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DAERA Environmental Advice for Planning

Practice Guide

Redeveloping Land Affected by Contamination

A Developers Guide to Planning Considerations and Environmental
Responsibilities

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Abbreviations and Acronyms

CLR11	The Model Procedures for the Management of Land Contamination
CL:AIRE	Contaminated Land: Applications in Real Environments
CSM	Conceptual Site Model
DAERA	Department of Agriculture, Environment and Rural Affairs
DQRA	Detailed Quantitative Risk Assessment
EA	Environment Agency
ENDS	Environmental Data Services
GQRA	Generic Quantitative Risk Assessment
HSENI	Health and Safety Executive Northern Ireland
MCERTS	the Environment Agency's Monitoring Certification Scheme
NIEA	Northern Ireland Environment Agency
PHA	Public Health Agency
PRA	Preliminary Risk Assessment
RIP	Remediation Implementation Plan
SuRF UK	Sustainable Remediation Forum UK
SWMP	Site Waste Management Plan
UKAS	United Kingdom Accreditation Service
WCLO	Waste and Contaminated Land (Northern Ireland) Order 1997
WM3	Waste Classification Guidance on the Classification and Assessment of Waste

1.0 Introduction

Land contamination has the potential to cause significant harm to ecosystems, human health and property, and pollution of the water environment (groundwater and surface waters, including rivers, lakes, and coastal waters) because of the presence of particular substances in, on, or under the ground.

Northern Ireland's historic and present day activities can have many impacts and pressures on the land. Contamination, in most cases, is likely to arise from a previous use of the site, or an adjacent site, that had an industrial activity on it at one time or another e.g. gasworks, textile manufacturing, landfill, sewage works, railway lands (**see DOE Industry Profiles link Section 6.2 for more detail**).

Redevelopment of contaminated land introduces a new or material change to land use. When redeveloping contaminated sites, **developers must ensure that all risks associated with potential land contamination have been identified and addressed so that the land is suitable for its new use**. Therefore, contaminated sites being redeveloped should be supported by suitable risk assessments and remediation strategies (if required) demonstrating that the risks have been understood and can be managed, supporting the new site use.

At all times, **it is the responsibility of the developer to follow good practice and identify the nature, scale and extent of land affected by contamination**, and if required, undertake remediation work to ensure the land is made suitable for its new use.

1.1 The purpose of this document?

The aim of this document is to provide developers with a simplified guide to redeveloping land affected by contamination in Northern Ireland. This guidance may also be a useful source of information for agents, contractors, planning officers and project managers associated with development schemes affected by land contamination. **It aims to signpost developers to key sources of information and to assist developers in determining what information is required to support the redevelopment of land affected by contamination as the applicant moves from the planning application stage to compliance of conditions.**

This document follows the UK risk-based framework, as presented in the [Model Procedures for the Management of Land Contamination CLR 11](#) (CLR11). **Developers should be aware that this guidance document is written from a Department of Agriculture, Environment and Rural Affairs (DAERA) perspective in relation to risks from contaminated land to environmental receptors (i.e. ground and surface waters) for which DAERA is a statutory consultee in the planning process.** Local Councils have additional statutory responsibilities for human health risks that you may need to consider.

The flow chart in **Section 3.0** provides colour-coded links to relevant checklists which are presented as **appendices** to this document. **Checklists 1 – 6** aim to provide a developer with key reporting requirements relevant to each of the three stages in the risk management process i.e. risk assessment (**purple**), options appraisal (**green**) and implementation of remediation (**blue**). These checklists describe some important elements of a report but these are not exhaustive.

Checklist 7 relates to **the management of waste** and the movement of materials on and/or off site (**brown**). Waste management requirements by developers are often overlooked in the risk management process and the checklist included aims to address this issue and assist developers in understanding better their responsibilities for waste management permits, licenses, authorisations and consents.

Checklist 8 relates to the suggested minimum contents of a Piling Risk Assessment report. Piling methods on land affected by contamination are likely to increase the risk of contamination being transported by creating new pathways. Therefore, DAERA recommend that Piling Risk Assessments should be undertaken.

Section 4.0 aims to provide direction to developers on the appointment of suitably qualified consultants to assist them through the risk management process. **Section 5.0** highlights the importance of considering of stakeholder engagement when redeveloping contaminated sites and **Section 6.0** aims to provide developers with links to useful websites, other guidance and data sources in relation to the contaminated land risk management process the redevelopment of land affected by contamination.

