by an operator are increasingly being used in the UK, although in England this is largely, but not exclusively, limited to the coal industry. The two main trade associations for the construction aggregates sector (Quarry Products Association and British Aggregates Association) operate mutual guarantee systems.

69. Existing guarantees cover the cost of rehabilitating the whole site and not just those areas affected by mineral wastes. Their costs are determined by total restoration costs, and the financial strength of the company. Restoration costs are a function of the area excavated, restoration methods, specified after-uses and aftercare requirements, amounts of waste generated, and the use of progressive restoration methods or long-term storage in tips and ponds. Annualised restoration costs also take into account the life of the operation.

Figure 1: illustrative examples of the costs of a guarantee*

Item	**Case A**	**Case B**
Annual turnover (T/O) (£m)	10	£50
Lifetime of operation	10 years	20 years
Total restoration cost (£m)	5	7
Annual restoration cost (£m)	0.5	0.35
Annual restoration cost as % T/O	5%	0.7%
Bond premium (@ 2%) (£m pa)	0.1	0.14
Bond premium as % annual restoration cost	20%	40%
Bond Premium as % T/O	1.0%	0.3%

**Set as the insurance bond at an annual premium of 2% of total bond value based on total restoration costs.*
Source: GHK and LUC

70. Case studies undertaken as part of the research for the ODPM indicate that these costs vary considerably. The highest annual restoration cost found represented 5% of turnover, the lowest 0.5% of turnover. The effect of the financial strength on the size of the insurance premium, and the required level of security, is difficult to estimate from these cases. Figure 1 summarises two of the case studies, one (Case A) representing a relatively short-term operation with relatively high annual restoration costs. Case B represents a longer-term operation with higher overall restoration costs but lower costs per annum.

71. Figure 2 below summarises the indicative range of costs a range of sites considered as case studies as part of the ODPM study. These may be an underestimate because they are based on a premium of 2%, when market commentators have suggested a higher premium of 5%, although experience in Ireland suggests that the cost of premiums are no more than 0.5% of the bond value.

Figure 2: indicative range of costs of guarantees

Mineral	T/O (£m)	Restoration cost (£m)	Annual cost of guarantee (£)	Cost as a % of value of guarantee	Cost as % of T/O
China clay	535	50	1,000,000	2.0%	0.2%*
Fluorspar	7	0.4	7,000	1.8%	0.1%
Limestone	6.1	2	40,000	2.0%	0.7%*
Opencast coal	10	4.9	98,000	2.0%	1.0%
Sand & gravel	2.5	0.075	1,000	1.3%	0.0%
Slate	19	2	10,000	0.5%	0.05%

* Assumes an insurance bond with a premium of 2% of the value of the bond. All other cases are actuals. Source: GHK and LUC

Annual costs

72. The additional costs can be estimated on the basis of the approximate cost per tonne, which the guarantees represent. Indicative costs from the case studies gave estimates of £0.25 per tonne (coal), £0.14 per tonne (fluorspar) and £0.42 (china clay)[19]. Taking a mid-range estimate of £ 0.28 per tonne for industrial minerals, then the additional annual costs to the sector would be in the order of £16m (14mt x £0.25, + 46mt x £0.28). This attributed cost of the proposed provisions will fall as the use of guarantees increases prior to the implementation of the proposal.

Company profitability

73. These additional costs only represent a reduction in company profitability if the costs cannot be passed to the customer in the price of the minerals. Based on the case studies, the views of the operators are that these costs will not be passed on where the producers are largely competing in a world market and the level of competition means that producers are essentially price takers. Where producers are largely competing in the domestic market against other domestic producers, such as the slate and aggregates sectors, the scope for pass through was acknowledged, not least because all producers would be affected.

74. Assuming that profit margins are in the order of 7-8% (although there is a wide variation), then the costs of the guarantees (based on the use of insurance bonds) in those sectors competing in world markets is likely to represent a reduction in profitability of the order of 12-15%. Obviously, the lower the margin, the greater will be the effect of the additional cost.

