



**BOROUGH SERVICES DIRECTORATE**

**GUIDANCE FOR INTERESTED  
PARTIES ON DEVELOPMENT ON  
LAND THAT MIGHT BE  
AFFECTED BY  
CONTAMINATION**

**MARCH 2006**

## January 2006

### *Who is this guidance aimed at?*

- 1.0 Owners, Developers, Consultants, the Planning Service, the Environment and Heritage Service (Waste and Contaminated Land Unit), Building Control Departments and anyone else involved in the preparation/review of land contamination reports required to be submitted to the Planning Service (in consultation with the Councils's' Borough Services Directorate).

### *What is the aim of this guidance?*

- 2.0 To inform the audience of the type of information that the Councils' Borough Services Directorate requires in order to assess desk study (phase 1), site investigation (phase 2), remediation and validation reports submitted **through the development control process**, where the proposed site might be affected by contamination with the potential to present unacceptable risks to proposed site users.

### *What issues does this guidance address?*

- 3.0 The main issues of concern to the Councils' Borough Services Directorate during the investigation and remediation of land, which might be affected by contamination, are the potential unacceptable risks posed to human health receptors from future use of the development site. EHS have the responsibility in providing suitable technical advice (through the development control consultation process) with regard to potential risks to waterways (e.g. rivers, groundwater and streams) to the Planning Service.

### *Why is this guidance required?*

- 4.0 The Councils' Borough Services Directorate is a consultee in the Planning process, and may therefore consider all applications for planning permission, where the development proposed might be affected by contamination.

The role of the Borough Services Directorate in this process is an advisory role to the Planning Service. The Councils' and the Borough Services Directorate do not have the regulatory role of the Planning Service.

**It should be emphasized that it is the responsibility of the owner/developer where development is proposed for ensuring that development is safe and suitable for use for the purpose for which it is intended.**

**The developer will be required to satisfy the Planning Service that unacceptable risk from contamination will be successfully addressed through remediation.**

**It is the responsibility of the Planning Service to ensure through the Town and Country Planning Regime that in the preparation of development plans and through development control all material planning considerations have been taken account of and this includes potential for land contamination.**

**The Planning Service is responsible for the determination/granting of planning applications and ensuring that any necessary planning conditions and/or obligations are attached and enforced in relation to contamination.**

The purpose of this document is to provide guidance in order to ensure that those parties responsible for conducting the desk study, site investigation, remediation and validation activities and writing technical reports in relation to such activities fully address all potential unacceptable risks to human health receptors. Adequate information must be presented and submitted to demonstrate the assessment process for all unacceptable risks and the option appraisal undertaken to ensure unacceptable risks to human health can be mitigated.

It is submitted that use of this guidance by interested parties (in conjunction with other relevant UK technical guidance) in relation to proposed development, may obviate or reduce potential and significant delays and even potential refusal of planning permission, caused by the failure to provide adequate information to the Planning Service with regard to the assessment and remediation of land contamination issues.

A developer should be aware that any actions or omissions with regard to a site where land contamination may be an issue could also have significant future repercussions in terms of liability.

For example if all relevant actions have not been taken with regard to unacceptable risks or development actions/omissions have created unacceptable risks, due to land contamination, the developer could incur liability under the Contaminated Land Regime (Part III of the Waste and Contaminated Land Order (NI) 1997 when commenced), where land may be determined as "contaminated land".

### ***How should this guidance be used?***

- 5.0 This guidance is intended to reflect good practice. However, failure to submit information to the standard referred to in the checklists provided in Appendix A may result in reports being rejected or in requests for further information by the Planning Service.

## Introduction

6.0 This guidance follows the risk-based framework adopted in the Model Procedures for the Management of Land Contamination – CLR 11 (Environment Agency 2004). An overview of the framework is shown in Figure 1.

There are a number of questions that need to be answered in order to satisfy the Councils' Borough Services Directorate that a site no longer presents any unacceptable risk/s to human health receptors.

These questions, together with the corresponding key activity stages from the Model Procedures and checklists from Appendix A, are shown in Figure 2.

