

# GUIDELINES

For the Creation, Implementation and Maintenance of an  
**Environmental Operating Plan**



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## **Disclaimer**

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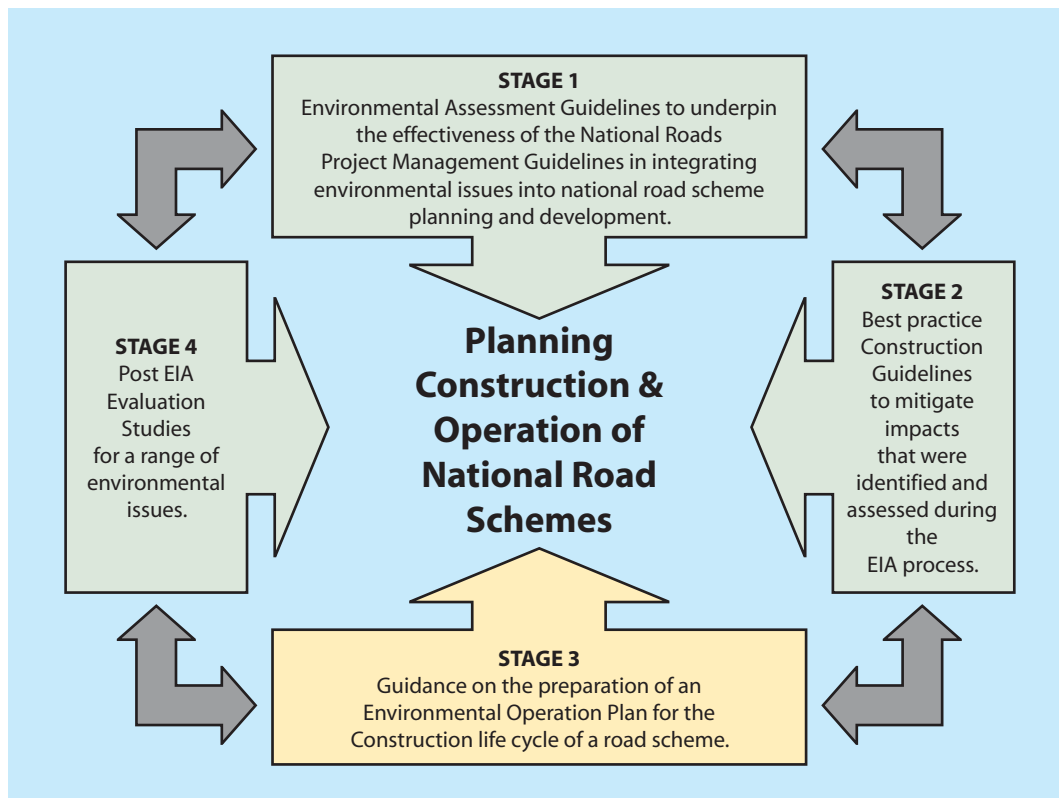
CHAPTER 1  
**INTRODUCTION**

## 1. INTRODUCTION

### 1.1. STRATEGIC OVERVIEW

In order to facilitate the integration of environmental issues into road scheme planning, construction and operation, the National Roads Authority (NRA) has put in place a four-stage strategy – the Environmental Integration Model, which is illustrated in Figure 1. In order to implement this strategy, the NRA has developed (and continues to develop and update) a series of best practice guidance documents. The NRA’s *Guidelines for the Creation, Implementation and Maintenance of an Environmental Operating Plan* represents such a best practice guidance document. The purpose of this document is to underpin Stage Three of the Environmental Integration Model, i.e. the development, implementation and maintenance of an Environmental Operating Plan (EOP) by the main contractor for the construction life cycle of a national road scheme project.

Figure 1: The National Roads Authority’s Four Stage Strategy –  
The Environmental Integration Model



## 1.2. THE PURPOSE OF THE ENVIRONMENTAL OPERATING PLAN (EOP) GUIDANCE DOCUMENT

The EOP is defined as a document that outlines procedures for the delivery of environmental mitigation measures and for addressing general day-to-day environmental issues that can arise during the construction phase of a national road scheme.

The primary focus of this document is to provide guidance to main contractors on how EOPs should be formulated, implemented and maintained. In addition, it will assist local authorities and the Engineer on what should ideally be incorporated in such plans. The content and nature of this document may also provide a source of useful reference material during the EIA process.

Whilst these guidelines are not mandatory, they are recommended in order to achieve best practice and consistency in the development of EOPs. The contents and examples contained in this guidance document are an attempt to illustrate how the development of an EOP should be approached. While the document attempts to address issues that are generic to most schemes, it should not be considered exhaustive and it is recommended, in the development of an EOP, that the main contractor takes cognisance of site-specific issues and characteristics. Where an EOP is required for a national road scheme, it will be the duty of the main contractor to ensure the sufficiency and accuracy of all material contained within it.

To varying degrees, all of the main contractor's site personnel should use elements of the EOP to avoid, prevent, reduce and/or compensate for the environmental impacts of the project works.

The use of the term 'main contractor's site personnel' in this guidance document is intended to include the site personnel of all subcontractors to whom the main contractor has subcontracted part of the Works. The term is also intended to include the site personnel of any specialists, nominated subcontractors, etc.

This guidance document employs the following generic titles: Project Manager, Programme Manager, Construction Manager, Environmental Manager, Site Agents, Forepersons and Safety Officers. It is recognised that the actual titles used by the main contractor may vary, however, the main contractor should assign relevant duties and responsibilities to the appropriate equivalent person.

## 1.3. THE OBJECTIVE OF THE EOP

The EOP should be designed to assist the main contractor in preventing, managing and/or minimising significant environmental impacts during the construction phase. To achieve this objective the EOP should:

- Comprehensively incorporate all Environmental Commitments set out in:
  - the Contract documents (in particular, the Works Requirements (WR));
  - the Environmental Impact Statement (EIS);

- any conditions and/or modifications imposed by An Bord Pleanála (ABP);
  - the Schedule of Commitments,
- and provide a method of documenting compliance with these Environmental Commitments and conditions/modifications;

- List all relevant environmental legislative requirements and provide a method of documenting compliance with these requirements, and
- Outline methods by which construction work will be managed to prevent, reduce or compensate for potential adverse impacts on the environment.

The EOP should also include any commitments and/or requirements emanating from contractually or legally prescribed consultations with third parties (e.g. National Parks and Wildlife Service (NPWS), Regional Fisheries Boards (RFB's) or Office of Public Works (OPW)) and provide a method of documenting compliance with these commitments and/or requirements.

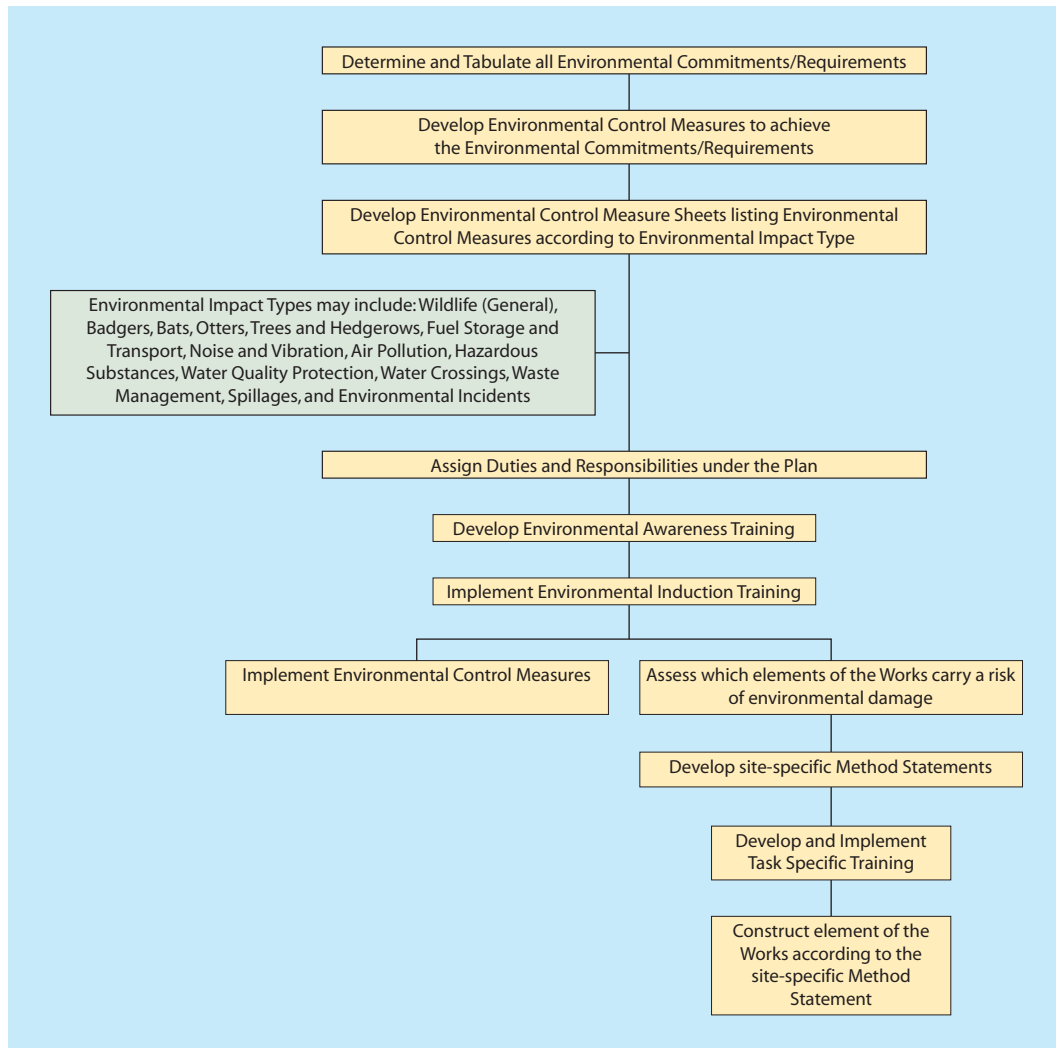
This document will provide an indicative template as guidance for the main contractor to ensure that they are fully aware of all Environmental Commitments and Requirements relevant to the scheme.

The guidance recommends that the EOP should:

- Clearly identify the roles and responsibilities of the main contractor's staff having regard to the main contractor's organisational structure;
- Incorporate procedures for communicating with the public;
- Incorporate procedures for communicating with relevant site-personnel;
- Incorporate procedures for Environmental Awareness Training for the main contractor's staff;
- Incorporate monitoring procedures and responses to monitoring results, where contractually required, and
- Provide for a system of audit with regard to the effectiveness of the EOP during the construction life cycle of the project.

The main steps involved in the creation, implementation and maintenance of an Environmental Operating Plan are illustrated in Figure 2.

Figure 2: Main Steps in the Creation, Implementation and Maintenance of an Environmental Operating Plan



#### 1.4. DYNAMIC NATURE OF THE EOP

It is anticipated that the EOP will be a dynamic document and the main contractor should ensure that it remains valid for the duration of the project. The EOP may need to be altered during the life cycle of the construction project to take account of monitoring results, legislative changes, outcomes of third-party consultations, etc. Additional appendices may be added to the EOP to accommodate monitoring results, waste permits, planning permissions, etc.

#### 1.5. REQUIREMENTS FOR THE ENVIRONMENTAL MANAGER

In order to help ensure the successful development, implementation and maintenance of the EOP,



it is recommended that the main contractor appoint a site Environmental Manager.

The Environmental Manager should possess sufficient training, experience and knowledge appropriate to the nature of the task to be undertaken, a Level Eight qualification recognised by the Higher Education and Training Awards Council (HETAC), or a University equivalent, or other qualification acceptable to the Employer, in Environmental Science or Environmental Management, or other subject acceptable to the Employer.

For smaller national road schemes it may not be necessary for the main contractor to engage the Environmental Manager as a full-time member of staff. However, in such circumstances, the Environmental Manager should be engaged as and when required in order to fulfil the duties and responsibilities specified in the EOP.

See also section 5.2.4 of this document concerning the role of the Environmental Manager.

#### 1.6. WHO REVIEWS THE EOP?

NRA contract documents generally require the main contractor to submit the EOP to the Engineer within 28 days after receiving notice of Commencement of Works from the Engineer and at defined intervals thereafter.

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In order to help fulfil his/her duties under the Contract, the Engineer should carry out an audit of the EOP at sufficient intervals to ensure the main contractor is complying with the environmental provisions of the Contract.

Where a Project Extranet site is being established it is recommended that an electronic version of the EOP be placed on this site to allow members of staff of the Contractor, the Engineer, the Employer and the National Roads Authority monitor and view the EOP.



CHAPTER 2  
**GENERAL  
PROJECT DETAILS**

## 2. GENERAL PROJECT DETAILS

The inclusion of general project details within the EOP will assist those without detailed knowledge of the scheme in quickly familiarising themselves with key elements of the project. The inclusion of such data will assist those who have a need to examine, review or audit the EOP in conveniently determining the extent and significance of the works. Box 1 indicates an example of General Project Details for a typical scheme.

General Project Details include data such as the project name; a description of the key elements of a project; the location of work sites, offices, compounds and borrow pits; the duration of the scheme and a map of the scheme.

BOX 1

### Example of General Project Details

**Project Name:**

N101 Malin Head to Beara Peninsula Scheme

**Project Description:**

The N101 Malin Head to Beara Peninsula Scheme will consist of the following:

- 40 kilometres of high quality dual carriageway connecting a link road in the Townland of Malin in the District Electoral Division of Malin District in the County of Donegal to the existing N101 Malin Head Bypass in the Townland of Castletownbere in the District Electoral Division of Beara in the County of Cork;
- A link road from the proposed Malin grade separated junction to the existing N101 west of Casteltownbere;
- Four grade separated junctions;
- Realignment of minor roads;
- A number of structures and culverts including twenty-four road bridges, one railway bridge, seven accommodation bridges and three river bridges, and
- Associated ancillary works.

**Location of all Work Sites, Offices, Compounds, Borrow Pits**

Map attached.

**Duration of the Project**

2 years and 6 months



CHAPTER 3  
**CONTACT SHEETS**

### 3. CONTACT SHEETS

Contact details of relevant personnel are required primarily in order to ensure the efficient reporting of environmental incidents. It is essential that these contact details be frequently reviewed to ensure that they are up-to-date.

Contact details include the position title, name, mobile phone number and email address of relevant personnel. Contact details may be broken down into three categories: main contractor contacts, employer contacts and third party contacts.

To ensure that relevant information moves through the site in an efficient manner it is recommended that all relevant main contractor, employer and third party consultation contact details be documented as outlined in Boxes 2-4.

3.1. MAIN CONTRACTOR CONTACTS

BOX 2

**Example Table of Main Contractor Contacts**

<b>Position Title:</b>	<b>Name:</b>	<b>Mobile Phone Number:</b>	<b>Email Address:</b>
Project Manager			
Programme Manager			
Construction Manager*			
Environmental Manager*			
Alternate to Environmental Manager			
Site Agents			
Forepersons			
Safety Officers*			
Site Emergency Number*			
* 24 hour contact details required.			

3.2. EMPLOYER CONTACTS

BOX 3

**Example Table of Employer Contacts**

<b>Organisation:</b>	<b>Position Title:</b>	<b>Name:</b>	<b>Mobile Phone Number:</b>	<b>Email Address:</b>
Project Resident Engineer's Office	Project Resident Engineer			
Regional Design Office	Design Office Project Manager			
Regional Design Office	Design Office Project Engineer			
Local authority	Liaison Officer			

3.3. THIRD PARTY CONTACTS

BOX 4

**Example Table of Third Party Contacts**

Organisation:	Position Title:	Name:	Phone Number:	Email Address:
Central Fisheries Board				
Regional Fisheries Board				
Waterways Ireland				
National Parks and Wildlife Service				
Department of Communications, Energy and Natural Resources				
Office of Public Works				
Environmental Protection Agency				
Local authority				
Department of the Environment, Heritage and Local Government				
Health and Safety Authority				
Emergency Services				
Other, as appropriate.				







CHAPTER 4  
**REFERENCE  
DOCUMENTS**

## 4. REFERENCE DOCUMENTS

A reference document section should be included within the EOP to indicate the documents referred to in its development. Reference documents may be divided into two categories: Scheme Specific Reference documentation and General Reference and Guidance documentation.

Scheme Specific Reference documents have been written specifically with the particular scheme in mind. Documents, such as the contract documents, the EIS, ABP's Order, Inspector's Report, and the Schedule of Commitments, will be referred to in determining the Environmental Commitments and Requirements which must be adhered to during the scheme's construction. Other Scheme Specific Documentation, such as the Health and Safety Plan, should be referenced to ensure that all works are carried out in a safe manner.

Box 5 contains an example list of scheme specific documentation.

General Reference and Guidance documentation of relevance indicate best practice approaches to addressing significant environmental impacts during the construction of road schemes. Cognisance of these documents should be taken in determining methods by which construction will be managed to prevent, reduce or compensate for potential adverse significant impacts on the environment. It is important to note that this list is non-exhaustive and that, from time to time, some of the listed documents may be revised. Regular updates of the NRA's *Environmental Assessment and Construction Guidelines* are available for download on [www.nra.ie/environment](http://www.nra.ie/environment).

Box 6 contains an example list of General Reference and Guidance documentation.

### 4.1. SCHEME SPECIFIC DOCUMENTATION

BOX 5

#### Example List of Scheme Specific Documentation

- **The Contract documents;**
- **The EIS;**
- **Copies of ABP's Order, Inspector's Report and other relevant documentation;**
- **The Schedule of Commitments;**
- Third Party Consultation Certificates;
- The Health and Safety Plan;
- The Quality Plan.

4.2. GENERAL REFERENCE AND GUIDANCE DOCUMENTATION

BOX 6

**Example List of General Reference and Guidance Documentation**

**NRA's Environmental Assessment and Construction Guidelines**

- *Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes* (National Roads Authority, 2005);
- *Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes* (National Roads Authority, 2005);
- *Guidelines of the Treatment of Bats During the Construction of National Road Schemes* (National Roads Authority, 2005);
- *Guidelines for the Treatment of Otters prior to the Construction of National Road Schemes* (National Roads Authority, 2006);
- *Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub, Post, Prior and During the Construction of National Road Schemes* (National Roads Authority, 2006);
- *Guidelines for Assessment of Ecological Impacts of National Road Schemes* (Rev 1, National Roads Authority, 2006);
- *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (Revision 1, National Roads Authority, October 2004);
- *Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (National Roads Authority, 2006);
- *Guidelines for the Assessment of Archaeological Heritage Impacts of National Road Schemes* (National Roads Authority, 2005);
- *Guidelines for the Assessment of Architectural Heritage Impacts of National Road Schemes* (National Roads Authority, 2005);
- *Guidelines for the Testing and Mitigation of the Wetland Archaeological Heritage for National Road Schemes* (National Roads Authority, 2005);
- *Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes* (National Roads Authority, 2005);
- *Environmental Impact Assessment of National Road Schemes – A Practical Guide* (National Roads Authority, 2005);
- *A Guide to Landscape Treatments for National Road Schemes in Ireland* (National Roads Authority, 2006).

