

CONTAMINATED LAND

A Guide to Submitting Planning Applications for Development of Contaminated Land.





CONTAMINATED LAND

A guide to contaminated land issues and their potential impact on planning applications.

Introduction

Due to the legacy left behind by North Lanarkshire's industrial past there is the potential for some contaminated land to remain. Contaminated land includes industrial sites where hazardous materials have been used including former gas works site, petrol stations and former landfills (see Table 1 for further examples). Contamination can pose a threat to the health of future users of the site and to the surrounding environment. Few sites are so badly contaminated that they cannot be re-used at all, but the contamination may limit the range of potential uses. The re-use of these so called brownfield sites is in line with the principle of sustainable development, because it effectively recycles the land and reduces pressure for development of greenfield sites. However, a balance needs to be struck between the need to bring the land back into beneficial use and the risks and liabilities posed by the contamination.

Changes in legislation in 2000 require that councils identify and inspect potentially contaminated sites. The Pollution Control Team undertakes these duties within North Lanarkshire. With the increasing demand for development, many of the sites now being considered have been previously used, and some are potentially contaminated. These factors led the planning system to adopt the 'suitable for use approach' to ensure any sites being developed do not carry an unacceptable risk from contamination (see PAN 33). It is a key role of the planning system to ensure, if necessary, that land is made suitable for a proposed end-use in line with current best practice.

It is the responsibility of the applicant to provide information on the condition of the site in terms of contamination to allow North Lanarkshire Council Pollution Control Team to assess any risk and, therefore, if the site is

suitable for the proposed end-use. The following guidance is provided to assist developers and other parties in submitting the information required by Pollution Control in the correct format. The information presented here is the minimum required for assessing the potential risk from contamination. Strict adherence to the format and content detailed here is required to ensure transparency of information and consistency of reporting style. This also ensures faster determination of any application.

Checklists at the end of this document give the minimum requirements that will be accepted by North Lanarkshire Council; any reports not strictly following the format detailed in this guidance will not be considered.

Table 1:
Examples of potential contaminative land uses

<ul style="list-style-type: none"> • Airports • Animal products works • Asbestos production or usage • Burial grounds • Cement and lime works • Chemical works including: <ul style="list-style-type: none"> - Coatings and printing inks manufacturing works - Cosmetics and toiletries manufacturing works - Explosives, propellant and pyrotechnics manufacture - Fine chemicals manufacturing works - Inorganic chemicals manufacturing works - Organic chemicals manufacturing works - Pesticides manufacturing works • Dry cleaners • Engineering works including: <ul style="list-style-type: none"> - Electrical and electronic equipment manufacturing works - Mechanical engineering and ordinance works - Railway engineering works • Gas works, coke works and other coal carbonisation plants 	<ul style="list-style-type: none"> • Metal manufacturing, refining and finishing works including: <ul style="list-style-type: none"> - Electroplating and other metal finishing works - Iron and steel works - Lead works - Non-ferrous metals (excluding lead works) - Precious metal recovery works • Oil refineries and bulk storage of crude oil and petroleum products • Printing and bookbinding works • Pulp and paper manufacturing works • Railway land • Road vehicle servicing and repair including: <ul style="list-style-type: none"> - Garages and filling stations - Transport and haulage centres • Sewage works • Waste recycling, treatment and disposal sites including: <ul style="list-style-type: none"> - Hazardous waste treatment plants - Landfills and other waste treatments or waste disposal sites - Solvent recovery works - Metal recycling sites
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COUNCIL POLICY ON CONTAMINATED LAND

It is council policy to reduce the amount of vacant and derelict land in North Lanarkshire and this means allowing such sites to be re-developed. This ensures efficient use of space in urban areas and assists regeneration initiatives in North Lanarkshire. It is imperative, however, that any development of land does not impact on human health or the environment and is developed in a safe, carefully considered manner in line with current best practice.