75. The additional costs of a guarantee over the lifetime of the site will be higher for new compared to existing sites, because part of the operation has been completed

[19] Table 8 in the Technical Annex

on existing sites without the additional cost. New sites will have the opportunity of factoring in the additional costs in the initial investment decision.

76. In the case where operators are able to practice progressive restoration, the additional costs of guarantees, per year, will be similar for new compared to exiting sites (of a similar nature) because annual restoration costs will be similar. For sites where there is no progressive restoration, and where there is no build-up of a restoration fund, there will be some advantage to new sites on an annual cost basis where the instrument requires the build-up of funds, because of the shorter remaining life and hence the time available over which to build up the fund.

Cost to UK economy

77. The incremental cost of the financial guarantees to the UK economy depends on the extent that the use of bonds (or equivalent instrument) is already current practice. Excluding construction minerals, which generally already have mutual funds in place, there are some 715 extractive sites in the UK, the large majority are in England.

78. The main obstacle to the use of such mutual funds as a complete response is that the cover is only accorded to members of the relevant trade association. Operators who are not members will not be covered. It is not always compulsory for members to join the fund. The trustees will need to retain the right to determine membership of the fund to protect existing members from any undue risk attached to new members.

79. It follows that whether membership is compulsory or not it should be based on a demonstrated compliance with conditions laid down by the fund. Since Article 14 requires some form of guarantee then given that individual schemes will be more expensive than membership of an industry scheme, there is a direct incentive for operators to improve their performance to a standard acceptable to trustees. Since it is not obvious that mutual guarantee trusts that do not have complete membership of an industry sector or trade association would be deemed unacceptable in compliance with the Article, this incentive effect would be an important influence on the level of cost.

80. It should also be noted that a major disincentive to MPAs of a greater use of guarantees is the perceived administrative cost of negotiating each individual guarantee. The increased use of a mutual guarantee trust in other sectors, especially in the coal industry, would have a significant cost reduction effect for MPAs in the event of Article 14 being implemented.

<u>Other implementation costs</u>

81. The Commission’s Explanatory Memorandum recognises that National administrations will have to create (or adapt) and then maintain regulatory, inspection and enforcement systems capable of meeting the obligations established for them by the proposal. They consider that most of the additional costs will be related to employing additional technical and administrative staff. They suggest that a "five-person unit at national Government level plus a

matching five-person unit in the competent authority might be expected to cost slightly less than 1 million Euros per year (salaries, other costs of employment, office space and other necessary facilities). Additional administrative capacity could be needed at the regional or local level".

82. Within the UK there are already specialist teams established in MPAs and the Health and Safety Executive. An initial assessment suggests that the main additional requirements for MPAs above those of existing practice in the UK would be the consideration of waste management plans, the review of existing planning permissions to ensure they achieve the aims of the both the WFD and this proposal, and the negotiation of financial guarantees. For the HSE there is likely to be a need to advise the industry on risk assessment for those sites likely to fall within the scope of the major-accident prevention policy of Article 6.

[Views are sought on:
- **whether it would be necessary to expand these teams in order to meet the proposal's obligations;**
- **on the suggested activities and the likely costs associated with them.]**

IMPACT OF THE PROPOSAL ON SMALL BUSINESSES

83. The Small Business Service has been notified of the proposal and will be invited to comment on this RIA as part of the overall consultation. Early indications from industry representatives[20] indicated that it was difficult for them to estimate the likely impact of the proposal at this stage as many assumptions needed to be made about the scope. It is likely however that the requirement for a financial guarantee could affect some smaller companies where they are unable to take advantage of industry-led mutual schemes. A number of issues were highlighted as being particularly relevant including:

    - definition of site, some operations have pipelines which transport the mineral to the treatment facility, or fine grained tailings to ponds situated several kilometres from the excavation.

