

DEVELOPMENT ON POTENTIALLY CONTAMINATED LAND AND/OR FOR A SENSITIVE END USE

Technical Guide for Planning Applicants and Developers



Buckinghamshire Land Quality Forum



South Bucks
District Council

DEVELOPMENT ON POTENTIALLY CONTAMINATED LAND AND/OR FOR A SENSITIVE END USE

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SCOPE OF GUIDE

The Buckinghamshire Land Quality Forum consists of representatives from the all five Local Authorities in Buckinghamshire. The forum identified that there was a need to produce a clear and informative guide for planning applicants and developers on how to deal with land contamination issues on sites being developed through the planning regime. It is hoped this guide will ensure that a consistent approach is taken across the region.

The purpose of this guide is to provide developers, planning agents and other applicants with details of the information required by local authorities for sites that may be affected by land contamination or for when sensitive end uses are introduced to a site. Please note that this guidance is not an exhaustive list of requirements and therefore developers are encouraged to speak with the relevant officer within their local authority (see contact details in Appendix 4).

Important

This guide is written to serve as an informative and helpful source of advice. Readers must note that legislation, guidance and practical methods are subject to change. All reasonable precautions have been taken to ensure that the information contained within this document is accurate at the time of publication. However, the Buckinghamshire Land Forum cannot assume legal responsibility for any loss or damage caused to person, land or property for persons relying on this information.

INTRODUCTION

Land contamination is principally a legacy of historical industrial activities and past waste disposal practices. Examples of such industries include gas works, chemical works, landfill sites, sewage works, petrol stations and scrap yards (Appendix 1). In some instances, substances and waste materials from these activities may have caused pollution to the ground. This contamination has the potential to cause harm to human health, ground and surface waters, ecological systems and the built environment. Land contamination can also include areas of land with elevated levels of naturally occurring substances or where substances are present as a result of accidents, spillages, aerial deposition or migration.

Part IIA of Environmental Protection Act 1990

In April 2000 the Government introduced new legislation (Part 2A of the Environmental Protection Act 1990) requiring all local authorities to inspect their areas for potentially contaminated land and, if necessary, to ensure that any contamination is 'cleaned up' (remediated). Part 2A introduced the legal definition of 'contaminated land':

"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) pollution of controlled waters is being, or is likely to be, caused."

Under Part 2A, all councils had a duty to produce a 'Contaminated Land Strategy' by July 2001. The main aim of these strategies is to identify all areas of land that are potentially contaminated within each local authority's boundaries. Copies of the individual Buckinghamshire Land Quality Forum strategies are available on request or can be viewed on the relevant local authority's website (see contact details in Appendix 4).

Despite the introduction of the Part 2A legislation, the planning process is still the main driver for dealing with land contamination issues. This will undoubtedly continue to be the case as government policy encourages the redevelopment of previously developed land ('brownfield' sites) to housing. As a result, land contamination issues will inevitably be a factor in many new developments.

National Planning Policy Framework (NPPF)

The National Planning Policy Framework (NPPF) March 2012 was introduced to help achieve sustainable development and it identifies the protection and enhancement of our natural environment as an aspect of

one of the three dimensions to sustainable development. As such land contamination, or the possibility of it, must be taken into account in the preparation of local and neighbourhood plans and is a material planning consideration in planning decisions. It remains the responsibility of the landowner/developer to identify land affected by contamination and, if necessary, to ensure that remediation is undertaken to secure a safe development. This will normally be achieved by attaching conditions to planning permissions requiring developers to perform a contamination assessment for their site. These conditions will typically be recommended by the Local Authority Environmental Health department in their role as statutory consultees to the planning process.

The NPPF states that:

“encouraging the effective use of land by reusing land that has been previously developed (brownfield land), provided that it is not of high environmental value” is a core planning principle.

“to prevent unacceptable risks from pollution and land instability planning policies and decisions should ensure that new development is appropriate for its location. The effects (including cumulative effects) of pollution on health the natural environment or general amenity and the potential sensitivity of the area or proposed development to adverse effects from pollution should be taken into account.”

“where a site is affected by contamination or land stability issues, responsibility for securing a safe development rests with the developer and/or landowner.”

Appendix 1 lists some examples of industries that may historically have contaminated or have the potential to contaminate the land they are sited upon, as well as neighbouring land.

Land uses that are considered sensitive to contamination include:

- All residential development
- Allotments
- Schools
- Nurseries
- Playgrounds
- Hospitals

Standard Planning Application (1APP)

In April 2008, the government department for Communities and Local Government (CLG) introduced the Standard Planning Application Form (1APP) to replace all existing planning application forms within

England. Section 15 ('Existing Use') of the 1APP form asks whether the proposal involves any of the following:

- Land which is known to be contaminated?
- Land where contamination is suspected for all or part of the site?
- A proposed use that would be particularly vulnerable to the presence of contamination?