RISK-BASED APPROACH

All sites within North Lanarkshire have to be treated as carrying a potential contamination risk, but obviously some sites carry a greater likelihood of risk being realised than others. A proven Greenfield site, for example, is unlikely to be contaminated and therefore no investigation would be required. Where the site history is less clear or potential contamination is suspected, however, a minimum of a Phase I Site Investigation (see later) will be required, if only to eliminate the need for further, more detailed Phase II investigation. If council records show a site to be a known potentially or statutorily contaminated

site it will generally be necessary undertake a full site investigation (Phase I and II) in order to allow planning application determination, unless it is clearly shown in the Phase I study that the risk is so low that further investigation is not necessary. All studies should follow a risk-based approach including qualitative assessment and, if necessary, quantitative modelling to characterise the site as per CLR 11 (LCRM), see Figure 1: Model Procedures for the Management of Land Contamination.

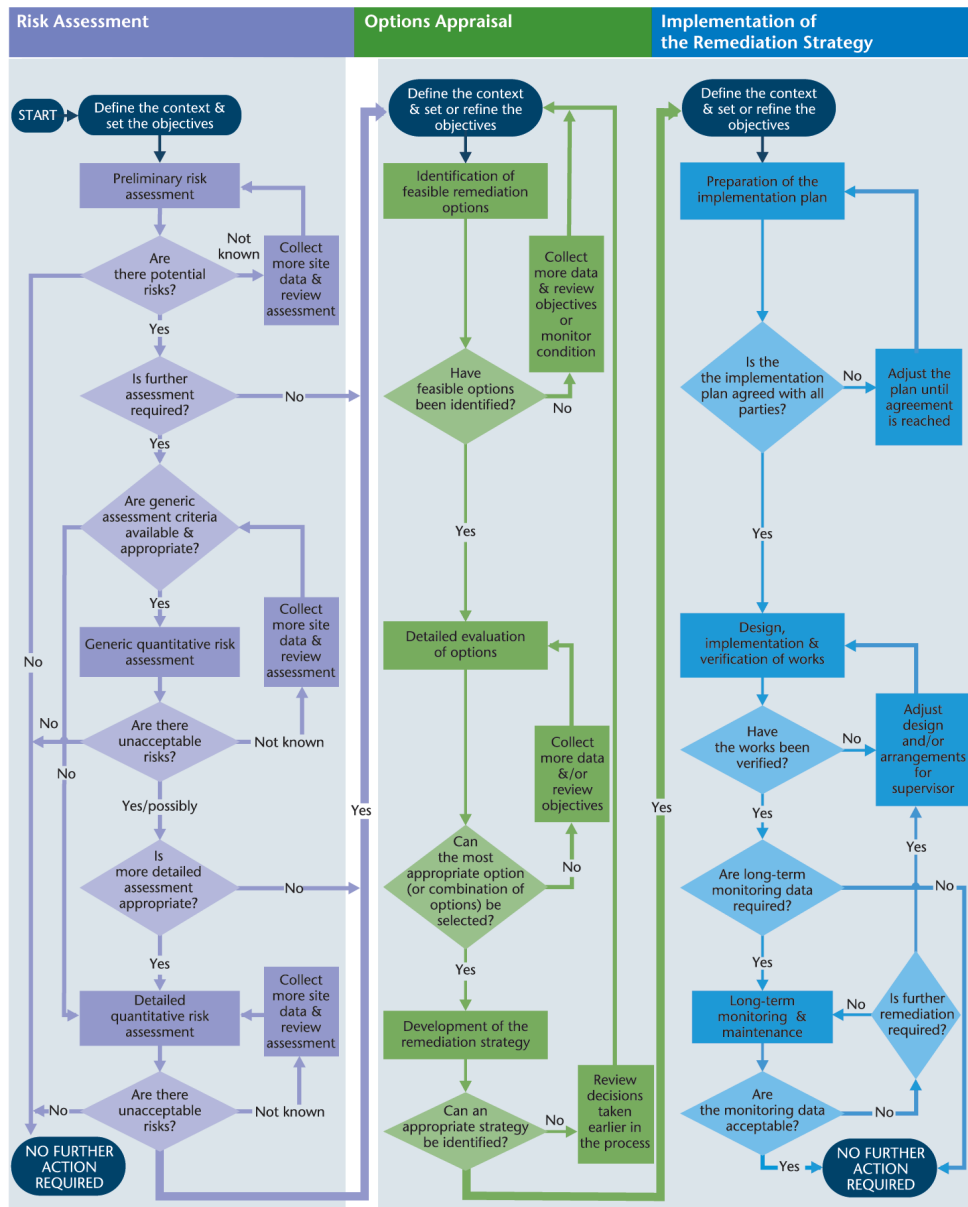
NB It is a requirement of North Lanarkshire Council that all potentially contaminated land is investigated using the current best practice, which nationally is, Model Procedures for the Management of Land Contamination (CLR 11), or the recent update which applies in England, Wales and NI, Land Contamination Risk Management (LCRM). Including BS 5930, BS 8576, Eurocode 7, ISO 15175, ISO 18400 series and ISO 5667 series of standards etc.