1.2 Key Points for Developers

What / When	Why	How via this document
<p>Has the land had a previous industrial use (with reference to the DOE Industry Profiles)? Is there potential for historical contamination to be present e.g. oil tanks, infilling? If yes, a Preliminary Risk Assessment (PRA), as a minimum, should be prepared in line with the UK technical framework as described in the Model Procedures for the Management of Land Contamination (CLR11) and with Checklist 1 of this guidance. This should be submitted by developers to the Planning Authority at planning Pre Application Discussions or at application stage.</p>	<ul style="list-style-type: none"> This is the technical framework that is consistent with government policies & legislation within the United Kingdom. To further identify land contamination issues for the application site. To better inform DAERA's advice to the Planning Authority. 	<p>Section 2.1 and Checklist 1</p>
<p>A suitably-qualified Environmental Consultant with relevant experience in support of environmental risk assessment and remediation should be appointed at the earliest opportunity when developing land affected by contamination.</p>	<ul style="list-style-type: none"> Failure to provide adequate supporting information with the planning submission may result in significant delays in the planning process. 	<p>Section 4.0</p>
<p>Should potential contamination exist, a Quantitative Assessment (QORA / DQRA) underpinned by an intrusive site investigation should be completed in accordance with the British Standards BS 10175:2011+A1:2013 Code of practice for investigation of potentially contaminated land sites and the Environment Agency Remedial Targets Methodology should be designed and implemented. Where a contaminated source is known to be present the developer should provide the information detailed and required by Checklist 2 and submit to the Planning Authority at planning application stage.</p>	<ul style="list-style-type: none"> This is the technical framework that is consistent with government policies & legislation within the United Kingdom. To ensure quality site data is captured to inform a Risk Assessment. To better inform DAERA's advice to the Planning Authority. 	<p>Section 2.1 and Checklist 2</p>
<p>A Remediation Options Appraisal in line with Checklist 3 of this guidance should be completed in the event of risks being identified and suitable remediation measures selected. Any Remediation Options Appraisal should be submitted by developers to the Planning Authority at planning application stage.</p>	<ul style="list-style-type: none"> This is the technical framework that is consistent with government policies & legislation within the United Kingdom. To better inform DAERA's advice to the Planning Authority. 	<p>Section 2.1 and Checklist 3</p>
<p>The verification process within the Implementation of Remediation stage must be completed demonstrating that the remediation has achieved its objective. Thorough record keeping and detailed supporting evidence can assist in an easier transition for developers through the verification process. Verification is normally associated with the Discharge of Conditions planning application stage and developers should provide the information detailed and required by Checklists 5 & 6 and submit to the Planning Authority.</p>	<ul style="list-style-type: none"> This is the technical framework that is consistent with government policies & legislation within the United Kingdom. To demonstrate the contamination risks have been removed & the land is suitable for use. To better inform DAERA's advice to the Planning Authority. 	<p>Section 2.1 and Checklist 5 & 6</p>
<p>When developing land affected by contamination, the management of all waste generated from any development should be suitably authorised through the relevant legislative requirements at the earliest opportunity. Appropriate licences, permits, authorisations and consents should be considered and, where relevant, obtained from the relevant regulatory body. Costs associated with the management of waste should be incorporated into a development project plan. Developers should consider Checklist 7 in relation to understanding waste management responsibilities and requirements when developing land affected by contamination.</p>	<ul style="list-style-type: none"> Waste producers have a legal responsibility to ensure they make the appropriate checks as set out in the Waste Duty of Care Code of Practice for Northern Ireland. Any waste generated should be appropriately classified & assessed in line with WM3. Waste management information is also required to be presented as part of the verification process. 	<p>Section 3.0 and Checklist 7</p>
<p>Engagement with stakeholders should be considered as it is an important part of the process of redeveloping land affected by contamination and should be incorporated into a development project plan. Early engagement is advisable and a mapping exercise of all relevant stakeholders that may be linked to or affected by the development should be completed.</p>	<ul style="list-style-type: none"> Remediation of land affected by contamination has the potential to affect the amenity of localities (dust, noise, odour, traffic) and often involves numerous different stakeholders. 	<p>Section 5.0</p>
<p>Ensure that costs associated with known and/or unforeseen contamination are provided for within the resources and timelines in the development project plan.</p>	<ul style="list-style-type: none"> The impacts of contaminated land (known or unforeseen) on a development project has the potential to significantly increase project costs and project timelines. 	<p>Section 2.1 and Checklist 1 & 2</p>
<p>Follow the flow chart included in Section 3.0 which links to the appendix checklists to determine what information is required and when in managing potential contamination risks and ensuring the site is safe for its new use.</p>	<ul style="list-style-type: none"> The flow chart and checklists are written in line with CLR11 and aim to provide a developer with key reporting requirements relevant to each of the three stages in the risk management process. 	<p>Section 3.0 and Appendix checklists</p>
<p>Consider the roles and responsibilities of various regulatory bodies and / or statutory consultees when developing land affected by contamination.</p>	<ul style="list-style-type: none"> Statutory consultees to the relevant Planning Authority – material considerations. Regulatory bodies may during the course of the development attend site for inspections. Appropriate licences, permits, authorisations and consents may be required for the development. 	<p>Section 2.0</p>

2.0 Legislative Context

Part III of the **Waste and Contaminated Land (Northern Ireland) Order 1997** (“WCLO 1997”) contains the legal provisions for the introduction of a Contaminated Land regime in Northern Ireland, equivalent to those operating under Part IIA of the Environmental Protection Act 1990 (“EPA 1990”) in England and Scotland since 2000 and in Wales since 2001. It provides a definition of Contaminated Land and an improved system for the identification and remediation of land where contamination is causing unacceptable risks to human health, the natural environment and / or property.

The WCLO was introduced in 1997, although Part III has not yet been commenced. **The main objectives of the Part III regime are similar to those provided by Part IIA of the EPA 1990 which is in force in England and Scotland since 2000 and in Wales since 2001.** Those objectives are to:

- a) Identify and remove unacceptable risks to human health and the environment;
- b) Seek to ensure that contaminated land is made suitable for its current use;
- c) Pursue the *polluter pays principal*;
- d) Ensure that the burdens faced by individuals, companies and society as a whole are proportionate, manageable and compatible with the principles of sustainable development.

These **objectives provide the basis for the “suitable for use” approach to the remediation of land, hence contributing to the objectives of sustainable development.**

The “*suitable for use*” approach promotes a risk- based approach in managing land affected by contamination by:

- (a) Recognising that the risks presented by any given level of contamination will vary according to land use and a range of site specific factors such as the underlying geology and hydrogeology. Risks therefore need to be assessed on a site specific basis;
- (b) Ensuring that land is suitable for its current use;
- (c) Ensuring that land is made suitable for any new use with planning consent in place; and

- (d) Limiting the requirements of remediation to the work necessary to prevent unacceptable risk to human health and the environment based on current land use or future use if planning consent is being sought or in place.

Via **the Planning Act (Northern Ireland) 2011** the planning process has an important role to play in managing land affected by contamination to ensure that the development is suitable for use. At the application stage the Consultees and other regulators (DAERA and Local Councils) provide advice to the relevant Council to ensure that the redevelopment of all potentially contaminated sites should be supported by adequate site investigation and risk assessment to identify all potential unacceptable risks; and a remediation strategy (if required) to ensure that the new development is suitable for use, be it residential, commercial or recreational space.

Should potential contaminating sources be known by a developer then a PRA needs to be provided, as a minimum, to further identify land contamination issues for the application site (see Section 7.0 Checklist 1).

2.1 Technical Framework- The Contaminated Land Risk Management Process

The Model Procedures for the Management of Land Contamination, CLR 11, have been developed to provide the technical framework for applying a risk management process when dealing with land affected by contamination. The process involves identifying, making decisions on, and taking appropriate remediation action to manage risks due to land being affected by contamination in a way that is consistent with government policies and legislation within the United Kingdom (UK).