15. Existing Use

Please describe the current use of the site:

Is the site currently vacant? Yes No

If Yes, please describe the last use of the site:

When did this use end (if known)?
DD/MM/YYYY
(date where known may be approximate)

Does the proposal involve any of the following:

Land which is known to be contaminated? Yes No

Land where contamination is suspected for all or part of the site? Yes No

A proposed use that would be particularly vulnerable to the presence of contamination? Yes No

If you have answered Yes to any of the above, you will need to submit an appropriate contamination assessment.

Figure 1 – Question 15 of 1 APP relating to contaminated land

Unless investigations have shown otherwise, any site subject to or adjacent to previous industrial use would be classed as land where contamination is suspected for all or part of the site. Any site with a proposed sensitive end use, as listed above, would be classed as a proposed use that would be particularly vulnerable to the presence of contamination. Therefore, where proposals involve either or both of the above scenarios, an appropriate contamination assessment will need to be submitted for the site with the planning application.

The following sections of this guide detail the information that should be submitted to the local authority as part of a planning application for development on land subject to or adjacent to previous industrial use and also where uses are being considered that are particularly sensitive to contamination. Appendix 2 presents a flow chart detailing the actions and information necessary at each stage of the planning process.

It is important to note that applications are likely to be not registered if they are submitted without a preliminary contamination assessment or if they fail to address all of the relevant issues in this guide.

Therefore, where a developer is proposing to develop on land that may potentially be contaminated, it is advisable to contact the relevant local authority's officer who deals with contaminated land, via the Local Planning Authority, to discuss any land contamination issues prior to submitting a planning application. It is important to remember that appropriate and timely action at this stage should reduce the likelihood of urgent and expensive action later in the process.

An advice note on how to complete question 15 of 1APP is available from each authority.

Environment Agency Consultation

The Environment Agency are the national regulators of controlled waters, which include rivers, groundwater, ponds, streams, canals, estuaries and coastal waters. The Environment Agency will normally be consulted by the Local Planning Authority on planning applications where:

- Development is proposed on previously developed land that may have given rise to contamination; and
- The site is located on an aquifer; and/or
- The site is located within 50 metres of a significant surface water body.

In such circumstances, the Environment Agency may recommend that conditions be attached to planning permissions requiring developers to perform a controlled waters contamination assessment for their site. These conditions may be imposed in addition to those recommended by the Local Authority Land Quality Specialists. The Environment Agency has produced their own 'Guidance on Requirements for Land Contamination Reports' (see References). Reference should therefore be made to this guidance where development sites may pose potential contamination risks to controlled waters. The Environment Agency guidance and the information contained in this document follow the same risk-based framework. Consequently, in both cases, the reporting requirements for each stage of the development process are very similar.

It is important to note that for sites where contamination poses potential risks to controlled waters, planning conditions will not be discharged until both the relevant Local Authority officer and the Environment Agency have approved all appropriate contamination assessment reports.

SITE CHARACTERISATION AND RISK ASSESSMENT

The Department for the Environment Food and Rural Affairs (Defra) and the Environment Agency published guidance in 2004 with the aim of providing a technical framework for applying a risk management process when dealing with land contamination issues. Reference should be made to this document, *'Model Procedures for the Management of Land Contamination – Contaminated Land Report 11'* (CLR11), before carrying out any phase of the site contamination assessment process. CLR11 can be downloaded for free from the Environment Agency's website (see References).

Site characterisation and risk assessment requires a phased approach. A Phase 1 assessment is predominantly a desk-based exercise, whereas a Phase 2 assessment involves intrusive investigation of the site. However, limited intrusive investigation may be required as part of a Phase 1 assessment in order to establish the nature of ground conditions on a site, such as the presence of made ground. If the Phase 1 assessment shows that contamination is or may be present on the site, then a Phase 2 assessment will be required.

The objective of the Phase 1 and Phase 2 investigations is to establish a risk assessment, which will enable the applicant and the regulators to clearly define the risk of harm from contamination to existing and proposed end users of the site, as well as to any other environmental receptors. Should unacceptable risks be identified, remedial works will be necessary to alleviate these risks.

Experienced and competent persons should perform all elements of the site characterisation process. This will usually involve the commissioning of a consultant or specialist. Such persons must be familiar with all current site investigation techniques and risk assessment methodologies. They should also be aware of current UK policy and the legislative framework surrounding land affected by contamination. The Buckinghamshire Land Quality Forum is unable to recommend specific consultants or contractors. Lists can be found in telephone and trade directories and on professional institution websites.

Phase 1 - Desktop Study, Site Walkover and Preliminary Risk Assessment

The Phase 1 assessment should consist of a desk study, site walkover, conceptual model and a preliminary risk assessment. The desk study comprises a search of available environmental information and historical maps, which can be used to identify the likelihood of contamination. A simple walkover survey of the site should be conducted to identify pollution linkages not obvious from the desk study. Limited intrusive investigation may also be appropriate at this stage. Therefore applicants need to familiarise themselves with the site and surrounding area, its former use and its potential to cause contamination.

