clean up

MJCA
Technical advisers on environmental issues

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Issue 20

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Over 30 years of reliability in a changing environment

Inside this issue:

National Planning Policy Framework

The revised National Planning Policy Framework (NPPF) was published in 2018 and sets out the Government's planning policies for England and how these are expected to be applied. The guidance is available from the following link. The key sections relating to contaminated land are as follows:

118. Planning policies and decisions should:

c) give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; and

f) remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.

178. Planning policies and decisions should ensure that:

a) a site is suitable for its proposed use taking account of ground conditions and any risks arising from land instability and contamination. This includes risks arising from natural hazards or former activities such as mining, and any proposals for mitigation including land remediation (as well as potential impacts on the natural environment arising from that remediation);

b) after remediation, as a minimum, land should not be capable of being determined as contaminated land under Part IIA of the Environmental Protection Act 1990; and

c) adequate site investigation information, prepared by a competent person, is available to inform these assessments.

What a waste!

It is just over 10 years ago since CL:AIRE introduced the Definition of waste: The Development Industry Code of Practice (DoWCoP). The scheme has been highly successful although based on MJCA experience, there is still some confusion regarding the management and re-use of materials in site development projects. The following provides a brief summary of the key issues associated with the management of materials and waste on development sites.

What is the definition of waste?

Materials are only considered to be waste if they are discarded, intended to be discarded or required to be discarded by the holder. Once discarded, they remain a waste until fully recovered. This remains the case even when the holder of the waste changes and the subsequent holder has a use for it.

Exclusions from the DoWCoP include:

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Services

- Environmental planning
- Contaminated land and remediation
- Geotechnical, ground and landfill engineering
- Waste process management solutions
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What a waste! - continued

"Waste Acceptance Criteria (WAC) testing is not suitable for waste classification purposes and WAC testing is used to determine suitability for disposal in landfill…"

"...land (in-situ) including unexcavated contaminated soil and buildings permanently connected with the land..." and "...uncontaminated soil and other naturally occurring material excavated in the course of construction activities where it is certain that that the material will be used for the purpose of construction in its natural state on the site from which it was excavated..."

These are definitions set out in guidance but the definition of waste is still a matter for the courts to decide.

What is not a waste?

- Natural soil with a suitable use and certainty of use at the site from which it was excavated. It is not a waste even if stored temporarily. Natural soil is not the same as inert waste.
- Aggregate, including bricks, tiles and concrete, that has been processed to meet the WRAP quality protocol.
- Imported primary aggregates/clay and secondary aggregates, topsoil manufactured to an approved specification from a permitted facility

What is a non-waste under DoWCoP?

- Natural soil from another (donor) site with a suitable use and certainty of use for engineering or general fill / construction purposes.
- Contaminated soil, including made ground from the site of origin, with a suitable use and certainty of use or from another site after permitted treatment on- or off-site (hub site)

What are some of the reasons why materials on a development site may be a waste?

Any materials discarded or intended to be discarded which applies to materials brought to site as well as sent away from site. For example:

- It is not needed (e.g. surplus to requirements).
- It is not suitable for use without processing (e.g. screening, crushing), often this applies to made ground and contaminated soils.
- There is no certainty of use at the time it was produced (even if a use is 'found' later)
- It is material which arises from invasive-weed-infected soil/plants
- It is mixed construction and demolition materials e.g., plasterboard, glass, wood and pipework. Accordingly it is important to implement a site waste management plan to segregate the materials on site.

Any activity on site involving waste including storage, treatment use or disposal may need a permit to be held by the organisation carrying out the activity. Certain treatment activities for the purpose of improving geotechnical properties of the materials and creating a suitably engineered soil may be considered not to be waste treatment activities. These include lime/cement stabilisation techniques, vibro and dynamic compaction, ground surcharging and soil reinforcement.

Why is Waste classification necessary?

It is part of 'Duty of Care' requirements to classify the waste. The main document used to help classify waste is the Environment Agency document entitled "WM3 Waste Classification: Guidance on the classification and assessment of waste". An assessment is necessary to determine what hazardous properties are present, which could initially include a desk study to assess if the materials to be excavated are likely to be natural and to assess if there have been any past industrial activities and therefore what types of contaminants are likely. Soil sampling is necessary to record the contaminants present and to assess their hazardous properties including the concentration and chemical classification (hazard statement/ properties) and if above the hazardous waste threshold (based on the method set out in WM3). Waste Acceptance Criteria (WAC) testing is not suitable for waste classification purposes. WAC testing is used to determine the suitability of the material for disposal in landfill (inert and hazardous).