THE POLLUTANT LINKAGE

A pollutant linkage is taken to be a relationship between three on-site factors: source, pathway and receptor, and all of these factors must be present for a site to be considered as statutorily contaminated under the Environmental Protection Act (1990). This model fits into the risk-based approach, where the risk is taken to be the probability of a pollutant linkage being realised. In the planning process, however, consideration must be given to the fact that contaminants may be present on-site without a pollutant linkage being present; a site with contaminants is, therefore, not necessarily statutorily contaminated. In all investigations a risk based approach working within the pollutant linkage concept should be adopted, but when conducting studies consideration must be given to contamination issues out-with this system which may be relevant to the planning process.



Figure 1. The process of managing land contamination



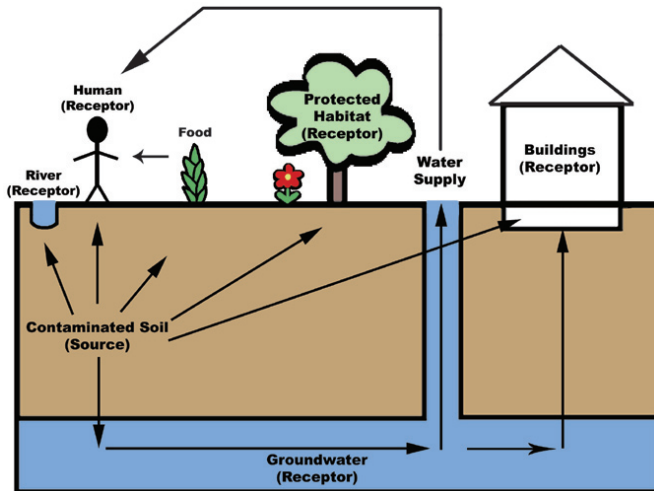
SITE INVESTIGATION CONTENT AND FORMAT GUIDANCE

PHASE I Preliminary Investigation and risk assessment (minimum requirements)

The condition of a site in terms of contamination is assessed with a site investigation. This typically involves three phases: Phase I, II and III. As well as gathering the relevant information the Phase I will determine the need for a Phase II investigation. The Phase II builds on the Phase I. Phase III lays down the Remediation strategy aiming to reduce the environmental and human health risks identified in Phase I and Phase II to an acceptable level, in a managed and documented manner.

- Purpose and aims of study
- Site location and layout plans
- Appraisal of full site history
- Assessment of environmental setting:
- Hydrogeology and geology
- Information from SEPA/North Lanarkshire Council including pollution incidents, water quality classification, landfill sites in proximity etc.
- Assessment of current/proposed site use and surrounding land uses
- Review of any previous site contamination studies or remediation
- Design of Conceptual Site Model (Figure 2) and preliminary assessment of risks (qualitative):
- Integration of all information gathered into conceptual model
- Appraisal of any potential pollutant linkages and discussion

Figure 2.
Example of a generic Conceptual Site Model



If the initial Phase I investigations indicate likely contamination (this may or may not be in the context of a pollutant linkage) then Phase II studies must be undertaken.