    - inert waste, how would inert waste be defined? The industry suggested that the tests applied under the Landfill Directive were not appropriate for mineral waste.

    - importation of material from another site, should mineral imported from another operator, and is then treated, be included in the scope of this

[20] British Aggregates Association
Barytes Association
COALPRO
CBI Minerals Committee
Quarry Products Association
Kaolin and Ball Clay Association
Silica and Moulding Sands Association
Mining Association of the United Kingdom
British Ceramics Confederation
British Cement Association

Proposal (as indicated in the Commission's Memorandum) or should it be covered under the Landfill Directive?

- waste facilities- and the one year time limit, which was considered to be too short for many operations.

- Annex III, the current wording could result in all waste facilities being classified as Category A, thereby requiring a major-accident prevention policy.

[Views are sought from small businesses on these and other matters which would impact on their operations and profitability.]

ENFORCEMENT, SANCTIONS, MONITORING AND REVIEW

84. The UK has a significant body of national legislation and regulation covering all aspects of extraction and processing of minerals including:

    - the granting of planning permissions for mineral extraction and providing for mineral extraction in development plans, taking account of environmental factors and safeguarding of resources for future generations (land use planning, including the application of EU Directives on EIA);

    - safe operation of sites (health and safety provisions);

    - protection of the environment from impacts of extraction including the restoration of sites (pollution control and planning conditions);

    - management and recycling of wastes (waste policy, land use planning, pollution control); and,

    - for aggregate minerals, a levy on sales introduced in April 2002 in order to encourage recycling and the use of mineral wastes, and thereby to reduce the amount of extraction of primary aggregate.

85. In England and Wales the legislative controls are principally provided by the Town and Country Planning Act 1990, the Mines and Quarries (Tips) Act 1969 and Quarries Regulations 1999 (for health and safety issues) and the Water Resources Act 1991 and Environment Act 1995 (for water pollution), together with various other Regulations. In Scotland the equivalent legislation is the Town and Country Planning (Scotland) Act 1997 and the Control of Pollution Act 1974. In Northern Ireland planning control is implemented through the Planning (Northern Ireland) Order 1991 the Water Act (NI) 1972 and the Quarries (Explosives) Regulations (NI).

86. Transposing legislation will be necessary, although the provisions will not necessarily have a significant impact on day to day site activity, because of existing controls. The following are those provisions in the proposal which are additional to current requirements in the UK:

Article 5 – waste management plans - there is no current specific requirement for such plans in UK law and a new provision would be required.

Article 6 – major-accident prevention and information - this is a similar provision to that contained within the Seveso II Directive. However, mineral workings are currently excluded from the scope of that Directive, and additional legislation would be required to implement it.

Article 7 – application and permit - a permit is already required in the UK for the management of the waste from mineral workings, although in many cases this is by means of conditions forming part of the overall planning permission for the operation, rather than specifically for waste management operations. This proposal, however, provides for permits produced pursuant of other national or Community legislation to be combined to form a single permit (Article 7(1)). It is likely that it will be necessary to introduce Regulations to change the basis for local authority decision making, in so far as it relates to the management of waste from the extractive industries, so that, as Competent Authorities, they ensure the objectives of the proposal are met, rather than merely having regard to them as material considerations alongside other considerations.

Article 14 – financial guarantee and environmental liability - the proposal would require the operator to provide the Competent Authority with a financial guarantee to cover the cost of rehabilitating the site, in case of default by the operator. The Article would allow the Competent Authority to accept industry-sponsored guarantee funds. Financial guarantees are increasingly being used, particularly in Scotland, Wales and Northern Ireland. They are not at present generally used or encouraged in policy in England, outside the opencast coal sector. Additional legislation would be required to implement this article.

87. Within the UK there are already specialist teams established in MPAs and the HSE that carry out regular review and, as appropriate, enforcement.