**Figure 1**

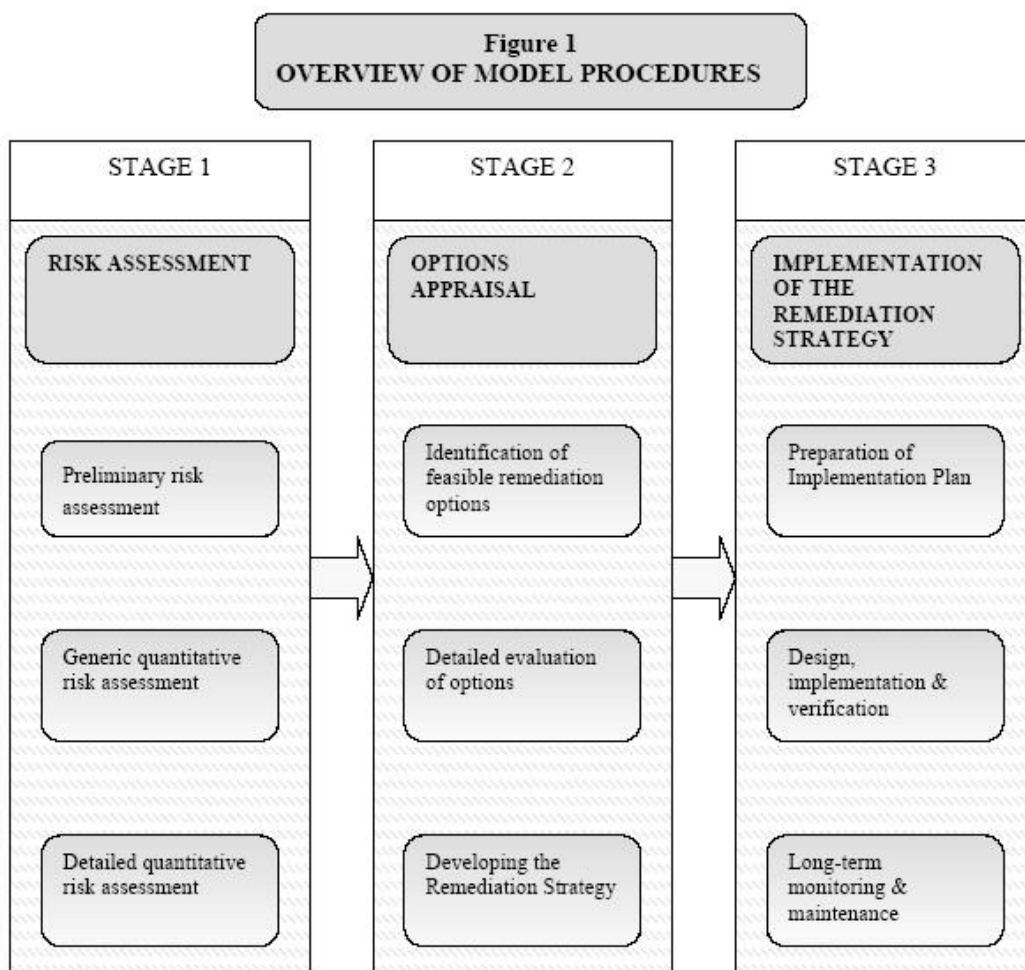
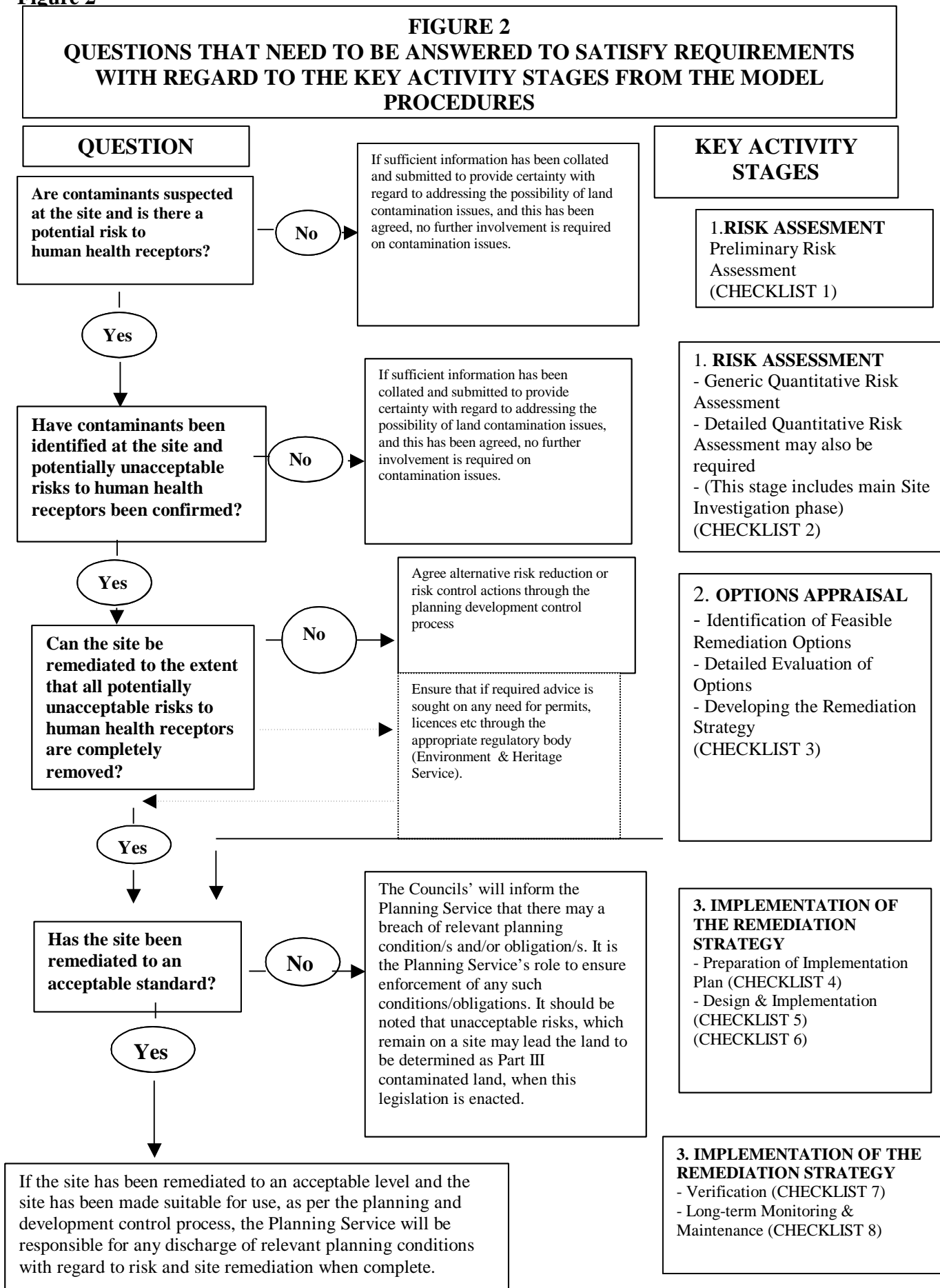


Figure 2



A brief description of each key activity stage (refer to the Model Procedures for further details) is provided below and checklists to help determine if the Councils' Borough Services Directorate's reporting requirements have been met at each stage are provided in Appendix A.

