

## A2: Scoping the Environmental Impacts of Demolition and Decommissioning Works

### Explanatory Note

For projects which require Environmental Impact Assessment (EIA), a scoping exercise must be undertaken early in the planning stages of the project. This enables the project to be designed to avoid or minimize negative environmental impacts and provides an opportunity to incorporate positive environmental enhancements into the project. Early consultation with all interested parties, including the Environment Agency, is an essential part of scoping. Even if a project does not require EIA under EIA legislation, it may be advisable (and in some cases necessary) to undertake a scoping exercise in any case (e.g. to support applications for other relevant consents and authorisations needed to carry out the project).

This guidance note aims to promote a good practice approach to scoping as part of the EIA process which in some respects goes beyond the statutory EIA requirements. When scoping a project, developers, or their consultants, should satisfy themselves that they have addressed all the potential impacts and the concerns of all organisations and individuals with an interest in the project.

This guidance note provides information on the most likely potential environmental impacts of demolition and decommissioning works. However, each project must be considered on a case-by-case basis as the detailed characteristics of the proposal and the site will determine the potential impacts.

This guidance is based on the main legal requirements on EIA stemming from the EC Directive and the UK Regulations. However, developers should seek independent legal advice to ensure that the proposed development is carried out in compliance with the requirements of this and any other relevant legislation, relating to planning as well as pollution control.

**This guidance note must be read in conjunction with the *Scoping Handbook*, which provides general guidance on the Environmental Impact Assessment process and the scoping of projects.**

**In addition, the following scoping guidance notes are also relevant to *all* projects involving demolition or decommissioning:**

- ◆ A1 Construction works
- ◆ A4 Vegetation management and conservation enhancements

**The following scoping guidance notes *may* be relevant in certain circumstances:**

- ◆ A3 Redevelopment and clean-up of contaminated land
- ◆ B3 Control of pest species, including disease vectors
- ◆ B4 Deliberate introduction of non-native and genetically modified species
- ◆ I2 Nuclear facilities, construction and decommissioning

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## 1. Introduction

- 1.1 This guidance note, in conjunction with the Scoping Handbook and the other notes listed on the previous page, seeks to help developers and other interested parties identify the potential impacts of demolition and decommissioning works on the environment as a whole. It should be emphasised that the list of impacts is by no means exhaustive and that a full investigation into *positive* and *negative* impacts should be undertaken. Early consultation with the Environment Agency, and other relevant organisations, will enable the identification of environmental issues and constraints and the avoidance of sensitive areas, thus reducing the need for redesigning and mitigating avoidable impacts at a later stage.
- 1.2 Following this brief introduction, an overview of the legal requirements for EIA in relation to demolition and decommissioning works is provided. The potential environmental impacts of such projects are identified in Section Three. The text and summary table in this section will enable the reader to begin to identify the likely impacts arising from the particular proposal under consideration. The subsequent sections present the mitigation measures that may be relevant to demolition and decommissioning works, followed by key references and further reading.
- Background to development type*
- 1.3 Demolition and decommissioning activities involve the closure of a facility and the clearance of existing structures from land to enable its subsequent use for some other purpose, or simply to remove a structure the continued existence of which may constitute a hazard or visual intrusion. In the latter case, the after use is likely to be an informal one, such as public open space. The activities that are likely to occur in connection with decommissioning and demolition of a facility include: demolition of any surface structures present, such as buildings; the securing of any hazardous features, such as open pits or slurry areas on mining sites; the recovery of useful materials, such as scrap metal and hardcore; and the removal of surplus material to an off-site location. Such activities are essential in the cycle of development and redevelopment of land. However, they may generate both positive and negative environmental impacts on people, fauna and flora and natural resources that have developed during the period since the site was constructed. Therefore a thorough scoping exercise and careful consideration of alternatives are of prime importance.

## 2. Development control and EIA

### *Development Control*

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- 2.1 Demolition and decommissioning works will fall under the Town and Country Planning system, though developers should contact their local planning authority to confirm whether or not their proposals require planning permission (or are subject to any other form of development control). They should also seek advice on the impact on their proposals of other planning-related legislation.