Through CLR11 there are **3 stages of risk management** and each stage has 3 tiers to work through. **In all cases, you must start with a Preliminary Risk Assessment (PRA).**

Stage 1: Risk assessment- see Checklists 1 & 2

The 3 tiers are:

1. Preliminary Risk Assessment (PRA)
2. Generic Quantitative Risk Assessment (GQRA)
3. Detailed Quantitative Risk Assessment (DQRA)

Stage 2: Options appraisal- see Checklist 3

The 3 tiers are:

1. Identify feasible remediation options
2. Detailed evaluation of options
3. Develop a remediation strategy

Stage 3: Implementation of the remediation strategy- see Checklists 4, 5 & 6

The 3 tiers are:

1. Prepare an implementation plan
2. Design, implementation and verification
3. Long-term monitoring and maintenance, if required

The risk assessment stage is an iterative process. It's normally followed in order but depending on the level of risk, you can jump a tier or proceed to the options appraisal stage. If you establish that the risks are acceptable then you can exit from the process. You may need to revise assumptions within the site conceptual model developed in the preliminary risk assessment as you get more information about the site. If unacceptable risks are identified when you have completed the Preliminary Risk Assessment, you must progress to a suitable quantitative risk assessment.

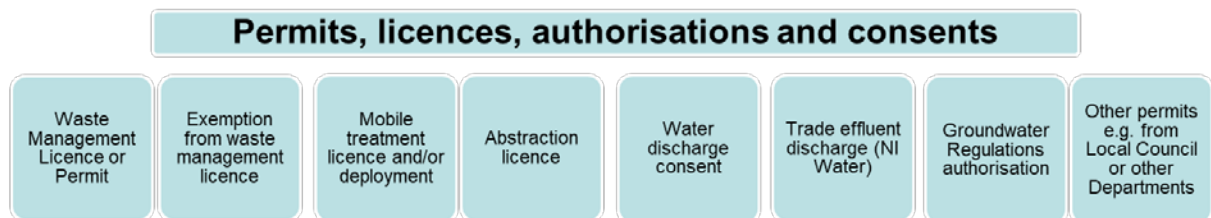
You must record your decisions with reference to suitable evidence produced in site specific reports as you progress through the stages. See **Checklists 1 – 6** for more information. **These checklists describe some important elements of a report but are not exhaustive.**

3.0 The Contaminated Land Risk Management Process Within the Planning Process in Northern Ireland

The flow chart shown below details how the contaminated land risk management process links to the planning process in Northern Ireland. If a development site is affected by contaminated land, the planning application to the local Planning Authority should be supported by a suitable risk assessment underpinning site data and a remediation strategy if unacceptable risks are identified in line with [CLR11](#).

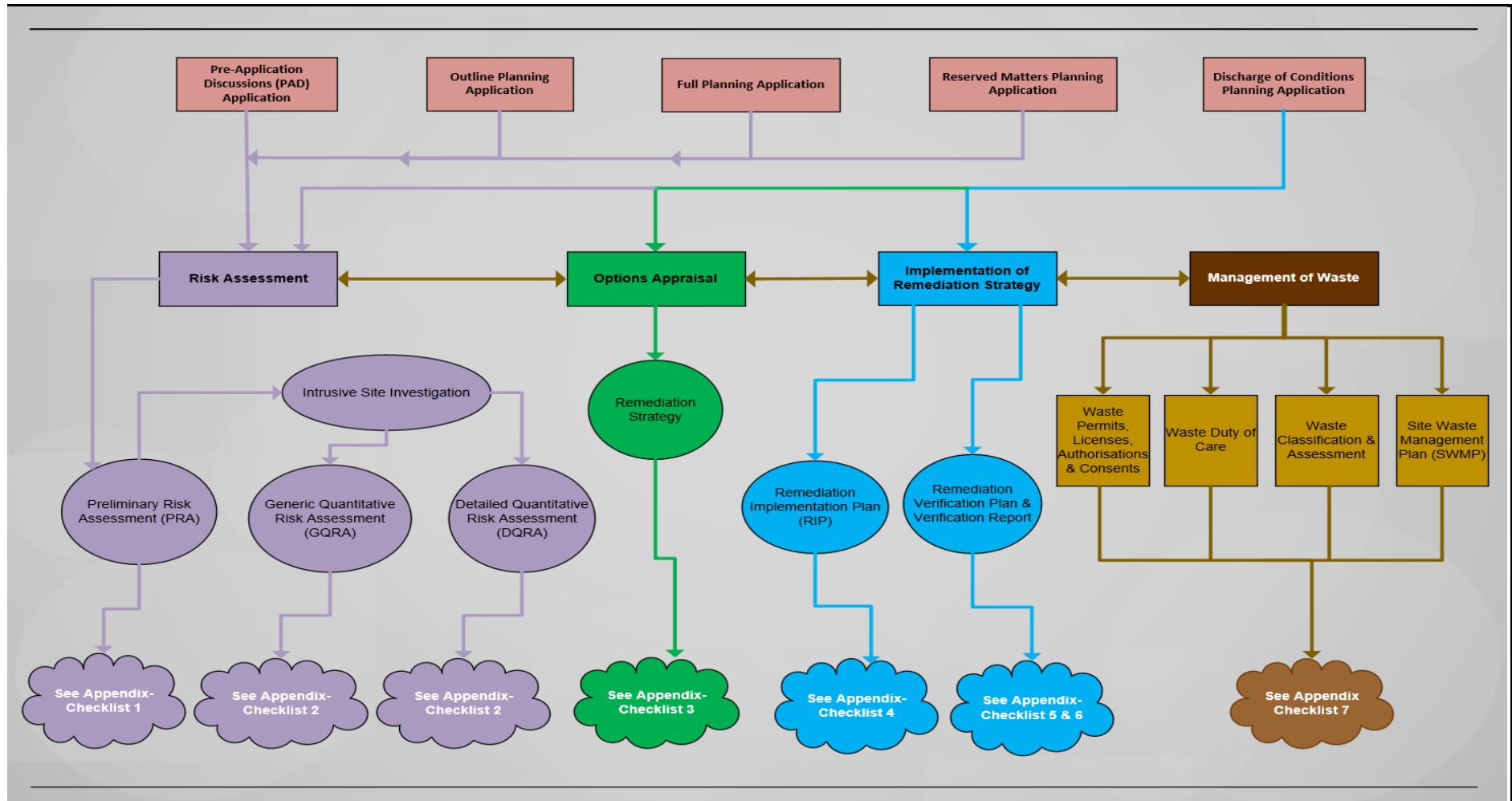
Depending on the level of risk a site has will depend on how much a developer will have to move through the flow chart and as such how far the developer will need to move through [CLR11](#).