**Other General Reference and Guidance Documentation of Relevance**

**Waste Related**

- *A Guide to Construction & Demolition Waste Legislation* (Rev. 1, RPOS-MCOS & MBCA, August 2004);
- *Code of Practice – Environmental Risk Assessment for Unregulated Waste Disposal Sites* (Consultation Draft, Environmental Protection Agency, October 2006);
- *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (DoEHLG, July 2006).

### Water Related

- C532 *Control of water pollution from construction sites: guidance for consultants and contractors* (Masters-Williams *et al*, 2001);
- SP156 *Control of water pollution from construction sites – guide to good practice* (Murnane *et al*, 2002);
- C648 *Control of water pollution from linear construction projects* (Murnane *et al*, 2006).

### General

- *Design Manual for Roads and Bridges* (Volume 10: Environmental Design and Management) (Highways Agency);
- *Design Manual for Roads and Bridges* (Volume 11: Environmental Assessment) (Highways Agency);
- C533 *Environmental management in construction* (Uren and Griffiths, 2000);
- C584 *Coastal and marine environmental site guide* (Budd *et al*, 2003);
- C587 *Working with wildlife, A resource and training pack for the construction industry* (Newton *et al*, 2004a);
- C613 *Working with wildlife pocket book* (Newton *et al*, 2004b);
- C650 *Environmental good practice on site* (second edition) (Chant-Hall *et al*, 2005a);
- C651 *Environmental good practice on site – pocket book* (Chant-Hall *et al*, 2005b);
- SP120 *A client's guide to greener construction* (CIRIA, 1995);
- *Towards Setting Environmental Quality Objectives for Soil - Developing A Soil Protection Strategy for Ireland* (Environmental Protection Agency, 2002);
- All other General Reference and Guidance Documentation of relevance.



CHAPTER 5

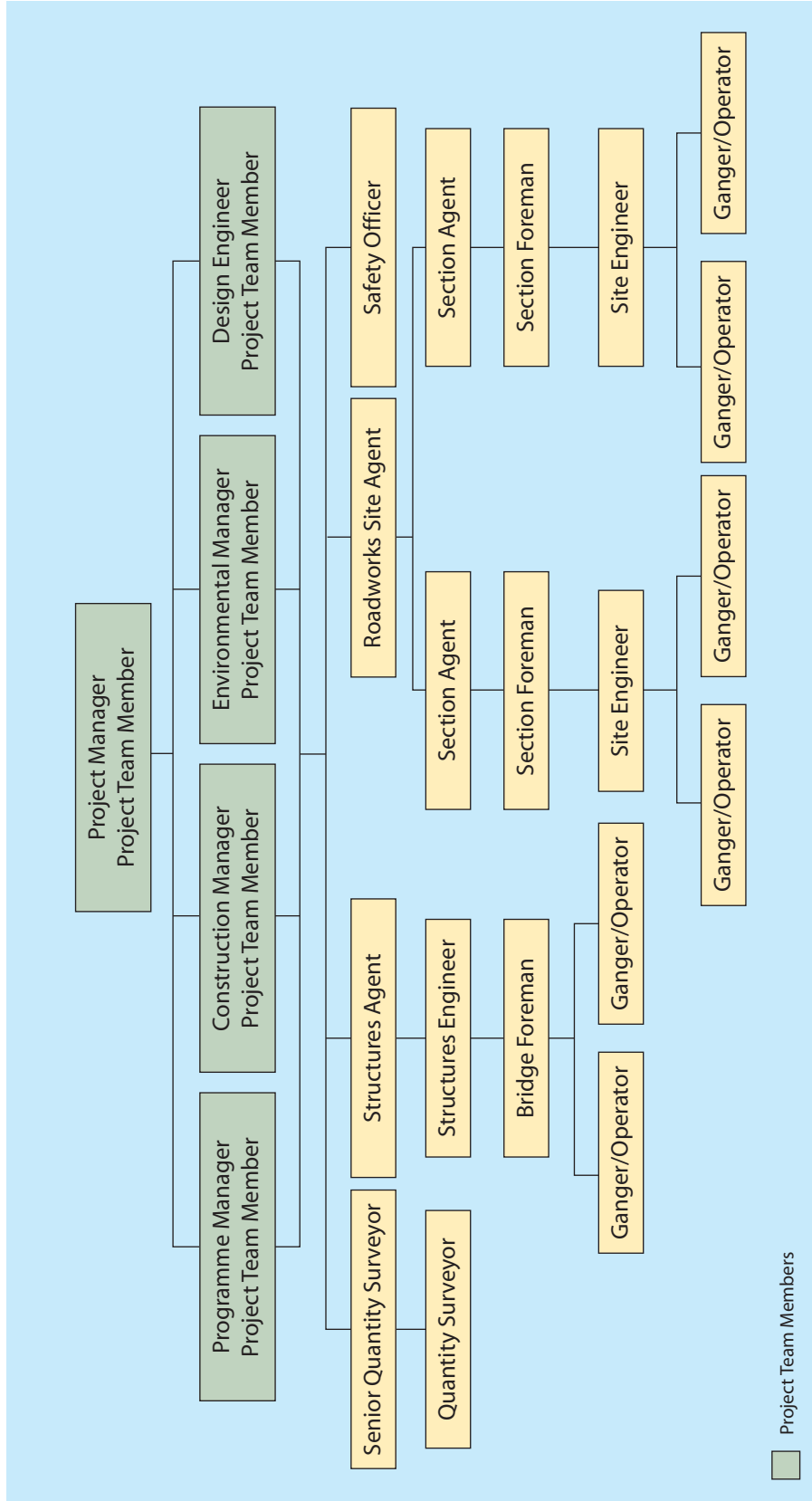
**ORGANISATIONAL  
STRUCTURE/  
DUTIES AND  
RESPONSIBILITIES**

## 5. ORGANISATIONAL STRUCTURE/DUTIES AND RESPONSIBILITIES

### 5.1. ORGANISATIONAL STRUCTURE

The main contractor's organogram illustrates the main contractor's reporting and hierarchal structure. This organogram should be included in the EOP and referred to in devising the duties and responsibilities of main contractor personnel under the EOP. The inclusion of the organogram will also allow those auditing and reviewing the EOP to quickly assess the extent and shape of the main contractor's project organisation and the duties and responsibilities of the various main contractor personnel. An example main contractor's organogram is indicated in Figure 3. However, it should be noted that the main contractor's organisational structure might vary in terms of layout and size depending on the size of the national road scheme project.

Figure 3: Example Organogram





## 5.2. DUTIES AND RESPONSIBILITIES

The EOP should clearly indicate the duties and responsibilities of the main contractor's members of staff. The assignment and communication of duties and responsibilities to individual named members will help ensure the successful implementation of the Plan. The Project Team, including the Project Manager, Construction Manager and Environmental Manager, should liaise during the formulation of the EOP to assign individual duties and responsibilities bearing in mind the overall organisational structure; the nature of Environmental Commitments and Requirements and the national road scheme project's specific characteristics. Example duties and responsibilities in relation to the Project Manager, Programme Manager, Construction Manager, Environmental Manager, Site Agents, Forepersons, Designers and all Project Personnel are given in Boxes 7 to 14.

### 5.2.1. Project Manager

BOX 7

#### Example duties and responsibilities of the Project Manager

Title: Project Manager

Name: \_\_\_\_\_

##### General

- Liaising with the Project Team in assigning duties and responsibilities in relation to the EOP to individual members of the main contractor's project staff.

### 5.2.2. Programme Manager

BOX 8

#### Example duties and responsibilities of the Programme Manager

Title: Programme Manager

Name: \_\_\_\_\_

##### General

- Liaising with the Project Team in assigning duties and responsibilities in relation to the EOP to individual members of the main contractor's project staff.

### 5.2.3. Construction Manager

The Construction Manager may have the general responsibility for ensuring the safe and effective organisation and management of construction activities. The general functions of the Construction

Manager may include:

- monitoring the progress and quality of the works;
- supervising and coordinating subcontractors and suppliers;
- ensuring that all Health and Safety regulations are met, and
- undertaking the strategic planning and coordination of the construction activities to ensure that the required personnel, plant, machinery and materials are available to enable the project to be completed on time, within budget and to the agreed quality.

In terms of the EOP, the Construction Manager should have overall responsibility for ensuring that the EOP objectives, as previously indicated are met. Box 9 indicates example duties and responsibilities of the Construction Manager.

BOX 9

### Example duties and responsibilities of the Construction Manager

Title: Construction Manager

Name: \_\_\_\_\_

The designated person has the following responsibilities in relation to environmental issues:

#### Site-Specific Method Statements

- Liaising with the Environmental Manager in preparing site-specific Method Statements for all Works activities where there is a risk of environmental damage, by incorporating relevant Environmental Control Measures and referring to relevant Environmental Control Measure Sheets;
- Liaising with the Environmental Manager in reviewing and updating site-specific Method Statements for all Works activities where Environmental Control Measure and Environmental Control Measure Sheets have been altered, and
- Liaising with the Environmental Manager where third party agreement is required in relation to site-specific Method Statements, Environmental Control Measures and/or Environmental Control Measure Sheets.

#### General

- Being familiar with the Reference Documents listed in Box 5 and 6 and, in particular, being aware of all Environmental Commitments and Requirements contained within them;
- Ensuring that all relevant information on project programming, timing, construction methodology, etc., is communicated from the contractor's Project Team, including the Project Manager and Programme Manager, to the Environmental Manager in a timely and efficient manner in order to allow pre-emptive actions relating to the environment to be taken where required;
- Ensuring that adequate resources are provided to carry out ecological surveys, where and when required;
- Ensuring that adequate resources are provided to design and install any environmental interventions;
- Liaising with the Engineer and providing information on environmental management to the Engineer during the course of the construction phase;
- Liaising with the Project Team in assigning duties and responsibilities in relation to the EOP to individual members of the main contractor's project staff, and
- Ensuring that the Environmental Manager performs regular and frequent environmental site inspections.

#### 5.2.4. Environmental Manager

The role of the Environmental Manager is vital in ensuring that the EOP is developed, implemented and maintained. The Environmental Manager should be responsible for co-ordinating the day-to-day management of environmental impacts during the construction phase and for assisting and

advising the main contractor's Project Team when programming construction activities and devising methodologies. The Environmental Manager should help ensure that works are constructed in accordance with the relevant Environmental Commitments and Requirements and that such compliance is adequately recorded and documented. The Environmental Manager should be involved in third-party consultations and in public and internal communications on environmental issues. The Environmental Manager should also be responsible for performing site inspections. In addition, the Environmental Manager should deal with licensing and permit issues; keep up-to-date with relevant environmental best practice and legislative changes; engage in staff training; manage responses to environmental incidents and engage environmental contractors as and when required.

The Environmental Manager should procure the advice and services of specialised qualified and accredited environmental professionals as and when required in order to help fulfil the Environmental Manager's duties and responsibilities under the EOP.

The requirements of an Environmental Manager in terms of experience, training and knowledge have already been outlined in Section 1.5. Box 10 provides an example of the duties/responsibilities of the Environmental Manager.

BOX 10

### Example duties and responsibilities of the Environmental Manager

Title: Environmental Manager

Name: \_\_\_\_\_

Name of Alternate: \_\_\_\_\_

He/She has the following responsibilities:

#### Site-Specific Method Statements

- Liaising with the Construction Manager in preparing site-specific Method Statements for all Works activities where there is a risk of environmental damage. These site-specific Method Statements should incorporate relevant Environmental Control Measures and take account of relevant Environmental Control Measure Sheets;
- Liaising with the Construction Manager in reviewing and updating site-specific Method Statements for all Works activities where Environmental Control Measures and Environmental Control Measure Sheets have been altered, and
- Liaising with the Construction Manager where third party agreement is required in relation to site-specific Method Statements, Environmental Control Measures and/or Environmental Control Measure Sheets.

#### General

- Being familiar with the contents, environmental commitments and requirements contained within the Reference Documents in Boxes 5 and 6;
- Being familiar with baseline data gathered during Environmental Impact Assessment and during pre-construction surveys;
- Listing all Environmental Commitments and Requirements in an Environmental Commitments Summary Table;
- Assisting the Construction Manager in liaising with the Engineer and the provision of information on environmental management to the Engineer during the course of the construction phase, and
- Liaising with the Project Team in assigning duties and responsibilities in relation to the EOP to individual members of the main contractor's project staff.

#### Third Party Consultations

- Overseeing, ensuring coordination and playing a lead role in third party consultations required statutorily, contractually and in order to fulfil best practice requirements;
- Ensuring that the minutes of meetings, action lists, formal communications, etc., are well documented and that consultation certificates are issued to the Engineer as required;
- Liaising with all prescribed bodies during site visits, inspections and consultations;
- Where new Environmental Control Measures are agreed as a result of third party consultation, ensuring that the EOP is amended accordingly;

- Where new Environmental Control Measures are agreed as a result of third party consultation, the Environmental Manager should liaise with the Construction Manager in updating relevant site-specific Method Statements, and
- Where required, liaising with the Construction Manager in agreeing site-specific Method Statements with third parties.

#### Licensing

- Ensuring that all relevant works have (and are being carried out in accordance with) the required permits, licences, certificates, planning permissions, etc.;
- Liaising with the designated licence holders with respect to licences granted pursuant to the Wildlife Act, 1976, as amended;
- Liaising with the designated licence holders and “*scientific agent*” (generally defined in the licence as “*the contractor engaged to carry out the scientific direction and monitoring of mitigation measures*”) with respect to licences granted pursuant to the European Communities (Natural Habitats) Regulations 1997, as amended, and
- Bringing to the attention of the Project, Design and Construction Team any timing and legal constraints that may be imposed on the carrying out of certain tasks.

#### Waste Management Documentation

- Holding copies of all permits and licences provided by waste contractors;
- Ensuring that any operations or activities that require certificates of registration, waste collection permits, waste permits, waste licences, etc., have appropriate authorisation, and
- Gathering and holding documentation with respect to waste disposal.

#### Legislation

- Keeping up to date with changes in environmental legislation that may affect environmental management during the construction phase;
- Advising the Construction Manager of these changes, and
- Reviewing and amending the EOP in light of these changes and bringing the changes to the attention of the main contractor’s senior management and subcontractors.

#### Site environmental inspections

- Carrying out regular documented inspections of the site to ensure that work is being carried out in accordance with the Environmental Control Measures and relevant site-specific Method Statements, etc, and
- Appending copies of the inspection reports to the EOP.

#### Specialist environmental contractors

- Identifying requirements for specialist environmental contractors (including ecologists, waste contractors and spill clean-up specialists) before commencement of the project;

- Procuring the services of specialist environmental contractors and liaising with them with respect to site access and report production;
- Ensuring that specialist environmental contractors are competent and have sufficient expertise to co-ordinate and manage environmental issues, and
- Co-ordinating the activities of all specialist environmental contractors on environmental matters arising out of the contract.

#### **Environmental Induction Training and Environmental Tool Box Talks**

- Ensuring that Environmental Induction Training is carried out for all the main contractor's site personnel. The induction training may be carried out in conjunction with Safety Induction Training, and
- Providing toolbox talks on Environmental Control Measures associated with site-specific Method Statements to those who will undertake the work.

#### **Environmental Incidents/Spillages**

- The Environmental Manager should be notified of all incidents where there has been a breach of agreed environmental management procedures: where there has been a spillage of a potentially environmentally harmful substance; where there has been an unauthorised discharge to ground, water or air; where there has been damage to a protected habitat, etc.;
- The Environmental Manager should prepare and be in readiness to implement at all times an Emergency Response Plan.
- The Environmental Manager is responsible for notifying the relevant statutory authority of environmental incidents, and
- Carrying out an investigation and producing a report regarding environmental incidents. The report of the incident and details of remedial actions taken should be made available to the relevant authority, the Engineer and the Construction Manager.

5.2.5. *Site Agent*

Site Agents may have responsibilities for day-to-day site operations. Their general responsibilities may include managing and supervision of the Works, dealing with the local authority and various statutory undertakers, liaising with the Engineer, dealing with the Designers and supervising subcontracts.

The Site Agent should be familiar with the contents, commitments and requirements relevant to his/her area of work contained within the Reference Documents listed in boxes 5 and 6.

BOX 11

**Example duties and responsibilities of the Site Agent**

Title: Site Agent

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_

He/She has the following responsibilities:

- Ensuring Forepersons under his/her control adhere to the relevant Environmental Control Measures and relevant site-specific Method Statements, etc;
- Ensuring that procedures agreed during third party consultations are followed;
- Reporting immediately to the Environmental Manager any incidents where there has been a breach of agreed environmental management procedures; where there has been a spillage of a potentially environmentally harmful substance; where there has been an unauthorised discharge to ground, water or air, damage to a protected habitat, etc., and
- Attending environmental review meetings as required.



### 5.2.6. Foreperson

Forepersons may have general responsibility for organising the workforce and subcontractors and ensuring they carry out high quality work in an efficient and safe manner and within budget.

Box 12 contains example duties and responsibilities of Forepersons in terms of the EOP.

#### BOX 12

### Example duties and responsibilities of the Foreperson

Title: Foreperson

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_

The foreperson is responsible for adhering to the relevant Environmental Control Measures and relevant site-specific Method Statements, etc.

He/She has the following responsibilities:

#### General

- Ensuring personnel under his/her control adhere to the relevant Environmental Control Measures and relevant site-specific Method Statements, etc., and
- Reporting immediately to the Environmental Manager and Site Agent any incidents where there has been a breach of agreed procedures: where there has been a spillage of a potentially environmentally harmful substance; where there has been an unauthorised discharge to ground, water or air; where there has been damage to a protected habitat, etc.

5.2.7. Designer

The general role of the Designer is commonly defined in the contract as a firm, organisation or person employed by the main contractor to undertake and certify the Design and to supervise the works.

Box 13 contains example duties and responsibilities of the Designer in terms of the EOP.

BOX 13

**Example duties and responsibilities of the Designer**

Title: Designer

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Name: \_\_\_\_\_

Designers should be familiar with the contents, commitments and requirements contained within the Reference Documents listed in boxes 5 and 6, and should be aware of how these impact on the design.