The Phase 1 assessment should include:

- Detailed site plan showing the site location, extent and boundary;
- Site walkover information including description of condition of structures, soils and vegetation;
- Geographical setting of site including geology, hydrology and hydrogeology;
- Review of current and historical maps for site and surrounding area;
- Previous, present and proposed uses of the site and adjacent land;
- Previous and current industrial processes carried out on site including environmental permits;
- Details of pollution incidents or spillages;
- Information on waste management and disposal practices including landfill sites;
- Details of water abstractions, discharge consents, drainage and services;
- Information on any mining, extraction or infilling activities;
- A review of any previous desk studies or site investigations;
- Initial sampling of soils, water and gas where appropriate; and
- An awareness of all potential on and off site receptors.

From the findings of this work, a preliminary conceptual model will be developed for the site. This will normally be in the form of a table or schematic diagram illustrating any potentially significant sources of contamination; pathways through which contaminants can travel; and receptors that eventually could be harmed.

The preliminary risk assessment and conclusions derived from the conceptual model will indicate whether a Phase 2 contamination assessment (intrusive site investigation and risk assessment) is required. The Phase 1 assessment should be submitted as a written report to the local authority prior to commencement of a Phase 2 investigation, as the local authority or Environment Agency may require further information or clarification of issues.

Various companies offer a database generated desk study type report. It is acceptable for these kinds of reports to be included as part of a Phase 1 assessment. However, such reports submitted in isolation will be inadequate to provide all of the information required for a Phase 1 assessment.

Local Authority Land Quality Specialists are also very useful sources of environmental information for desk study purposes. Therefore it is advisable to contact the relevant departments to see if they hold any records relating to potential contamination issues with a particular site. Please note that there may be a charge for the provision of such environmental information.

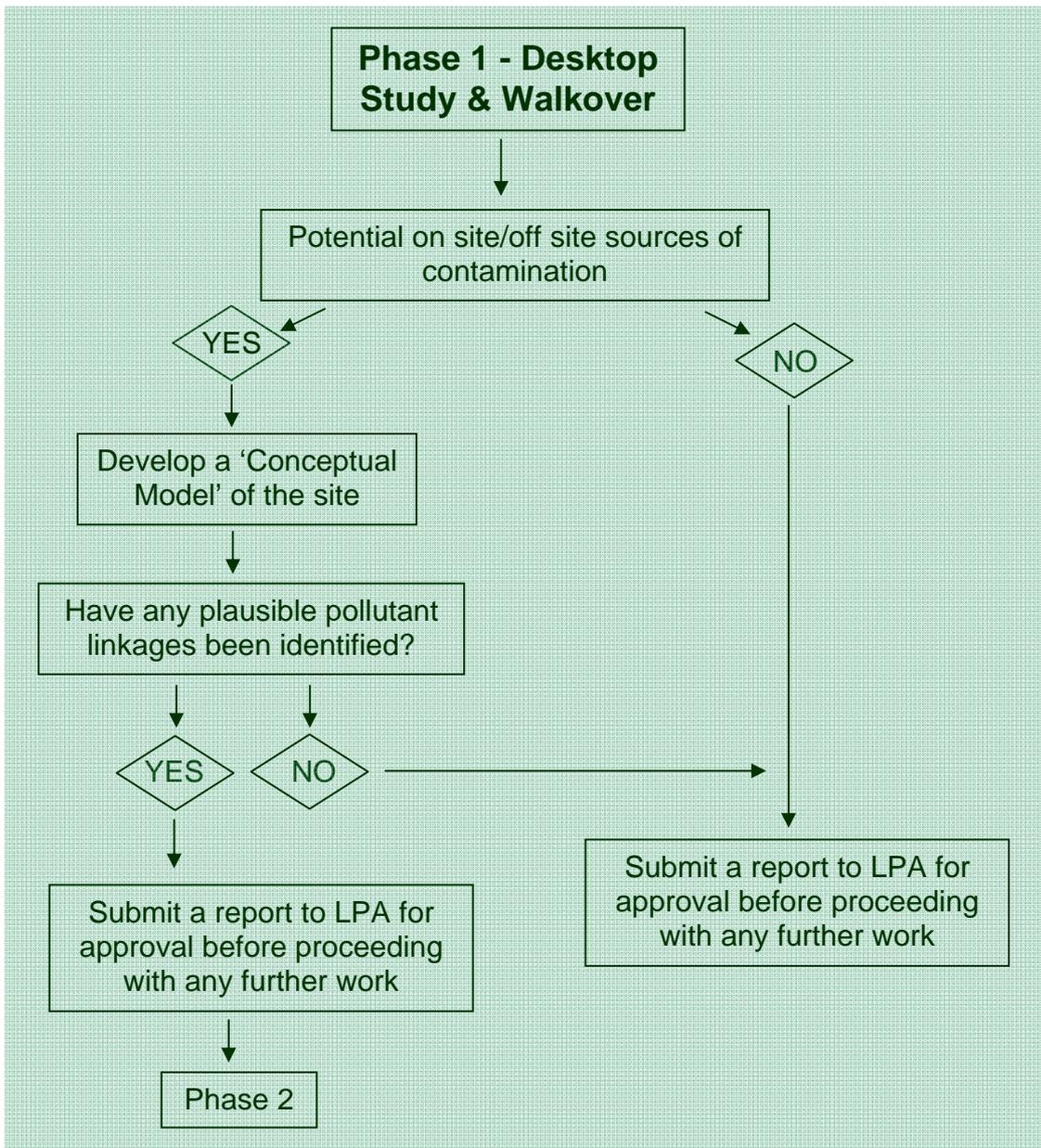


Figure 1 – Flow diagram of Phase 1 Desk Study, Site Walkover and Preliminary Risk Assessment

Phase 2 – Intrusive Site Investigation

A Phase 2 assessment consists of an intrusive site investigation and a subsequent risk assessment. The investigation process should seek to confirm potential source-pathway-receptor pollutant linkages at the site to allow refinement of the preliminary conceptual model. The data obtained will be used to inform a decision as to whether the site is potentially harmful and if remedial works are required to mitigate any risks from contamination present.