## STAGE 1- RISK ASSESSMENT

7.0 Risk assessment is a process, which should be carried out within a tiered framework.

Hence it may become necessary to revise assumptions made in the early stages of the assessment, as more information becomes available about the site (see Box 1).

### Box 1

#### STAGES OF RISK ASSESSMENT

<b>Box 1 RISK ASSESSMENT</b>	
<b>Each tier of the risk assessment process should follow these four basic steps:</b>	
1) Hazard Identification	– Establishing contaminant sources
2) Hazard Assessment	- Analyzing the potential for unacceptable risks (what pathways and receptors could be present, what pollution linkages could result and what the effects could be)
3) Risk Estimation	- Predicting the magnitude and probability of the possible consequences (what degree of harm or pollution might result to what receptors and how likely it is) that may arise as a result of a hazard
4) Risk Evaluation	- Deciding whether a risk is unacceptable

## ***PRELIMINARY RISK ASSESSMENT***

- 8.0 The purpose of the preliminary risk assessment stage is to develop an **outline conceptual exposure model** (see Box 2) and establish whether or not there are any potentially unacceptable risks arising from contamination at the site.

For the purpose of this guidance, the Borough Services Directorate is concerned with ensuring that there has been adequate consideration of the identification of potential unacceptable risks to human health.

In terms of preliminary risk assessment the main activity will entail the collection of information required to identify all **plausible pollutant linkages** at the site in order that the outline conceptual exposure model can be prepared.

Preliminary risk assessment may include desk study activity and site walkover survey/s, such surveys are undertaken to verify data and obtain additional information such as anecdotal evidence from employees.

Depending on the outcome of the preliminary risk assessment stage, further action may be required, for example if there are any gaps in information or potentially unacceptable risks are identified at the site.

In some cases there may be sufficient information to be able to move straight to an appraisal of any required remediation measures.

If the applicant is able to demonstrate, through the submission of adequate information (site reports submitted through the development control process) that the site does not present any unacceptable risks to human health, it may be accepted that no further information/action is required.

**Box 2**

**CONCEPTUAL EXPOSURE MODEL**

<b>Box 2</b>
<b>CONCEPTUAL MODEL</b>
<p>The conceptual model is a representation of the understanding of the site and the surrounding environment including the geology, groundwater, surface water bodies, potential contamination, processes (e.g. volatilisation, leaching) acting on substances present and contaminant migration pathways. It should describe all pollutant linkages at the site, taking into account the current and proposed uses of the site.</p> <p>The conceptual model can be expressed in a visual, written or tabular format or, preferably, a combination of all three. The use of vertical cross-sections is recommended.</p> <p>For the purposes of this guidance, the conceptual model should concentrate on pollutant linkages that have human health features as the receptor.</p>

***QUANTITATIVE RISK ASSESSMENT (INCLUDING SITE INVESTIGATION)***

9.0 The purpose of the quantitative risk assessment stage is to:

- Refine and update the conceptual exposure model
- Confirm pollutant linkages
- Evaluate potential unacceptable risks
- Provide the basis for the appraisal of remedial measures when unacceptable risks are identified at the site.

This stage should be undertaken when the preliminary risk assessment identifies potential unacceptable risks at the site.

In the context of this guidance, the Borough Services Directorate is concerned with unacceptable risks to human health.

It is anticipated that quantitative risk assessment will be required in most cases where contamination is known to be present or is suspected at the site, as a high degree of confidence in the preliminary risk assessment findings is usually required to demonstrate that any other outcome is acceptable.

Further information on the presence and extent of contaminants, pathways and receptors and other site characteristics required for the quantitative risk assessment may be gathered through intrusive site investigations.

When commissioning laboratories and reporting on the results of chemical analyses, soils testing should be undertaken in accordance with the MCERTS performance standard (See Box 3).

### Box 3

#### MCERTS

**Box 3**  
**MCERTS**

The Monitoring Certification Scheme (MCERTS) is designed to improve the quality of monitoring data. The MCERTS Performance Standard for Laboratories Undertaking Chemical Testing of Soil provides an application of the European and international standard, BS EN ISO/IEC 17025:2000, specifically for the chemical testing of soil.

Accreditation to the MCERTS performance standard for soil laboratory tests is recommended where reports are submitted on a voluntary basis or for planning purposes, including site investigation, verification of remediation and long-term monitoring activities.

Further details on MCERTS are available on the Environment Agency's website and [www.mcerts.net](http://www.mcerts.net).

The Environment Agency has launched its MCERTS scheme for chemical testing of soils with publication of Version 2 of the MCERTS performance standard.

The conceptual exposure model should be refined and pollutant linkages confirmed as a result of the site investigations.

The risks associated with those linkages should then be evaluated using either generic or site-specific assessment criteria, or a combination of both.

The recommended approach for assessing risks to human health (see Box 4) is that a target concentration (see Box 5) is set for an appropriate compliance point and site derived concentrations should not exceed that concentration.