PHASE II (minimum requirements)
(intrusive site investigation and
risk assessment):

- Construct site investigation methodology
- Full explanation and justification for design based on the conceptual model with mention of probability of missing hotspots and site coverage and characterisation
- Plan showing exploration locations
- Discussion of sampling and analytical strategies
- Discussion on how it complies with BS 10175:2011+A2:2017
- Refined conceptual site model
- Risk Assessment taking into account severity of potential consequences and probability of pathway realisation
- Full working and justification for any risk assessment model used
- Full and clear discussion of results (including graphical representation) indicating what they tell us about site and its characteristics
- Recommendations for remediation guided by proposed end-use, risk assessment, final conceptual model and financial and technical constraints
- Recommendations for further study

PHASE III (minimum requirements)
or REMEDIATION STATEMENT
(must be submitted prior to
remediation works):

- Objectives of remediation works
- Detailed description of works to be carried out
- Description of ground conditions
- Type, form and severity of contamination
- Full methodology
- Drawings
- Approximate timescales
- Consents, agreements and licences
- Full site management procedures including health and safety

Plan for any deviation from original plan including notifying Pollution Control

- Full details of how the works will be validated to ensure remediation standards have been met

Validation Reports
(submitted after remediation)

- Who carried out the work
- Details and justification for any deviation from original Remediation Statement
- Substantiating data and interpretation
- Explanation of how all remediation objectives have been met

This information is also provided in table 2 on page 9 which is based on figure 2.1, from a joint publication by the Environment Agency and NHBC and the Chartered Institute of Environmental Health R & D Publication 66

Checklists are provided at the end of this guidance to help the applicant ensure that they have included all of the relevant information. The scope of the submitted reports must reflect the size and complexity of the site, necessary level of investigation as well as the likely contamination risks.

NOTE: Failure to comply with the guidelines in this document will result in the report being rejected due to insufficient information.

Table 2. Site Investigation Content and Format Guidance

PHASE I REPORT	Consult Local Authority and other relevant parties	STEP 1 Establish former uses of the site. Collect physical data and undertake walk-over
		STEP 2 Identify contaminants of concern. List industries in step 1 including industry specific contaminants and geology – based contaminants
		STEP 3 Develop Conceptual Site model of the site
	Submit planning application with desk study	STEP 4 Undertake Hazard Assessment. Review data and conduct exploratory investigations if further information is required
PHASE II REPORT	Consult Local Authority and other relevant parties	STEP 5 Design and implement ground investigation
		STEP 6 Undertake risk estimation. Obtain generic assessment criteria or calculate site – specific concentrations with appropriate criteria
	Submit report for assessment	STEP 7 Undertake risk evaluation. Identify unacceptable risks from comparison of measured concentrations with appropriate criteria
PHASE III REMEDIAL STRATEGY	Consult Local Authority and other relevant parties	STEP 8 Identify and evaluate options for remedial treatment based on risk management objectives
	Submit report for assessment	STEP 9 Select preferred remedial strategy and submit for approval
PHASE IV COMPLETION/ VALIDATION REPORT	Consult Local Authority and other relevant parties Submit report for assessment	STEP 10 Design and implement remedial works. Undertake verification of remedial action
	Conditions discharged	STEP 11 Implement monitoring and maintenance programmes

Modified from Environment Agency R & D Publication 66

Checklist 1 (minimum requirements)

<p>PHASE 1 Preliminary Risk Assessment/Desk study Objective is to obtain a good understanding of site history, setting, current and proposed use</p>	✓
<p>Purpose & Aims of the study. A statement is required explaining the reason for the report.</p>	
<p>Site Location Plan and current layout plans (appropriately scaled and annotated with north point, National Grid Reference (minimum 6 figures) and site area in hectares.</p>	
<p>Environmental Setting including the interpretation and implications of:</p> <ul style="list-style-type: none"> • the geology, hydrogeology and hydrology of the area • information from the Environment Agency on abstractions, pollution incidents, water quality classification, landfill sites within 250 metres and flood risk. • whether there are any archaeological or ecological considerations 	
<p>Conceptual Site Model (CSM) which is essential, showing all potential: source - pathway - receptor linkages</p> <p>Site History, including former industrial uses on and adjacent to the site from historical maps.</p>	
<p>Interpretation of CSM including Qualitative Risk Assessment.</p> <p>Identification of potential contaminants of concern and source areas.</p> <p>Identification of information gaps and uncertainties, recommendations for intrusive contamination investigations (if necessary) to include the identification and justification of target areas for more detailed investigation.</p>	
<p>Conclusions and Recommendations.</p>	