The intrusive investigation needs to be performed by a suitably qualified and experienced consultant or specialist. Investigation should be carried out in accordance with CLR11 and British Standard ‘BS10175:2011 Investigation of potentially contaminated sites – Code of practice’ (see References).

TECHNICAL GUIDE FOR PLANNING APPLICANTS AND DEVELOPERS

All sampling strategies should be designed to provide data that is representative of the site conditions as a whole. Sampling should be undertaken in accordance with recognised sample collection methodology and guidance. Reference to the historical site information obtained from the desk study is essential in order to target possible sources of contamination and to ensure that an appropriate suite of analysis is performed. Underground structures such as fuel tanks, pipework and foundations will also need to be identified. Off site sampling may also be required in order to assess whether migration of contamination is occurring away from the site.

A suitably accredited laboratory should be used to undertake analysis of samples. Where available, chemical analysis of samples must be by methods accredited to the Environment Agency's MCERTS (Monitoring Certification Scheme) standard.

Following completion of the investigation, analysis results need to be compared against suitable assessment criteria. Soil sample contaminant concentrations should be compared to Soil Guideline Values (SGVs) that have been developed to be protective of human health. Where these are unavailable for particular contaminants, the CIEH/LQM *'Generic Assessment Criteria for Human Health Risk Assessment'* may be used (see References). Assessment criteria can also be derived using the Environment Agency's CLEA UK Software. Other risk assessment tools might also be acceptable, but their use must be fully justified and conform to current UK policy.

The Environment Agency's *'Remedial Targets Methodology – Hydrogeological Risk Assessment for Land Contamination'* guidance should be used for assessing contamination risks to ground and surface waters (see References). The first step of the assessment is to compare water and leachate samples to the appropriate environmental water quality standards. If more detailed assessment is required, it is recommended that the Environment Agency are consulted.

BSI, CIRIA, CIEH and NHBC/RSK have all published guidance documents for ground gas risk assessment (see References). Where ground gas issues have been identified on a site, ground gas investigations and risk assessment need to be carried out in accordance with these documents.

Following completion of the investigation, a Phase 2 report detailing the investigation methodologies used, results, conclusions and recommendations needs to be submitted to the local authority for approval.

The report should include:

- Rationalisation for sampling locations including reference to desk study findings;
- Sampling techniques used;
- Plans of sampling locations;
- Borehole and trial pit logs;
- Groundwater and ground gas monitoring where applicable;
- Copies of laboratory analysis certificates;
- Discussion of ground, groundwater and gas conditions and any contamination encountered;
- Qualitative and quantitative risk assessments including comparison of analytical results with appropriate assessment criteria;
- Refinement of the conceptual model and preliminary risk assessment;
- Discussion of any uncertainties in relation to the conclusions; and
- Recommendations for further investigation (if required) and remediation.

If the Phase 2 assessment shows that there are unacceptable risks from contamination to human health, property or the wider environment, then remediation will be required.