**Box 4**

**REMEDIAL TARGETS METHODOLOGY**

<p>Box 4</p> <p><b>REMEDIAL TARGETS METHODOLOGY</b></p>
<p>The Councils' Borough Services Directorate recommends that risk assessments for human health receptors from ground contamination should be undertaken in accordance with the tiered framework set out within the Contaminated Land Exposure Assessment Model and associated current UK guidance.</p>

**Box 5**

**SELECTION OF SUITABLE CONTAMINANT ASSESSMENT CRITERIA**

<p>Box 5</p> <p><b>SELECTION OF SUITABLE CONTAMINANT ASSESSMENT CRITERIA</b></p>
<p>When undertaking a risk assessment to determine if unacceptable risks to human health may be present, site derived values of contaminants in soil or other media, should be compared to relevant standards and contaminant assessment criteria, within the UK risk based framework.</p> <p><b>Reference and utilisation of other risk assessment frameworks and/or standards/reports produced by authoritative organisations may be acceptable, however their use must be justified for use in the UK context.</b></p>

## STAGE 2- OPTIONS APPRAISAL

10.0 The aim of the "options appraisal" stage (i.e. for remediation) is to establish which remediation option, or combination of options, provides the best approach to remediating all pollutant linkages that present an unacceptable risk at the site. The Borough Services Directorate's main concerns at this stage will be to ensure that:

- Remediation criteria selected for the site are protective of human health
- Appropriate remediation options have been selected for each relevant pollutant linkage (see Box 6)
- The Remediation Strategy addresses all relevant pollutant linkages

**The applicant should be aware that where the proposed remediation scheme will necessitate requirements, such as waste management licences, environmental permits, discharge consents etc. that account is taken of the aforementioned at an early stage in the options appraisal.**

The regulatory body responsible for requirements such as waste management licences, environmental permits and discharge consents is the Environment and Heritage Service, Waste and Contaminated Land Unit/Water Quality Unit.

### ***IDENTIFICATION OF FEASIBLE REMEDIATION OPTIONS***

11.0 Site-specific remediation objectives should be identified and remediation criteria for measuring compliance against these objectives should be derived at this stage. The Borough Services Directorate recommends that remediation criteria for human health should be derived in accordance with the Remedial Targets Methodology (see Box 4).

A short-list of feasible remediation options, i.e. options that are capable of achieving the remediation criteria derived for the site given site-specific constraints, should then be identified and be taken forward for detailed evaluation.

### ***DETAILED EVALUATION OF OPTIONS***

12.0 A review of the short-listed remediation options should be undertaken to determine which are the most appropriate for addressing each relevant pollutant linkage.

Detailed information on the technical attributes of each option will be required for the review and evaluation criteria will need to be developed for assessing the relative merits of each option.

Proposals for combining options should be included where more than one option is required.

**Box 6**

**RELEVANT POLLUTANT LINKAGE**

<p>Box 6</p> <p><b>RELEVANT POLLUTANT LINKAGE</b></p>
<p>A relevant pollutant linkage is one that has been identified during the risk assessment stage as representing unacceptable risks to human health or the environment.</p> <p>For the purposes of this guidance, relevant pollutant linkages are taken to be only those that represent an unacceptable risk to human health receptors.</p>

13.0 The applicant is advised to ensure that an assessment of likely regulatory requirements and feasibility of obtaining the appropriate environmental licences, permits etc. within the required timescale form part of the evaluation. The evaluation should also take account of Best Practicable Environmental Option (see Box 7), cost benefit, environmental outcomes and appropriate timescales for remediation.

***DEVELOPING THE REMEDIATION STRATEGY***

14.0 The Remediation Strategy sets out how the remediation options selected for each relevant pollutant linkage, or combination of options, will be put into place at the site.

It should provide a clear picture of how relevant pollutant linkages will be remediated and the remedial works verified. Practical issues such as zoning and phasing of remediation and proposals for obtaining the appropriate environmental licences, permits etc. should be addressed within the Remediation Strategy.

### **STAGE 3- IMPLEMENTATION OF THE REMEDIATION STRATEGY**

15.0 The main aims of the implementation stage are to ensure that the remedial works deliver the site remediation criteria without causing harm to the environment and that there is an accurate and permanent record of the works.

#### ***PREPARATION OF IMPLEMENTATION PLAN***

16.0 The Implementation Plan translates the Remediation Strategy into a clear set of remediation activities for the site. It should set out all aspects of the design, preparation, implementation, verification and long-term monitoring and maintenance of the remediation. The Implementation Plan should be capable of demonstrating to that:

- Site remediation criteria derived for relevant pollutant linkages will be achieved
- Appropriate environmental permits, licences etc. have been, or will be, obtained
- The remediation activities will be protective of human health
- Measures will be taken to mitigate potential risks to human health that may arise if there are significant variations from the Remediation Strategy.

#### **Box 7 BEST PRACTICABLE ENVIRONMENTAL OPTION (BPEO)**

<p>Box 7 <b>BEST PRACTICABLE ENVIRONMENTAL OPTION (BPEO)</b></p>
<p>The BPEO principle may be adopted to ensure that the option, or mix of options, provides the most benefit or the least damage to the environment, at acceptable cost, in the long-term as well as the short-term.</p>

## ***DESIGN, IMPLEMENTATION AND VERIFICATION***

- 17.0 Through the planning and development control process it must be demonstrated adequately by the developer that the site remediation is completed in accordance with the Remediation Strategy.

Once the detailed remediation design is complete, a **Verification Plan** should be prepared detailing the data gathering requirements necessary to demonstrate that the remediation meets the site remediation criteria.

A **Monitoring and Maintenance Plan** will also be required if the remediation is to include permanent structures/equipment etc that require maintenance or if there will be a need for monitoring to demonstrate the continuing effectiveness of the site remediation following substantial completion of the site works.