*Environmental Impact Assessment*

- 2.2 Demolition and decommissioning activities are not included as a separate development type in the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 (SI 1999 No. 293). However, it is feasible that any of the developments listed in these Regulations may involve demolition works in order for the proposed development to proceed, or decommissioning works following the end of useful operations of the development. Therefore, an assessment of the environmental impacts of such works may be required as a component of an EIA required under these Regulations. Information on the thresholds beyond which projects will require EIA is provided in the Regulations and in associated official guidance (DETR Circular 02/99 and Welsh Office Circular 11/99).
- 2.3 The DETR has published guidance (referred to in the Scoping Handbook) which helps in the decision on whether, in respect of Schedule 2 projects, impacts are significant and whether EIA should be required. The guidance thus contains “indicative criteria”, although area sensitivity and project-specific issues must be taken into account and the decision is still discretionary.
- 2.4 Although the formal EIA of proposed demolition or decommissioning works is not required, the Environment Agency and other statutory consultees and regulators may request environmental information concerning the proposal. An EIA may provide the most appropriate method for a developer to collate the necessary information.

*Other licences, consents and authorisations*

- 2.5 Certain aspects of decommissioning and demolition operations may require prior permission from the Environment Agency. These may include for example the handling, storage and disposal of waste materials on- or off-site, which may require a waste management licence and the discharge of water from the site which will require a discharge consent. It is recommended that the developer seek independent legal advice and liaise with the Environment Agency during project design and subsequent stages to identify the consents, licences and authorisations that will be required.

### **3. Potentially significant environmental issues**

- 3.1 The EIA Directive requires the EIA to ‘identify, describe and assess...the direct and indirect effects of a project on the following factors: human beings, fauna and flora; soil, water, air, climate and the landscape; material assets and the cultural heritage; [and] the interaction between the [above] factors.’ Socio-economic issues, health and safety in the workplace, material assets and the cultural heritage are all considered in EU Guidance on scoping (ERM, 2001b) but are not impacts categories for which the Environment Agency is the principal competent authority. Advice on these issues is presented in this guidance note without prejudice to the advice of the relevant competent authority, but the relevant competent authority should be consulted for each of these categories in all cases (further advice on the appropriate competent authority to contact is given in the Scoping Handbook).
- 3.2 Demolition and decommissioning activities have the potential to affect the environment in many ways. They can differ widely in terms of their mode of operation and location, and key issues are likely to vary from site to site. Therefore, it is recommended that expert advice on detailed technical issues should be obtained. Chief amongst these is potential hazard to

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workers or to local residents or the environment. A thorough investigation of the characteristics of the site in its present state is particularly important where hazardous activities are known to have taken place, such as chemical processing. Such investigations are equally important where critical aspects of the history of the site are unknown, often the case for many old industrial sites. The objective of these investigations will be to identify areas which are hazardous, for example relating to the use of asbestos or the storage or disposal of waste materials, perhaps in buried storage tanks. Site plans for old or complex sites are often inadequate for identifying such areas and where particularly hazardous materials may be present specialist contractors should be employed to ensure identification and safe disposal.

3.3 Environmental impacts can affect both humans and ecological resources. Potential impacts are discussed here in broad terms only as their nature and intensity will depend on the physical characteristics of the project and the composition of any polluting materials. An EIA of proposed demolition and decommissioning works should take these factors into account in assessing potential impacts on the environment.

3.4 The following paragraphs should be read in conjunction with Table A2. This details the activities involved in demolition and decommissioning operations, and the impacts arising from them.

#### **Water environment**

3.5 Surface water hydrology can be affected during demolition and decommissioning through the generation of fine materials eroded as a result of clearing surfaces and exposing soils to rainwater and drainage water. This may be deposited in watercourses and change the nature of the streambed.

3.6 Surface water quality can similarly be affected by such fine material. This will change the quality of the water, especially if the fine material is contaminated as a result of previous activities on the site.