COMPETITION ASSESSMENT

88. The Department has completed the Office of Fair Trading's Competition Filter. This requires that policy makers consider the market that will be affected i.e. firms that compete against one another to sell the same or similar products or services. On the basis of available information, and recognising the specialist nature of the separate sectors and markets of the minerals industry, completion of the filter suggests only a limited competitive impact from the proposal other than in specialist and limited sectors where a number of factors, including geological conditions, limit competition.

[Comment on this assessment is sought from the consultation.]

INITIAL SUMMARY

Option	**Total cost per annum**	**Total benefit per annum**
1. 'Do nothing'	Current situation	Current situation
2. Support the proposal as currently drafted.	The costs under Option 2 are likely to be greater than under Option 3 because of the potential inclusion of inert waste and lack of clarity in other aspects of the proposal.	Benefits arise from a consistent set of rules across the EU and the effect on competitiveness (particularly for those minerals that are traded internationally) rather than necessarily in relation to significant additional safeguards to the UK environment. Reduction in frequency or severity of accidents in Europe should enhance the general image of the industry, even if the main improvements were outside of the UK.
3. Negotiate for amendments	In part this will depend on the technical guidelines and requirements still to be advised and success in negotiating, but on a provisional basis subject to further consultation the main costs are likely to be: (i) one off costs in the order of £2,000,000 relating to the major-accident prevention provisions (ii) additional annual costs in the order of £16m arising from the financial guarantee.	As for Option 2 but with the added advantage of clearer and less onerous application.

ANNEX 1

THE WASTE FRAMEWORK DIRECTIVE

The Waste Framework Directive (75/442/EEC as amended by 91/156/EEC) ('the WFD') lays down general provisions and principles for the management[21] of waste, as defined in Article 1(a) of the Directive. Article 2(1)(b)(ii) of the WFD establishes that waste resulting from prospecting, extraction, treatment and storage of mineral resources and the working of quarries will be excluded from the scope of the Directive where they are 'already covered by other legislation'.

At the time of adoption of the proposal, the Commission was of the view that the term 'already covered by other legislation' referred to Community legislation only. The starting position in the Proposal is therefore that waste from the extractive industries is already subject to the general provisions of the WFD, and the current Proposal will provide supplementary provisions.

The UK's view has been that the term 'already covered by other legislation' refers to (a) EU and national legislation already in force prior to 18 March 1991 (the date the amended WFD was adopted); and (b) consolidating or amending legislation which consolidates or amends a legal framework that was in force prior to 19 March 1991 – provided that the changes do not involve any reduction in the level of environmental protection and such legislation provides an effective means of fulfilling the aims of the WFD.

On this basis, the UK has considered that the Town and Country Planning Acts, the Mines and Quarries (Tips) Act and related legislation are 'other legislation' for the disposal and recovery of mineral wastes from mining and quarrying. Waste from this sector is therefore excluded from the definition of 'controlled waste' (which corresponds to 'Directive Waste') by section 75(7)(c) of the Environmental Protection Act 1990 which sets out the main controls on the management of waste.

A request was made to the European Court of Justice (ECJ) for a preliminary ruling on interpretation of Article 2 of the WFD[22]. The Court issued its judgement on 11 September 2003. In its judgement, the Court stated that "national legislation must be regarded as other legislation within the meaning of Article 2(1)(b) of that directive covering a category of waste mentioned in that provision, if it relates to the management of that waste as such within the meaning of Article 1(d) of Directive 75/442, and if it results in a level of protection of the environment at least equivalent to that aimed at by that directive, whatever the date of its entry into force".