Once the site remediation is complete, a **Verification Report** will be required to demonstrate that the agreed site remediation criteria have been achieved. This report should provide a full record of all remediation activities carried out at the site and data collected in accordance with the requirements of the Verification Plan. In some cases reports on the verification works may require to be phased in order to demonstrate progress and enable any regulatory body to monitor such progress. This would be an additional reporting requirement and would not replace the need for a final completed version of the report. Details of monitoring, sampling and test results undertaken prior to, during and post-completion of the remediation works are required to be submitted to the Planning Service at appropriate stages within the reporting process, in order that relevant consultees to the Planning Service can be consulted on such submissions at the appropriate stage in the process.

## ***LONG-TERM MONITORING AND MAINTENANCE***

- 18.0 Long-term monitoring and/ or maintenance will only be necessary if a Monitoring and Maintenance Plan was required and prepared due to site specific remediation requirements.

## Useful References

### *Guidance*

- British Standards Institution (2001) Investigation of Potentially Contaminated Sites, Code of Practice, BS: 10175.
  - Construction Industry Research and Information Association (1995-1998) Special Publications 101-112, Remedial Treatment for Contaminated Land, Volumes I to XII.
  - Department of the Environment (1997) A Quality Approach for Contaminated Land Consultancy, Environmental Industries Commission in Association with the Laboratory of the Government Chemist (CLR 12).
  - Department of the Environment (1994) CLR Report No.4: Sampling Strategies for Contaminated Land.
  - Department of the Environment (1994) Industry Profiles
  - Department of the Environment, Food and Rural Affairs and Environment Agency (2002) Potential Contaminants for the Assessment of Land (CLR 8)
  - Department of the Environment, Transport and the Regions (2000) Guidelines for Environmental Risk Assessment & Management, Revised Departmental Guidance.
  - Environment Agency (2004) Environment Agency Policy Number 307\_03 on Chemical Test Data on Contaminated Soils -Qualification Requirements.
  - Environment Agency (2004) Model Procedures for the Management of Land Contamination (CLR 11).
  - Environment Agency (2000) Technical Aspects of Site Investigation (Volumes I and II) R&D Technical Report P5-065/TR.
  - Environment Agency (2000) Secondary Model Procedure for the Development of Appropriate Soil Sampling Strategies for Land Contamination, R&D Technical Report P5 066/TR.
  - Environment Agency and National House Building Councils' (2000) Guidance for the Safe Development of Housing on Land Affected by Contamination, R&D Publication 66.
  - National Assembly for Wales (2002) Planning Policy Wales: Chapter 13 Minimising and Managing Environmental Risks and Pollution.
  - Office of the Deputy Prime Minister (2004) Planning Policy Statement 23: Planning and Pollution Control.
  - WRc (1995) Soil Water and Groundwater Sampling.
- The Model Procedures for the Management of Land Contamination (CLR 11) contain a comprehensive list of references on a wider range of issues than are addressed in this guidance.

**Websites**

- These websites contain many useful references:
- British Standards Online at [www.bsi-global.com](http://www.bsi-global.com)
- Construction Industry and Research and Information Association contaminated land website at [www.contaminated-land.org](http://www.contaminated-land.org)
- DEFRA website at [www.defra.gov.uk](http://www.defra.gov.uk)
- Environment Agency website at [www.environment-agency.gov.uk](http://www.environment-agency.gov.uk)

## APPENDIX A Reporting Requirements

*Checklists provided in this Appendix*

MODEL PROCEDURES KEY ACTIVITY STAGE	CHECKLIST	REPORTING REQUIREMENTS FOR:
1. Risk Assessment	Checklist 1	Preliminary Risk Assessment
	Checklist 2	Quantitative Risk Assessment (including Site Investigation)
2. Options Appraisal	Checklist 3	Combined Options Appraisal
3. Implementation of the Remediation Strategy	Checklist 4	Implementation Plan
	Checklist 5	Verification Plan
	Checklist 6	Monitoring & Maintenance Plan
	Checklist 7	Verification Report
	Checklist 8	Monitoring Reports

The Councils' Borough Services Directorate recommends that the checklists are completed, signed, dated and submitted to the Planning Service (these should be forwarded by the planning authority together with the relevant reports, in order to demonstrate that the reports have been checked recently and by an appropriately qualified person. Evidence of professional qualifications and experience may be requested.

### *General Comments*

- A1 A preliminary risk assessment must be submitted as a minimum in all cases. The reporting stages that should then be completed for each site will depend on the outcome of the preliminary risk assessment and progression through the questions posed in Figure 2.

Other regulatory bodies such as the Environment and Heritage Service should be consulted concerning its own requirements with regard to pollution of waterways. Guidance with regard to management considerations that are not addressed in the checklists, is provided in the Model Procedures document CLR 11.

The reporting requirements provided in the checklists represent good practice but are not exhaustive.

Depending on site-specific factors, further work and reporting may be required. Comment boxes are provided beneath the checklists for additional comments and explanation for failure to meet any of the reporting requirements, e.g. because they are not applicable in the individual circumstances at a site.

All reports should be prepared by suitably qualified professionals.

### ***Combining Reports***

- A2 Repetition can be minimised if reports are combined or cross-referenced properly. In particular, the site investigation and quantitative risk assessment reports should be combined or submitted together, as the Councils' Borough Services Directorate will ensure that the site investigation report is always accompanied by a risk assessment to explain the significance of the investigation findings.

Both factual and interpretative reports should be supplied. Reporting requirements for all three elements of the Options Appraisal are combined into one checklist as it is anticipated that they will be included in one submission to the Planning Service (to be consulted by other interested parties/consultees) in most cases.

If the Remediation Strategy is submitted separately, it should clearly cross-reference or summarise the findings of the earlier Options Appraisal reports.