3.7 Demolition and decommissioning activities may have significant impacts on groundwater hydrology and quality. The most likely hazard is from underground storage tanks and pipelines which contain toxic or hazardous materials. Invariably, residual or even very large quantities of these materials may remain when a site is abandoned. Groundwater contamination often occurs when such storage tanks are punctured or when pipelines are damaged during demolition and ground clearance activities.

3.8 In order to protect vulnerable groundwater resources it is the policy of the Environment Agency to encourage new developments to locate in areas of low vulnerability to groundwater pollution. However, this policy does not imply an automatic prohibition on demolition and decommissioning works within Source Protection Zones.

#### **Land**

3.9 Demolition and decommissioning activities will have implications for the physical characteristics and land use of the site. By their nature, such projects have the potential to change the site significantly. Issues to consider include: the effect on landscape character of the area, which may be considerably improved by the removal of unsightly and derelict structures. Soils may be compacted by the operation of heavy plant, or may become contaminated with toxic materials or reduced in quality by mixing with demolition waste, such as bricks and concrete.

#### **Air and Climatic Factors**

3.10 Demolition and decommissioning works have the potential to affect local air quality. A whole range of demolition and site clearance activities may generate dust which may constitute a nuisance for local people. This may become a health hazard if dust is contaminated with toxic

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chemicals, such as asbestos, as a result of previous activities on site. Local air quality may decline as a result of gaseous and particulate emissions from vehicle movements on- and off-site.

**Ecology**

- 3.11 The main ecological impacts are likely to arise from the demolition and clearance of a site which has been abandoned or underused for some considerable time. During such periods plant and animal communities may develop on site. The ecological system that develops on derelict land are often of considerable biological interest and provide pockets of high biological diversity in otherwise impoverished areas. Their clearance may deprive local people of valued wildlife resources.

**Human environment**

- 3.12 The potential impacts of demolition and decommissioning operations on the human environment may take a variety of forms. They are divided here into sections covering socio-economic and health issues; amenity, visual impact and nuisance issues; and culture, heritage and archaeology.
- 3.13 The potential for socio-economic and perceived health impacts arising from demolition and decommissioning works will be site specific. Employment associated with decommissioning work may provide temporary jobs for some local people. Health impacts are likely to arise when hazardous materials on site are released into the environment, generally as dust. Previously, the site itself may have constituted a hazard, especially to children, as a result of dangerous structures or features on site. Thus, demolition activities may lessen the overall risk to local people. Nuisance and hazard may be associated with the heavy trucks removing recovered materials and demolition waste off-site.
- 3.14 The identification of which of these issues are significant or are perceived to be significant is an important function of public involvement during the scoping exercise. Understanding likely public concerns is a key issue and reference to experiences from other similar developments and any public representations to the local planning authority should be made.
- 3.15 Amenity, visual impact and nuisance issues that commonly need to be addressed are the visual impact of the demolition or decommissioning works, and noise and vibration nuisance from traffic movements on and off site for the duration of the works. Any restrictions to access that may arise as a result of the development should also be considered, as should the creation of nuisances such as ...
- 3.16 Impacts on architectural and archaeological heritage may be associated with the structures themselves which may be of interest for industrial archaeological reasons. These effects on such archaeological and historical features should be taken into account. The likelihood of there being any unrecorded features of archaeological interest occurring should be taken into account in the planning of site operations.

*Table A2*

- 3.17 The impact identification table highlights:
- ◆ sources of impact (development activities);
  - ◆ potential impacts;
  - ◆ receptors for these impacts.

- 3.18 It is recommended that the table is annotated and used during consultations with other interested parties. Reference should also be made to the prompt lists detailing impacts and sources of impacts in the Scoping Handbook.