He/She has the following responsibilities:

**General**

- Participating in Third Party Consultations and liaising with Third Parties through the Environmental Manager, and
- Being familiar with and taking account of the *Environmental Assessment and Construction Guidelines* issued by the National Roads Authority (see References Appendix 2).

#### 5.2.8. All Project Personnel

All project personnel employed by the main contractor, including machinery operators and general operatives, will have duties and responsibilities under the EOP.

Box 14 contains example duties and responsibilities of all project personnel in terms of the EOP.

#### BOX 14

### Example duties and responsibilities of All Project Personnel

All personnel should attend Environmental Induction Training before commencing work on site.

Personnel should adhere to the relevant Environmental Control Measures and relevant site-specific Method Statements set out in this Plan.

He/She has the following responsibilities:

- Reporting immediately to the Environmental Manager and Site Agent any incidents where there has been a breach of agreed procedures including: a spillage of a potentially environmentally harmful substance; an unauthorised discharge to ground, water or air, and damage to a protected habitat, etc. Depending on circumstances it may be appropriate for general operatives and machinery operators to report directly to their Foreperson who will then report to the Environmental Manager and Site Agent.



CHAPTER 6  
**ENVIRONMENTAL  
COMMITMENTS**

## 6. ENVIRONMENTAL COMMITMENTS

As indicated previously in Section 1.3, Environmental Commitments may emanate from, *inter alia*:

- The Contract documents (in particular, the Works Requirements (WR));
- The Environmental Impact Statement (EIS);
- The conditions or modifications imposed by An Bord Pleanála (ABP) in their consent for the scheme;
- The Schedule of Commitments;
- Relevant environmental legislation, and/or
- Legally or contractually prescribed third party consultation (e.g. “*Consult and comply*” provisions contained within the Contract).

The Environmental Manager should create a summary table (example set out in Box 15) in which each Environmental Commitment is noted. In order to understand the rationale for such commitment, the relevant document, Act, etc., should be referenced.

It is important to note that the Environmental Commitments may alter over the course of construction. Therefore, it is imperative that the Environmental Manager updates the listing as appropriate.

Once the Environmental Commitments have been entered, the Environmental Manager should input the method by which it is proposed to ensure that the Environmental Commitment is met (e.g. a reference to the relevant site-specific Method Statement or Environmental Control Measure – as discussed further in Chapter 7).

Again, the methods by which it is proposed to ensure that the Environmental Commitments are met may alter during the course of construction. For example, the Environmental Manager might agree to alter relevant site-specific Method Statements after legally or contractually prescribed consultations with third parties; as a result of changes in relevant environmental legislation; or, where monitoring indicates that environmental limit values legally or contractually prescribed are being breached.

The Environmental Commitments table should be updated during construction to indicate a reference to the documentary proof that the Environmental Commitment has been met. This may be in the form of a signed off site-specific Method Statement, consultation certificate, results of monitoring, etc., as appropriate. The documentary proof should be attached to the EOP.

BOX 15

**Example of an Environmental Commitments Table**

Environmental Commitment	Reference to Source of Environmental Commitment (e.g. paragraph number of the EIS, section of an Act, etc.)	Reference to Method by which the Environmental Commitment will be met (e.g. site-specific Method Statement or Environmental Control Measure).	Reference to Documentary Proof that Environmental Commitment has been met (e.g. signed off site-specific Method Statement, signed off Consultation Certificate, Results of Monitoring).





CHAPTER 7  
**ENVIRONMENTAL  
CONTROL MEASURES**

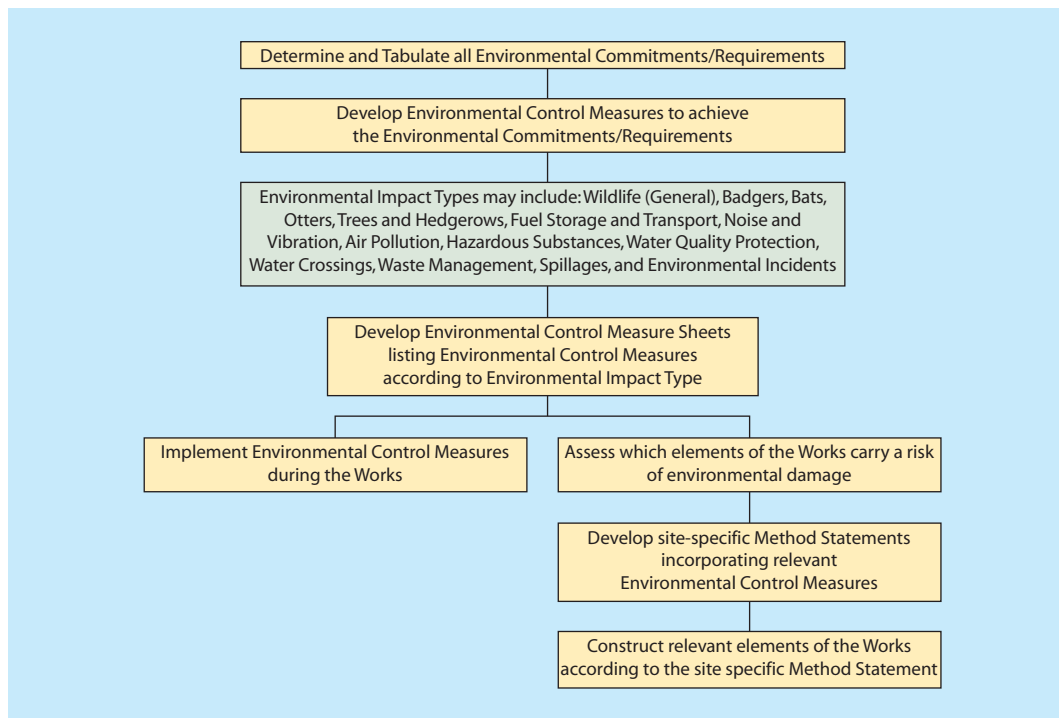


## 7. ENVIRONMENTAL CONTROL MEASURES

This chapter will demonstrate the meaning of the term Environmental Control Measure. Through providing examples of best practice Environmental Control Measures, grouped according to environmental impact type into Environmental Control Measure Sheets, this chapter will also indicate the number and nature of measures that are likely to be required to meet the Environmental Commitments/Requirements.

Figure 4 outlines the main steps in developing and implementing Environmental Control Measures. The figure alludes to the fact that certain Environmental Control Measures are ‘generally’ implemented during the Works. These Environmental Control Measures, e.g. ‘operating a just-in-time delivery of materials system’ (in order to minimise waste) or, ‘throttling back or shutting down of intermittently used machinery when not in use’ (in order to control noise at source), are not associated with discrete elements of the Works. Through appropriate training, direction and supervision of staff, such measures will be incorporated into every day working practices. However, as demonstrated in Chapter 8, where discrete elements of the Works carry a risk of environmental damage, e.g. the culverting of a watercourse, it will be necessary to incorporate relevant Environmental Control Measures into a site-specific Method Statement.

Figure 4: Main Steps in Developing and Implementing Environmental Control Measures



### 7.1. ENVIRONMENTAL CONTROL MEASURES

Environmental Control Measures are discrete actions or procedures that will assist in meeting the Environmental Commitments/Requirements. Sometimes a single Environmental Control Measure will be sufficient to meet the Environmental Commitment/Requirement. For example, the EIS may state, “*Appropriate signage and barriers should be erected prior to all construction activities to ensure that no construction activity or storage of material takes place within the Root Protection Area of a tree scheduled for retention*”. This Environmental Commitment becomes the Environmental Control Measure, as it is a discrete action in and of itself.

However, often a series of Environmental Control Measures will be required as some Environmental Commitments/Requirements may be generic in nature. For example, an EIS may contain such statements as, “*Runoff from machine service and concrete mixing areas must not enter watercourses*”. In order to achieve this commitment a number of Environmental Control Measures may be required, such as ensuring that no concrete mixing or machine servicing takes place within a certain distance of a watercourse and that machine service areas have a sealed drainage system running through a petrol interceptor prior to outfall.

As outlined in Chapter 8, it may be necessary to incorporate such a series of Environmental Control Measures into a site-specific Method Statement.

### 7.2. ENVIRONMENTAL CONTROL MEASURE SHEETS

Environmental Control Measure Sheets are simply sheets listing Environmental Control Measures according to environmental impact type (e.g. Impacts on Bats, Badgers, Water Crossings, etc.). Section 7.3 contains typical examples of Environmental Control Measure Sheets.

Whilst every effort has been made to ensure that the Environmental Control Measures contained within the example sheets are representative of best practice, it remains the responsibility of the Environmental Manager to ensure that all Environmental Control Measures are sufficient to meet the Environmental Commitments.

The Environment Manager should be responsible for bringing the Environmental Control Measure Sheets to the attention of the Site Agent and Foreperson. The Foreperson should be responsible for bringing the relevant Environmental Control Measure Sheet to the attention of all site personnel for review and sign-off.

### 7.3. EXAMPLE ENVIRONMENTAL CONTROL MEASURE SHEETS

Examples of Environmental Control Measure Sheets are presented in Boxes 16 to 27 inclusive and cover the following environmental impact types:

- Wildlife (General) (Box 16);
- Badgers (Box 17);

- Bats (Box 18);
- Otters (Box 19);
- Trees and Hedgerows (Box 20);
- Fuel Storage and Transport (Box 21);
- Noise and Vibration (Box 22);
- Air Pollution (Box 23);
- Hazardous Substances (Box 24);
- Water Quality Protection (Box 25);
- Water Crossings (Box 26);
- Waste Management (Box 27);
- Spillages (Box 28), and
- Environmental Incidents (Box 29).

The environmental impact types covered in a specific EOP should be representative of the characteristics of the individual road scheme.

The example Environmental Control Measure Sheets provide, *inter alia*, information on licensing, approvals and legislation. This information is intended as general guidance on relevant legislation, and is not comprehensive. When dealing with individual cases, readers should consult the full texts of the legislation, and obtain their own legal advice if necessary.

### 7.3.1. Example Environmental Control Measure Sheet – Wildlife (General)

An Example Environmental Control Measure Sheet in relation to Wildlife (General) is presented in Box 16.

This sheet outlines Environmental Control Measures in relation to the:

- pre-construction ecological walkover, and
- clearance authorization.



It also lists the responsibilities of individual main contractor personnel and indicates relevant reference documentation.

BOX 16

### Example Environmental Control Measure Sheet – Wildlife (General)

#### Environmental Control Measures – Pre-Construction Ecological Walkover

- The Reference Documents will identify animals, plants and/or habitats that require special treatment during the construction phase. However, because there is usually a time lag between the carrying out of fieldwork for the EIS and the actual commencement of ground clearance, an ecological walkover by competent ecologists should take place immediately before any clearance work begins.
- The Environmental Manager should arrange for the ecological walkover to take place and is responsible for reporting to the Construction Manager and Site Agents any findings that warrant alterations in the planned clearance.
- During the walkover the ecologist/s should identify the areas specified in the EIS that require special treatment. The Environmental Manager should ensure that these areas are clearly identified (initially using spray paint) and appropriately fenced off.

#### Environmental Control Measures – Clearance Authorization

- Clearance work in an area should not commence until the Environmental Manager has given authorisation for clearance within approved chainages. A suggested Clearance Authorisation Form (Form 2) is presented in Appendix 1.

#### Responsibility

- The Environmental Manager should arrange for an ecological walkover. He/she should issue clearance authorization to the Site Agent or Foreperson.
- The Site Agent should not commence clearance until he/she has signed the clearance authorization and has agreed to any special conditions.

#### References

Environmental Control Measure Sheets for Bats, Badgers and Trees and Hedgerows.

Form 2 Clearance Authorization (see Appendix 1 – Forms).

#### 7.3.2. Example Environmental Control Measure Sheet – Badgers

The badger is one of the larger wild mammals in Ireland. As it is relatively common and widespread throughout most of the country it is one of the mammals most likely to be encountered during the construction of a national road scheme. Therefore, it will usually be necessary that an Environmental Control Measure Sheet be drawn up in relation to badgers. An Example Environmental Control Measure Sheet in relation to badgers is contained in Box 17. This box indicates Environmental Control Measures in relation to:



- the pre-construction ecological walkover;
- consultation with relevant statutory authority;
- compliance with relevant licences, approvals and legislation;
- badger sett protection, and
- post-construction monitoring and mitigation.

The box also suggests responsibilities for individual main contractor personnel and recommends the production of site-specific Method Statements in relation to certain badger related works.

BOX 17

### Example Environmental Control Measure Sheet – Badgers

#### Environmental Control Measures – Pre-Construction Ecological Walkover

- The Environmental Manager should ensure that signs of badger activity are assessed during the Pre-Construction Ecological Walkover.

#### Environmental Control Measures – Consultation

Prior to their commencement, all works impacting on badgers and their breeding or resting places should be agreed and documented in consultation with the relevant statutory authority:

- National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government.

Such consultation should take place at the earliest opportunity in order to avoid any delay in obtaining licences or disruption to the works programme.

#### Environmental Control Measures – Compliance with relevant Licences, Approvals and Legislation

All works impacting on badgers and their breeding or resting places should be carried out in accordance with relevant licences, approvals and legislation.

- All works should comply with the provisions of the Wildlife Acts. Badgers and their setts are protected under the provisions of the Wildlife Act, 1976, and the Wildlife (Amendment) Act, 2000. This legislation makes it an offence to intentionally kill or injure a protected species or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal unless such activities are carried out in accordance with an appropriate licence.

- The removal of badgers from affected setts and subsequent destruction of these setts should be conducted under licence. An application for a licence should be submitted to the NPWS with the relevant ecological information from the detailed badger survey. At least three weeks is normally required to process a licence application, but early discussions with the NPWS can expedite the procedure. Conditions are usually attached to each licence granted in respect of badgers. It is normal practice to impose seasonal constraints e.g. that breeding setts are not interfered with or disturbed during the badger-breeding season (December to June inclusive). Closure of setts during the breeding season would require monitoring to demonstrate no sett activity.

#### **Environmental Control Measures – Badger Sett Protection**

- A map (at an appropriate scale) should be attached to the Environmental Operation Plan showing the general locations of badger setts and crossing points. The map should be available to Site Agents, Forepersons and Monitoring Staff.

#### **Site-specific Method Statements – Badgers**

Site-specific Method Statements should be drawn up for the following Works:

- The exclusion of badgers from setts;
- The destruction of setts;
- The construction of artificial setts;
- The construction of badger underpasses;
- The construction of mammal resistant fencing, and
- Site works in the vicinity of badger setts.

#### **Environmental Control Measures – Post-Construction Monitoring and Mitigation**

- Quarterly monitoring of mitigation measures should take place after completion of construction. Monitoring should be continued for at least one year after construction work ceases.

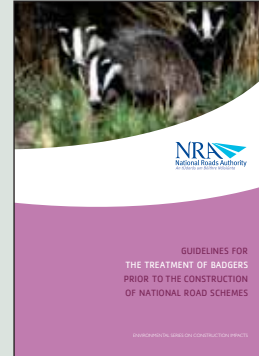
#### **Responsibility**

The Environmental Manager is responsible for ensuring that:

- Third party consultations take place;
- Liaising with the Designated Licence Holders and ensuring that the removal of badgers from affected setts and subsequent destruction of these setts is conducted under licence;
- A pre-construction ecological walkover is carried out;
- Environmental Control Measures are drawn up;
- Site Agents and Forepersons are made aware of requirements, and
- Post-mitigation monitoring takes place.

## References

*Guidelines for the Treatment of Badgers prior to the Construction of National Road Schemes* (National Roads Authority, 2005)



### 7.3.3. Example Environmental Control Measure Sheet – Bats

All bat species in Ireland are protected by both national and European legislation. Certain species of bat tend to be widespread and fairly common in Ireland and it is likely that Environmental Commitments/Requirements in respect of bats will arise and will need to be met on most national road scheme projects. An Example Environmental Control Measure Sheet in relation to bats is presented in Box 18. Examples are given of Environmental Control Measures in relation to:

- consultation with statutory bodies;
- compliance with relevant licences, approvals and legislation;
- signage of potential bat roosts;
- pre-construction surveys;
- bat protection, and
- post-construction monitoring.



The creation of site-specific Method Statements is recommended in relation to certain bat related activities. Responsibilities in relation to main contractor personnel and reference documents are also listed.

BOX 18

### Example Environmental Control Measure Sheet - Bats

#### Environmental Control Measures – Consultation

Prior to their commencement, all works impacting on bats and/or their breeding sites or resting places should be agreed and documented in consultation with the relevant statutory authority:

- National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government.

Consultation should take place at the earliest opportunity, prior to any works commencing, in order to avoid delay in obtaining licences or disruption to the works programme.

#### Environmental Control Measures – Compliance with relevant Licences, Approvals and Legislation

All works impacting on bats and/or their breeding sites or resting places should be carried out in accordance with relevant licences, approvals and legislation.

- All works should comply with the provisions of the Wildlife Acts and the European Communities (Natural Habitats) Regulations (1997-2005). The European Communities (Natural Habitats) Regulations (1997-2005) give effect to the Habitats Directive (92/43/EEC). Bats, their breeding sites and resting places are protected under both national legislation (the Wildlife Acts and the European Communities (Natural Habitats) Regulations) and European legislation (the Habitats Directive (92/43/EEC)). There is additional protection for lesser horseshoe bats because of their inclusion in Annex II of the Habitats Directive. The Wildlife Acts make it an offence to intentionally kill or injure a protected species or to wilfully interfere with or destroy the breeding site or resting place of a protected wild animal.
- The felling of trees that are identified as bat roosts or the demolition of buildings, bridges, etc., containing bat roosts should be conducted under licence. These licences are currently granted under Regulation 25 of the European Communities (Natural Habitats) Regulations, 1997 (as amended). An application for a wildlife licence should be submitted to the NPWS with the relevant ecological information from the detailed bat survey. At least three weeks is normally required to process a licence application, but early discussions with the NPWS can expedite the procedure. Conditions are usually attached to each licence granted in respect of bats. Conditions might require that:
  - the demolition of a building containing a bat roost should only occur within a certain season;
  - the licensee carry out a scientific programme of monitoring and supplementary mitigation measures to investigate and provide data on the effectiveness of the mitigation measures, and
  - the timing and sequencing of the implementation of mitigation measures.