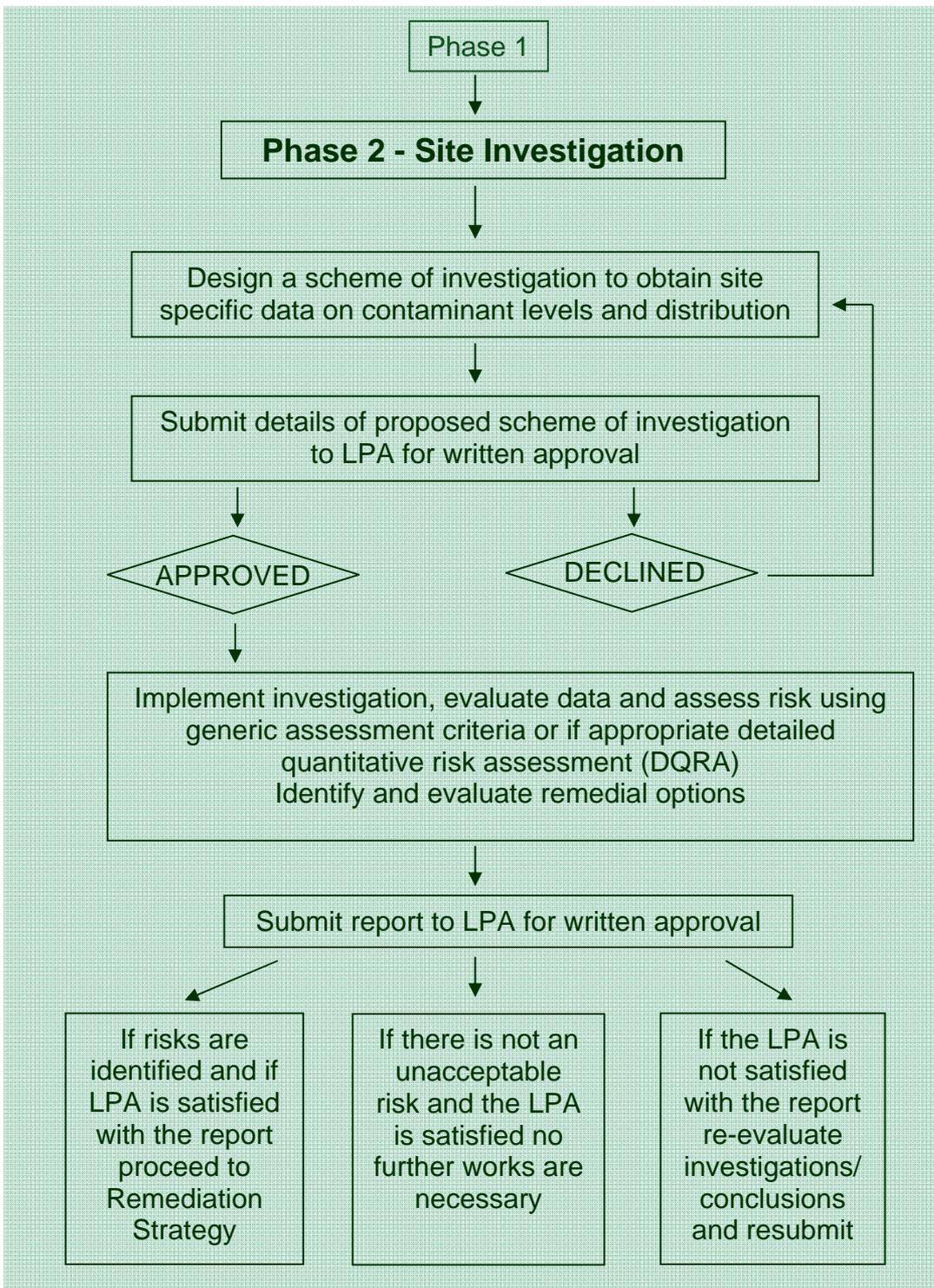


Figure 2 – Flow diagram of phase 2 Intrusive Site Investigation

REMEDIATION STRATEGY

A remediation strategy is a document detailing what action is to be carried out so that contamination no longer presents a risk to human health, property, the environment or ecological systems. The report should include details on how the remedial works will be validated to ensure that the remedial objectives have been met. The strategy must be submitted to and approved by the local authority prior to the commencement of remedial works at the site. If remediation of controlled waters is necessary, the Environment Agency will need to approve the proposed works.

Historically the most popular form of remediation to deal with contamination has been 'dig and dump' to landfill. However, current technology allows treatment of soils and waters contaminated to certain levels to be reused. The Buckinghamshire Land Quality Forum encourages the use of alternative and more sustainable remediation techniques to 'dig and dump'.

Such remediation techniques include:

- *In-situ* and *ex-situ* bioremediation of soils;
- Soil washing;
- Monitored natural attenuation;
- Air sparging and soil vapour extraction;
- *In-situ* and *ex-situ* thermal desorption;
- Permeable reactive barriers;
- *In-situ* chemical oxidation; and
- Soil stabilisation and solidification.

As part of the production of the remediation strategy, an options appraisal of feasible remediation options should be performed.

Some remedial works may require applications for environmental permits, licenses or consents, especially those involving waste management activities. All such agreements will need to be in place before site works commence. The Environment Agency should be consulted where works involve mobile plant or have waste management issues.

Where remediation requires importation of soil on to the site for use in garden or soft landscaped areas, this material must be 'clean' and suitable for use. Appropriate validation documentation will need to be submitted to the local authority to confirm that imported material is suitable for use. In certain

circumstances, material reclaimed from the site for reuse in garden or soft landscaped areas may also require validation before placement in these areas. Appendix 3 outlines the validation sampling policy which has been adopted by each Local Authority within the Buckinghamshire Land Quality Forum.

Any unexpected contamination or pathways discovered during site works need to be immediately reported to the local authority. Any necessary additional investigation, risk assessment or remedial works will need to be approved by the local authority.