The Verification and Monitoring and Maintenance Plans may be submitted as part of, or appendices to, the Implementation Plan.

## CHECKLIST 1

<b>Preliminary risk assessment reporting requirements:</b>	
Contents:	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Report objectives	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site location map and National Grid Reference	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site layout plans*	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site area in hectares	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description of site and surroundings	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Details of desk study research undertaken (including the review of previous site contamination investigation reports (desk study and/or intrusive) remediation proposals	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Information on past and current activities at the site	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Details of intended future use of the site	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Unique references for all relevant planning applications or permissions at the site	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Historical Ordnance Survey (NI) maps* and site plans* and if available, aerial photographs	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Environmental setting including: <ul style="list-style-type: none"> <li>• superficial deposits and solid geology</li> <li>• hydrology</li> <li>• hydrogeology (including the interaction between all relevant shallow and deep groundwaters and how they flow to potential receptors)</li> <li>• Information from EHS with regard to location and status of relevant surface water and groundwater receptors and vulnerability, including all abstracted uses, landfill sites and land quality database information etc.</li> <li>• Pollution Incidents</li> </ul>	Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/>
Information on site drainage and other man-made potential pollutant pathways, e.g. underground services	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Identification of potential contaminants of concern and source areas	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Consultations with the local authority	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Consultations with the Environment and Heritage Service	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Consultations with other appropriate bodies	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Review and summary of previous reports, with report references	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Outline conceptual model with nature and location of human health and environmental receptors clearly identified	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description of possible pollutant linkages for human health	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Identification of potentially unacceptable risks to human health including criteria used to identify those risks and interpretation of preliminary risk assessment	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Discussion of uncertainties and gaps in information	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description and justification of next steps proposed at the site, e.g. carry out site investigation and quantitative risk assessment	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Conclusions	Yes <input type="checkbox"/> /No <input type="checkbox"/>
<b>*All plans and historical map extracts must be legible, suitably scaled and annotated, with a north point, and clearly show the site boundary.</b>	



## CHECKLIST 2

<b>Quantitative risk assessment (including site investigation) reporting requirements:</b>	
Contents:	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Report objectives	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site location map and National Grid Reference	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site layout plans*	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Review and summary of previous reports, with report references	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Outline conceptual model with all contaminant sources, pathways and receptors identified	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Results of preliminary risk assessment	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Details of any preparatory enabling works e.g. moving mounds of waste, breaking out concrete and demolition works.	Yes <input type="checkbox"/> /No <input type="checkbox"/>
<b>Site investigation:</b>	
Investigation objectives and Justification of Exploration, Sampling and Analytical Strategies.	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Summary of work done	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site investigation strategy, including: <ul style="list-style-type: none"> <li>• rationale for investigation</li> <li>• methods used for forming exploratory holes e.g. boreholes, trial pits, window samples</li> <li>• details of any borehole sampling undertaken</li> <li>• methods used for collecting, preserving and transporting samples to the analytical laboratory</li> </ul>	Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site sampling strategy, including: <ul style="list-style-type: none"> <li>• rationale for strategy</li> <li>• description and explanation of monitoring, sampling and testing programmes</li> <li>• monitoring and sampling locations, depths (metres below ground and frequencies)</li> </ul>	Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/>  Yes <input type="checkbox"/> /No <input type="checkbox"/>
Analytical strategy, including: <ul style="list-style-type: none"> <li>• rationale for selection of analytical parameters</li> <li>• justification of selection of samples for testing</li> <li>• justification and description of chemical analyses, in accordance with the MCERTS performance standard for soils</li> <li>• details of quality assurance and quality control requirements for laboratory analyses</li> </ul>	Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/>
Plan showing monitoring and sample point locations*	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Details of in-situ tests and geotechnical tests required to provide data for quantitative risk assessment	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description of site works and on-site observations	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Measures undertaken to prevent unacceptable risks to human health and the environment as a consequence of site investigation methods used	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Presentation and interpretation of investigation results, including: <ul style="list-style-type: none"> <li>• description of ground conditions encountered at the site</li> <li>• cross-sections showing site strata and shallow and deep groundwater</li> </ul>	Yes <input type="checkbox"/> /No <input type="checkbox"/>

Councils' Guidance for Interested Parties on Development on Land that might be Affected by Contamination

Final Version: March 2006

<ul style="list-style-type: none"> <li>• levels</li> <li>• summary tables of chemical analyses, site monitoring and test results</li> <li>• description of type, nature and spatial distribution of contamination, with plans where appropriate*</li> <li>• evaluation of site investigation results against the outline conceptual model</li> </ul>	<p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p>
<p>Annexes containing:</p> <ul style="list-style-type: none"> <li>• exploratory hole logs including grid co-ordinates and ground elevation (logged by suitably qualified professionals)</li> <li>• Monitoring boreholes or other type of installation methodology</li> <li>• monitoring/sampling/test results</li> <li>• description of samples submitted for analysis</li> <li>• laboratory analytical reports, completed in accordance with the MCERTS performance standard for soils</li> <li>• chain of custody records</li> </ul>	<p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p>
<p><b>Quantitative risk assessment: Generic and/or Site- Specific</b></p>	
Risk assessment objectives	Yes ð/Noð
Description of proposed development	Yes ð/Noð
Conceptual model, revised following site investigation, with sources, pathways and receptors clearly identified	Yes ð/Noð
<b><u>Rationale for the chosen risk assessment approach and explanation for why it is valid for the site</u></b>	Yes ð/Noð
Discussion of relevant exposure scenarios	Yes ð/Noð
<b><u>Assessment criteria selected for the site, with justification for all criteria used</u></b>	Yes ð/Noð
<p><b>Description of risk assessment model, if used, and:</b></p> <ul style="list-style-type: none"> <li>• <b>input parameters</b></li> <li>• <b>safety factors</b></li> <li>• <b>assumptions</b></li> <li>• <b>any sensitivity analysis undertaken</b></li> </ul>	<p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p>
Calculation worksheets/ model inputs and outputs provided	Yes ð/Noð
Constraints and limitations relating to data quality and risk assessment method	Yes ð/Noð
Identification of pollutant linkages that present an unacceptable risk to human health	Yes ð/Noð
Discussion of uncertainties and their impact on the outcome of the risk assessment	Yes ð/Noð
Results of risk estimation if detailed quantitative risk assessment is undertaken	Yes ð/Noð
Evaluation of unacceptable risks to human health taking into account both the current use of the site and details of the proposed development.	Yes ð/Noð
Description of evaluation method and criteria used	Yes ð/Noð
Description and justification of next steps proposed at the site, e.g. carry out Options Appraisal (remediation) for pollutant linkages that present an unacceptable risk to human health	Yes ð/Noð
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### CHECKLIST 3