[21] Defined in Article 1(d) of the WFD as "the collection, transport, recovery and disposal of waste, including the supervision of such operations and after-care of disposal sites."
[22] Case C-114/01 Avesta Polarit

TECHNICAL ANNEX

TABLE1
ESTIMATED MINERAL WASTE PRODUCTION IN THE UK

[1,8] Waste minerals (Thousand Tonnes) Category											
Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
[2] Colliery	36,450	36,679	32,900	25,229	15,927	17,575	16,112	15,141	12,543	10,444	8,806
[3] Opencast	9,932	10,423	9,347	8,871	8,559	8,944	9,292	9,107	8,094	8,095	7,181
[4] China Clay	27,339	26,205	22,526	22,156	22,778	23,283	20,537	26,648	21,608	20,745	21,790
[5] Clay	19,756	16,335	15,172	13,799	15,174	16,725	14,507	13,791	14,110	13,560	14,205
[6] Slate	7,180	7,200	6,520	9,240	8,040	5,500	8,180	6,940	9,000	7,220	7,200
[7] Quarrying	54,814	51,039	48,416	49,466	53,057	51,558	48,677	47,380	35,602	46,619	33,595

Source:

1 Estimates are based on the production data in UK Minerals Year Book, published by British Geological
2 Colliery waste estimate is based on deep-mined coal assuming a ratio of waste to saleable product
3 Coal waste is based on opencast and other coal production and is also based on a
4 China clay waste is estimated on the ratio of waste to saleable product
5 Clay waste is estimated on the ratio of waste to saleable product
6 Slate waste is estimated on the ratio of waste to saleable product of
7 Quarrying waste is estimated on the ratio of waste to saleable product
8 Figures are

(Source: DEFRA, 19.6.2003. Note – the clay waste to saleable product ratio used in the above table is considered by the British Geological Survey (BGS) to significantly over-estimate the amount of waste produced by that sector. At opencast coal sites the ratio of waste to product may be in the range 12:1 to 18:1, although this is returned to the void as part of the restoration process)

TABLE 2
SUMMARY OF ACTIVE MINES AND QUARRIES IN THE UK IN 2003

Mineral worked	Number of active sites	England	Wales	Scotland	Northern Ireland
Sand and Gravel	801	578	26	119	78
Limestone	347	264	51	13	19
Sandstone	305	200	29	41	35
Igneous and Metamorphic Rock	205	50	12	97	46
Common Clay and Shale	178	164	5	7	2
Peat	114	76	3	35	0
Chalk	65	61	0	0	4
Opencast Coal	55	27	7	21	0
Silica Sand	48	35	3	10	0
Slate	41	26	14	1	0
Deep mined coal	26	18	8	0	0
China clay	17	17	0	0	0
Others*	101	85	5	9	2
Total	2303	1601	163	353	186

(Source: BGS BritPits Database).
* A full list of mineral types worked in the UK is given in Table 6

TABLE 3
UK EMPLOYMENT IN THE MINERALS INDUSTRY, 2001

Mineral	Great Britain (a)				Northern Ireland
	Mines		Quarries	Total	
	Underground	Surface			
Ball clay	-	-	312	312	-
Calcspar	-	-	8	8	-
Chalk	-	-	557	557	(c)…
Chert and flint	-	-	3	3	-
China clay	-	-	482	482	-
Clay and shale	-	-	1073	1073	(c)…
Coal (b)	(e)9535	…	3332	12867	-
Dolomite	-	-	999	999	-
Fireclay	2	-	32	34	(c)…
Fuller's earth	-	-	8	8	-
Gypsum	123	22	33	178	-
Honestone	3	1	-	4	-
Igneous rock	-	-	3065	3065	368
Limestone	37	33	4769	4839	173
Oil and gas	-	-	-	(d)	-
Ore minerals	16	19	15	50	-
Peat	-	-	253	253	-
Potash	512	216	-	728	-
Salt	31	20	3	54	(c)…
Sand and gravel	-	-	7742	7742	427
Sandstone	-	-	1593	1593	347
Silica sand	6	6	826	838	-
Silica stone	-	-	2	2	-
Slate	6	39	502	547	-
Soapstone and talc	-	-	2	2	-
Others	-	-	-	-	286
Total	10271	356	25611	36238	1601