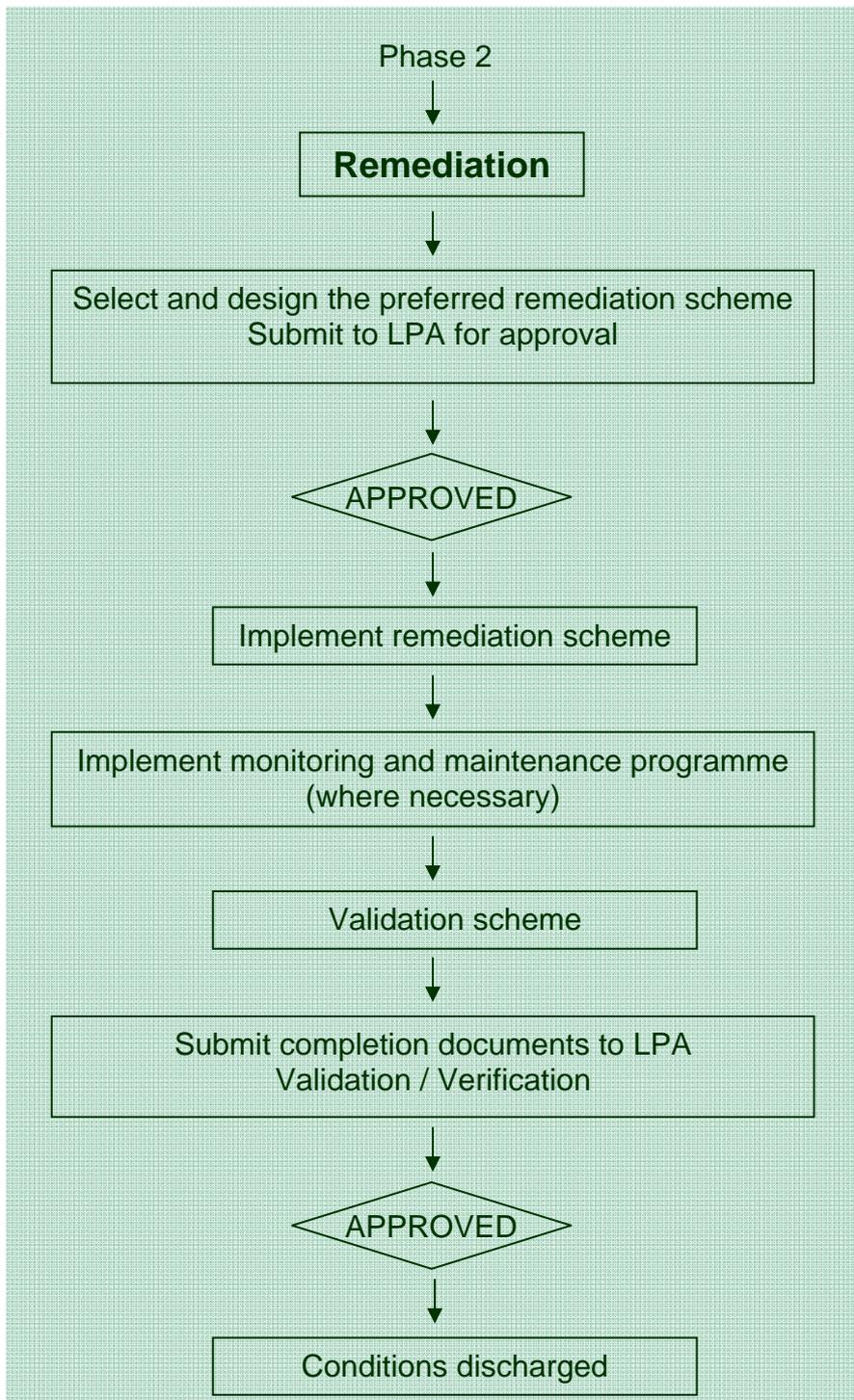


Figure 3 – Flow diagram of development and implementation of a remediation strategy

VERIFICATION/VALIDATION

Following completion of remediation works, the developer will be required to submit a verification report to the local authority for approval. This should normally be before construction works commence, unless the remediation forms part of the construction process (e.g. placement of cover layers in garden areas or installation of gas protection measures in buildings). The verification report should provide confirmation that all measures outlined in the approved remediation strategy have been successfully completed, including where appropriate, validation testing.

The report should include:

- A summary of the works carried out and the risks that have been managed;
- Validation sampling of any imported soils, including details of the source of material and appropriate analysis;
- All laboratory and *in-situ* test results and, if applicable, monitoring results for groundwater and ground gas;
- Photographic and other media records;
- Certification of any gas protection measures installed in individual buildings;
- Waste management and disposal documentation ('Duty of Care'); and
- Confirmation that the remediation objectives have been met.

In certain circumstances it may be necessary for the developer to conduct post-completion monitoring to verify that the remediation has been successful. This should be undertaken to the satisfaction of the local authority and the results of the monitoring should be submitted for review.

On large schemes where development may be phased, progressive discharge of the planning conditions may be possible provided a satisfactory verification report is received for each phase. In some cases a planning condition may remain post remediation where long term monitoring is still required.

When the council is satisfied that the site has been remediated and is suitable for use the Local Planning Authority will formally discharge the relevant planning conditions for the development.

OTHER ISSUES

There are some issues that developers need to consider for all phases of the investigation and remediation.

All submitted reports should be clear, ordered and rational and avoid the excessive use of scientific terminology and jargon. A summary written in non-technical language should also be provided. Copies of reports should be made available where possible in electronic format however hard copies will also be accepted.

The developer is responsible for ensuring that site workers and members of the public are protected from the potential effects of contamination during the entire process. Enforcement for health and safety matters on construction sites is the responsibility of the Health and Safety Executive (HSE).