Waste management requirements by developers are often overlooked in the risk management process and the flow chart below and **checklist 7** aim to assist developers in better understanding their responsibilities for waste management permits, licenses, authorisations and consents.



Above: A schematic of the relevant permits, licences, authorisations and consents a developer may need to obtain linked to the development of land affected by contamination

The Contaminated Land Risk Management Process Within the Planning Process in Northern Ireland



4.0 Professional Skills and Competencies in the Risk Management of Land Affected by Contamination

Because of the complex, technical nature of this issue, and the typical timescales involved in undertaking detailed investigations, **DAERA recommend that developers appoint suitably-qualified Environmental Consultants (demonstrating possession of the necessary skills, competence and experience in the assessment and remediation of contaminated land) at the earliest opportunity.** Developers are strongly advised to ensure that appointed Environmental Consultants are familiar with and follow this developer's guide and the UK risk management framework provided by [CLR11](#).

DAERA is unable to recommend specific consultants and/or organisations to carry out work for developers. **Environmental Data Services (ENDS)** provides a comprehensive listing of local and United Kingdom based environmental consultants which are available to view and search on through the ENDS website at <https://www.endsdirectory.com/>.

It is important for developers to ensure that their appointed consultants / contractors are selected on the basis of having the necessary skills and expertise to complete the work to the required standards using best practice. As a minimum, they should reference the relevant guidance documentation, the [CLR11](#) risk management processes and be able to demonstrate their capability and ability to deliver the required programme to time and budget whilst complying with all necessary permits and permissions.

A development project is more likely to be successful, and considerable effort and expense spared, if appropriately qualified experts with relevant environmental experience are engaged and used at an early stage and at suitable times thereafter as the development progresses to completion with evidence of verification of remediation submitted to the Local Planning Authority.

A project to this nature will require a multi-disciplinary team that provide a range of professional skills to fully address the specific needs of each development project. These could include, but are not limited to:

- Geo-environmental engineers (**ground investigations of land contamination**)
- Geologists (**rocks and soils**) and Hydrogeologists (**groundwater**)

- Environmental scientists (management of waste, relevant permits)
- Ground gas experts
- Human health risk assessors
- Toxicologists (**human health exposure risk assessors**)
- Ecologists (**flora and fauna**)
- Remediation engineers (**to design, operate and verify effective treatments**)
- Project managers (**delivery mechanisms**)

For each specialist a number of professional accreditations could be produced through which suitably experienced persons could be engaged in a development project and each of these should be checked in their own merits.

5.0 Stakeholder Engagement Considerations When Redeveloping Land Affected by Contamination

Stakeholder engagement is an important part of the process for the redevelopment of land affected by contamination and there is a growing acceptance, and indeed an expectation, that establishing long-term sustainable relationships with stakeholders is essential to ensure robust design, delivery and evaluation when redeveloping contaminated sites. Therefore, **developers in Northern Ireland are encouraged to incorporate stakeholder engagement at an early stage within their project plans.** Stakeholder engagement is defined as regular, structured interactive activities and engagements, such as workshops and meetings with defined participants to achieve agreed goals or outcomes.

Early engagement with stakeholders is strongly recommended for all remediation projects, as this will identify issues and problems which developers may not have been aware of and therefore better inform the site approach and programme.

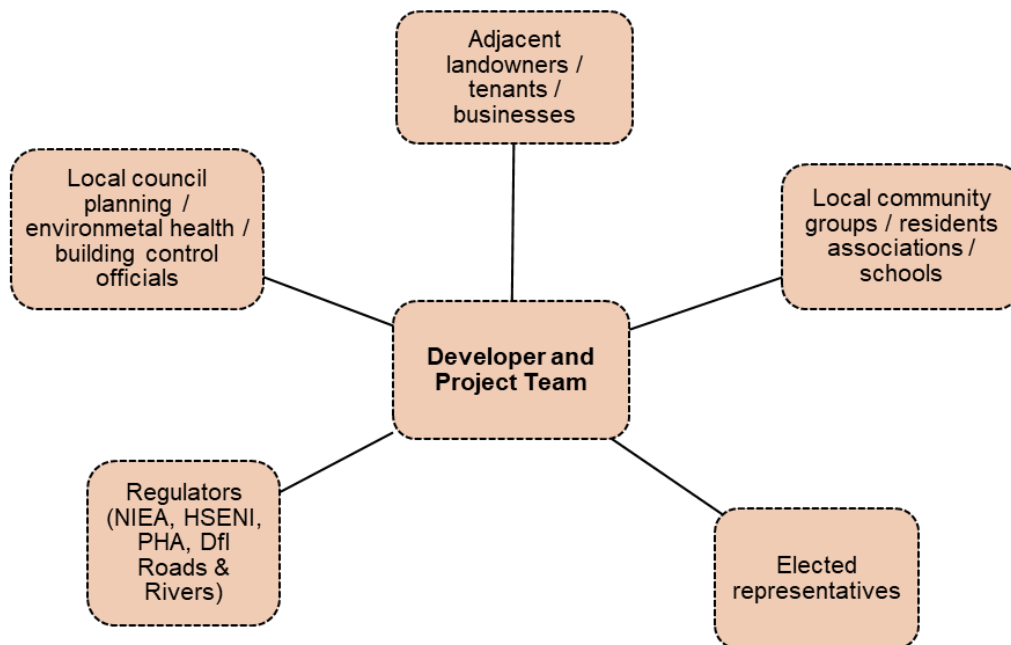
Stakeholder groups may include the project team (site owner, the developer, various sub-contractors, environmental advisors), elected representatives, the regulator(s) and planners. Other stakeholders who may not be involved in the decision-making process but can be equally important include those who might use the site (workers, visitors), those with a financial involvement in the site (banks, lenders, insurers), the site neighbours (adjacent owners and

tenants, local community groups, local schools, councils) and other technical specialists, researchers, pressure groups.