(a) where more than one mineral is extracted in a mine or quarry all employment is attributed to the chief mineral
(b) at March 2002
(c) included with 'Others
(d) estimated workforce employed offshore, including personnel on offshore installations, mobile drilling rigs, service vessels, support barges and survey teams, 15,700 as at February 2001
(e) including surface workers at mines

Source: BGS UK Minerals Yearbook 2002, using data from the Office of National Statistics and Department of Enterprise Trade and Investment (Northern Ireland)

TABLE 4
NUMBER OF EMPLOYEES AT WORKPLACES WITHIN THE MAIN MINERAL SECTORS IN 2000

Workplace (site) size by employees by SIC sub-sector	Employee size bands*			
	1-49	**50-299**	**300+**	**Total**
1421 : Operation of gravel and sand pits	1,134	49	2	1,185
1411 : Quarrying of stone for construction	517	8	-	525
1412 : Quarrying of limestone, gypsum and chalk	268	23	1	292
1010 : Mining and agglomeration of hard coal	237	30	14	281
1422 : Mining of clays and kaolin	152	23	1	176
1450 : Other mining and quarrying nec	136	2	-	138
1413 : Quarrying of slate	120	-	-	120
1430 : Mining of chemical & fertilizer minerals	56	1	1	58
1030 : Extraction and agglomeration of peat	39	-	-	39
1320 : Mining: non-ferrous metal ores	18	-	-	18
1440 : Production of salt	13	5	-	18
1310 : Mining of iron ores	4	-	-	4
1020 : Mining and agglomeration of lignite	1	-	-	1
Total	**2,695**	**141**	**19**	**2,855**

Source: Annual Business Inquiry: Workplace Analysis
Note: The figures in this table were collected on a different basis to those in Table 3 and relate to a different year.

TABLE 5
WASTE MANAGEMENT FACILITIES AT ACTIVE MINERAL SITES

Type of Mineral	Total No of sites	No of sites with discrete waste manage-ment facilities	Type of waste management facilities						
			Spoil tip	Lagoon with dam	Lagoon below ground level	Over-burden for Backfill	Stock-pile	Other – Flint store	Other – waste water stored in ponds
Limestone/ Dolomite	109	74	51	13	12	39	59		
China Clay	1		17	6	5	11	8		
Coal (Deep)	8	7	7	6	1		1		
Coal (Open)	12	12	1	9	4	12	11		
Oil/ Gas	24	18				18			
Chalk	19	11	1		1	11	6	1	
Clay/Shale	64	45	10	3	14	37	30		8
Gypsum/ Anhydrite	2	1					1		
Igneous	69	30	22	6	19	8	28		
Ironstone	1								
Peat	120	15			1	2	14		
Salt	1								
Sand/ Gravel	290	177	6	36	108	143	106		
Sand (Industrial)	18	17	7	6	9	13	16		
Sandstone	72	31	8	2	7	34	18		
Slate	11	9	9		2	2	2		
Vein Minerals	3	3	1	1	1				
Other Mineral	11	3	3	1	2	5	8		
TOTAL	835	450	133	89	186	330	308	1	8