<b>Combined options appraisal (remediation/risk management options) reporting requirements:</b>	
Contents	Yes ☐/No☐
Report objectives	Yes ☐/No☐
Site location map and National Grid Reference	Yes ☐/No☐
Site layout plans*	Yes ☐/No☐
Review and summary of previous reports, with report references	Yes ☐/No☐
Summary of relevant pollutant linkages that require remediation	Yes ☐/No☐
Statement and explanation of remediation objectives, i.e. what the remediation needs to achieve, for each relevant pollutant linkage	Yes ☐/No☐
Statement of remediation criteria against which compliance with remediation objectives for each relevant pollutant linkage	Yes ☐/No☐
Statement of overall site remediation criteria (these should always be protective of human health) where they differ from the criteria derived for relevant pollutant linkages	Yes ☐/No☐
<b>Identification of feasible remediation options:</b>	
Summary of feasible remediation options identified for each relevant pollutant linkage, including general characteristics of those options and methods used for collecting information on them	Yes ☐/No☐
Short-list of feasible remediation options to be taken forward for more detailed consideration, including:	Yes ☐/No☐
• an assessment of their suitability for use at the site	Yes ☐/No☐
• reasons for selecting options on the short-list and rejecting others	Yes ☐/No☐
<b>Detailed evaluation of remediation options:</b>	
Evaluation of short-list remediation options, including explanation of evaluation criteria used	Yes ☐/No☐
Identification of the most appropriate option for each relevant pollutant linkage and justification for its selection	Yes ☐/No☐
Reasons for rejecting other remediation options on the short-list	Yes ☐/No☐
Justification for any proposals to combine remediation options	Yes ☐/No☐
<b>Remediation Strategy:</b>	
Description of the Remediation Strategy, including:	
• technical and scientific basis of the strategy	Yes ☐/No☐
• requirement for preparatory works	Yes ☐/No☐
• effectiveness of combining remediation options, where required	Yes ☐/No☐
• proposed site zoning and phasing of remediation	Yes ☐/No☐
• verification of remediation and monitoring requirements	Yes ☐/No☐
• constraints and limitations to remediation	Yes ☐/No☐
• timescales required for environmental permits, licences etc.	Yes ☐/No☐
• expected durability of the proposed remediation	Yes ☐/No☐
• measures to prevent unacceptable risks arising from remediation activities at the site	Yes ☐/No☐
Justification for any changes required under the Remediation Strategy to remediation criteria derived for any relevant pollutant linkages	Yes ☐/No☐
Summary of alternative remediation strategies considered	Yes ☐/No☐

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Justification for selection of the preferred Remediation Strategy	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description of how the Remediation Strategy will deliver remediation criteria derived for all relevant pollutant linkages	Yes <input type="checkbox"/> /No <input type="checkbox"/>
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**Name & position:**.....

**Contact Information:** .....

**Date:** .....

Further Comments:

## CHECKLIST 4

<b>Implementation Plan reporting requirements:</b>	
Contents:	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Report objectives	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site location map and National Grid Reference	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site layout plans*	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Review and summary of previous reports, with references	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description of ground conditions at the site, including waterways features	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Remediation objectives for each relevant pollutant linkage	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Remediation criteria for relevant pollutant linkages	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Overall site remediation criteria	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Remediation methodology, i.e. what is to be done by way of remediation	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Phasing of the remediation works and approximate timescales for each phase	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site preparation and operational constraints	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site procedures for managing the remediation works in a manner that will not cause unacceptable risks to human health and/or the environment	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Discussion of permitting requirements and proposals for obtaining the appropriate permits, e.g.: <ul style="list-style-type: none"> <li>• PPC permit</li> <li>• waste management site licence</li> <li>• exemption from waste management licensing</li> <li>• mobile plant licence</li> <li>• abstraction licence or consent</li> <li>• discharge consent</li> <li>• Groundwater Regulations authorisation</li> <li>• flood defence consent</li> <li>• other permits</li> </ul>	Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/>
Details of how any variations from the Implementation Plan that have the potential to impact on human health receptors (including any areas of unexpected contamination encountered) will be dealt with during the site works.	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Monitoring boreholes/installation methodology	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Cross-reference to the Verification Plan and, if required, Monitoring and Maintenance Plan for the site.	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Plans* showing: <ul style="list-style-type: none"> <li>• areas to be remediated</li> <li>• proposed locations and phasing of remediation works</li> <li>• area to be used for stockpiling segregated contaminated and clean, site-derived and imported materials</li> <li>• location of areas to be remediated in relation to any proposed development</li> <li>• proposed monitoring locations</li> </ul>	Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/> Yes <input type="checkbox"/> /No <input type="checkbox"/>
<p><b>*All plans map extracts must be legible, suitably scaled and annotated, with a north point, and clearly show the site boundary.</b></p>	