Care must be taken during site works to ensure that additional pollutant linkages are not created. For example, piling can create direct pathways for contaminants to migrate into groundwater, open up routes for ground gas migration, and may expose site workers to contaminated arisings.

Just because a piece of land looks green and lush, it does not mean that there is no contamination at the site. It is always advisable that checks are made on the condition of the land at the start of any proposed development scheme. It should also be noted that when a property is built, a receptor is added to the site. This means that ensuring the land is free from contamination is of great importance.

If the investigations prove that there are no contamination issues to the local authority's satisfaction, then no further action will be necessary. Once this has been confirmed in writing by the local authority, then development will be able to proceed.

Land contamination is a serious planning issue. In cases of non-compliance, the local authority can take legal action.

If land is discovered to be affected by contamination following development of a site, local authorities have powers under Part 2A to take action to investigate the land and secure any necessary remediation. Obviously if the land is occupied this may mean severe disruption to the site occupiers. Legal action may be taken to ensure that land is sufficiently remediated and costs may also be recovered from the developer and/or landowner, regardless of whether they have performed the works.

KEY POINTS

- It is the applicant and developer's responsibility to ensure the safe development and secure occupancy of the site.
- It is important to identify actual and potential contamination pollutant linkages at an early stage in order to avoid unexpected costs and delays during and after development.
- Suitably qualified professionals should be employed to address contaminated land issues.
- A Phase 1 contamination assessment report should be submitted with any planning application involving land that is suspected or known to be contaminated and/or if the proposed end use is considered sensitive to contamination (e.g. housing, schools, playgrounds, allotments or hospitals).
- All reports and proposed actions will require written approval from the local authority.
- Maintaining a close and effective dialogue with the local authority at all stages of the process is essential to prevent circumstances that lead to delay, expense and/or legal action.

Acknowledgements

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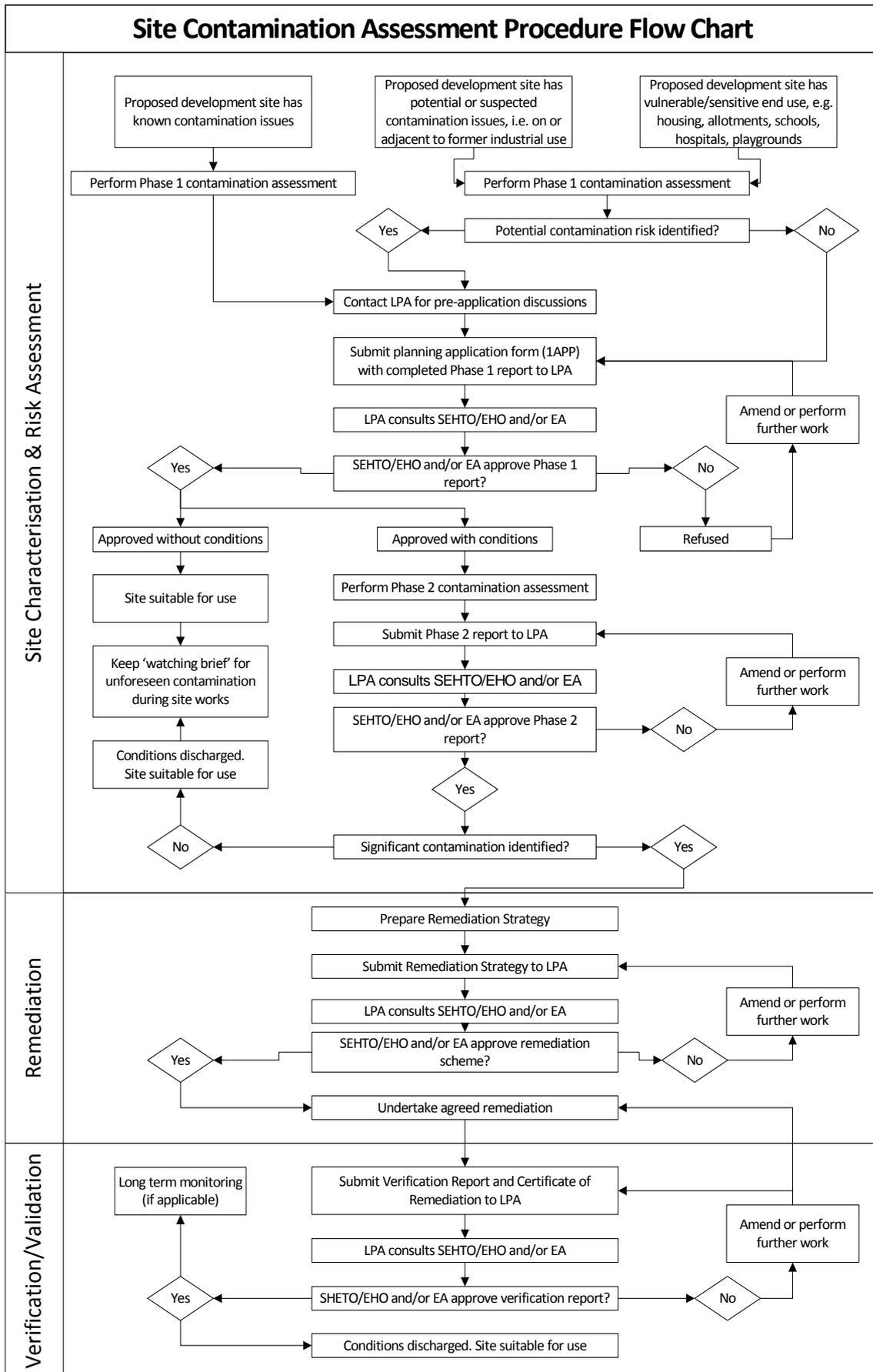
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APPENDIX 1: EXAMPLES OF POTENTIALLY CONTAMINATIVE LAND USES