Source: MPA Survey , 2002

TABLE 6

SUMMARY OF WASTE CLASSIFICATION AND AMOUNT OF WASTE PRODUCED BY ACTIVE MINERAL WORKINGS IN THE UK

Mineral commodity	Number of active sites1	Total UK production 2001[2] (thousands of tonnes)	Mineral to waste ratio[3]	Estimated waste production (thousands of tonnes)	Waste Classification	Perceived Risk*	Comments
Sand & Gravel	801	80793	9:1	8977	Inert	Very low	Possibility of deleterious minerals (radioactive) in fine tailings in some quarries, especially near granite areas.
Limestone	347	102552	9:1	11394	Non-hazardous	Very low	Possibility of included vein minerals Pb, Ba, Zn, F in a few quarries
Sandstone	305	19967	9:1	2219	Inert	Very low	
Igneous and Metamorphic Rock	205	51501	9:1	5722	Inert	Low	Possibility of deleterious minerals (radioactive and asbestiform) in fine tailings
Chalk	65	8205	9:1	912	Non-hazardous	Very low	
Silica Sand	48	3848	9:1	428	Inert	Low	Possibility of sulphides in some operations
Common Clay and Shale	178	10426			Inert	Very low	Possibility of sulphides and gypsum in some operations
Slate	41	551	1:20	11020	Inert	Very low	
Coal – deep mined	26	17347	2:1	8674	Hazardous	Low	Pyrite in most operations
Opencast Coal	55	14166	2:1	7083	Non-hazardous	Low	Much lower pyrite levels than deep-mined coal
Peat	114	1814000m3	100% mineral	Very small	Non-hazardous	Very Low	Very absorbtive substance

China Clay	17	2204	1:9	19836	Non-hazardous	Very low	Possibility of deleterious minerals (radioactive) in fine tailings at some locations
Ball Clay	20	999			Non-hazardous	Very low	Small amounts of lignite at some locations
Fuller's Earth	2	52000		Small	Non-hazardous	Very low	
Gypsum	6	1700 – includes anhydrite		Small	Non-hazardous	Very low	
Anhydrite	1	With gypsum figure		Very small	Non-hazardous	Very low	
Salt	9	6100	100% mineral	Small	Non-hazardous	Very low	Waste disposed of in abandoned solution cavities.
Potash	1	882		180	Non-hazardous	Low	Possiblity of minor hazard due to mercury in clay waste.
Fluorspar	8	50		100	Hazardous F Pb Zn Ba	Low	Fluorite and sulphides in all operations.
Barytes	5	66	Na		Hazardous Ba Pb Zn F	Low	Fluorite and sulphides in some operations
Calcite	6	12	Na	Small	Hazardous F Pb Zn Ba	Low	Fluorite and sulphides in some operations
Serpentine	1	Very small	Na	Very small	Inert	Very low	Possibility of presence of deleterious asbestiform minerals.
Flint	8	2	Na	Small	Inert	Very low	
Honestone	2	Very small	Na	Very small	Inert	Very low	
Iron Ore – Ochre	2	Very small	Na	Very small	Non-hazardous	Very low	

Iron Ore – Hematite	1	0.5	Na	Very small	Non-hazardous	Low	Presence of small amounts of fluorite and sulphides.
Iron Ore – Ironstone	6	Very small	Na	Very small	Non-hazardous	Low	Possibility of minor amounts of radioactive and/or arsenic.minerals.
Bauxite	1	Very small	Na	Very small	Non-hazardous	Very low	
Tufa	2	Very small	Na	Very small	Non-hazardous	Very low	
China Stone	1	3	Na	Small	Non-hazardous	Very low	
Talc	1	5	Na	Small	Inert	Very low	Possibility of presence of deleterious asbestiform minerals.
Tin	1	Very small tourist operation	Na	Very small	Inert	Low	Similar to sand and gravel operations. Possibility of minor amounts of radioactive and/or arsenic.minerals.

[1] source: BGS BritPits Database
[2] source: United Kingdom Minerals Yearbook 2002
[3] source: Douglas and Lawson, 2000
Na – No figure available
* Risk cannot be quantified without a proper individual site assessment. The measure shown is simply the perceived risk overall, taking the quarries for each commodity as a whole