Checklist 2 (minimum requirements)

<p>PHASE 2 Quantitative Risk Assessment/Site Investigation Objective: to refine and update the conceptual model, provide detailed site specific information on substances in, on or under the ground, geology and groundwater, confirm relevant pollutant linkages, evaluate potentially unacceptable risks through generic or detailed quantitative risk assessment and provide the basis for the Options Appraisal.</p>	✓	<p>Site Specific Risk Assessment for both Health and Environmental Receptors. To include:</p> <ul style="list-style-type: none"> Objectives and details of proposed site use Details of the models selected and justification of choice for the site Justification for input parameters, with source reference for literature values and additional calculations for field derived parameters, assumptions, safety factors Any model printouts that have been generated (e.g. <i>CLEA Model</i> and <i>P20</i>, the data worksheets should be included) Note, where non-UK models are used, it will be important to make modifications to them ensuring compliance with UK policy.
<p>Purpose & Aims of the study. A statement is required explaining the reason for the report</p>		
<p>Site Location Plan and current layout plans (appropriately scaled and annotated with north point, National Grid Reference (minimum 6 figures) and site area in hectares</p>		
<p>Review and Summary of any previous reports with references</p>		<p>Interpretation of Results including:</p> <ul style="list-style-type: none"> Description of ground conditions (made ground and ground water) Discussion of the nature and extent of contamination Meaningful comparison of the analytical results to appropriate standards, with full justification of the standards chosen To include consideration of ground gas and the presence of asbestos
<p>Revised Conceptual Site Model (CSM) which is essential, showing all potential: source - pathway - receptor linkages</p>		
<p>Sampling Strategy. Refer to <i>BS10175</i> for methodology, justification and location plan Borehole and Trial Pit Logs.</p>		
<p>Gas and Vapour Monitoring. Must include atmospheric conditions and flow rates as per <i>CIRIA C665 & BS 8485:2015+A1:2019</i></p>		<p>Evaluation of Site Investigation results against Conceptual Model</p>
<p>Chemical Test Data with Quality Assurance Procedures including laboratory and certification</p>		<p>Conclusions and Recommendations. This should include remediation proposals and further monitoring when required.</p>

Checklist 3 (minimum requirements)

<p>PHASE 3 Remediation Strategy Objective is to establish which remediation option, or combination of options, provides the best approach to remediating all pollution linkages that present an unacceptable risk at the site, whilst meeting best practice and current technical guidance.</p>	✓
<p>Purpose & Aims of the study. A statement is required explaining the reason for the report.</p>	
<p>Site Location Plan and current layout plans (appropriately scaled and annotated with north point, National Grid Reference (minimum 6 figures) and site area in hectares).</p>	
<p>Details of chosen Remedial Options – what remediation is needed to achieve remediation of each identified pollutant linkage.</p>	
<p>Revised Conceptual Site Model (CSM) which is essential, showing how it is proposed to break all identified: source - pathway - receptor linkages</p>	
<p>Proposed Standard of clean up depending on the proposed end use of the site.</p>	
<p>Outline of how remediation strategy will be verified and Future Monitoring Requirements</p>	
<p>Monitoring and Maintenance Plan giving details of future monitoring and or maintenance requirements in a Monitoring and Maintenance Plan (where necessary) once remediation has been completed.</p>	

Checklist 4 (minimum requirements)

<p>PHASE 4 Validation Report Objective is to clearly demonstrate that the remediation activities have been completed satisfactorily, have not caused harm to third parties and the environment and that the remediation criteria for each of the relevant pollutant linkages have been met</p>	✓
<p>Purpose & Aims of the report. A statement is required explaining the reason for the report.</p>	
<p>Site Location Plan and current layout plans (appropriately scaled and annotated with north point, National Grid Reference (minimum 6 figures) and site area in hectares).</p>	
<p>Specification of Engineered Cover System where appropriate</p>	
<p>Waste Transfer documentation where appropriate including the type and amount of material taken off site and the disposal location.</p>	
<p>Suitable Certification and Validation Testing of any imported materials</p>	
<p>Validation of any Gas Perclusion Measures including gas-proof membranes, vent trenches or periscope vents etc.</p>	
<p>Final Conceptual Site Model (CSM) which is essential, showing that all identified: source - pathway - receptor linkages have been broken</p>	
<p>Validation of Chemical Test Data and Results of any further Monitoring</p>	

Glossary of terms

Brownfield Site: Any area of land that has been subject to a previous land use at some point in the past, usually industrial but not necessarily always the case.