### **Environmental Control Measures – Signage of Potential Bat Roosts**

- Prior to any construction or site clearance activities, it is important that all relevant personnel are made aware of any structures or areas that are known to be important to bats and of the legal protection afforded to bats and their habitat. It is also recommended that a notice be erected on all buildings, trees and bridges that were identified in the EIS as potential bat roosts. An example of such a notice is provided in the NRA's *Guidelines for the Treatment of Bats during the Construction of National Road Schemes* (National Roads Authority, 2005).

### **Environmental Control Measures – Pre-Construction Surveys (Buildings/Bridges)**

- Although detailed bat surveys are carried out during the EIS phase, there is the potential that bats may be discovered after construction has commenced. In such circumstances, a detailed survey should be undertaken and any appropriate mitigation measures implemented.
- Where the EIS, or subsequent surveys, indicate that the presence of bats is suspected or known in a building/bridge, a bat specialist should undertake a comprehensive examination of the building/bridge immediately prior to demolition. This examination should determine the nature of the roost (i.e., number, species, whether it is a breeding population of bats), as well as its exact location.

### **Environmental Control Measures – Pre-Construction Surveys (Trees)**

- In areas identified in the EIS as having bat presence, trees should be identified immediately prior to felling for the presence of bats and/or other bat activity. This survey should be carried out by a suitably qualified bat specialist and should include a visual inspection of the tree during daylight hours followed by a night time detector survey. The survey should be carried out from dusk through the night till dawn to ensure that bats do not re-enter the tree.

### **Environmental Control Measures – Bat Protection**

- A map (at an appropriate scale) should be attached to the Environment Operating Plan showing the locations of bats roosts, etc. The map should be available to Site Agents and Forepersons.

### **Site-Specific Method Statements – Works impacting on Bats**

Site-specific Method Statements should be completed for:

- Tree felling;
- Building demolition;
- Bridge restructuring, and
- Exclusion of bats.

### Environmental Control Measures – Post-Construction Monitoring

- Upon completion of the road construction, monitoring during the appropriate season should be undertaken by a bat specialist to determine the effectiveness of the mitigation measures employed.

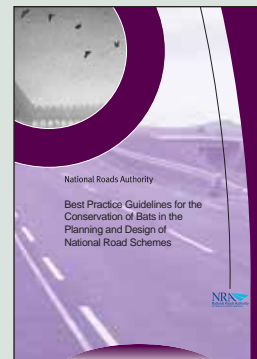
### Responsibility

The Environmental Manager is responsible for ensuring that:

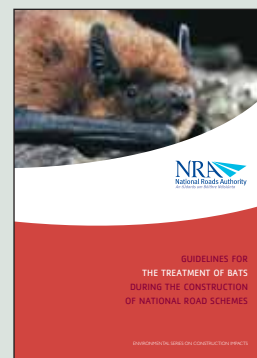
- A pre-construction survey is carried out;
- Third Party Consultation takes place;
- Environmental Control Measures are drawn up;
- Site Agents and Forepersons are made aware of requirements, and
- Post-mitigation monitoring takes place.

### References

*Guidelines for the Treatment of Bats during the Construction of National Road Schemes* (National Roads Authority, 2005).



*Best Practice Guidelines for the Conservation of Bats in the Planning of National Road Schemes* (National Roads Authority, 2005).



#### 7.3.4. Example Environmental Control Measure Sheet – Otters

The Eurasian otter (*Lutra lutra*) is relatively common and ubiquitous on rivers and streams in Ireland and it is, therefore, likely that its breeding sites or resting places, or its feeding habitat will be encountered during the construction of a national road scheme. As the species has suffered a decline in numbers in many parts of Europe, its protection in Ireland is an issue of considerable conservation importance.



Therefore, it will usually be necessary that an Environmental Control Measure Sheet be drawn up in relation to otters. An Example Environmental Control Measure Sheet in relation to otters is contained within Box 19. Examples are given of Environmental Control Measures in relation to:

- the pre-construction ecological walkover;
- consultation with relevant statutory authority;
- compliance with relevant licences, approvals and legislation;
- otter holt protection, and
- post-construction monitoring and mitigation.

BOX 19

### Example Environmental Control Measure Sheet – Otters

#### Environmental Control Measures – Pre-Construction Ecological Walkover

- The Environmental Manager should ensure that signs of otter activity are assessed during the Pre-Construction Ecological Walkover.

#### Environmental Control Measures – Consultation

Prior to their commencement, all works impacting on otters and their breeding or resting places should be agreed and documented in consultation with the relevant statutory authority:

- National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government.

Such consultation should take place at the earliest opportunity in order to avoid any delay in obtaining licences or disruption to the works programme.

#### Environmental Control Measures – Compliance with relevant Licences, Approvals and Legislation

All works impacting on otters and their breeding or resting places should be carried out in accordance with relevant licences, approvals and legislation.

- Otters, along with their breeding and resting places, are protected under the provisions of the Wildlife Act, 1976, as amended by the Wildlife (Amendment) Act, 2000. Otters have additional protection because of their inclusion in Annex II and Annex IV of the Habitats Directive, which is transposed into Irish law in the European Communities (Natural Habitats) Regulations, 1997 (S.I. No. 94 of 1997), as amended.
- The removal of otters from affected holts, and the subsequent destruction of these holts, must be conducted under a Regulation 25 derogation under the 1997 Habitats Regulations. The National Parks and Wildlife Service (NPWS), of the Department of the Environment, Heritage and Local Government, is responsible for processing these licences. An application for a Regulation 25 derogation should be submitted to the NPWS along with the relevant ecological information from otter surveys. At least three weeks is normally required to process a derogation application. Conditions will usually be attached to each derogation granted in respect of otters and operations at holts or in their vicinity. Closure of holts requires a monitoring period to ensure that there is no current otter activity at the holt. Derogations may not be provided by the NPWS for the closure of holts containing a breeding female or young otters. Derogations may also be required for any works likely to cause disturbance (e.g. piling and blasting) to active breeding holts (when present within c.150m of a scheme).

### **Environmental Control Measures – Otter Holt Protection**

- A map (at an appropriate scale) should be attached to the Environmental Operation Plan showing the general locations of otter holts and otter crossing-points, where applicable. The map should be available to Site Agents, Forepersons and Monitoring Staff.

### **Site-specific Method Statements – Otters**

Site-specific Method Statements should be drawn up for the following Works:

- The exclusion of otters from holts;
- The destruction of holts;
- The construction of otter ledges on culverts and bridges;
- The construction of otter underpasses;
- The construction of mammal resistant fencing;
- The construction of culverts and bridges known to contain otters, and
- Site works in the vicinity of otter holts.

### **Environmental Control Measures – Post-Construction Monitoring and Mitigation**

- Quarterly monitoring of mitigation measures should take place after completion of construction. Monitoring should be continued for at least one year after construction work ceases.

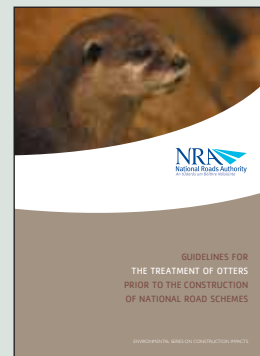
### **Responsibility**

The Environmental Manager is responsible for ensuring:

- That third party consultations take place;
- Liaison with the Designated Licence Holders and ensuring that the removal of otters from affected holts and subsequent destruction of these holts is conducted under licence;
- That a pre-construction survey is carried out;
- Environmental Control Measures are drawn up;
- Site Agents and Forepersons are made aware of requirements, and
- Post-mitigation monitoring takes place.

### **References**

*Guidelines for the Treatment of Otters Prior to the Construction of National Road Schemes* (National Roads Authority, 2006).



### 7.3.5. Example Environmental Control Measure Sheet – Trees and Hedgerows

It is almost certain that every national road scheme project will encounter trees and hedgerows. Balanced effort will have been made in the planning of national road schemes to reduce the impact on trees and hedgerows. The EIS may sometimes schedule trees that should be retained during construction. Trees and hedgerows, as well as being valuable natural resources in and of themselves, also provide habitats and, breeding and resting places for many species including bats and birds. Therefore, it is likely that a number of Environmental Commitments/Requirements will need to be met in respect of trees and hedgerows. An Example Environmental Control Measure Sheet in relation to trees and hedgerows is presented in Box 20. Environmental Control Measures are provided in relation to:



- consultation with statutory bodies;
- compliance with relevant licences, approvals and legislation;
- pre-construction remedial works and the installation of protective measures;
- pre-construction tree clearance;
- protection during construction, and
- post-construction monitoring.

Responsibilities for relevant main contractor personnel and references are also indicated.

#### BOX 20

### Example Environmental Control Measure Sheet – Trees and Hedgerows

#### Environmental Control Measures – Consultation

- Consultation is required with the relevant planning authority in relation to trees protected by a Tree Preservation Order (TPO).
- Consultation with the NPWS is required in relation to trees identified as bat roosts.

#### Environmental Control Measures – Compliance with relevant Licences, Approvals and Legislation

- Reasonable efforts should be made to avoid the felling of trees and clearance of hedgerows during the peak nesting season from March to July. Section 46(a) of the Wildlife (Amendment) Act, 2000, makes it an offence “for a person to cut, grub, burn or otherwise destroy, during the period beginning on the 1st day of March and ending on the 31st day of August in any year, any vegetation growing on any land not then cultivated”. However, this requirement is waived for the purposes of roads construction. Notwithstanding this waiver, the contractor should make reasonable efforts to avoid the felling of trees during the peak nesting season from March to July.

- If there is the potential to directly impact on a tree or group of trees protected by a TPO made under Section 205 of the Planning and Development Act, 2000, immediate consultation with the planning authority should ensue.
- The felling of trees that are identified as bat roosts should be conducted under licence obtained from the NPWS. Trees that are identified as bat roosts are afforded legal protection by the Wildlife Acts, 1976 and 2000, and the EU Habitats Directive (Under S.I. 94 of 1997).

#### **Environmental Control Measures – Pre-Construction Remedial Works and the Installation of Protective Measures**

In order to comply with a TPO and preserve trees identified for retention, the installation of protective measures and the undertaking of all remedial works should be carried out prior to commencement of any on-site construction activity. Environmental Control Measures might include:

- Trees scheduled for retention should be marked using high-visibility tape during the initial ecological walkover.
- Appropriate signage and barriers should be erected to ensure that no construction activity or storage of material takes place within the Root Protection Area.
- When pedestrian activity is deemed necessary within the Root Protection Area, adequate ground protection should be provided. This may be in the form of a layer of bark mulch spread to a thickness of approximately 100mm or the use of single thickness scaffolding boards placed upon a layer of geotextile material (to allow water penetration).
- Where it is necessary to allow medium sized vehicles to cross the Root Protection Area, a temporary buffer zone may be created. The ground within the temporary buffer zone should be covered by 25mm plywood sheets, layered upon 25mm of quarry gravel, layered upon 150mm of bark mulch. Steel plates can also be used.
- Remedial works including pruning and crown thinning on trees to be retained or on newly created treelines should be carried out by a qualified tree surgeon in accordance with BS 3998 (1989) *Recommendations for tree work* and the advice of a qualified arborist, where deemed necessary.

#### **Environmental Control Measure – Pre-Construction Tree Clearance**

- Reasonable efforts should be made to avoid the felling of trees during the peak nesting season from March to July.

#### **Environmental Control Measures – Protection during Construction**

- Where excavation work is required within the Root Protection Area of a tree scheduled for retention, such work should be carried out by mini-digger and/or hand as deemed appropriate. Exposed roots should be wrapped in a hessian sacking to avoid desiccation and roots less than 2.5cm in diameter can be pruned back to a side root. The advice of a qualified arborist should be sought if larger roots that influence anchorage need to be severed. Trunk protection should also be put in place using hessian sacking and timber strips clad around the tree.
- Alterations in ground levels should be carried out in accordance with the guidance contained within the NRA's *Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post The Construction of National Road Schemes* (National Roads Authority, 2006).

### Environmental Control Measures – Post-Construction Monitoring

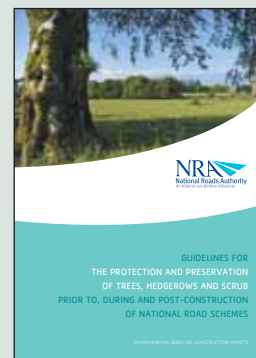
- Upon completion of the road construction, monitoring should be carried out to determine the success of the measures employed. Monitoring should be continued for at least one year after construction work ceases.
- Remedial works may be required including irrigation of a tree's root system; the application of a phosphorous-based fertilizer and/or the use of compressed air injection to counteract soil compaction.
- Once any remedial works are complete and all plant equipment has evacuated the site, protective barriers and ground protection can be removed.

### Responsibility

- The Environmental Manager should produce a map clearly recording the trees and hedgerows to be retained.
- The Environmental Manager should ensure that trees to be retained are identified and marked during the ecological walkover.
- The Environmental Manager should make the Site Agents and Forepersons aware of the trees and hedgerows to be retained.
- The Environmental Manager should ensure that site specific Method Statements are drawn up for all work in the vicinity of retained trees.
- The Environmental Manager should engage the services of an Arborist, where deemed necessary.
- The Site Agent should ensure that enclosures are kept in place during the construction phase.

### References

*Guidelines for the Protection and Preservation of Trees, Hedgerows and Scrub Prior to, During and Post The Construction of National Road Schemes* (National Roads Authority, 2006).





### 7.3.6. Example Environmental Control Measure Sheet – Fuel storage and Transport

Oil may escape from storage facilities either as a single catastrophic spillage or, through a prolonged low level of initially undetected seepage, which can often be equally or potentially more damaging. Whatever the cause, once in the external environment, the recovery of oil from soil, groundwater or surface water and drains is difficult, costly and such efforts may have only limited success. In addition to the direct environmental damage, there is potential for significant costs to the originator in terms of post-spill cleanup, compensation claims and legal penalties. The application of Environmental Control Measures in relation to the storage and filling of oil may reduce this risk of liability. Box 21 contains an Example Environmental Control Measure Sheet outlining typical Environmental Control Measures under the following headings:

- oil storage and filling facilities;
- secondary containment;
- fuel bowsers, and
- generators or other equipment.

Responsibilities for relevant main contractor personnel and references are also indicated.

#### BOX 21

### Example Environmental Control Measure Sheet – Fuel Storage and Transport

#### Environmental Control Measures – Oil Storage and Filling Facilities

- Oil storage tanks and the associated filling areas should be located on firm level ground avoiding sloping ground and particularly permeable soil.
- Oil storage tanks and the associated filling area and distribution pipe network should be at least 10 metres distant from surface water courses (rivers, streams, field drains) and 50 metres from wells or boreholes. When selecting a location consideration should also be given to proximity of surface water drains, sewer manholes, etc.
- The oil filling facility should be such that access for oil filling can only take place with the prior notification of a designated person.
- The facility should allow for a specified routine of inspection and should facilitate early detection of any oil leakage through observation by staff.
- Suitable barriers should be installed to protect against accidental impact.
- Where possible, the filling tank should be within direct sight of the delivery tanker in order to eliminate overfilling. Where this is not possible a second person should be in attendance throughout the filling period.
- Where the tank is provided with a flexible draw off pipe for filling of site vehicles etc. the hose should be fitted with a lockable shut off valve located at the fixed exit point from the tank. The delivery end of the flexible pipe should be fitted with a 'squeeze to open' valve. When not in use the dispensing head should be 'docked' within the bund. It should be noted that such a refuelling area should be sited over an impermeable surface graded so as to direct any spillage and inevitable minor drippage through an adequately sized, designed and serviced below ground oil interceptor.

- A purpose designed, removable, drip tray should be provided beneath the connection point to catch any residual oil during filling and disconnection of the flexible tanker hose. This drip tray should be regularly emptied. Prior to filling, the bund should be free of any accumulated rainwater.
- A notice should be located immediately adjacent to the filling point detailing filling procedures and emergency response measures.

#### **Environmental Control Measures – Secondary Containment**

- Secondary containment should be provided by means of an above ground bund i.e. an impermeable wall and base within which the tank sits, raised above the floor, on plinths. Most oil storage facilities use reinforced concrete/masonry bunds that are constructed in situ. Block wall construction is generally not recommended. However, for small quantities of oil, purpose built Glass Reinforced Plastic (GRP) bunds, or similar, may be suitable.
- The bund should be impermeable to oil and water and be of sufficient structural strength to withstand, with a sufficient margin of safety, the pressure exerted by a sudden oil tank collapse and the subsequent (lesser, but prolonged) pressure of the volume contained.
- Associated equipment such as filling and off take points, sighting gauges etc., should be located within the bund.
- The bund capacity should be sufficient to contain 110% of the tank's maximum capacity. Storage of oil drums or similar items that would consume bund capacity should not be permitted. Ideally the bund should have 250mm height remaining above the 10% additional capacity to accommodate wave effects that may be encountered during the sudden collapse of a tank.
- Where there is more than one tank within the bund the capacity should be sufficient to accommodate 110% of the largest tank's maximum capacity or 25% of the total maximum capacities of all tanks, whichever is the greater.
- The bund should be free of any service holes, drainage valves or similar openings.
- The bund base should slope towards a rainwater sump of sufficient size to accommodate a submersible pump for oil recovery and regular rainwater removal.
- Where water contained within the bund has an oil sheen, the Environmental Manager should be notified and the bund should be pumped out by a specialist contractor.

#### **Environmental Control Measures – Fuel Bowsers**

- Fuel bowsers should be banded or double skinned. Refuelling from bowsers should only take place a minimum of 10 metres distant from surface watercourses (e.g. rivers, streams, field drains) and a minimum of 50 metres from wells or boreholes. Refuelling should not take place near manholes or drains.

#### **Environmental Control Measures – Generators or Other Equipment**

- Drip trays should be put in position when using generators or other equipment where leakage or spillage could occur.

### Responsibilities

- \_\_\_\_\_ is the designated person for \_\_\_\_\_ area responsible for being present during tanker refilling operations of oil storage tanks.
- \_\_\_\_\_ is the designated person responsible for checking bunds weekly.
- \_\_\_\_\_ is the designated person authorised to pump from the bund only when accumulated rainwater is clear.

### References

*Best Practice Guidelines BPGCS005 – Oil Storage Guidelines* (Enterprise Ireland).

#### 7.3.7. Example Environmental Control Measure Sheet – Noise and Vibration

Construction activity often generates community noise/vibration complaints, even when it takes place over a limited time frame. There are often many Environmental Commitments/Requirements in relation to construction noise and vibration. Therefore, a number of Environmental Control Measures may be required to meet these commitments/requirements. An Example Environmental Control Measure Sheet in relation to Noise and Vibration is outlined in Box 22. Environmental Control Measures are presented under the headings:

- consultation;
- compliance with relevant licences, approvals and legislation;
- construction noise and vibration;
- communication with the public;
- piling and blasting;
- control of noise and vibration (general);
- control of noise and vibration at source;
- controlling the spread of noise and vibration, and
- construction of permanent noise reducing measures.