TABLE 7
MINERAL PRODUCTION DATA - EU 15

Mineral Type (thousand tonnes)	***EU (15) Production (thousand tonnes) 2001														Total EU (15) production (thousand tonnes)	UK as % of EU 15
	Austria	Bel & Lux	Den	Fin	France	Ger	Gre	Ire	Italy	Neth	Port	Spain	Swed	UK		
Metal (thousand tonnes)																
Lead	22	96	_	_	242	529	28	58	203	24	4	122	75	* **1**	1,404	**0.07%**
Energy (thousand tonnes)																
Total coal	1	100	0	0	2,300	202,275	60,400	0	150	0	0	22,500	0	* **30,025**	317,751	**9.45%**
Industrial (thousand tonnes)																
Potash (K_2O equivalent)	_	_	_	_	257	3,549	_	_	_	_	_	569	_	** **900**	5,275	**17.06%**
Feldspar	_	_	34	40	650	500	95	_	2,500	_	120	600	40	** **2**	4,581	**0.04%**
Fluorspar	_	_	_	_	115	30	_	_	45	_	??	134	3	** **53**	380	**13.95%**
Kaolin (China clay)	_	_	2	_	375	3,799	65	_	100	_	146,4	400	_	** **2,100**	6,841	**30.70%**
Barytes	_	8	_	_	81	108	800	_	30	_	_	44	_	** **59**	1,130	**5.22%**
Limestone & dolomite	31	33,500	961	3	_	68,562	90	1000	120,700	_	45,500	12,128	484	** **99,000**	381,959	**25.92%**
Silica sand	_	_	_	148	_	_	125	_	3,000	_	_	_	_	** **4,000**	7,273	**55.00%**
Chalk	_	_	410	_	_	_	_	_	_	_	_	980	_	** **8,000**	9,390	**85.20%**
Gypsum & anhydrite	_	400	_	_	4,500	2,000	700	_	1,200	_	700	_	_	** **1,700**	11,200	**15.18%**
Fuller's earth	_	_	_	_	_	500	_	_	30	_	_	_	_	** **44**	574	**7.67%**
Salt	401	_	605	_	7,100	8,461	150	_	3,800	5,000	626	4,100	_	** **6,100**	36,343	**16.78%**

Sources:
*A Study on the Costs of Improving the Management of Mining Waste, Symonds Group, October 2001
**UK Minerals Yearbook 2002. Website - http://www.bgs.ac.uk/mineralsuk/statistics/uk/ukmy.html
***The United States Geological Survey (USGS) 2001 data. Website - http://minerals.er.usgs.gov/minerals/
_ Indicates where data are not available

TABLE 8

INDICATIVE COST PER TONNE OF GUARANTEES

Mineral	Annual cost of guarantee (£)	Annual output (thousand tonnes)	Annual cost per tonne (£)
China clay	1,000,000	2,400	0.42
Fluorspar	7,000	50	0.14
Limestone	40,000	1,500	0.03
Opencast coal	98,000	400	0.25
Sand & gravel	1,000	250	0.00
Slate	10,000	900	0.01

Source: GHK Case Studies

TABLE 9
THE UK EXTRACTIVE INDUSTRY, 2001

Type of Mineral	Units	England	Wales	Scotland	N Ireland	UK
Total industry	No. Sites	1,580	155	320	140	2,195
	Output (1000 tonnes)	253,710	26,719	44,039	37,623	362,091
Construction minerals	No. Sites	1,039	116	250	122	1,527
	Output (1000 tonnes)	186,513	24,168	34,914	20,935	266,530
Total (ex construction)	No. Sites	541	39	70	18	668
	Output (1000 tonnes)	67,197	2,551	9,125	16,688	95,561
Of which:						
Energy minerals	No Sites	96	19	18	12	145
	Output (1000 tonnes)	20,600	2,200	7,800	13,412	44,012
Industrial minerals	Sites	445	20	52	6	523
	Output (1000 tonnes)	46,597	351	1,325	3,276	51,549
Total (ex-construction) in need of a site Guarantee (estimated)	Sites	429	20	42	9	500
	Output (1000 tonnes)	48,117	906	3,268	6,972	59,263

Source: GHK - based on data from UK Minerals Yearbook 2001

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