Methods of engagement with stakeholders include;

- Call in centres
- Daytime / evening meets
- Social media platforms / site specific web page
- Workshops
- Questionnaires / surveys
- Media outlets- television, newspapers, radio
- Round table discussions
- Focus groups

Consideration should be given to using digital technologies, tools and platforms to reach and engage with your stakeholders. Visualisations such as figures, diagrams and photographs can be particularly helpful to stakeholders, as can the use of plain English with the avoidance of technical terms.



Above: A schematic of stakeholders to be considered by a developer and project team in relation to land affected by contamination

6.0 Useful Websites With Regards to the Contaminated Land Risk Management Process in Northern Ireland

The [DAERA Environmental Advice for Planning](#) is a key website for developers and will help advise on the supporting environmental information for redeveloping land affected by contamination. Below are number of other relevant websites which developers may find useful reference points;

- **DAERA-** <https://www.daera-ni.gov.uk/articles/contaminated-land>
- **Environment Agency-** <https://www.gov.uk/contaminated-land>
- **Health and Safety Executive Northern Ireland-** <https://www.hseni.gov.uk>
- **Public Health Agency-** <http://www.publichealth.hscni.net/>
- **Building Control Northern Ireland-** <http://www.buildingcontrol-ni.com/>
- **ENDS Directory-** <https://www.endsdirectory.com/>
- **United Kingdom Accreditation Service-** <https://www.ukas.com/search-accredited-organisations/>

6.2 Useful Guidance and Data Sources With Regards to the Contaminated Land Risk Management Process in Northern Ireland

The following useful sources of information are available to assist developers in relation to the contaminated land risk management process in Northern Ireland.

- [NIEA's Historic Land Use Database](#) provides information on previous land uses across Northern Ireland.

- [The UK technical framework as described in the Model Procedures for the Management of Land Contamination \(CLR11\)](#) sets out the principles of how to manage risks from land contamination if you're a landowner or developer.
- [Contaminated Land: Applications in Real Environments \(CL:AIRE\)](#) provides an extensive list of links to past and present water and land references published in relation to the management of land contamination
- [Sustainable Remediation Forum UK \(SuRF UK\)](#) sets out why sustainability issues associated with remediation need to be factored in right from the outset of a project. It identifies opportunities for considering sustainability at a number of key points in a sites redevelopment or risk management process
- [DOE Industry Profiles](#) provide developers interested in contaminated land with information on the process, materials and wastes associated with individual industries. They also provide information on the likely presence of contamination, the effect of mobility of contaminants and guidance on potential contaminants. They are not definitive studies but they introduce some of the technical considerations that need to be in mind at the start of an investigation.
- [CIRIA \(2018\) A Guide to Small Brownfield Sites and Land Contamination](#) provides advice on the technical, financial and planning barriers and issues that can obstruct the development and management of small brownfield sites.
- [NIEA Waste Management Public Registers](#) contain information relating to waste management activities in Northern Ireland.
- [NIEA Water Discharge Consent Public Registers](#) provide information on approximately 140,000 Discharge Consents.
- [NIEA Water Management Unit Water Information Request Viewer](#) provides water quality, abstraction, industrial and domestic consent and pollution incident information relating to Northern Ireland.
- [NetRegs Contaminated Land Advice](#) explains how land contamination can be prevented and who is responsible for cleaning up land contamination:

Appendices

Checklist 1- Preliminary Risk Assessment (PRA)

Contents
Report objectives
Site location map and Irish Grid reference
Site layout plans*
Site area in hectares
Description of site and surroundings
Details of desk study research undertaken
Information on past and current activities at the site
Details of intended future use of the site
Unique references for all relevant planning applications or permissions at the site
Historical Ordnance Survey maps* and site plans* and if available, aerial photographs
Environmental setting including: <ul style="list-style-type: none"> • superficial deposits and solid geology • hydrology • hydrogeology (including the interaction between all relevant shallow and deep groundwater and how they flow to potential receptors) • location and status of relevant surface water and groundwater receptors (water features survey), including all abstracted uses and natural discharge such as springs, river base flow and wetlands • Information on site drainage and other man-made potential pollutant pathways, for example underground services. • Identification of potential contaminants of concern (CoC) and source areas
Consultations with the local council
Consultations with DAERA
Consultations with other appropriate bodies i.e. utilities
Review and summary of previous reports, with report references
Outline Conceptual Site Model (CSM) with nature and location of environmental receptors clearly identified
Description of possible pollutant linkages for environmental receptors
Identification of potentially unacceptable risks to environmental receptors, including criteria used to identify those risks
Discussion of uncertainties and gaps in information
Description and justification of next steps proposed at the site, for example carry out site investigation and quantitative risk assessment
* All plans and historical maps extracts should be large scale, to scale, with a north point, and clearly show the site boundary.

Output Report to be Provided by Developer	Decisions to be Established by Developer	Outputs to be Provided by Developer
Preliminary Risk Assessment (PRA) - first tier of risk assessment that develops the initial conceptual model of the site and establishes whether or not there are any potentially unacceptable risks	What the context and objectives are for the risk assessment What the outline conceptual model is for the site What potential unacceptable risks can be identified What further action is appropriate	Decision Record - a summary of context and objectives, the outline conceptual model, the potentially unacceptable risks and the proposed next steps in relation to the site. An explanation of the background to the risk assessment, the basis for the development of the conceptual model, the evaluation of the potential risks and the basis for the decision what happens next.