**Table A2. Summary of Key Potential Impacts of Demolition and Decommissioning Works**

| Potential Receptors of Impact |  | Activities and Potential Impacts  |  |  |
|-------------------------------|--|---|--|--|
|                               |  | Construction phase  | Operation phase/on-going site maintenance  | Decommissioning / Post-operation   |
| <b>WATER</b>                  | surface water hydrology & channel morphology | <p><b>Use of vehicles and machinery</b></p> <ul style="list-style-type: none"> <li>increase in surface runoff from soil compaction</li> </ul> <p><b>Works next to or near water courses</b></p> <ul style="list-style-type: none"> <li>change in flow velocities</li> <li>increased erosion and subsequent changes in bed and bank stability</li> <li>increased flood risk</li> </ul> <p><b>Earthworks</b></p> <ul style="list-style-type: none"> <li>increased sedimentation of water courses</li> </ul> | <p><b>Use of vehicles and machinery</b></p> <ul style="list-style-type: none"> <li>increase in surface runoff from soil compaction</li> </ul> <p><b>Site drainage</b></p> <ul style="list-style-type: none"> <li>rapid transfer of rainwater to water courses via drains</li> <li>changes to flow regimes of water courses downstream of the landfill</li> <li>change in deposition regime, caused by changes in flow and possible increase in sediment input from soil erosion</li> <li>increased flood risk</li> </ul> | <p><b>Site drainage</b></p> <ul style="list-style-type: none"> <li>increase in surface runoff following sealing of landfill</li> <li>possible increased flood risk</li> <li>dust suppression by spraying may lead to run-off problems</li> </ul> |
|                               | surface water quality                        | <p><b>Earthworks</b></p> <ul style="list-style-type: none"> <li>pollution from suspended material</li> <li>disturbance of contaminated soil and subsequent pollution of water courses</li> </ul> <p><b>Materials management</b></p> <ul style="list-style-type: none"> <li>pollution from spills or leaks of fuel, oil and construction materials</li> </ul>  | <p><b>Leachate management</b></p> <ul style="list-style-type: none"> <li>decrease in water quality from sudden releases (e.g. from liner failure) or gradual seepage of leachate into nearby water courses</li> </ul> <p><b>Materials management</b></p> <ul style="list-style-type: none"> <li>pollution from spills or leaks of fuel and oil</li> </ul> <p><b>Use of machinery</b></p> <ul style="list-style-type: none"> <li>sediment-loading of water courses</li> </ul>   | <p><b>Leachate management</b></p> <ul style="list-style-type: none"> <li>continued pollution of surface water by leachate escaping a capped landfill</li> </ul>  |
|                               | groundwater hydrology                        | <p><b>Earthworks and site drainage</b></p> <ul style="list-style-type: none"> <li>reduction in water table</li> <li>changes to groundwater distribution and flow</li> </ul>   | <p><b>Physical presence of landfill</b></p> <ul style="list-style-type: none"> <li>continued alteration of groundwater flow</li> </ul>   | <p><b>Physical presence of former landfill</b></p> <ul style="list-style-type: none"> <li>ongoing alterations to ground water flows</li> </ul>   |
|                               | groundwater quality                          | <p><b>Earthworks</b></p> <ul style="list-style-type: none"> <li>disturbance of contaminated soil and subsequent groundwater pollution</li> </ul> <p><b>Materials management</b></p> <ul style="list-style-type: none"> <li>pollution from spills or leaks of fuel, oil and building materials</li> </ul>  | <p><b>Leachate management</b></p> <ul style="list-style-type: none"> <li>contamination from sudden releases (e.g. from liner failure) or slow seepage of leachate to groundwaters</li> </ul> <p><b>Materials management</b></p> <ul style="list-style-type: none"> <li>contamination from spills or leaks of fuel and oil</li> </ul>   | <p><b>Leachate management</b></p> <ul style="list-style-type: none"> <li>continued pollution of ground water by leachate escaping a capped landfill</li> </ul>   |



