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Geoenvironmental
Ground Contamination and Testing

Site Investigation/Contamination Risk Assessment

In the British Isles, it is quite remarkable just how much countryside we have. But this land is heavily protected from the growing urban sprawl and threat of development and, inevitably, what developed space we have becomes ripe for re-development. This unavoidably involves a change in land use, such as from an industrial to a residential setting. As such, a site investigation is required to unveil the legacy of historical development in underlying soils and groundwater.

A site investigation is tailored to the scale and complexity of your site and involves the collection and analysis of soil, surface water, groundwater and ground gas data to locate the presence and severity of any potential sources of contamination that may present a risk to end users. A site investigation is undertaken in a single or number of phased stages. Information gathered from an initial Desk Study allows us to create an initial Conceptual Site Model (CSM). Phase 2 involves the excavation of trial pits or drilling of exploratory boreholes on-site. The information gathered enables us to update the CSM identifying any potential sources, pathways and receptors of contamination and subsequent pollutant linkages. The CSM informs the contamination risk assessment, classifying potential contaminants within the underlying soils, estimating level of risk and if further investigation is necessary. Remediation is then based on the finalised CSM where linkages have been proved.

Chemical Laboratory Testing

Ground & Water offers chemical laboratory testing services, which will help you in identifying any contamination present in the ground and groundwater, waste and excavated material earmarked for removal. We test anything from semi-metals to PAHs (Polycyclic Aromatic Hydrocarbons) and asbestos in soil and water. Our standard practice is to identify any potential determinands as a result of Phase I Site Investigation, (Desk Study) which shows possible sources of contamination on-site. The next stage of the site investigation includes Phase II, comprising of an intrusive site investigation followed by chemical testing of samples in a laboratory.

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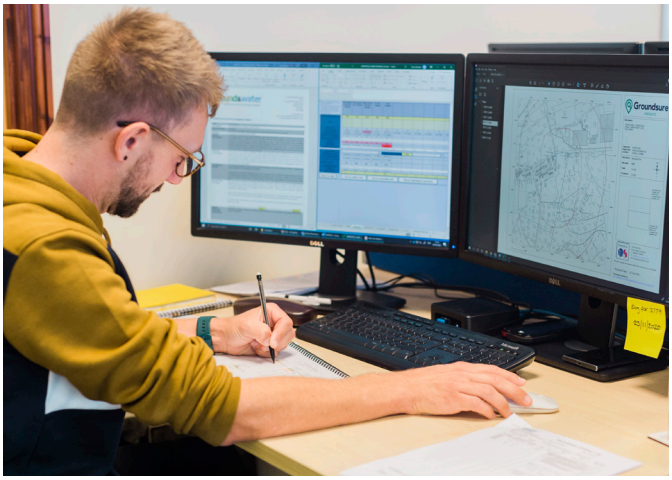
Generic Quantitative Risk Assessment

When investigating potentially contaminated land, a standardised risk assessment process is carried out to identify potential pollutants and assess their risks where necessary. A Generic Quantitative Risk Assessment (GQRA) falls into Phase 2 of this process and may be required where a contamination risk has been identified in Phase 1.

At its core, a GQRA involves the comparison of data against a set of existing screening criteria. This requires quantitative data, often gathered through intrusive investigations and testing, together with the appropriate generic assessment criteria (GAC) that adhere to industry standards. The GAC used are specific to the substance/pollutant detected.

The comparison of primary data against GAC allows for a refining of the conceptual site model to better assess site-specific pollutant pathways. Following this, remediation or further works (in the form of a Detailed Quantitative Risk Assessment) can be proposed.



Detailed Quantitative Risk Assessment

The purpose of a Detailed Quantitative Risk Assessment (DQRA) is to establish and use more detailed site-specific information and criteria to decide whether an unacceptable risk is present at the site. It is often undertaken following the GQRA in line with UK EA guidance, where one or more pollutant linkages may have been identified which require further assessment. A DQRA is typically undertaken on sites which are complex geologically and/or hydrogeologically. It is used to collate detailed site-specific information in order to refine the risk understanding within the pollutant linkages or to develop site-specific assessment criteria to be used within the risk assessment or remediation.

A DQRA is likely to consider the following factors:

- Complexity of the site, ground conditions and processes.
- Which contaminants and/or receptors need to be considered.
- Review of specialist information to assess the pollutant linkages.
- Review of both the combined and/or cumulative factors.
- Potential changes to the site.
- The uncertainty of data, such as unusual results.
- Confidence in the data.
- Transparency of risk that is fully justified.

Following the completion of a DQRA there will be a greater understanding of the conceptual site model enabling appropriate site-specific assessment criteria to be used to identify whether an unacceptable risk is present to the identified receptors.

Quantitative Asbestos in Soils Risk Assessment

Asbestos! As we continue to learn about the world around us, we also learn about the potential harmful substances it contains. One such material is asbestos. Before the 1980s, asbestos was used extensively within building material and was regularly referred to as 'the magic mineral'. Providing fire, thermal and acoustic insulation and often acting as protection and reinforcement in asbestos-cement, it can be found everywhere. As materials degrade, the asbestos they contain is released into the soil.

Asbestos is normally encountered in three forms: Chrysotile (white), Crocidolite (blue) and Amosite (brown). The type and amount of asbestos encountered within soils (or infused within concrete) tells us how much of a risk it presents. Once suspected asbestos is encountered, the sample of soil is sent to a laboratory for identification and quantification. The quantification provides a percentage of the type of asbestos encountered, which will be used for an asbestos risk assessment. The asbestos risk assessment is undertaken in accordance with the guidance of CIRIA733 based on the type of soil encountered and the quantified percentage.

Once the asbestos is identified and quantified the human health risk can be determined, typically for Lung Cancer and Mesothelioma. This also allows engineers to identify asbestos in soil sources for removal to a suitable landfill.

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Verification and Validation

Verification and validation works are undertaken following remediation works. The purpose is to confirm the remedial works have been successful and are documented to aid in the approval stage by the regulatory bodies.

This can involve:

- If soil is/has been imported or a cover system is to be adopted. Inspection is undertaken by a qualified engineer to ensure the thickness complies with the agreed requirement laid out in the remediation strategy.
- Soil chemical testing with comparison to appropriate standards to ensure the site is suitable for the proposed end use.
- Inspection of any contamination 'hot spots' identified in the intrusive investigation.
- Groundwater sampling can also be undertaken to meet remedial targets.

If you require any of the services described above, please email:
enquiries@groundandwater.co.uk
or call us on 0333 600 1221