Checklist 2- Quantitative Risk Assessment (including site investigation)

Contents
Report objectives
Site location map and Irish Grid reference Site layout plans*
Review and summary of previous reports, with report references
Outline Conceptual Site Model (CSM) with nature and location of environmental receptors features clearly identified
Results of Preliminary Risk Assessment (PRA)
Details of any preparatory enabling works, for example moving mounds of waste, breaking out concrete
Site investigation:
Investigation objectives
Summary of work done
Site investigation strategy, including:
<ul style="list-style-type: none">• rationale for investigation• methods used for forming exploratory holes, for example boreholes, trial pits, window samples• details of any borehole sampling undertaken• methods used for collecting, preserving and transporting samples to the analytical laboratory
Site sampling strategy, including:
<ul style="list-style-type: none">• rationale for strategy• description and explanation of monitoring programmes for groundwater and, if encountered, surface waters (upstream and downstream conditions should be represented)• monitoring and sampling locations, depths (metres below ground and AOD) & frequencies
Analytical strategy, including:
<ul style="list-style-type: none">• rationale for selection of analytical parameters• selection of samples for leachability testing• description of chemical analyses, in accordance with the MCERTS performance standard for soils• quality assurance and quality control requirements for laboratory analyses
Plan showing monitoring and sample point locations*
Details of in-situ tests and geotechnical tests required to provide data for quantitative risk assessment
Description of site works and on-site observations
Measures undertaken to prevent pollution of environmental receptors as a consequence of site investigation methods used
Presentation and interpretation of investigation results, including:
<ul style="list-style-type: none">• description of ground conditions encountered at the site, including groundwater regime and surface water features• cross-sections showing site strata and shallow and deep groundwater levels• summary tables of chemical analyses, site monitoring and geotechnical test results• description of type, nature & spatial distribution of contamination, with plans if appropriate• evaluation of site investigation results against the outline conceptual model
Annexes containing:
<ul style="list-style-type: none">• exploratory hole logs including grid co-ordinates and ground elevation (logged by suitably qualified professionals)• construction details for monitoring boreholes or other type of monitoring installation, for example response zone, method of sealing borehole annulus• monitoring results• groundwater levels• description of samples submitted for analysis• laboratory analytical reports, completed in accordance with the MCERTS performance standard for soils• chain of custody records

Checklist 2- Quantitative Risk Assessment (including site investigation) (continued)

Contents		
Quantitative risk assessment:		
Risk assessment objectives		
Description of proposed development Conceptual Site Model (CSM), revised following site investigation, with nature and location of environmental receptors clearly identified		
Rationale for the chosen risk assessment approach and explanation for why it is valid for the site Discussion of relevant exposure scenarios		
Assessment criteria selected for the site, with justification for all criteria used		
Description of model, if used, and: <ul style="list-style-type: none"> • input parameters • safety factors • assumptions • any sensitivity analysis undertaken 		
Calculation worksheets provided		
Constraints and limitations relating to data quality and risk assessment method		
Identification of pollutant linkages that present an unacceptable risk of pollution to controlled waters		
Discussion of uncertainties and their impact on the outcome of the risk assessment		
Results of risk estimation if detailed quantitative risk assessment is undertaken		
Evaluation of unacceptable risks to environmental receptors taking into account both the current use of the site and details of the proposed development, for example foundation design, surface drainage and foul water disposal Description of evaluation method and criteria used		
Description and justification of next steps proposed at the site, for example carry out options appraisal for pollutant linkages that present an unacceptable risk of pollution to environmental receptors		
* All plans should be large scale, to scale, with a north point, and clearly show the site boundary.		
Output Report to be Provided	Decisions to be Established by Developer	Outputs to be Provided by Developer
Generic Quantitative Risk Assessment (GQRA)- risk assessment carried out using generic assumptions to estimate risk or to develop generic assessment criteria	What pollutant linkages can be evaluated using generic assessment criteria and assumptions Whether unacceptable risks associated with these linkages can be identified What further action is appropriate	Decision Record- the pollutant linkages identified based on the development of the conceptual model; the generic assessment criteria used to assess risks; the unacceptable risks identified; and the proposed next steps in relation to the site. An explanation of the development of the conceptual model (in particular the results of the site investigations); the selection of criteria and assumptions; the evaluation of potential risks; and the basis for the decision on what happens next.
Detailed Quantitative Risk Assessment (DQRA)- risk assessment carried out using detailed site-specific information to estimate risk or to develop site-specific assessment criteria	What tools and criteria are appropriate for estimating and evaluating the risks from particular pollutant linkages Whether unacceptable risks associated with these linkages can be identified What further action is needed	Decision Record- the pollutant linkages identified based on the development of the conceptual model; the tools and criteria used to estimate and evaluate risks; the unacceptable risks identified; and the proposed next steps in relation to the site. An explanation of the development of the conceptual model (in particular the results of the site investigations); the development and choice of criteria, tools and assumptions for risk estimation; the evaluation of the potential risks and the basis for the decision on what happens next.

Checklist 3- Combined Options Appraisal

Contents		
Report objectives		
Site location map and Irish Grid reference.		
Site layout plans*		
Review and summary of previous reports, with report references		
Summary of relevant pollutant linkages that require remediation		
Statement and explanation of remediation objectives, that is, what the remediation needs to achieve, for each relevant pollutant linkage		
Statement of remediation criteria against which compliance with remediation objectives for each relevant pollutant linkage can be measured		
Statement of overall site remediation criteria (these should always be protective of environmental receptors) where they differ from the criteria derived for relevant pollutant linkages.		
Identification of feasible remediation options:		
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		
Shortlist of feasible remediation options to be taken forward for more detailed consideration, including:		
<ul style="list-style-type: none"> • an assessment of their suitability for use at the site • reasons for selecting options on the shortlist and rejecting others 		
Detailed evaluation of remediation options:		
Evaluation of shortlisted remediation options, including explanation of evaluation criteria used		
Identification of the most appropriate option for each relevant pollutant linkage and justification for its selection		
Reasons for rejecting other remediation options on the shortlist		
Justification for any proposals to combine remediation options		
Remediation strategy:		
Description of the remediation strategy, including:		
<ul style="list-style-type: none"> • technical and scientific basis of the strategy • requirement for preparatory works • effectiveness of combining remediation options, where required • proposed site zoning and phasing of remediation • verification of remediation and monitoring requirements • constraints and limitations to remediation • timescales required for remediation options to become fully effective • assessment of requirements for environmental permits, licences etc. • expected durability of the proposed remediation • measures to prevent pollution of environmental receptors being caused by remediation activities • Justification for any changes required under the remediation strategy to remediation criteria derived for relevant pollutant linkages 		
Summary of alternative remediation strategies considered		
Justification for selection of the preferred remediation strategy		
Description of how the remediation strategy will deliver remediation criteria		
* All plans should be large scale, to scale, with a north point, and clearly show the site boundary.		
Output Report to be provided	Decisions to be Established by Developer	Outputs to be Provided by Developer
<p>Remediation Strategy- a plan that involves one or more remediation options to reduce or control the risks from all the relevant pollutant linkages associated with the site</p>	<p>What site specific objectives relating to pollutants and to other technical and management issues are relevant to the selection of remediation options</p> <p>Which remediation options should be taken forward for more detailed evaluation</p> <p>Which remediation option(s) is the most appropriate for each relevant pollutant linkage</p> <p>Which options (if any) need to be combined</p> <p>How in broad terms, the remediation strategy is to be implemented and what practical issues may be involved.</p> <p>Whether the proposed remediation strategy continues to meet all specified remediation, management and other technical objectives and is acceptable on cost-benefit grounds.</p>	<p>Decision Record-</p> <ul style="list-style-type: none"> • the site specific objectives and the shortlist of remediation options • a description of the most appropriate remediation option for each relevant pollutant linkage and which, if any, options may need to be combined. • a description of the remediation strategy and how it meets the objectives for individual pollutant linkages and the site as a whole <p>An explanation of</p> <ul style="list-style-type: none"> • the basis on which the selection of objectives and feasible remediation options was made. • the basis on which particular remediation options have been selected and other rejected. • how that remediation strategy was developed.