| Potential Receptors of Impact |                               | Activities and Potential Impacts   |   |  |
|-------------------------------|-------------------------------|--|---|--|
|                               |                               | Construction phase   | Operation phase/on-going site maintenance   | Decommissioning / Post-operation   |
| LAND                          | landscape                     | <b>Excavations &amp; earthworks</b> <ul style="list-style-type: none"> <li>creation of a new landform</li> </ul>   | <b>Physical presence of landfill</b> <ul style="list-style-type: none"> <li>change in character of landscape</li> </ul>   | <b>Physical presence of former landfill</b> <ul style="list-style-type: none"> <li>possible raised land and existence of surface structures (e.g. gas flaring equipment)</li> </ul>  |
|                               | soils                         | <b>Use of vehicles and machinery</b> <ul style="list-style-type: none"> <li>compaction</li> <li>erosion</li> </ul> <b>Earthworks</b> <ul style="list-style-type: none"> <li>further erosion of exposed soil</li> <li>removal or alteration of soils on site for landfill liner construction</li> </ul> | <b>Waste disposal</b> <ul style="list-style-type: none"> <li>contamination of soil from toxic or hazardous waste materials</li> <li>generation of landfill gas and its possible migration to soils beyond site boundary</li> </ul> <b>Use of vehicles and machinery</b> <ul style="list-style-type: none"> <li>soil compaction</li> <li>soil erosion</li> </ul> | <b>Legacy of disposed waste</b> <ul style="list-style-type: none"> <li>implications of contaminated land for future use of site</li> <li>damage to soil in restored landfill from landfill gas</li> </ul> <b>Presence of landfill cap</b> <ul style="list-style-type: none"> <li>soil erosion due to increased surface runoff</li> </ul> |
|                               | geology                       | <b>Excavations</b> <ul style="list-style-type: none"> <li>removal of rock by excavation works</li> </ul>   | <b>Excavations</b> <ul style="list-style-type: none"> <li>further removal of geological resource following site expansion</li> </ul>  |  |
| AIR                           | local air quality             | <b>Use of vehicles and machinery</b> <ul style="list-style-type: none"> <li>emissions from construction site traffic</li> <li>dust generation</li> </ul>   | <b>Landfill gas generation</b> <ul style="list-style-type: none"> <li>releases of landfill gas to the atmosphere</li> </ul> <b>Use of vehicles and machinery</b> <ul style="list-style-type: none"> <li>exhaust emissions</li> </ul>  | <b>Landfill gas generation</b> <ul style="list-style-type: none"> <li>continued release of landfill gas to atmosphere</li> </ul>   |
|                               | regional / global air quality |  | <b>Landfill gas generation</b> <ul style="list-style-type: none"> <li>contribution to the greenhouse effect from releases of landfill gas</li> </ul>  | <b>Landfill gas generation</b> <ul style="list-style-type: none"> <li>continued contribution to greenhouse effect</li> </ul>   |

| Potential Receptors of Impact |                     | Activities and Potential Impacts   |  |   |
|-------------------------------|---------------------|--|--|---|
|                               |                     | Construction phase   | Operation phase/on-going site maintenance  | Decommissioning / Post-operation  |
| FLORA & FAUNA                 | aquatic ecology     | <p><b>Drainage works and use of vehicles</b></p> <ul style="list-style-type: none"> <li>negative impact on flora and fauna from increased sediment loading of streams</li> </ul> <p><b>Materials management</b></p> <ul style="list-style-type: none"> <li>harm to aquatic flora and fauna from oil, fuel, cement or other substances entering watercourses</li> </ul> | <p><b>Waste disposal</b></p> <ul style="list-style-type: none"> <li>pollution of watercourses by leachate</li> </ul> <p><b>Site drainage</b></p> <ul style="list-style-type: none"> <li>indirect effect on aquatic flora and fauna from ongoing changes to stream hydrology and morphology</li> </ul> <p><b>Materials management</b></p> <ul style="list-style-type: none"> <li>direct and indirect effects from oil, fuel or other substances entering the aquatic environment</li> </ul> | <p><b>Post closure land-use</b></p> <ul style="list-style-type: none"> <li>continued effects of soil contamination</li> <li>possible migration of leachate or landfill gas</li> </ul> <p><b>Restoration design</b></p> <ul style="list-style-type: none"> <li>opportunity for enhancement of nature conservation value</li> </ul>           |
|                               | terrestrial ecology | <p><b>Earthworks and excavations</b></p> <ul style="list-style-type: none"> <li>habitat removal, fragmentation or severance</li> <li>disturbance to, or loss of, species (including rare and sensitive species)</li> </ul>   | <p><b>Physical presence of landfill</b></p> <ul style="list-style-type: none"> <li>alteration or loss of terrestrial habitats</li> </ul> <p><b>Landfill gas generation</b></p> <ul style="list-style-type: none"> <li>harm to species from releases of landfill gas</li> </ul> <p><b>Waste disposal activities</b></p> <ul style="list-style-type: none"> <li>disturbance to, or loss of, species (including rare and sensitive species)</li> </ul>  | <p><b>Physical presence of former landfill</b></p> <ul style="list-style-type: none"> <li>continued habitat fragmentation or severance</li> </ul> <p><b>Restoration design</b></p> <ul style="list-style-type: none"> <li>positive or negative effect on existing ecology from introduction of new (possibly non-native) species</li> </ul> |