The allocation of responsibilities is also exemplified along with a listing of reference documents.

BOX 22

### Example Environmental Control Measure Sheet – Noise and Vibration

#### Environmental Control Measures – Consultation

- Consultation may be required with the local authority in relation to construction activities at certain times.

#### Environmental Control Measures – Compliance with relevant Licences, Approvals and Legislation

- Generally, the explicit permissions of the relevant local authority will be required for construction activities at certain times other than that required in respect of emergency works.

#### Environmental Control Measures – Construction Noise and Vibration

- Site-specific Method Statements should be drawn up for works near to noise and vibration sensitive receptors.
- The Reference Documents will identify noise and vibration sensitive receptors. A map (at an appropriate scale) should be attached to the EOP showing the location of sensitive receptors. The map should be available to Site Agents and Forepersons.

#### Environmental Control Measures should consider the following aspects:

- Noise limits;
- Methods for selecting plant items;
- Practicable noise control measures for plant items likely to be used;
- Hours of operation;
- Procedures for dealing with emergency work;
- Procedures for dealing with specific activities with the potential to generate significant levels of noise, e.g. piling, blasting, and
- Communication with the general public.

The Reference Documents may prescribe maximum permissible noise levels at the façade of dwellings during construction. Table 1 illustrates levels that are generally considered acceptable. These levels are indicative only and it may be more appropriate to apply more stringent limits in areas where pre-existing noise levels are low:

**Table 1: Maximum permissible noise levels at the façade of buildings during construction.**

Day and times	$L_{Aeq}(1 \text{ hr})$ dB	$L_{pA(max)}$ dB
Mon – Fri 7.00-19.00 hrs	70	80
Mon-Fri 19.00-22.00hrs*	60	65
Sat 8.00-16.30hrs	65	75
Sun & Bank Holidays 8.00-16.30*	60	65

\*Work at these times will require the permission of the local authority.

The Reference Documents may prescribe allowable vibration levels during road construction. The levels below have been derived through consideration of the various standards and compliance with these levels, in the absence of other statutorily imposed limits for individual road schemes (e.g. in An Bord Pleanála’s approval), should ensure that there is little or no risk of damage to buildings. Table 2 indicates typically allowable vibration during road construction in order to minimise the risk of building damage.

**Table 2: Allowable vibration during road construction in order to minimise the risk of building damage.**

Allowable vibration velocity (Peak particle velocity) at the closest part of any sensitive property to the source of vibration at a frequency of:		
Less than 10Hz	10 to 50Hz	50 to 100Hz (and above)
8 mm/s	12.5 mm/s	20 mm/s

In some instances it has been shown that a Public Communications Strategy can be beneficial. BS 5228: Part 1: 1997 **Noise and vibration control on construction and open sites** points to the benefits of establishing such a strategy, viz:

*It is well established that people’s attitudes to noise can be influenced by their attitudes to the source itself. Noise from a site will tend to be accepted more readily by local residents if they consider that the site operator is doing all that he or she can to avoid unnecessary noise... People’s attitudes to vibration may be similarly influenced.*

Given the potential benefits, the main contractor should consider the development of an appropriate communications strategy. The nature of this strategy can vary from scheme to scheme but it is recommended that some of the Environmental Control Measures suggested in Box 22 be considered for incorporation into such a strategy.

BOX 22

### Example Environmental Control Measure Sheet – Noise and Vibration (contd.)

#### Environmental Control Measures – Communication with the Public

- A Public Communications Strategy should be established to promote awareness of measures being taken to restrict noise and vibration to acceptable levels. See Chapter 10.

#### Environmental Control Measures – Piling and Blasting

- A publicity campaign should be undertaken prior to the commencement of piling and blasting, explaining the work being carried out and the reasons for the work.
- An on-site documented complaints procedure should be implemented.
- Blasting should be carried out at similar times each day to reduce the ‘startle’ effect.
- Trial blasts should be carried out in less sensitive areas to assist in blast designs and identify potential zones of influence.

#### Environmental Control Measures – Control of Noise and Vibration (General)

Environmental Control Measures in relation to Noise and Vibration may be split into two categories:

- Control of noise and vibration at source, and
- Controlling the spread of noise and vibration.

#### Environmental Control Measures – Control of Noise and Vibration at Source

- Where reasonably practicable, noisy plant or processes should be replaced by less noisy alternatives.
- Plant should be properly and regularly maintained.
- Compressors should be ‘sound reduced’ models fitted with properly lined and sealed acoustic covers which should be kept closed whenever machines are in use and all ancillary pneumatic tools should be fitted with suitable silencers.
- Machinery, which is used intermittently, should be shut down or throttled back to a minimum during those periods when not in use.
- All vehicles and mechanical plant should be fitted with effective exhaust silencers.
- Noise from existing plant and equipment can be reduced by modification or by the application of improved sound reduction methods, but this should only be carried out after consultation with the manufacturer.
- Depending on the nature of the machine and on their ventilation requirements the use of enclosures and acoustic sheds should be considered where their use is reasonably practicable.
- Where deemed reasonably practicable, plant and site equipment should be located away from noise sensitive receptors.
- Plant known to emit noise strongly in one direction should, when possible, be orientated so that the noise is directed away from noise sensitive receptors.

### **Environmental Control Measures – Controlling the Spread of Noise and Vibration**

At certain times during construction and at particular locations the use of temporary noise attenuating devices should be considered:

- The erection of temporary noise attenuating screens may be required in order to reduce noise levels below the maximum permissible noise levels. Noise-attenuating screens can be made up of formwork panels or constructed from at least 12 mm thick plywood and battens. Plywood may need to be stiffened with additional battens to prevent drumming. The lower edge of the panels should rest on the ground with any gap plugged by spoil, sandbags, etc.
- The use of temporary or the advance construction of permanent berms may be appropriate.
- Site buildings or material stockpiles may be located so as to shield sensitive receptors.

### **Environmental Control Measures – Construction of Permanent Noise Reducing Measures**

Permanent noise mitigating measures installed on national road schemes should achieve the noise design commitments specified in the Contract documents, the EIS, any conditions and/or modifications imposed by ABP and the Schedule of Commitments. It will generally be required that such noise mitigation measures achieve the noise design goal ‘*performance standard*’ of 60 L<sub>den</sub> as specified in the *Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (Revision 1, National Roads Authority, October 2004). In order to demonstrate that these noise design commitments are being achieved, the following Environmental Control Measures should be implemented:

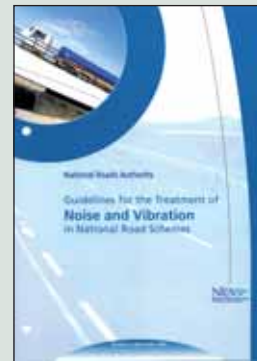
- Documented evidence demonstrating that all noise mitigation measures will achieve the noise design commitments should be attached to the EOP. The Contractor’s Designer, as advised by an acoustic specialist, should produce this report. This Environmental Control Measure should be in addition to any contractual requirements for the provision of documented evidence demonstrating that all noise mitigation measures meet the noise design commitments.
- Documented evidence demonstrating that all noise barriers have achieved the performance specified in the Contract in accordance with I.S. EN 1793 – 1:1998, I.S. EN 1793 – 2:1998, I.S. EN 1793 – 3:1998, I.S. EN 1794 – 1:2003 and I.S. EN 1794 – 2:2003 following the specifications outlined in I.S. EN 14388:2005 should be attached to the EOP. This documented evidence should demonstrate how the barriers meet the specified standards and should clearly indicate the absorptive performance (where such barrier is used) and airborne sound insulation categories of the constructed barriers as outlined in I.S. EN 1793 – 1:1998 and I.S. EN 1793 – 2:1998. This Environmental Control Measure should be in addition to any contractual requirements for the provision of such documented evidence.

**Responsibility**

- The Site Agent should be familiar with the noise sensitive receptors and alert the Environmental Manager in good time prior to work commencing in these areas.
- The Environmental Manager should develop site-specific Method Statements in conjunction with the Construction Manager.

**References**

*Guidelines for the Treatment of Noise and Vibration in National Road Schemes* (Revision 1, National Roads Authority, October 2004).



BS 5228: *Noise and vibration control on construction and open sites.*

ISO1996-1 1982 *Acoustics – Description and measurement of environmental noise – Part 1: Basic quantities and procedures.*

### 7.3.8. Example Environmental Control Measure Sheet – Air Pollution

The impact of both dust and vehicle emissions during the construction phase will have been considered within the EIS and there is likely to be a number of Environmental Commitments/Requirements emanating from the reference documents. Box 23 indicates a number of Environmental Control Measures that will assist in meeting these commitments/requirements. Environmental Control Measures are presented under the headings:

- Consultation;
- Compliance with relevant Licences, Approvals and Legislation;
- Air Pollution, and
- Construction Monitoring.

The allocation of responsibilities is also exemplified along with a listing of reference documents.



BOX 23

## Example Environmental Control Measure Sheet – Air Pollution

### Environmental Control Measures – Consultation

- Water for damping down or cleaning should not be abstracted from watercourses without prior agreement from the relevant body:
  - Regional Fisheries Board;
  - National Parks and Wildlife Service;
  - Office of Public Works, and/or
  - Waterways Ireland.

### Environmental Control Measures – Compliance with relevant Licences, Approvals and Legislation

- Air quality standards applicable to the assessment of local impacts upon human health and vegetation are set out in various EU Directives and are also embodied in Irish legislation. Directive 96/62/EC on ambient air quality and assessment – also known as the Air Quality Framework Directive – establishes a framework under which the EU sets limit values for specified pollutants. The first Air Quality Daughter Directive (1999/30/EC) sets limit values for pollutants such as nitrogen dioxide and fine particulates (PM<sub>10</sub>). The second Air Quality Daughter Directive (2000/69/EC) sets limit values for benzene and carbon monoxide. These two daughter Directives were transposed into Irish law by the Air Quality Standards Regulations 2000 (S.I. No. 271 of 2002).
- In addition to the limit values specified in these Regulations, account should be taken of any more onerous road scheme specific controls specified within the EIS or imposed by ABP.

### Environmental Control Measures – Air Pollution

- In situations where the source of dust is within 25m of sensitive receptors (e.g., Designated Conservation Areas or residential housing, schools, hospitals, places of worship, sports centres and shopping areas (i.e., places where members of the public are likely to be regularly present)) the erection of screens (permeable or semi-permeable fences) should be considered.
- Burning of any material on site should be strictly prohibited.
- Haulage vehicles transporting gravel and other similar materials to site should be covered.
- Access and exit of vehicles should be restricted to certain access/exit points.
- Vehicle speed restrictions should be considered.
- Stockpiles should be covered.
- Gravel should be used at site exit points to remove caked-on dirt from tyres and tracks.
- Equipment should be washed at the end of each work day.
- Hard surfaced roads should be wet-swept to remove any deposited materials.
- Unsurfaced roads should be restricted to essential site traffic only.
- Wheel-washing facilities should be located at all exits from the construction site.

- Dust production as a result of site activity should be minimized by regular cleaning of the site access roads using vacuum road sweepers and washers. Access roads should be cleaned at least 0.5 km on either side of the approach roads to the access points.
- The frequency of cleaning should be determined by the Site Agent and is weather and activity dependent.
- Stockpiles height should be kept to a minimum and slopes should be gentle to avoid windblown soil dust.
- The following should be damped down during warm and sunny weather:
  - Unpaved areas subject to traffic and wind;
  - Structures and buildings during demolition;
  - Stockpiles;
  - Areas where there will be loading and unloading of dust-generating materials, and
  - Borrow-pits.

#### Environmental Control Measures – Construction Monitoring

- Where dust monitoring is a condition of planning permission granted for the operation of borrow pits, the requirements of the planning authority should be adhered to. Where specific emission limits are not set, a general guide that might be adopted is 1mg/m<sup>3</sup>. See *Batneec Guidance Note for the Extraction of Minerals* (Environmental Protection Agency, 1997).
- Where required, a schedule for dust monitoring, recording and reporting should be drawn up.

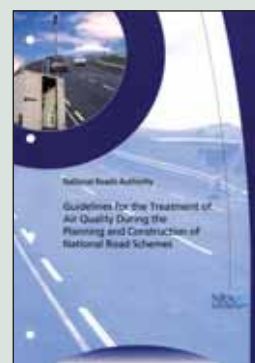
#### Responsibility

- The Environmental Manager is responsible for organising dust monitoring, where required.
- The Site Agent is responsible for organising dust suppression through use of bowsers and cleaners.

#### References

*Batneec Guidance Note for the Extraction of Minerals* (Environmental Protection Agency, 1997).

*Guidelines for the Treatment of Air Quality During the Planning and Construction of National Road Schemes* (Consultation Draft, National Roads Authority, 2006).



*Control of Dust from Construction and Demolition Activities* (BRE, 2003)

### 7.3.9. Example Environmental Control Measure Sheet – Hazardous Substances

Hazardous substances are used on most national road scheme projects. It is important that they are stored and handled in an appropriate manner. Box 24 examples Environmental Control Measures in relation to hazardous substances. The potential responsibilities of the main contractor’s personnel are also discussed.

BOX 24

#### Example Environmental Control Measure Sheet – Hazardous Substances

##### Environmental Control Measures – Hazardous Substances

- Substances marked with any of the labels in Figure 5 should be stored more than 10 metres from surface watercourses and more than 50 metres from wells or boreholes.
- Lubricating oils should be stored on bunded pallets in storage units.
- Where there is a watercourse on site, suitably stocked spill kits (with booms of sufficient length to prevent spillages moving downstream) should be kept on standby when works are being carried out in the vicinity of the water. Site operatives should be trained in the use of the spill kits.
- All hazardous substances should be stored in a safe manner in such a way that they will not be at risk of spillage or damage, e.g. away from traffic routes.
- Empty canisters or containers that contained hazardous substances should be disposed of in hazardous waste skips.
- Fencing and timber treated with Copper-Chrome-Arsenic (CCA) may be treated as a hazardous substance.
- The Environmental Manager should keep copies of Material Safety Data Sheets for all hazardous substances centrally.
- Subcontractors should provide a copy of the Material Safety Data Sheets to the Environmental Manager for all hazardous substances brought on site.

Figure 5: Hazardous Symbol Labels



BOX 24

**Box 24 – Example Environmental Control Measure Sheet – Hazardous Substances (Contd.)**

**Responsibility**

- The Site Agent is responsible for ensuring hazardous substances are properly stored.
- Subcontractors should provide a copy of Material Safety Data Sheets to Environmental Manager.
- The Environmental Manager should keep copies of Material Safety Data Sheets for all hazardous substances centrally.

*7.3.10. Example Environmental Control Measure Sheet – Water Quality Protection*

Construction activities, if not managed correctly, have the potential to pollute surface water and groundwater. Potential impacts include impacts on adjacent surface water and groundwater uses, including domestic and public wells. Potential sources of pollution include surface water runoff containing large amounts of suspended solids entering watercourses; works, including concreting and grouting activities near watercourses and dewatering associated with excavations. Box 25 indicates relevant Environmental Control Measures under the following headings:



- consultation;
- compliance with relevant licences, approvals and legislation;
- runoff and sediment control;
- surface water;
- groundwater;
- dewatering trenches;
- concrete, and
- emergency response.

The allocation of responsibilities is also exemplified along with a listing of reference documents.

BOX 25

### Example Environmental Control Measure Sheet – Water Quality Protection

Prior to their commencement, discussions should take place with the local authority to determine if any work activities associated with the project require a licence to discharge an effluent to waters. Such consultation should take place at the earliest opportunity in order to avoid any delay in obtaining licences or disruption to the works programme.

#### **Environmental Control Measures – Compliance with relevant Licences, Approvals and Legislation**

- The Fisheries Acts, 1959-2003, in combination with the Local Government (Water Pollution) Acts, 1977-1990, provide a general prohibition on causing water pollution and include provisions concerning: licensing of discharges to waters and sewers, water quality standards and the civil liability of polluters. It is important to note that the Acts define “waters” to include both surface water and groundwater bodies. Section 171, as amended, of the Fisheries (Consolidation) Act, 1959, states that the “*throwing, emptying, permitting or causing to fall onto any waters deleterious matter*” is an offence unless such an activity “*is done under and in accordance with a licence granted by the Minister.*” Therefore, it is a breach of the Acts to discharge polluting materials, such as cement truck washings, to ditches, streams or rivers. Certain site activities, such as the discharging of sewerage from a site compound or offices to a sewer, will require a discharge licence obtained from the local authority.
- The European Communities (Quality of Salmonid Waters) Regulations, 1988, (S.I. No. 293 of 1988) give effect to the Council Directive of the 18th of July 1978 (78/659/EEC). These Regulations protect scheduled freshwaters by requiring local authorities to adopt action programmes, comprising appropriate measures, to reduce pollution and to ensure that scheduled standards are complied with. Where a national road scheme has the potential to pollute such Salmonid Waters, monitoring of water quality may be required under the Contract.
- The European Communities (Quality of Shellfish Waters) Regulations, 2006, (S.I. No. 268 of 2006) give effect to the Council Directive of the 30th of October 1979, on the quality required of shellfish waters (79/923/EEC). These Regulations protect scheduled shellfish waters by requiring the Minister for Communications, Energy and Natural Resources, in consultation with prescribed public authorities, to establish a programme of action with the objective of taking reasonably practicable steps to reduce pollution in the scheduled shellfish waters. Where a national road scheme has the potential to pollute such Shellfish Waters, monitoring of water quality may be required under the Contract.

#### **Environmental Control Measures – Runoff and Sediment Control**

- Establish drainage and runoff controls before starting site clearance and earthworks.
- Minimise the area of exposed ground.

- Retain as much existing vegetation as possible.
- Delay clearing and topsoil stripping of each phase of the works until shortly before construction begins.
- Establish vegetation as soon as practical on all areas where soil has been exposed.
- Close and revegetate open trenches as soon as possible.

#### Environmental Control Measures – Surface water

- Water quality of all watercourses within and adjacent to the construction area should be determined before work commences during the pre-construction walkover phase. This will establish a baseline and allow any changes resulting from work activity to be tracked.
- Spill kits should be readily available in the vicinity of all work areas close to watercourses.
- The water quality of salmonid waters should be monitored during work activity upstream and downstream (e.g. 50m) of the crossings. Samples should be analysed having regard to the European Communities (Quality of Salmonid Waters) Regulations, 1988. Table 3 outlines suggested parameters, frequency and manner of sampling which may be appropriate for such monitoring.