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Further Comments:
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### CHECKLIST 5

<b>Verification Plan reporting requirements:</b>	
Contents:	Yes ð/Noð
Report Objectives	Yes ð/Noð
Site location map and National Grid Reference	Yes ð/Noð
Site layout plans*	Yes ð/Noð
Review and summary of previous reports, with references	Yes ð/Noð
Scope of remediation works to be undertaken and any design details required to inform the Verification Plan	Yes ð/Noð
Description of what constitutes completion for the remedial works and how completion will be verified.	Yes ð/Noð
Data gathering requirements to demonstrate that site remediation criteria are achieved for each relevant pollutant linkage, such as: <ul style="list-style-type: none"> <li>• sampling and monitoring strategy, including e.g.: <ol style="list-style-type: none"> <li>1. validation testing of excavations to remove contaminated materials</li> <li>2. validation testing of materials excavated, treated and deposited at the site</li> <li>3. validation testing of materials imported as 'clean fill'</li> <li>4. post-completion verification testing of the remediated area</li> <li>5. background water quality testing in groundwater and nearby surface waters</li> <li>6. water quality testing of any treated groundwater and surface waters</li> <li>7. site sampling and monitoring methods and frequency</li> </ol> </li> <li>• how on and off-site observations will be recorded</li> <li>• explanation and schedule of chemical analyses, to be undertaken in accordance with the MCERTS performance standard for soils</li> <li>• laboratory quality assurance and control requirements</li> </ul>	<p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p> <p>Yes ð/Noð</p>
Performance testing required, e.g. for contaminant barriers and capping layers	Yes ð/Noð
Plans showing proposed sampling and monitoring point points*	Yes ð/Noð
Explanation of how compliance with discharge consents, abstraction licences, etc. will be demonstrated	Yes ð/Noð
Proposed actions in case: <ul style="list-style-type: none"> <li>• test results and monitoring data show that the remediation activities will not achieve the remediation criteria derived for relevant pollutant linkages</li> <li>• site works vary from those anticipated in the Implementation Plan</li> </ul>	<p>Yes ð/Noð</p> <p>Yes ð/Noð</p>
Timing for preparation of the Verification Report, particularly if any remediation activities will extend beyond substantial completion of the main site works	Yes ð/Noð
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## CHECKLIST 6

<b>Monitoring and Maintenance Plan reporting requirements:</b>	
Contents:	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Report objectives	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site location map and National Grid Reference	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site layout plans*	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Scope and explanation of site monitoring (this is taken to include sampling for ease of reference) and/or maintenance work required following completion of site works	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Statement and justification of end-point for the site monitoring programme	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Proposed monitoring assessment criteria and reasons for their selection	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Measures for ensuring that the required monitoring and/or maintenance undertaken to remediate relevant pollutant linkages continue to be effective	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Schedule of monitoring and maintenance required	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Monitoring boreholes or other type of monitoring installation methodology	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Method of collecting, preserving and transporting samples to the analytical laboratory	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Type and suitability of monitoring equipment to be used	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Plans showing proposed monitoring point and maintenance locations*	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description of chemical analyses required, to be undertaken in accordance with the MCERTS performance standard for soils	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Laboratory quality assurance and control requirements	Yes <input type="checkbox"/> /No <input type="checkbox"/>
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## CHECKLIST 7

<b>Verification Report requirements:</b>	
Contents:	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Verification work objectives	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site location map and National Grid Reference	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site layout plans*	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Review and summary of previous reports, with references	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description of relevant pollutant linkages addressed	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description of remedial works undertaken	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Details of and justification for any variations from the Verification Plan	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Results of verification, validation and performance testing specified in the Verification Plan and any subsequent variations	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Provision of laboratory analytical reports, completed in accordance with the MCERTS performance standard for soils	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Plans* showing remediated areas, indicating any variations from those shown in the Implementation Plan	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Details of permits, licences, authorisations and consents obtained for the site and evidence of compliance with them	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description of reinstatement works, including methodology for decommissioning e.g. monitoring boreholes	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Description of the final condition of the site at completion	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Assessment of the potential impact of the site at final condition on human health when put to the proposed end-use	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Details of any permanent installations required as part of the remedial works, that are to be left in place post-completion of site works	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Confirmation of post-completion monitoring and/or maintenance requirements	Yes <input type="checkbox"/> /No <input type="checkbox"/>
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Further Comments:
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## CHECKLIST 8

<b>Monitoring Report requirements:</b>	
Contents:	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Report objectives	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site location map and National Grid Reference	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Site layout plans*	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Scope of site monitoring (this is taken to include sampling for ease of reference) and sampling activities required to ensure that remediation of relevant pollutant linkages continues to be effective and human health receptors continue to be protected from unacceptable risks	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Plans* showing monitoring point locations	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Schedule of monitoring activities undertaken since the previous report	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Schedule and results of chemical analyses	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Laboratory analytical reports, completed in accordance with the MCERTS performance standard for soils	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Assessment of on-going compliance with remediation criteria	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Report on actions taken in response to exceptional monitoring results	Yes <input type="checkbox"/> /No <input type="checkbox"/>
Recommendations for future monitoring, including any variations required from the monitoring programme provided in the Monitoring and Maintenance Plan	Yes <input type="checkbox"/> /No <input type="checkbox"/>
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