| Potential Receptors of Impact |  | Activities and Potential Impacts  |  |  |
|-------------------------------|--|---|--|--|
|                               |  | Construction phase  | Operation phase/on-going site maintenance  | Decommissioning / Post-operation   |
| <b>HUMAN ENVIRONMENT</b>      | socio-economic <sup>1</sup>                            | <b>Earthworks and excavations</b> <ul style="list-style-type: none"> <li>disruption of services such as electricity, gas, water, or telecommunications due to the presence of underground cables and pipes</li> <li>construction-related employment</li> </ul> <b>Negative publicity</b> <ul style="list-style-type: none"> <li>migration of people away from proposed landfill site</li> </ul> | <b>Waste disposal operations</b> <ul style="list-style-type: none"> <li>continued migration of people away from the operation landfill site</li> </ul>   | <b>Restoration design and after-use</b> <ul style="list-style-type: none"> <li>public perception of the area may improve following sensitive restoration plans</li> </ul>  |
|                               | health and safety <sup>1</sup>                         | <b>Earthworks and excavations</b> <ul style="list-style-type: none"> <li>risk of injury on construction site</li> </ul> <b>Negative publicity</b> <ul style="list-style-type: none"> <li>adverse reaction to perceived health issues</li> </ul>   | <b>Waste disposal operations</b> <ul style="list-style-type: none"> <li>risk of harm to humans from waste deposited (e.g. consumption of contaminated groundwater)</li> </ul> <b>Landfill gas generation</b> <ul style="list-style-type: none"> <li>risk of explosions or fires</li> </ul>   | <b>Landfill gas migration</b> <ul style="list-style-type: none"> <li>risk of fires due to landfill gas migrating underground beyond the site boundary</li> <li>possible ground subsidence due to waste decomposing or underground fires</li> </ul> |
|                               | amenity  | <ul style="list-style-type: none"> <li></li> </ul>  | <ul style="list-style-type: none"> <li>possible alteration of rights of way or reduction in access</li> </ul>  | <b>Restoration design</b> <ul style="list-style-type: none"> <li>provision of amenity/recreational area</li> </ul>   |
|                               | nuisance   | <b>Use of vehicles and machinery</b> <ul style="list-style-type: none"> <li>noise from construction traffic and operations</li> <li>mud on roads</li> </ul>   | <b>Use of vehicles and machinery</b> <ul style="list-style-type: none"> <li>noise</li> <li>mud on roads</li> </ul> <b>Site management</b> <ul style="list-style-type: none"> <li>odours from waste deposited and landfill gas</li> <li>production of unsightly litter</li> <li>attraction of insects, scavenging birds, rats and other vermin</li> </ul> | <b>Landfill gas generation</b> <ul style="list-style-type: none"> <li>continued release of landfill gas</li> </ul>   |
|                               | architectural and archaeological heritage <sup>1</sup> | <ul style="list-style-type: none"> <li>damage to known or unknown features of archaeological or cultural importance</li> </ul>  | <ul style="list-style-type: none"> <li>further damage to archaeological features resulting from expansion of the site</li> </ul>   |  |

**Additional site specific issues:**

<sup>1</sup> The Agency considers that key impacts to be identified and assessed are likely to include the following, but further advice and guidance should be sought from the relevant competent authority, as included in the Scoping Handbook.