Table 3: Parameters that should be analysed

Column 1	Column 2
Parameter	Frequency and Manner of Sampling
Temperature	Weekly, and at appropriate intervals where the works activities associated with the scheme have the potential to alter the temperature of the waters.
Dissolved Oxygen	Weekly, minimum one sample representative of low oxygen conditions of the day of sampling.
pH	Weekly.
Suspended Solids	Monthly.
BOD <sub>5</sub>	Monthly.
Nitrites	Monthly.
Phenolic Compounds	Monthly where the presence of phenolic compounds is presumed.
Petroleum Hydrocarbons	Monthly.
Non-ionized Ammonia and Total Ammonium	Monthly.
Total Residual Chlorine	At appropriate intervals where works activities associated with the scheme have the potential to alter the Total Residual Chlorine of the waters.
Conductivity	Weekly.

BOX 25

### Example Environmental Control Measure Sheet – Water Quality Protection (Contd.)

- The Environmental Manager should draw up a schedule of surface water quality monitoring required (listing the type of report expected, detailing who the reports should be sent to, etc.) and arrange for monitoring to be carried out by competent persons. The Environmental Manager should maintain reports for the duration of the project.
- Where monitored parameters are found to exceed the standards laid down in the Contract and where such exceedances are associated with the road project, the Environmental Manager should initiate and report on corrective action. This may require the alteration of relevant Environmental Control Measures. It is relevant to note that the standards laid down in the Contract may have been defined having regard to the European Communities (Quality of Salmonid Waters) Regulations, 1988 or to the European Communities (Quality of Shellfish Waters) Regulations, 2006.

#### Environmental Control Measures – Groundwater

- Domestic/farm wells or other relevant groundwater abstractions at risk of being polluted should be identified prior to commencement of work. Water quality in these wells should be determined prior to the commencement of works.
- Domestic or farm wells or other relevant groundwater abstractions situated adjacent to a cut should have water levels monitored on a monthly basis.
- Water quality should be monitored twice yearly (summer and winter). Samples should be analysed in accordance with the European Communities (Drinking Water) Regulations, 2000 (S.I. No. 439 of 2000). A schedule of monitoring should be drawn up. The Environmental Manager should maintain reports for the duration of the project.
- The Environmental Manager should liaise with residents that have the potential to be impacted by the Works. Where water quality or yield is affected by the Works, the Environmental Manager should ensure that those affected are provided with an alternative source of water until the matter is rectified.

#### Environmental Control Measures – Dewatering trenches

- Water from trenches, ditches or other sources should not be pumped directly into another watercourse. Water can be pumped to a settlement pond or tank or pumped to grassland.
- Settlement ponds commonly require a retention time of 2-3 hours to allow suspended solids to settle out. Finer particulate matter, e.g. clays, may require longer retention times and possibly larger ponds. Typical dimensions of a settling pond for a 3-hour settling time are indicated in Table 4.

Table 4: Typical dimensions of a settling pond

Typical dimension of a settling pond for a three hour settling time ( <i>Environmental good practice on site – Second Edition (CIRIA, 2005)</i> )			
Pump diameter	Discharge rate	Length	Width
6 in pump	3000 l/min	60 m	20 m
	6000 l/min	80 m	27 m
4 in pump	1000 l/min	30 m	10 m
	2500 l/min	50 m	17 m

(Assuming 1m deep ponds where length = three times the width)

BOX 25

**Example Environmental Control Measure Sheet – Water Quality Protection (Contd.)**

- Site-specific Method Statements should be drawn up for all dewatering activities.
- Third party consultation should take place before water from settling ponds is discharged.

**Environmental Control Measures – Concrete**

- The washout from concrete mixing plant or ready-mix concrete lorries will be contaminated with cement and highly alkaline. It should not be allowed to enter any watercourse.
- Concrete trucks should not wash out within 200 metres of watercourses. Ideally concrete trucks should return to base to carry out washing operations.
- Where washout is allowed on site this should be clearly signposted and drivers made aware of the designated location.

**Environmental Control Measures – Emergency Response**

- In the event of silting or pollution of a river, stream, ditch or other watercourse or groundwater, the Environmental Manager and Site Agent should be contacted immediately.
- The Emergency Response Plan should be put into action (see Emergency Response Plan control sheets).
- All personnel working in the vicinity of watercourses should be provided with a toolbox talk on the Emergency Response Plan.



### Responsibility

- The Environmental Manager is responsible for ensuring that appropriate water pollution prevention measures are put in place and that water sampling is carried out. Where standards are breached he/she should carry out an investigation and in conjunction with the Site Agent, he/she should ensure remedial action is taken and further samples taken to verify that the situation has returned to normal.
- The Environmental Manager is responsible for ensuring spill kits are readily available in vulnerable locations and that booms for rivers are long enough and have adequate anchorage.
- The Foreperson is responsible for ensuring the spill kits are adequately stocked and should inform the Environmental Manager when items have been used.

### Reference

Emergency Response Plan.

#### 7.3.11. Example Environmental Control Measure Sheet – Water Crossings

The construction of structures crossing watercourses and works near watercourses are common engineering activities undertaken during road scheme development. There are a number of potential impacts associated with such operations including:



- Interference with fish migration and spawning, mammal movement, rare plants and their habitats and with riparian and linear wildlife corridors;
- Loss of aquatic and riparian habitat;
- Alteration of flow regime;
- Harmful discharges during construction and operation, and
- Interferences with angling or obstruction of anglers' movement along a channel.

Given these potential impacts, a number of Environmental Commitments/Requirements may need to be met during the construction life cycle of the project. Box 26 highlights a number of Environmental Control Measures under the headings:

- consultation;
- compliance with relevant licences, approvals and legislation;
- restrictions on in-stream works;
- diversion and dewatering activities;
- earthworks adjacent to watercourses;
- in-stream works;

- temporary crossings;
- concrete pours, and
- abstraction of water from watercourses.

The allocation of responsibilities is also exemplified along with a listing of reference documents.

## BOX 26

### Example Environmental Control Measure Sheet – Water Crossings

#### Environmental Control Measures – Consultation

Works within the Lands Made Available (LMA) under the Contract should be agreed and documented in consultation with the relevant statutory authority, where appropriate:

- Central Fisheries Board (CFB);
- Relevant Regional Fisheries Boards (RFB);
- National Parks and Wildlife Service (NPWS) of the Department of the Environment, Heritage and Local Government;
- Engineering Division of the Department of Communications, Energy and Natural Resources (DCENR);
- Office of Public Works (OPW);
- The Loughs Agency;
- Waterways Ireland (WI), and
- Relevant local authorities.

#### Environmental Control Measures – Compliance with relevant Licences, Approvals and Legislation

All works should be carried out with the required statutory licences and approvals:

- All electro-fishing procedures require a licence issued by the Department of Communications, Energy and Natural Resources.
- The approval of the Commissioners of Public Works is required under Section 50 of the Arterial Drainage Act, 1945, for the construction or alteration of any bridge over any watercourse and under Section 47 of the same Act for the alteration or erection of weirs in any watercourse.
- All in-stream works should be carried out in accordance with an approved method statement and under the direction of Fisheries Board personnel.

#### Environmental Control Measures – Restrictions on In-Stream Works

- In-stream works should not be carried out in watercourses frequented by salmon or trout during the Annual Close Season. The duration of the season varies regionally within the period from the beginning of October to the end of February. The timing of works should always be considered on a site-specific basis and in agreement with the RFB because some rivers have late spawning salmonids. It is essential, therefore, that the Construction Manager keeps the Environmental Manager updated on the Schedule of the Works.

- Where the watercourse contains significant populations of other species including lamprey, freshwater pearl mussel, freshwater crayfish, coarse fish, etc., restrictions as to the operating window for in-stream works may also apply. The relevant statutory authority (NPWS, RFB, etc.) should be contacted in this regard.

#### **Environmental Control Measures – Diversion and Dewatering Activities**

- In-stream containment and dewatering operations should be considered to facilitate activity within closed periods. Having created a temporary diversion during the open season, construction of a culvert can proceed during the closed season in the original channel. Subsequent redirection of the stream back into the original channel should be undertaken in the open season. RFB personnel should be present on-site when the watercourse is initially diverted.
- Dewatering will not normally be an option where species protected under the Wildlife Acts, Habitats Regulations, EU Habitats Directive or Freshwater Fish Directive occur in significant numbers. Where dewatering is to be undertaken, it should be preceded by a fish salvage operation carried out by the relevant Fisheries Board or by fully qualified and authorised personnel.
- All dewatering flows should be passed through ponds or tanks to remove sediments in order to minimise any potential environmental impacts.

#### **Environmental Control Measures – Earthworks adjacent to Watercourses**

Site-specific Method Statements should be developed for all earthworks adjacent to watercourses taking into account the Environmental Control Measures listed below:

- Prior to earthworks commencing, haulage routes over all watercourses and drains should be temporarily culverted to avoid movement of vehicles across watercourses. Larger watercourses may require the provision of measures for temporary crossings.
- Site, surface drainage and silt control measures should be established prior to commencing earthworks.
- Silt laden run-off should be directed to silt lagoons. Silt control measures should be increased with increased gradient and buffer zones being incorporated between ponds and watercourse.
- Run-off from the working site or any area of exposed soil should be channelled and intercepted at regular distance intervals for discharge to silt-traps or lagoons with over-flows directed to land rather than to a watercourse.
- The Contractor should establish a maintenance schedule and site-specific Method Statement for the silt and pollution control measures during the construction period. This should be undertaken in consultation with the relevant authority.

### Environmental Control Measures – In-Stream Works

Site-specific Method Statements should be developed for all in-stream works in watercourses taking into account the Environmental Control Measures below:

- Watercourses and riverbanks, upstream and downstream of the crossing, should not be disturbed unless directly associated with the bridge/road structure. The extent of bank side interference and vegetation removal should be agreed, identified, documented and demarcated with appropriate fencing in advance of undertaking any construction works.
- In-stream works and bank side clearance in the immediate area of the crossing should be kept to a minimum and adequate measures should be put in place to control or minimise the risk of siltation. This may include such measures as:
  - Bunding and diversion of site run-off to settlement ponds;
  - Stripping of topsoil. (see *Soils in A Guide to Landscape Treatments for National Roads Schemes in Ireland* (National Roads Authority, 2006)), and
  - Covering of temporary stockpiles.
- Operation of machinery in-stream should be kept to an absolute minimum.
- The Foreperson should ensure that all machinery entering or operating in-stream is mechanically sound and should carry out regular visual checks on all machinery for leaks of oil, hydraulic fluid, fuel, diesel, etc.
- The Foreperson should ensure that machinery is steam cleaned prior to the start of in-stream work in order to prevent contaminants being carried into the water.
- Where in-stream material is to be removed, coarse aggregates, if present, should be stockpiled for replacement in the reformed or new channel.
- Care should be taken with in-stream vegetation if required for landscape treatments. (see *A Guide to Landscape Treatments for National Roads Schemes in Ireland* (National Roads Authority, 2006)).
- Concrete should not be used for preventing erosion of stream beds where a softer option is available e.g. natural bank stabilisation techniques such as willow faggoting, stone armour, logs, conifer tops or composite protection using products such as coir-matting or geoweb with appropriate planting (reeds, willow, etc). (see *A Guide to Landscape Treatments for National Roads Schemes in Ireland* (National Roads Authority, 2006)).
- A spill kit with booms and soakage pads suitable for oil/diesel should be kept in the vicinity of the in-stream work.

### Environmental Control Measures – Temporary Crossings

Site-specific Method Statements should be developed for all temporary crossings of watercourses taking into account the Environmental Control Measures below:

- Forging of watercourses to gain access to the opposite bank should only be considered where no alternative option exists and under the approval of the RFB, and/or the NPWS where species protected under the Wildlife Acts, Habitat Regulations, Habitats Directive or the Freshwater Fish Directive occur in significant numbers.
- Where possible, access should be restricted to one crossing point and, where feasible, traffic movements should be limited.

- Where temporary crossings are required the number should be kept to a minimum.
- Crossing points should be constructed of suitable material and in a manner that will not give rise to rutting, ponding and silt run-off.
- To avoid siltation of watercourses from crossing point locations, silt traps should be placed at temporary crossing points with an associated buffer strip. Silt traps should be maintained and cleaned regularly during the course of the works.

#### **Environmental Control Measures – Concrete Pours**

Site-specific Method Statements should be developed for all concrete pours in the vicinity of watercourses taking into account the Environmental Control Measures below:

- Pouring of concrete for aprons, sills, and other works should be carried out in the dry and allowed cure for 48 hours before reflooding.
- Pumped or tremied concrete should be monitored carefully to ensure no accidental discharge into the watercourse.
- Mixer washings and excess concrete should not be discharged to surface water.

#### **Environmental Control Measure – Abstraction of Water from Watercourses**

- Abstraction of water from watercourses for dust control should be from dedicated watering points; these should preferably be taken from silt lagoons located on site or from an excavated site, replenished by ground infiltration and not by stream infiltration. No abstraction should occur on small watercourses.

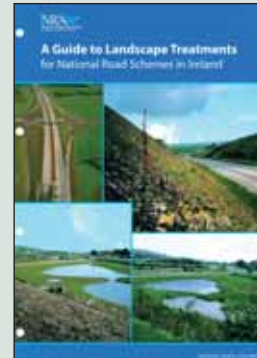
#### **Responsibility**

- The Environmental Manager should liaise with the relevant authorities (Central Fisheries Board, Regional Fisheries Board, National Parks and Wildlife Service, Department of the Marine, Engineering Services of Office of Public Works and the local authority).
- The Environmental Manager should draw up an environmental control measure for all water crossing/in-stream works in conjunction with the Site Agent and designers. He/she should bring the environmental control measure to the attention of the Foreperson.
- The Foreperson is responsible for checking vehicles before in-stream works commence and at intervals thereafter.
- The Foreperson should ensure that a suitable spill kit is readily available.
- The Foreperson should ensure that silt traps are checked and cleared regularly according to the environmental control measure.

### References

*Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes* (National Roads Authority, 2005).

*A Guide to Landscape Treatments for National Road Schemes in Ireland* (National Roads Authority, 2006).



#### 7.3.12. Example Environmental Control Measure Sheet – Waste Management

The management of Construction and Demolition (C&D) waste should reflect the waste management hierarchy, with waste prevention and minimisation being the first priority, succeeded by reuse and recycling. During site clearance and construction works, there are numerous opportunities for the beneficial reuse and recycling of the materials. The subsequent use of recycled materials in construction works also reduces the quantities of waste which ultimately need to be consigned to landfill sites.



Waste management is the subject of extensive regulation and there will be numerous Environmental Commitments/Requirements to be met during the construction life cycle of the project. Box 27 presents an Example Environmental Control Measure Sheet in relation to Waste Management with Environmental Control Measures highlighted under the following headings:

- consultation;
- compliance with relevant licences, approvals and legislation;
- construction and demolition waste management plan;
- waste prevention, reuse and recycling;
- storage and treatment of topsoil; storage and treatment of acceptable subsoils;
- appointment of waste contractors;
- treatment of hazardous waste;

- treatment of recyclable waste;
- treatment of general waste, and
- discovery of buried waste.

The allocation of responsibilities is also highlighted along with a listing of reference documents.

BOX 27

### Example Environmental Control Measure Sheet – Waste Management

#### Environmental Control Measures – Consultation

All works should be agreed and documented in consultation with the relevant statutory authorities, which include:

- Waste Management/Environment Department of the relevant local authority, and
- Environmental Protection Agency.

#### Environmental Control Measures – Compliance with relevant Licences, Approvals and Legislation

All works should comply with the relevant licences, approvals and legislation:

- The Waste Management Acts (WMA), 1996 to 2005, and associated regulations create a ‘cradle to grave’ responsibility for the management of waste. Under the waste management regulatory code, authorization is required to carry out any waste-related activity. The WMA sets out the following provisions:
  - Specific authorizations are needed for both the collection of waste and its recovery/disposal;
  - Section 34 of the WMA imposes a general obligation on any person/contractor (other than a local authority) to obtain a waste collection permit, where they are engaged in the collection of waste on a commercial basis. These authorizations are issued under the Waste Management (Collection Permit) Regulations, 2001, (S.I. No. 402 of 2001) and the Waste Management (Collection Permit)(Amendment) Regulations, 2001, (S.I. No. 540 of 2001);
  - Sections 39-41 of the WMA and associated regulations govern the process of licensing by the Environmental Protection Agency (EPA), of specified waste recovery and disposal activities. These authorisations are issued under the Waste Management (Licensing) Regulations, 2000, (S.I. No. 185 of 2000) as amended, and

- Under the Waste Management (Permit) Regulations, 1998, (S.I. No. 165 of 1998) certain waste disposal and recovery activities, generally those of low volume and perceived as posing a low risk to the environment, do not need a waste licence and instead require a permit from a local authority or a Certificate of Registration from the EPA/local authority. A waste permit should be obtained from the local authority by the Contractor for the use of inert material for restoration of borrow pits or land where the amount is less than 5,000 tonnes per annum. The permit is usually applied for on behalf of the landowner on whose land the borrow pit is located. The Site Agent is responsible for ensuring that the conditions of the waste permit are met on site. The Site Agent should record of the amounts and final location of materials and records should be submitted to the Environmental Manager on a quarterly basis.
- The Draft Waste Management (Facility Permit and Registration) Regulations (July 2005) were issued for public consultation with a view to simplifying and streamlining the existing system and propose a number of amendments to existing Regulations. These proposals attempt to resolve a number of issues raised by construction industry stakeholders and have the objective, where feasible, of making authorisation applications for reuse and recycling of C&D waste-related activities a more attractive proposition for developers. Proposed amendments include:
  - a reduction in the time allowed for local authorities to acknowledge receipt of a valid application and the period within which the application should be determined;
  - a requirement for applicants to provide details of traffic management systems, and
  - a proposed maximum threshold of 25,000 tonnes per annum in respect of a "Certificate of Registration" for the recovery of C&D waste for land reclamation.
- The Waste Management (Hazardous Waste) Regulations, 1998, (S.I. No. 163 of 1998) stipulate general conditions for the management of hazardous waste.
- The Waste Management (Movement of Hazardous Waste) Regulations, 1998, (S.I. No. 147 of 1998) provide for a system of consignment notes (C1 Forms) to track and monitor the movement of hazardous waste within the State.
- The Carriage of Dangerous Goods by Road Act, 1998, (No. 43 of 1998) and associated Regulations outline requirements and conditions for the transport of hazardous waste.
- UK Guidance Notes 29/1-4 outline Health and Safety requirements in Demolition Work.
- In addition to the various pieces of legislation on waste, aspects of the Litter Pollution Acts, 1977 to 2003, and the Litter Pollution Regulations, 1999, may also be relevant to a contractor on a road construction scheme. Litter is defined, in Section 2 of the Act, as:

*A substance or object, whether or not intended as waste (other than waste within the meaning of the Waste Management Act, 1996, which is properly consigned for disposal) that, when deposited in a place other than a litter receptacle or other place lawfully designated for the deposit, is or is likely to become unsightly, deleterious, nauseous or unsanitary, whether by itself or with any other such substance or object, and regardless of its size or volume or the extent of the deposit.*



There is a general prohibition on the creation of litter and there is an obligation on the occupier of land that is a public place or a place that is visible from a public place, to keep it free from litter. This obligation applies to a Contractor on a road scheme.