Checklist 4- Implementation Plan

Contents		
Report objectives		
Site location map and Irish Grid reference		
Site layout plans*		
Review and summary of previous reports, with references		
Description of ground conditions at the site, including environmental receptor features		
Remediation objectives for each relevant pollutant linkage		
Remediation criteria for relevant pollutant linkages		
Overall site remediation criteria		
Remediation methodology, that is, what is to be done by way of remediation		
Phasing of the remediation works and approximate timescales for each phase		
Site preparation and operational constraints		
Site procedures for managing the remediation works in a manner that will not cause pollution of controlled waters		
Discussion of permitting requirements and proposals for obtaining the appropriate licenses, permits, authorisations and consents, for example:		
<ul style="list-style-type: none"> • Waste Management Licence or Permit • Exemption from waste management licence • Mobile treatment licence and/or mobile treatment licence deployment • Abstraction licence • Water discharge consent (DAERA) • Trade effluent discharge (NI Water) • Groundwater Regulations authorisation • Other permits e.g. from Local Council or other Departments 		
Details of how any variations from the implementation plan that have the potential to impact on environmental receptors (including any areas of unexpected contamination encountered) will be dealt with during the site works		
Construction details of proposed monitoring boreholes		
Cross-reference to the verification plan and, if required, monitoring and maintenance plan for the site		
Plans showing*:		
<ul style="list-style-type: none"> • areas to be remediated • proposed locations and phasing of remediation works • areas to be used for stockpiling segregated contaminated and clean, site-derived and imported materials • location of areas to be remediated in relation to any proposed development • proposed monitoring locations 		
* All plans should be large scale, to scale, with a north point, and clearly show the site boundary.		
Output Report to be Provided	Decisions to be Established by Developer	Outputs to be Provided by Developer
Remediation Implementation Plan- a plan that sets out all aspects of design, preparation, implementation, long-term maintenance and monitoring of the remediation.	<p>The remediation strategy for the Relevant Pollutant Linkage that formed the basis of the implementation plan</p> <p>Who will undertake each aspect of implementation of the remediation strategy and what competencies are required</p> <p>What regulatory permits or licences are likely to be required</p> <p>What form of contract and technical specifications will be used to deliver the remediation strategy</p> <p>Timescales for completion of different activities, including any subsequent long-term monitoring activities</p>	Decision Record- an agreed implementation plan that will deliver the project objectives in a timely, safe, cost-effective and quality assured manner.

Checklist 5- Verification Plan

Contents		
Report objectives		
Site location map and Irish Grid reference Site layout plans*		
Review and summary of previous reports, with references		
Scope of remediation works to be undertaken and any design details required to inform the verification plan		
Description of what constitutes completion for the remedial works and how completion will be verified.		
Data gathering requirements to demonstrate that site remediation criteria are achieved for each relevant pollutant linkage, such as:		
<ul style="list-style-type: none"> • sampling and monitoring strategy, including: <ul style="list-style-type: none"> a) validation testing of excavations to remove contaminated materials b) validation testing of materials excavated, treated and deposited at the site c) validation testing of materials imported as 'clean fill' d) post-completion verification testing of the remediated area e) background water quality testing in groundwater and nearby surface waters f) water quality testing of any treated groundwater and surface waters • how on- and off-site observations will be recorded • explanation and schedule of chemical analyses, to be undertaken in accordance with the MCERTS performance standard for soils • laboratory quality assurance and control requirements 		
Performance testing required, for example for contaminant barriers and capping layers		
Plans showing proposed sampling and monitoring point points*		
Explanation of how compliance with waste authorisations, discharge consents, abstraction licences, etc. will be demonstrated		
Proposed actions in case:		
<ul style="list-style-type: none"> • test results and monitoring data show that the remediation activities will not achieve the remediation criteria derived for relevant pollutant linkages • site works vary from those anticipated in the implementation plan 		
Timing for preparation of the verification report, particularly if any remediation activities will extend beyond substantial completion of the main site works		
* All plans should be large scale, to scale, with a north point, and clearly show the site boundary.		
Output Report to be Provided	Decisions to be Established by Developer	Outputs to be Provided by Developer
Remediation Verification Plan- a plan that sets out the requirements for gathering data to demonstrate that remediation meets the remediation objectives and criteria	The final form of the design for remediation The procurement strategy That remediation has achieved its objectives as evidenced by a verification plan Whether long-term monitoring and maintenance are required	Decision Records covering agreement on- the final form of the design, the procurement strategy, that remediation has achieved its objectives and the need for long-term monitoring and maintenance. Other outputs will be; <ul style="list-style-type: none"> • the final form of the design, including design drawings, specifications and other contract documents • health and safety plans and risk assessments • necessary regulatory permits or licences • contracts for all parties involved • progress reports • a verification plan and verification report • a monitoring and maintenance plan