## 4. Mitigation measures

4.1 Following the scoping exercise and the identification of potential environmental effects, mitigation measures should be proposed to avoid or reduce potential negative impacts to air, water, land, ecology and humans, or to introduce positive aspects to the development. Guidance has been provided by the Environment Agency to assist developers on a range of relevant subjects in the form of Pollution Prevention Guidelines (see “References and Further Reading” in the Scoping Handbook).

4.2 Whereas a primary consideration in impact mitigation must be the siting of a particular activity, in the case of demolition, location is predetermined. Mitigation, therefore, is bound up with the planning of site operations and their implementation. Thorough site investigation should seek to identify on-site resources, such as areas of vegetation, which can be retained through the demolition and site clearance process and provide infrastructure for subsequent redevelopment of the site. Thus, planning of activities should seek to avoid damage to important ecological sites and features which contribute to high quality landscapes.

### **Mitigating the impacts of decommissioning and demolition activities**

4.3 Decommissioning and demolition activities have the potential to affect all environmental receptors. The following list summarises the mitigation measures most relevant to decommissioning and demolition activities:

- ◆ thorough investigation of site and site history to identify potential risks and hazards to workers, local people and the environment;
- ◆ phasing of construction work to minimize disturbance to wildlife at sensitive times of year, such as during the breeding season or when young are being raised;
- ◆ timing site activities during the day to reduce impact on local people
- ◆ inform local people of particular activities, such as demolition charges in advance
- ◆ use of techniques to minimize compaction of soil, such as restricting access during wet conditions, and using protective boarding and low ground pressure machinery. If necessary, soil should be carefully removed and stored for subsequent reinstatement;
- ◆ use of dust control strategies;
- ◆ storage of fuel, equipment and construction materials so as to minimize the risk of soil contamination or water pollution (see Environment Agency Pollution Prevention Guideline 5, on *Construction and Demolition*);
- ◆ setting the route and timing of heavy trucks taking demolition debris off site for disposal so as to avoid residential areas or other sensitive human receptors (e.g. schools, hospitals, nursing homes);
- ◆ access roads should avoid riparian zones and should be built using appropriate construction materials;
- ◆ where hard standing is provided this should be permeable wherever possible to reduce site run-off;
- ◆ install adequate site security

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- ◆ recover, reuse and recycle salvaged materials, if possible, on site to minimize vehicle movements
  - ◆ install an appropriate water management system as early as possible, for example, sustainable urban drainage systems to minimize the impact of the subsequent developed site on receiving water courses;
  - ◆ effective stabilization of altered landforms so as to minimize soil erosion and the potential for water pollution from suspended solids;
  - ◆ existing habitat features should be incorporated into site design and protected from change;
  - ◆ sites of archaeological or cultural interest should be preserved in situ where possible, although relocation should be considered where damage is unavoidable;
  - ◆ wheel washing facilities for vehicles leaving the site;
  - ◆ sheeting of trucks carrying materials off site;
  - ◆ management operations should aim to minimize disturbance to adjacent residential and recreational uses.

## 5. References and further reading

1. Construction Industry Research and Information Association (2001) Sustainable urban drainage systems – Best Practice Guide. C523, CIRIA, London.
2. Construction Industry Research and Information Association (2000a) Groundwater Control – Design and Practice. ISBN 0 86017 5154
3. Construction Industry Research and Information Association (2000b) Sustainable urban drainage systems – Design manual for England and Wales. C522, CIRIA, London.
4. Construction Industry Research and Information Association (1999a) Sustainable Urban Drainage Systems Best Practice. Construction Industry Research and Information Association, London.
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7. Construction Industry Research and Information Association (1994) Environmental Assessment. Special Publication 96. CIRIA, London.
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