### Environmental Control Measures – Construction and Demolition Waste Management Plan

- A project Construction and Demolition Waste Management Plan should be prepared. This Plan should form part of the EOP:
  - Regard should be had to the *Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (DoEHLG, July 2006) in preparing and maintaining this plan.
  - The Waste Management Hierarchy (illustrated in Figure 6) should be assessed and applied in the preparation and maintenance of the Construction and Demolition Waste Management Plan.
  - The Construction and Demolition Waste Management Plan should address the following aspects of the Project:
    - Analysis of the waste arisings/material surpluses;
    - Specific waste management objectives for the project;
    - Methods proposed for prevention, reuse and recycling of wastes, and
    - Material handling procedures.
  - The Construction and Demolition Waste Management Plan should contain individual headings describing the following:
    - Description of the Project;
    - Wastes arising including proposals for minimisation/reuse/recycling;
    - Estimated cost of waste management;
    - Demolition plan, and
    - Record keeping procedures.
- As part of the record keeping procedures, the Environmental Manager should keep records provided by waste contractors of all waste being removed from site. The Environmental Manager should record waste removed from site on a quarterly basis. This information should be recorded in a format similar to Form 1 in Appendix 1.

Figure 6: Waste Management Hierarchy



BOX 27

### Example Environmental Control Measure Sheet – Waste Management (Contd.)

#### Environmental Control Measures – Waste Prevention, Reuse and Recycling

- The permitted use of reclaimed materials should be maximised in the works.
- Good materials' handling should be applied. This will reduce/eliminate waste.
- Accurate estimating should be applied to ensure that large surpluses of construction materials are not delivered to site.
- Coordination with suppliers should take place. Where possible, suppliers should be encouraged to take back/buy back surplus and sub-standard/rejected materials.
- A “just-in-time” delivery system should be operated. Material deliveries should be co-ordinated with its use in order to reduce/eliminate waste.
- Where permitted, the use of C&D waste-derived aggregates such as dry-filling, hardcore or as granular fill in construction works should be considered.
- Where permitted, on-site crushers should be used to produce aggregates thus reducing transportation impacts.
- Where permitted, inert material should be used in the restoration/reinstating of land prior to topsoil spreading or the restoration of borrow-pits off site.

#### Example Environmental Control Measures – Storage and Treatment of Topsoil

- Compaction of topsoil should be avoided, as this will limit growth.
- Mixing of different topsoils in stockpiles should be avoided.
- Repeated handling of topsoils should be avoided, as it can destroy the structure of the material.
- Stockpiles greater than two metres high should be avoided to prevent anaerobic conditions.
- Where possible, the use of rotating hammers or cutters during screening should be avoided.
- Transport over long distances should be avoided in order to retain local soil compatibility.
- Movement of topsoil in wet weather should be avoided.
- Topsoil should be loosely dumped in stockpiles that should be shaped to shed water.
- Invasive species should be removed from topsoil and safely disposed of.

#### Environmental Control Measures – Storage and Treatment of Acceptable Subsoils

Subsoils acceptable for use as fill material can become unacceptable during handling by the ingress of water. The following Environmental Control Measures will reduce/eliminate this possibility:

- Leave the vegetation and topsoil in place for as long as possible.
- Where appropriate excavation should occur when the subsoil is likely to be acceptable (e.g. after dry weather). Where possible, earthworks should be avoided during inclement weather.
- Subsoils should be placed in favourable weather conditions.

- Stockpiling should be avoided.
- Material should be compacted immediately after placement.
- Gradients should be provided on compacted subsoils to rapidly remove any surface water.
- Ruts caused by plant movements should be removed.

#### **Environmental Control Measures – Appointment of Waste Contractors**

- Waste contractors engaged on the project should be vetted prior to their services being engaged.

#### **Environmental Control Measures – Treatment of Hazardous Waste**

- A specialist hazardous waste contractor should be engaged prior to the commencement of works that may generate such waste.
- Hazardous waste should be segregated into a separate well-marked covered skip. The skip should be kept at least 50 metres from watercourses or boreholes and wells.
- All site personnel should be made aware of the requirement to segregate hazardous from non hazardous waste.
- Hazardous wastes include:
  - Vehicle batteries;
  - Containers with residues of resins, latex, plasticizers, glues, adhesives, wood preservatives;
  - Mineral oils or oily substances;
  - Timber, including fencing, treated with Copper-Chrome-Arsenic timber preservative may be treated as hazardous waste;
  - Gas cylinders, and
  - Asbestos.
- Hazardous waste should be removed from site by a specialist waste contractor with a waste collection permit.
- Hazardous waste facilities are licenced by the Environmental Protection Agency (EPA). The Environmental Manager should ensure that the hazardous waste contractor provides a copy of the licence for the facility to which the hazardous waste is being brought.
- Consignment notes (C1 Forms) track and monitor the movement of hazardous waste within the State. C1 Forms should be completed for every consignment of hazardous waste other than the movement of waste within the premises where it is produced, stored, treated or deposited and are available from the local authority.
- The export of hazardous waste requires completion of a TFS Form. The local authority issues and monitors Transfrontier Movement of Waste Forms which are used to control and track movements and disposal/recovery of certain categories of waste outside the State. The specialist waste disposal company, employed by the contractor, should arrange for the correct completion of these forms. The Environmental Manager should ensure that copies of these forms are completed in conjunction with the waste contractor and are kept for the duration of the project.

**Environmental Control Measures – Treatment of Recyclable Waste**

- Where possible, pallets and wood should be recycled.
- Material to be recycled should be kept separate from other wastes and site personnel should be made aware of what types of waste can be recycled.
- The Environmental Manager is responsible for identifying a waste contractor to remove waste that can be recycled or reused. He/she should obtain records for all waste leaving the site for this purpose.

**Environmental Control Measures – Treatment of Canteen Waste**

- Covered bins should be provided for canteen waste associated with site offices. Canteen waste should be removed by a permitted contractor to a licensed site.

**Environmental Control Measures – Treatment of General Waste**

- Skips for general waste should be removed by a permitted contractor to a licensed site. The skips should be identifiable so that hazardous waste is not dumped in them.
- It is the Foreperson's responsibility to organise the removal of skips from his/her area when they are full.
- It is an offence under the Litter Acts to litter the site. Site personnel should be made aware of the prohibition during induction.
- The Foreperson is responsible for ensuring his/her functional area is litter free.

**Environmental Control Measures – Discovery of Buried Waste**

- If during the course of site clearance and topsoil removal, an unauthorised landfill is discovered, work should stop immediately. The Foreperson should inform the Environmental Manager as soon as possible.
- The Environmental Manager should report unauthorised landfills to the relevant local authority as soon as possible.

**Responsibility**

- The Environmental Manager should be responsible for creating and updating the Construction and Demolition Waste Management Plan.
- The Environmental Manager should ensure, where appropriate, that Certificates of Registration, Waste Permits and/or Waste Licences are applied for and in place in good time before earthworks commence.
- The Environmental Manager should keep copies of the Certificates of Registration, Waste Permits and/or Waste Licences and check whether the conditions of these are met.
- The Site Agent is responsible for ensuring the conditions of the Waste Permit are met on site. He/she should produce records of the amounts of material and the final location of the material. Records should be submitted to the Environmental Manager on a quarterly basis.
- The Construction Manager should evaluate the anticipated volume of inert material that will be generated and where and what volume of this will be used.
- The Environmental Manager should coordinate the disposal of hazardous waste.

- The Environmental Manager should identify and engage the services of a specialist hazardous waste contractor prior to the commencement of works that may generate such waste.
- The Environmental Manager should ensure that the hazardous waste contractor provides a copy of his/her Waste Collection Permit.
- The Environmental Manager should ensure that the hazardous waste contractor provides a copy of the licence for the facility to which the hazardous waste is being brought.
- The Environmental Manager should ensure that the hazardous waste contractor provides a copy of all Consignment notes (C1 Forms).
- The Environmental Manager should ensure that the hazardous waste contractor provides a copy of all TFS Forms.
- The Environmental Manager is responsible for identifying a waste contractor to remove waste that can be recycled or reused. He/she should obtain records for all waste leaving the site for this purpose.
- The Foreperson is responsible for ensuring his/her functional area is litter free and that skips are removed and replaced in a timely manner.
- The Foreperson should inform the Environmental Manager of the discovery of an unauthorised landfill as soon as possible.
- The Environmental Manager should report unauthorised landfills to the relevant local authority as soon as possible.
- The Environmental Manager should retain records provided by waste contractors of all waste being removed from site. Such records should be appended to the EOP. The Environmental Manager should record waste removed from site on a quarterly basis. This information should be recorded in a format similar to Form 1 in Appendix 1.

### References

*Best Practice Guidelines on the Preparation of Waste Management Plans for Construction and Demolition Projects* (DoEHLG, July 2006).

*A Guide to Construction & Demolition Waste Legislation* (1st Rev., RPOS-MCOS & MBCA, August 2004).

*Code of Practice – Environmental Risk Assessment for Unregulated Waste Disposal Sites* (Consultation Draft, Environmental Protection Agency, October 2006).

### 7.3.13. Example Environmental Control Measure Sheet – Spillages

Given the number and quantities of hazardous substances (e.g. numerous bituminous based liquids, admixtures, fuels, oils, concrete and paints) stored and handled in the construction of a national roads scheme project, it is important that an Emergency Response Plan be prepared and in readiness to implement at all times in the event of spillages/pollution risks occurring. Box 28 presents the application of such a plan as an Environmental Control Measure.

BOX 28

### Example Environmental Control Measure Sheet – Spillages

#### Environmental Control Measures – Consultation

- Spillages of oils or chemicals to a watercourse should be reported to the local authority and the respective Regional Fisheries Board.

#### Environmental Control Measures – Spillages

As an Environmental Control Measure, the Environmental Manager should prepare and be in readiness to implement at all times an Emergency Response Plan. The following list outlines issues likely to be appropriate for inclusion in such a plan:

1. Site staff should report the spillage immediately to the Environmental Manager and Site Agent (depending on circumstances, it may be appropriate for general operatives and machinery operators to report directly to their Foreperson who will then report to the Environmental Manager and Site Agent);
2. The Environmental Manager should report the spillage to the relevant Regional Fisheries Board and local authority;
3. Where possible, the source of pollution should be identified;
4. Switch off all sources of ignition;
5. Stop the spillage spreading:
  - a. Stop the flow;
  - b. Dam the flow with earth, sand, etc., and
  - c. Divert the flow away from drains and watercourses.
6. Use absorbent materials from the spill kit to mop up the spill (sand or absorbent materials should be used rather than detergents);
7. Place boom across watercourse as a precaution;
8. Do not wash spillage into a drainage system. Washing will only make the situation worse and extend the pollution to other water bodies/drainage systems;
9. If the spill has already reached drains, block off the entrance to the drains;
10. Shovel contaminated sand/earth/absorbent granules into sacks or skips;
11. A specialist oil removal company should remove pooled oil.

#### Environmental Control Measures – Contacts

As an Environmental Control Measure, the Environmental Manager should append the relevant contact details to the Emergency Response Plan document. Examples of such contact details include:

Environmental Manager	
Alternate to Environmental Manager	
Specialist oil removal company	
Local authority	
Fisheries Board	
Loughs Agency	
National Parks and Wildlife Service	
Waterways Ireland	

**Environmental Control Measures – Location of Emergency Spill Kits**

A map indicating the location of all emergency spill kits should be attached to the Emergency Response Plan document.

**Responsibility**

- All site staff should report any spillages of oil or chemicals to the Environmental Manager and Site Agent immediately (depending on circumstances it may be appropriate for general operatives and machinery operators to report directly to their Foreperson who will then report to the Environmental Manager and Site Agent).
- The Environmental Manager should prepare and be in readiness to implement at all times an Emergency Response Plan to spillage incidents.
- The Environmental Manager should report the spillage to the Regional Fisheries Board, local authority and any other relevant authority.

*7.3.14. Example Environmental Control Measure Sheet – Environmental Incidents*

Box 29 outlines a number of example Environmental Control Measures in relation to environmental incidents. These Environmental Control Measures deal with environmental incidents, such as fires resulting in air pollution incidents, and exclude spillages which were covered under the previous subsection.

BOX 29

**Example Environmental Control Measures – Environmental Incidents**

- The Environmental Manager or Site Agent should be contacted as soon as possible where there is any incident that carries the possibility of negative environmental consequences (e.g. a fire resulting in an air pollution incident or damage to part of an area of vegetation designated for protection).
- Standard emergency procedures should be taken to get the incident under control and prevent injury or loss of life in the first instance.
- Work in the area should be halted and the Environmental Manager should be called to the scene to assess the situation and to decide on initial responses and remedial measures.
- The Environmental Manager is responsible for alerting the relevant authorities.

**Responsibility**

- Site staff should contact the Environmental Manager or Site Agent as soon as possible where there is any incident that carries the possibility of negative environmental consequences.
- The Environmental Manager is responsible for alerting the relevant authorities.







CHAPTER 8  
**SITE-SPECIFIC  
METHOD STATEMENTS**

## 8. SITE-SPECIFIC METHOD STATEMENTS

### 8.1. SITE SPECIFIC METHOD STATEMENTS

A Method Statement may be defined as a statement of the construction methods and resources to be employed in executing construction work. Whilst Method Statements may be devised for numerous Works activities on national road schemes, there may be a specific contractual requirement for site-specific Method Statements to be devised for Works activities where there is a risk of environmental damage. In this regard national road scheme contract documents may contain the following provision:

*Notwithstanding any other requirements of the Contract, site-specific method statements shall be provided for all Works activities where there is a risk of environmental damage.*

The Environmental Manager should examine which elements of Works carry the likelihood of significant environmental damage. Having established which elements of the Works carry such a risk, the Environmental Manager should assist in the production of site-specific Method Statements. As previously outlined in Chapter 7, the Method Statement should refer to relevant Environmental Control Measure Sheets and incorporate relevant Environmental Control Measures. The Method Statement should include:

- The proposed method of construction and how impacts shall be mitigated;
- Contingency plans and emergency plans to limit damage caused by accidents, spills or other unforeseen events, and
- Notification procedures to the relevant Authorities, Utilities and Service Providers.

The Contract may require that site-specific Method Statements be reviewed and/or approved by third party consultees where required (e.g. the Contract may require that proposals in respect of the execution of the Works that carry a risk of significant adverse environmental impact on watercourses be submitted to the relevant Regional Fisheries Board for approval prior to works commencing).

The main contractor may be contractually required to submit details of Method Statements to the Engineer for written consent in advance of execution of the works.

An example of a site-specific Method Statement is outlined in Box 30.

8.2. SAMPLE SITE-SPECIFIC METHOD STATEMENT

8.2.1. *Sample Site-Specific Method Statement: Demolition of Buildings containing Bat Species*

<b>BOX 30</b>	
<b>Site-Specific Method Statement: Demolition of the Building at Chainage 13+00 LHS</b>	
<b>A. Resource Required</b>	
<b>Labour</b>	
1	Site Agent
2	Forepersons
3	Machine Operators (as necessary)
4	General Operatives
5	Safety Officer
6	Environmental Manager
<b>Plant &amp; Equipment</b>	
1	Teleporter with cradle.
2	20/30 tonne excavators.
3	Dumptruck (as necessary).
<b>B. Material &amp; Supplies</b>	
Not Applicable.	

<b>C. Staff Responsibilities</b>			Responsibility
Position Title			
Environmental Manager			
Site Agent			
Foreperson			
Safety Officer			Ensure compliance with the Health and Safety Plan.
<b>D. Environmental Control Measure Sheets</b>			
Environmental Control Measure Sheet – Wildlife (General)			
Environmental Control Measure Sheet – Bats			
Environmental Control Measure Sheet – Trees and Hedgerows			
<b>E. Health and Safety Risk Assessment</b>			
<b>F. Method</b>			
<b>Operation</b>	<b>Person Responsible</b>	<b>Signature</b>	<b>Date</b> <b>Comment</b>
1. Obtain copy of Licence issued by NPWS.	Environmental Manager	Environmental Manager	01/06/06 Copy of licence received from the Engineer. See attached licence.

2.	Main contractor's Engineer to survey and inspect the building to ensure that no hazardous materials are present and that all services are disconnected.	Site Engineer	Site Engineer	01/06/06	No hazardous materials were present. All services have been disconnected. See survey report attached.
3.	Ensure that Scientific Agent (listed in the Licence) examines building prior to demolition.	Environmental Manager	Environmental Manager	02/06/06	Building contained roosting bats as indicated in the EIS. Bats are inaccessible and the exclusion procedure must be followed.  Scientific Agent
4.	Install one-way valves over suitable access points as per the advice of the Scientific Agent.	Environmental Manager	Environmental Manager	02/06/06	One-way valves installed in accordance with best practice.  Scientific Agent
5.	Allow a sufficient period for bats to be excluded from the building as per the advice of the Scientific Agent.	Environmental Manager	Environmental Manager	06/06/06	Four day exclusion period required in accordance with best practice.  Scientific Agent

6.	Liaise with the Scientific Agent in organising a bat detector assessment immediately prior to demolition.	Environmental Manager	Environmental Manager	06/06/06	No bat activity recorded. Demolition may proceed.  Scientific Agent
7.	Carefully remove fascia, ridge tiles and flashing from one side of the building under the advice of the Scientific Agent.	Environmental Manager	Environmental Manager	06/06/06	Roof removal carried out in accordance with best practice.  Scientific Agent
8.	Liaise with the Scientific Agent in organising a final examination of the building to assess for the presence of any remaining bats.	Environmental Manager	Environmental Manager	07/06/06	No bats likely to be remaining. Proceed to demolish building.  Scientific Agent
9.	Demolish building in accordance with the Demolition Plan.	Site Agent	Site Agent	07/06/06	Building demolished in accordance with Demolition Plan.  Environmental Manager



CHAPTER 9  
**ENVIRONMENTAL  
AWARENESS TRAINING**



## 9. ENVIRONMENTAL AWARENESS TRAINING

The purpose of Environmental Awareness Training is to ensure that all of the main contractor's site personnel have the appropriate knowledge to successfully implement the EOP. Without such training, those involved in constructing the scheme would not be aware of relevant Environmental Control Measures and, consequently, Environmental Commitments/Requirements would not be met. Therefore, it is essential that all of the main contractor's site staff receive relevant and appropriate training.