Checklist 6- Verification Report

Contents		
Verification work objectives		
Site location map and Irish Grid reference		
Site layout plans*		
Review and summary of previous reports, with references		
Description of relevant pollutant linkages addressed		
Description of remedial works undertaken		
Details of and justification for any variations from the verification plan		
Photographic records		
Key items of correspondence or meeting minutes		
Results of verification, validation and performance testing specified in the verification plan and any subsequent variations		
Provision of laboratory analytical reports, completed in accordance with the MCERTS performance standard for soils.		
Plans showing* remediated areas, indicating any variations from those shown in the implementation plan		
Plans showing* monitoring sample locations		
Details of permits, licences, authorisations and consents obtained for the site and evidence of compliance with them		
Details of waste management documentation including Hazardous Waste Consignment Notes and Duty of Care Waste Transfer Notes and demonstration of compliance		
Description of reinstatement works, including methodology for decommissioning groundwater monitoring boreholes		
Description of the final condition of the site at completion		
Assessment of the potential impact of the site at final condition on environmental receptors when put to the proposed end use		
Details of any permanent installations required as part of the remedial works, that are to be left in place after completion of site works		
Confirmation of post-completion monitoring and/or maintenance requirements		
* All plans should be large scale, to scale, with a north point, and clearly show the site boundary.		
Output Report to be Provided	Decisions to be Established by Developer	Outputs to be Provided by Developer
<p>Remediation Verification Report - provides a complete record of all remediation activities on site and the data collected as identified in the verification plan to support compliance with agreed remediation objectives and criteria</p>	<p>The final form of the design for remediation</p> <p>The procurement strategy</p> <p>That remediation has achieved its objectives as evidenced by a verification plan</p> <p>Whether long-term monitoring and maintenance are required</p>	<p>Decision Records covering agreement on- the final form of the design, the procurement strategy, that remediation has achieved its objectives and the need for long-term monitoring and maintenance.</p> <p>Other outputs will be;</p> <ul style="list-style-type: none"> the final form of the design, including design drawings, specifications and other contract documents health and safety plans and risk assessments necessary regulatory permits, licences or consents and waste management documentation contracts for all parties involved progress reports a verification plan and verification report a monitoring and maintenance plan

Checklist 7- The Waste Duty of Care, Classification and Assessment of Waste & Waste Licences, Authorisations and Consents

Contents
The Waste Duty of Care
Have you referred to The DAERA Duty of Care- A Code of Practice for Northern Ireland and do you understand your legal obligations with regards to the production of waste?
Has a waste hierarchy assessment been completed to demonstrate that you have taken into account the Waste Hierarchy when making decisions on the management of your waste?
Have you ensured you have transferred waste to a person/company who is authorised to receive it i.e. licence holder and/or registered waste carrier?
Have you provided sufficient information which describes the waste, when you transfer it to another person, sufficiently well to allow them to comply with their duties?
Have you fully completed transfer notes (non-hazardous waste) and consignment notes (hazardous waste) for the waste you transferred to another authorised person?
Have you prevented the escape of waste or prevented waste causing pollution or harm while you held it?
Have you taken steps to ensure that those you transferred the waste to have taken steps to ensure the waste does not escape whilst in their possession?
The Classification and Assessment of Waste
Have you referred to Waste Classification Guidance on the Classification and Assessment of Waste: Technical Guidance WM3 in relation to classifying and assessing waste produced from your development?
Have you followed the order of precedence detailed in WM3, Appendix A; searching by industry process or business activity that produced the waste to reach the correct List of Waste code?
Have any waste samples taken been done so in line with Appendix D: Waste Sampling of the Classification and Assessment of Waste: Technical Guidance WM3?
Have you ensured the analytical laboratory used to analyse any waste samples taken are accredited by the United Kingdom Accreditation Service (UKAS)?
Have you kept auditable records relating site investigation locations to the classified waste?
Waste licences, authorisations and consents
Have you considered whether or not your development may require an DAERA authorisation; <ul style="list-style-type: none"> • A waste management exemption • A waste management licence and/or a mobile plant deployment application • A water discharge consent
Have you considered the relevant DAERA guidance associated with waste management authorisations?
Have you ensured you have transferred waste to a person/company who is authorised to receive it i.e. licence holder and/or registered waste carrier?
Have you obtained evidence that the person/company hold a relevant authorisation with DAERA?
Have you ensured the person/company that you transferred your waste to is authorised to accept that type and classification of waste?
Site Waste Management Plans (SWMP)
Has a SWMP been considered as part of your development?
If adopted who will have responsibility in ensuring the SWMP is updated as the development progresses?

Site Waste Management Plans (SWMP) are promoted as an example of best practice in the construction industry and a SWMP is a document that describes, in detail, the amount and type of waste from a construction project and how it will be reused, recycled or disposed off. Following the SWMP procedure could help to reduce the amount of waste produced and will help manage waste more effectively.

Checklist 8- Piling Risk Assessments for Land Affected by Contamination

Piling and penetrative ground improvement methods are commonly used on land affected by contamination, where previous development has resulted in a thickness of loose or compressible soils and “made ground”, which may be contaminated.

DAERA recommend that Piling Risk Assessments should be undertaken in accordance with the methodology contained within the Environment Agency document ***Piling & Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention***.

Suggested Minimum Contents of a Piling Risk Assessment Report	
1.	Introduction: describing the site setting including geology, hydrogeology, soil or groundwater contamination, topography, geotechnical considerations and requirements for piling or ground improvement methods
2.	Initial selection of piling method with justification of the preferred method
3.	Identification of potential adverse environmental impacts
4.	Site-specific assessment of the identified risks to the environment, workers and end users
5.	Identification of any changes to preferred method. Consideration of mitigation measures that may be required
6.	Identification of Quality Assurance / Quality Control methods and measures
7.	Justification of selected methodology: including mitigation, Quality Assurance / Quality Control and monitoring measures, with regard to geotechnical, financial, environmental and waste management considerations

Failure by developers to declare at application stage if piling and penetrative ground improvement methods are to be adopted at their site may result in delays to planning decisions and/ or commencement of development. It is recommended by DAERA that if piling and penetrative ground improvement methods are to be adopted by a developer that this is declared at the application stage and that a Piling Risk Assessment is presented.

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