- Foundries, metal processing & finishing works
- Heavy engineering & engineering works, e.g. car manufacture, electricity works
- Military/defence related activities e.g. former MOD land
- Electrical & electronic equipment manufacture & repair
- Gasworks, coal carbonisation plants
- Oil refineries, petroleum storage & distribution sites, storage of heating oil/heating oil tanks
- Manufacture & use of asbestos, cement, lime & gypsum
- Manufacture of organic & inorganic chemicals, including pesticides, acids/alkalis, pharmaceuticals, solvents, paints, detergents and cosmetics
- Munitions & explosives production, testing & storage sites
- Glass making & ceramics manufacture
- Textile industry, including tanning & dyestuffs
- Paper & pulp manufacture, printing works & photographic processing
- Timber treatment & saw mills
- Food processing industry & catering establishments
- Railway depots, dockyards (including filled basins), garages, road haulage depots, airports
- Landfill, storage & incineration of waste
- Sewage works, farms, stables, kennels, chicken farms & dairy's
- Abattoirs, animal waste processing & burial of diseased livestock
- Scrap yards
- Dry cleaning premises
- All types of laboratory
- Radioactive substances used in industrial activities, e.g. luminising works
- Burial sites & graveyards
- Agriculture – excessive use or spillage of pesticides, herbicides, fungicides, sewage sludge & farm waste disposal
- Naturally occurring radioactivity, including radon
- Methane & carbon dioxide production
- Garages for maintenance/repair of vehicles, workshops, transport haulage, bus depot
- Railways
- Brickworks, quarries, sand and gravel pits & unknown filled land
- Brewing & malting
- Gas works/ gas manufacturing & distribution
- Hospitals

APPENDIX 2:



LPA – Local Planning Authority SEHTO – Senior Environmental Health Technical Officer EHO – Environmental Health Officer EA – Environment Agency

APPENDIX 3: VALIDATION SAMPLING POLICY

Imported/recycled materials for backfill and capping

In order to ensure the quality assurance of imported/recycled material to be used for backfilling and/or capping, the Council expects that such material be either screened at the source or on a batch basis as it is brought onto the site to ensure that all materials meet the agreed specification by means of analytical testing. The rate of sampling is (approximately) one suite of analysis per 250m³ of materials for landscaped areas and one suite of analysis per 50m³ for residential gardens*.

Each sample will undergo laboratory testing for total and leachable parameters in accordance with the schedule below:

- Arsenic, boron, cadmium, chromium, copper, cyanide, lead, mercury, nickel, pH, phenol, selenium, sulphides, zinc, Total Petroleum Hydrocarbons, gasoline range organics (C4 to C10), diesel range organics (C11 to C28), oil range organics (C20 to C44), and Total PAH.

Results will be assessed against those generic guideline values that have been previously agreed with the Council's Contaminated Land Officer/Senior Environmental Health Technical Officer/Environmental Health Officer.

- Water-soluble sulphate.

Results will be assessed with Building Research Establishment Special Digest No1, "Concrete in Aggressive Ground" (Appendix A).

The results of the testing will be submitted to the Council's relevant officer who deals with contaminated land prior to the undertaking of the importation of inert fill materials to ensure their suitability and prevent the need for double handling of materials off-site should any of the testing fail the validation analysis.

Site excavations

Again, for reasons of quality assurance, the Council generally expects a minimum of 1 sample per side and 2 samples from the base for excavations dimensions of up to 10m x 10m x 1m in depth. For larger excavation dimensions the samples will be taken at intervals of 15 – 25m on the sides with a similar interval on the base. Sampling rates may vary from site to site depending upon the nature of the excavation – early contact with the Council's officer who deals with contaminated land is highly recommended. The use of PID measurements is highly recommended during excavation/sampling as an in situ screening tool.

Retrospective sampling

The Council expects, as a minimum, 2 samples (profile) per garden/plot.

* Figure relates to 1 sample per garden based on a garden size of 10m x 10m with a 0.5m depth of cover.

APPENDIX 5: CONTACT INFORMATION

Aylesbury Vale District Council

- ✉ Environmental Health and Licensing
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HP19 8FF
- ☎ 01296 585605
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Chiltern District Council

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Milton Keynes Council

- ✉ The Civic Offices
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District Council

Wycombe District Council

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