### 9.1. EOP, EIS AND CONTRACTUAL REQUIREMENT BRIEFING

The Environmental Manager should provide a briefing for all of the main contractor's senior management including the Project Manager, Programme Manager, Construction Manager, Design Engineers, Structures Agents and Site Agents on the EOP and the Commitments/Requirements that must be met during the construction phase. It is recommended that the Employer's Site Monitoring Team be invited to attend.

### 9.2. ENVIRONMENTAL INDUCTION TRAINING

The Environmental Manager should provide Environmental Induction Training for all senior management and Forepersons using an Environment Induction Sheet (Box 31 indicates the possible format of such a sheet, but note that this example only deals with a minority of the issues which should be addressed). All other site personnel should receive environmental induction in conjunction with safety induction training. In certain circumstances it may be appropriate for the Safety Officer to provide this. No person should work on site without first receiving environmental induction.

The use of the term 'main contractor's site personnel' in this guidance document is intended to include the site personnel of all subcontractors whom the main contractor has subcontracted part of the Works. The term is also intended to include the site personnel of any Specialists, nominated subcontractors, etc.

Signed records of training should be kept for all environmental training provided (See Form 3 – Environmental Training in Appendix 1). Copies of training records should be given to the Environmental Manager.

### 9.3. TASK-SPECIFIC TRAINING

Where a site-specific Method Statement, (one which incorporates Environmental Control Measures) has been devised for a Works activity all main contractor site personnel involved in that activity should be given a toolbox talk outlining the Environmental Control Measures.

The Foreperson is responsible for providing the toolbox talk and for providing signed training records to the Environmental Manager.

9.3.1. Environmental Induction Sheet

BOX 31

### Example of an Environmental Induction Sheet

#### Storage

- Hazardous materials marked with the following symbols should be stored at least 10 metres from surface watercourses and 50 metres from wells or boreholes.



- Soil should not be stockpiled more than two metres high and stockpiles close to housing should be damped down in dry weather to prevent dust blow.
- Subcontractors should provide a copy of the Material Safety Data Sheets for all hazardous substances brought on site.

#### Water

- It is strictly prohibited to discharge water or any other matter to drains, ditches, streams, rivers, lakes or other water bodies unless permission has been given by the Foreperson.
- Check all pumps/compressors/generators for fuel and oil leaks in the morning before use. If any problems are identified inform your supervisor immediately.
- Wash concrete mixers in designated areas away from surface water drains or ditches. Concrete is highly polluting.
- Tools, plant and vehicles must not be washed in watercourses.

#### Fuel & Oil

- Spill kits, sand or earth should be used if spillages of fuel or oil occur.
- Always use a drip tray when using generators.
- Never refuel adjacent to a watercourse.
- If you discover a spillage, contain it, stop it at source if possible, and report it immediately to the Environmental Manager and Site Agent (depending on circumstances it may be appropriate for general operatives and machinery operators to report directly to their Foreperson who will then report to the Environmental Manager and Site Agent).

#### Waste

- Waste should be segregated into separate skips or areas according to waste type. The Foreperson will indicate the locations of and types of wastes acceptable in such skips.
- Burning of any type of material on site is strictly prohibited.
- It is an offence to litter on site. All food waste, drink bottles and wrapping should be disposed of to bins.

### **Trees and Other Vegetation**

- Vegetation can only be cleared when a signed clearance authorization has been received by the Foreperson from the Environmental Manager. The clearance authorization should be for specific chainages.
- Trees and other vegetation that are to be protected during the construction phase should be either fenced or marked with appropriate signage. Do not disturb these areas. No items or materials should be stored within the fenced areas.

### **Wildlife**

- Many animals and their habitats are protected under the Wildlife Acts. It is an offence to harm them. If you see any signs of bats, badgers or otters inform the Foreperson.

### **Local Community**

- If approached by members of the public with an environmental complaint or query direct them to the Environmental Manager.



CHAPTER 10  
**COMMUNICATION**

## 10. COMMUNICATION

The procedures adopted for the internal and external communication of information regarding specific elements of a scheme can have a significant bearing on how efficiently the scheme is delivered. A good communications strategy promotes awareness, education and information sharing on a particular scheme's progress.

### 10.1. EXTERNAL COMMUNICATION WITH THE PUBLIC

Where a particular scheme has the potential to impact members of the public during the construction phase, it is recommended that the contractor put in place a Public Communications Strategy (Note: some National Road Scheme Contracts require that such Public Communications Strategies are subject to the consent of the 'Public Liaison Officer', or equivalent officer, appointed by the Employer in which case said officer should be consulted in the creation, maintenance and implementation of such a strategy). This strategy should provide a two-way mechanism for members of the public to communicate with a designated member of the Contractor's staff and for Contractors to communicate important information on various aspects of the scheme to the general public. A complaints register (See Form 4 in Appendix 1) should form part of the communications strategy and it is recommended that all complaints be handled in an efficient manner with the complainant receiving some form of communication one week after lodging a complaint. All environmentally related complaints should initially be directed to the Environmental Manager. The complaints register should have prescribed methodologies for documenting and actioning complaints received from the community and other relevant stakeholders. All environmental complaints and actions to address such complaints should be communicated to the Construction Manager. It is recommended that a fulltime member of the Contractor's staff be designated with responsibility for updating the complaints register and a copy of the register should be kept at the site security office as well as at the Environmental Manager's office.

The principal component of a Public Communications Strategy should include:

1. Procedures to inform members of the community directly affected by the construction phase on schedules for any activity of a particularly disruptive nature which is likely to impinge on their property, e.g. blasting, demolition, dredging, pile driving and any mitigating actions that are being taken (shielding, restriction on work hours, etc) to minimize such disruption.
2. Details of a contact name and number for any complaints that may arise during such works.

### 10.2. INTERNAL COMMUNICATION

- The site management meeting should include environmental issues on the agenda.
- Weekly site safety meetings should include environmental issues on the agenda.
- The Environmental Manager should report on environmental issues to the site management meetings.
- The Environmental Manager should attend the weekly meetings.



CHAPTER 11  
**INSPECTIONS,  
AUDITING AND  
MONITORING  
COMPLIANCE**

## 11. INSPECTIONS, AUDITING AND MONITORING COMPLIANCE

### 11.1. ENVIRONMENTAL INSPECTIONS BY THE ENVIRONMENTAL MANAGER

The Environmental Manager should carry out environmental inspections at appropriate intervals. Where appropriate and when required, the Environmental Manager should arrange to be accompanied on these environmental inspections by qualified and accredited environmental professionals, whose knowledge and experience may cover the fields of landscape architecture, ecology, noise and other environmental sciences. The Environmental Manager should append the reports of the environmental inspections to the EOP.

The inspections might deal with the following:

- Have all site personnel been inducted?
- Are site personnel adhering to the relevant Environmental Control Measures and performing all Works activities in accordance with the relevant site-specific Method Statements?
- Are hazardous substances stored appropriately?
- Is waste being disposed of appropriately? Is waste being segregated?

The results of the inspections should be discussed at the weekly site safety and environmental meetings.

### 11.2. MONITORING

The Contract documents, EIS, Conditions and/or Modifications imposed by ABP, Schedule of Commitments, environmental legislative requirements, the provisions of licences and the results of consultations with contractually or legally prescribed third parties may require the execution of certain types of monitoring (e.g. water quality, noise and vibration and/or air quality modelling, etc.).

The Environmental Manager should draw up a schedule of monitoring required, listing the type of report expected and detailing to whom the reports should be sent, etc. It is the responsibility of the Environmental Manager to ensure that all monitoring is carried out by competent persons.

Form 5 Monitoring Schedule (see Appendix 1) provides an example of such a schedule.

Where the monitoring results fall outside the range contractually required, the Environmental Manager is responsible for initiating and reporting on corrective action. This may require the alteration of relevant Environmental Control Measures.

### 11.3. AUDITS

#### 11.3.1. *Audit by Environmental Manager*

The Environmental Manager, in conjunction with the Construction Manager, should carry out an

audit of the EOP on each anniversary of the commencement date to determine whether the EOP is effective in ensuring that the Contractor is meeting all Environmental Commitments/Requirements. Where required as a result of such audits, the Environmental Manager should make all necessary changes to the Plan and bring them to the attention of the Site Agent and Forepersons, etc. All changes to the EOP should be made by the Environmental Manager and approved by the Construction Manager. The reports of these audits should be annexed to the EOP. A potential starting point for the format of such an audit is presented in Form 6 (Appendix 1).

The EOP may be revised, as appropriate, between annual audits (e.g. where Environmental Control Measures are updated).

The Environmental Manager should track environmental legislation on a six monthly basis. Changes in legislation can be tracked by subscribing to Iris Oifigiúil updates from Government Publications and downloading relevant regulations or acts from [www.oireachtas.ie](http://www.oireachtas.ie). Any changes in the legislation that could affect the Plan should be brought to the attention of the Construction Manager, the Site Agents and Forepersons, etc.

### *11.3.2. Audit by the Engineer*

The Contract Documents may provide that the design and execution of the works and the remedying of defects therein shall meet the requirements of and shall be consistent with the EIS; any Schedule of Commitments and Ameliorative Measures or otherwise extracted from the EIS, or arising from the oral hearing or from the approval of the EIS by An Bord Pleanála. The design and execution of the works and the remedying of defects therein should also comply with relevant legislation. It is important to note the compliance with relevant legislation, as well as being a 'legal' requirement, is also a contractual requirement. In order to help fulfil his/her duties under the Contract, the Engineer should carry out an audit of the EOP at regular intervals to ensure the main contractor is complying with the environmental provisions of the Contract.







CHAPTER 12  
**HANDOVER OF  
THE FINAL EOP  
TO THE ENGINEER**

## **12. HANDOVER OF THE FINAL EOP TO THE ENGINEER**

Two copies of the final and complete EOP should be supplied to the Engineer immediately following the end of the defects notification period.



APPENDIX 1  
**FORMS**

<b>FORM 1</b>						
<b>Quarterly Record of Waste Removed from Site</b>						
<b>Form 1</b>						
Quarterly Records of Waste Removed from Site						
Title:	Issue No.:					
Page:	Ref. No.:					
Issued by:	Approved by:					
Date	EWCode	Description of area - Waste Material removed - Volume Total from (e.g. Chainage range)	Weight or Volume Total	Disposal contractor	Final destination (Landfill name Recycler, etc)	Documentation attached? List
All columns should be filled in, including EWC Code (European Waste Catalogue available online at <a href="http://www.environ.ie">www.environ.ie</a> ). The European Waste Catalogue codes for Construction and Demolition Waste (including excavated soil from contaminated sites) are reproduced below:						
<b>17 01</b>		<b>Concrete, bricks, tiles, ceramics.</b>				
17 01 01		Concrete.				
17 01 02		Bricks.				
17 01 03		Tiles and ceramics.				

APPENDIX 1  
FORMS

17 01 06*	Mixtures of, or separate fractions of concrete, bricks, tiles and ceramics containing dangerous substances.
17 01 07	Mixture of concrete, bricks, tiles and ceramics other than those mentioned in 17 01 06.
<b>17 02</b>	<b>Wood, glass and plastic.</b>
17 02 01	Wood.
17 02 02	Glass.
17 02 03	Plastic.
17 02 04*	Glass, plastic and wood containing or contaminated with dangerous substances.
<b>17 03</b>	<b>Bituminous mixtures, coal tar and tarred products.</b>
17 03 01*	Bituminous mixtures containing coal tar.
17 03 02	Bituminous mixtures containing other than those mentioned in 17 03 01.
17 03 03*	Coal tar and tarred products.
<b>17 04</b>	<b>Metals (including their alloys).</b>
17 04 01	Copper, bronze, brass.
17 04 02	Aluminium.
17 04 03	Lead.
17 04 04	Zinc.
17 04 05	Iron and Steel.
17 04 06	Tin.
17 04 07	Mixed metals.
17 04 09*	Metal waste contaminated with dangerous substances.
17 04 10*	Cables containing oil, coal tar and other dangerous substances.
17 04 11	Cables other than those mentioned in 17 04 10.
<b>17 05</b>	<b>Soil (including excavated soil from contaminated sites), stones and dredged spoil.</b>
17 05 03*	Soil and stones containing dangerous substances.
17 05 04	Soil and stones other than those mentioned in 17 05 03.
17 05 05*	Dredging spoil containing dangerous substances.
17 05 06	Dredging spoil other than those mentioned in 17 05 05.

17 05 07*	Track ballast containing dangerous substances.
17 05 08	Track ballast other than those mentioned in 17 05 07.
<b>17 06</b>	<b>Insulation materials and asbestos-containing construction materials.</b>
17 06 01*	Insulation materials containing asbestos.
17 06 03*	Other insulation materials consisting of or containing dangerous substances.
17 06 04	Insulation materials other than those mentioned in 17 06 01 and 17 06 03.
17 06 05*	Construction materials containing asbestos.
<b>17 08</b>	<b>Gypsum-based construction material.</b>
17 08 01*	Gypsum-based construction materials contaminated with dangerous substances.
17 08 02	Gypsum-based construction materials other than those mentioned in 17 08 01.
<b>17 09</b>	<b>Other construction and demolition waste.</b>
17 09 01*	Construction and demolition waste containing mercury.
17 09 02*	Construction and demolition waste containing pcb (for example pcb-containing sealants, pcb-containing resin-based floorings, pcb-containing sealed glazing units, pcb-containing capacitors).
17 09 03*	Other construction and demolition wastes (including mixed wastes) containing dangerous substances.
17 09 04	Mixed construction and demolition wastes other than those mentioned in 17 09 01, 17 09 02 and 17 09 03.

\* Any waste marked with an asterisk (\*) is considered as a hazardous waste pursuant to Directive 91/689/EEC on hazardous waste (European Waste Catalogue and Hazardous Waste List (valid from 1/1/2002) Environmental Protection Agency, Ireland).

<b>FORM 2</b>			
<b>Authorisation for Clearance</b>			
<b>Form 2</b>			
<b>Title:</b>	Authorisation for Clearance		
<b>Page:</b>	<b>Ref. No.:</b>	<b>Issue No.:</b>	
<b>Issued by:</b>	<b>Approved by:</b>	<b>Date:</b>	
The area between chainage _____ and chainage _____ has been surveyed by _____ (Ecologist's name) on ___/___/___ and has been deemed ready for clearance.			
<b>Signed:</b>	_____	<b>Date:</b>	___/___/___
	Environmental Manager or Designate		
<b>Authorisation Received by:</b>	_____	<b>Date:</b>	___/___/___
	Site Agent or Foreperson		
<b>Special Instructions:</b>			



FORM 3

## Environmental Training Record

### Form 3

Title: Environmental Training Record

Issued by:

Ref. No.:

Issue No.:

Approved by:

Date:

Training Session Title: \_\_\_\_\_ (insert Environmental Control Measure/Environmental Control

Measure Sheet/Site-Specific Method Statement, etc.)

Trainer Name (Block Letters) : \_\_\_\_\_

Trainer Signature: \_\_\_\_\_

Date: \_\_\_/\_\_\_/\_\_\_

Name of Training Recipient (Block Letters) & Signature:

Main Contractor/Sub-contractor

FORM 4

## Environmental Complaints Register

**Form 4**

Environmental Complaints Register	
Title:	Page 1 of 1
Page:	Ref. No.:
Issued by:	Approved by:
	Issue No.:
	Date:

<b>Date</b>	_ / _ / _
Complaint received by:	
Complaint recorded by:	
Complaint made by:	
Name:	
Address:	
Telephone:	
Email Address:	
Nature of the complaint:	
Weather conditions at time of complaint:	
Complaint reported to:	
Action taken:	
Was there a follow up call to complainant?	YES/NO
Use additional sheets if required	

<b>FORM 5</b>					
<b>Monitoring Schedule</b>					
<b>Form 5</b>					
Monitoring Schedule					
Title:	Monitoring Schedule		Issue No.:		
Page:	Page 1 of 1	Ref. No.:	Date:		
Issued by:	Approved by:				
<b>Location</b>	<b>Parameters</b>	<b>Frequency</b>	<b>By whom</b>	<b>Report type</b>	<b>Distribution to</b>

<b>FORM 6</b>	
<b>Audit Format</b>	
<b>Form 6</b>	
Audit Format	
Title:	Page 1 of 1
Page:	Ref. No.:
Issued by:	Approved:
	Issue No.:
	Date:

No.	Query	Outcome	Action required	Date for completion
1	Has the EOP been created, maintained and implemented?			
2	Has the EOP being submitted to the Engineer at appropriate intervals?			
3	Has an Environmental Manager, having sufficient training, experience and knowledge appropriate to the nature of the task to be undertaken, been appointed by the main contractor?			
4	Have General Project Details been included within the EOP?			
5	Have Contact Details of relevant persons and bodies been incorporated and updated within the EOP?			
6	Has an up-to-date and appropriate Reference Document Section been included within the EOP?			

7	Has the main contractor's organisational structure been illustrated within the EOP?			
8	Have duties and responsibilities been satisfactorily assigned under the EOP?			
9	Have all the Environmental Commitments and Requirements been identified and documented?			
10	Have all Environmental Control Measures necessary to comply with the Environmental Commitments and Requirements been developed and documented?			
11	Have all site-specific Method Statements been developed for Works activity where a risk of environmental damage is present?			
12	Has Environmental Awareness Training been adequately carried out? Are records of training available and attached to the EOP?			
13	Is the complaints register being filled in?			
14	Do minutes of meetings show environmental issues on the agenda?			
15	Has the Environmental Manager carried out regular environmental inspections? Have the reports of the inspections been appended to the EOP?			
16	Has an appropriate schedule of monitoring been drawn up? Where monitoring falls outside of the range contractually required, has the Environmental Manager initiated and reported on corrective action?			
17	Have the Environmental Manager and Construction Manager audited the EOP on an annual basis?			



## APPENDIX 2 REFERENCES

## References

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*Guidelines for the Testing and Mitigation of the Wetland Archaeological Heritage for National Road Schemes* (National Roads Authority, 2005).

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