Conceptual (Site) Model as defined CLR 11 or the recent update which applies in England, Wales and NI, Land Contamination Risk Management (LCRM): A representation of the characteristics of the site in diagrammatic or written form that shows the possible relationships between contaminants, pathways and receptors.

Contaminant: A substance present in, on or under any land, which has the potential to cause harm to people, buildings or the environment or pollution of controlled waters.

Contaminated Land: Defined in s78A(2) of EPA 1990 as “any land which appears to the local authority in whose area it is situated to be in such a condition, by reason of substances in, on or under the land, that (a) significant harm is being caused or there is a significant possibility of such harm being caused, or; (b) significant pollution of the water environment is being caused or there is a significant possibility of such pollution being caused.”

CLEA: The Contaminated Land Exposure Assessment Model, the UK human health risk assessment model for contaminated land, published on 14th March 2002 by the Department of the Environment, Food and Rural Affairs (DEFRA) and Environment Agency.

CLR Reports: A series of ‘contaminated land research’ reports originally produced by the contaminated land research programme of the Department of the Environment. Some reports are currently in production by the Department of the Environment Food and Rural Affairs.

Pathways: One or more routes or means by which a receptor is exposed to a contaminant, or could be so exposed.

Receptor: Can include people, living organisms, ecological systems, building which are or can be subject to harm by contaminants. Also includes the water environment which are or may be polluted by contaminants present on, in or under land.

Remediation/remedial action: Any works or steps taken in relation to contaminated land or waters for the purpose of preventing, minimising or mitigating the effect of any harm or pollution. This can include restoring the land or controlled waters to their former state.

Risk Assessment: An assessment of the probability or frequency of occurrence of a defined hazard (for example skin exposure to the soil) with the potential to cause harm and magnitude (including the seriousness) of the consequences.

Other Risk Assessment Models: Consideration must be given to the inherent limitations and assumption of each model.

Source: The presence of a contaminant/contaminants in, on or under any land.



UKAS: (United Kingdom Accreditation Service). The sole national body recognised by government for the accreditation of testing calibration laboratories, certification and inspection bodies. UKAS accreditation demonstrates the integrity and competence of organisations providing calibration, testing, inspection and certification services. This means that the customer reduces the risk of selecting an incompetent evaluator and acting upon invalid results.

Accredited laboratories can be found at www.ukas.org or telephone 020 8927 8400 at UKAS Feltham, Middlesex.

Verification report: required to demonstrate that any remediation carried out has been done in accordance with the approval remediation strategy and has met the objectives of the strategy. Verification reports should include records of testing and monitoring of remedial works, all results of any testing and monitoring, and correspondence from regulatory authorities.

Pollution Control and Public Health Contact Details:

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Relevant Guidance/Legislation	Link/Source
Environmental Protection Act 1990: Part IIA Contaminated Land - Statutory Guidance: Edition 2 (2006)	http://www.scotland.gov.uk/Publications/2006/06/05131212/0
Planning Advice Note 33	Planning Advice Note 33: Development of contaminated land - gov.scot
Assessing risks posed by hazardous ground gasses to buildings CIRIA C665	https://www.ciria.org/ProductExcerpts/C665.aspx
The Contaminated Land (Scotland) Regulations 2005	http://www.opsi.gov.uk/legislation/scotland/ssi2005/20050658.htm
Industry profiles	https://www.claire.co.uk/useful-government-legislation-and-guidance-by-country/76-key-documents/198-doe-industry-profiles
Guidance on the safe development of housing on land affected by contamination	https://www.nhbc.co.uk/binaries/content/assets/nhbc/products-and-services/tech-advice-and-guidance/guidance-for-the-safe-development-of-housing-on-land-affected-by-contamination.pdf
Code of practice: The investigation of potentially contaminated sites – British Standards Institute, BS10175	



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