What are the options for managing the materials/waste?

This depends on the nature of the materials, how they are used and site specific circumstances. Some examples include:

- The materials are not a waste in accordance with the Waste Framework Directive
- The use of waste permit exemptions for low risk activities (e.g. U1, T5, T7)
- The use of a Quality Protocol to recover

What a waste! - continued

materials (usually through a process which is the subject of a permit) to a specification that meets a relevant WRAP protocol

- The application of Environment Agency Regulatory Position Statements for example the use of manufacture topsoil, the treatment of asphalt, the reuse of PFA/FBA
- The activity needs an Environmental Permit
- The materials can be managed under one of the CL:AIRE Definition of Waste Code of Practice (DoWCoP) scenarios.

What next?

It is understood that although DoWCoP Version 3 has been in preparation for some time it will not now be released. Further guidance on the existing version of the scheme is being prepared. by CL:AIRE..

Development of contaminated land

Contaminated land in England is dealt with under statutory legislation and the land use planning system generally. The Model Procedures for the Management of Land Contamination, CLR 11, published by the Environment Agency and the Department of Environment, Food, and Rural Affairs in 2004 is a technical framework for applying a risk management process when dealing with land affected by contamination. The assessment process involves identifying, making decisions on and taking appropriate action to deal with land contamination in a way that is consistent with government policies and legislation within the UK. For a development under the planning system it is the responsibility of the developer to carry out the appropriate site assessments and any remediation necessary to ensure that the development is safe and suitable for its intended use. These actions are secured normally through planning conditions rather than other legislation because the development provides both the opportunity and the resources to carry out remediation works where necessary and to take account of factors such as the proposed site layout and the management practices.

The revised National Planning Policy Framework (NPPF) was published in 2018 and sets out the government's planning policies for England and how these are expected to be applied. The guidance is available from the following link. The revised Framework replaces the previous NPPF published in March 2012. There are no substantive changes in the revised guidance with regard to the development of land which is contaminated.

Despite the legislation and guidance being in place over several decades, Local Authority contaminated land officers who review technical documents submitted as part of an application for the development of contaminated land are concerned that some of these supporting documents are still not prepared to a suitable standard and do not follow CLR11 guidance. The Yorkshire and Lincolnshire Pollution Advisory Group (YALPAG) which comprise the contaminated land officers from the local authorities in these regions together with a number local authorities in the North East, a total of 38 local authorities, have published a guidance document entitled "Development on Land Affected by Contamination Technical Guidance for Developers, Landowners and Consultants" dated March 2018 a copy of which is available here. The purpose of this guidance is to promote consistency and good practice for development on land affected by contamination. The guidance sets out information regarding the preparation of a preliminary risk assessment phase comprising a desk study and site investigation including the details of the type of information which is needed in preparing these reports. Where the preliminary risk assessment identifies potential risks from the development of contaminated land information is provided in the guidance with regard to the need to carry out a detailed quantitative risk assessment and a remediation options appraisal when assessing further land affected by contamination as part of land development to determine which remediation options are the most appropriate and how the remediation strategy will be implemented. Although there is nothing new in this guidance, it sets out clearly the information necessary for the assessment and development of contaminated land together with four checklists including the information needed for a preliminary risk assessment, site investigation and risk assessment and, where the remediation of contaminated land is necessary a checklist for the remediation strategy and a Verification Report.

"...The guidance sets out information regarding the preparation of a preliminary risk assessment phase comprising a desk study and site investigation..."

Ground gas assessment

"Gas monitoring data recorded with field equipment can occasionally record anomalies for example 'false positive' concentrations of methane …"

Ground gas assessment is carried out routinely as part of contaminated land investigations. The method typically involves the analyses of ground gases using field equipment at monitoring boreholes. The gases recorded generally comprise methane, carbon dioxide and oxygen concentrations and most field equipment can record trace gases such as carbon monoxide and hydrogen sulphide. Atmospheric pressure and gas flow rates and differential pressure at the monitoring boreholes are also recorded generally.

To assess whether the concentrations of methane or carbon dioxide have the potential to represent a hazard to a proposed development, a gas screening value (GSV) is calculated. The GSV is calculated by multiplying the maximum gas concentration (as a mathematical value) recorded at each monitoring borehole by the maximum measured borehole gas flow rate. The calculated GSVs are used to assess the ground gas regime at the development site within a specified 'Characteristic Situation', whereby a GSV Characteristic Situation 1 is a very low risk and a GSV Characteristic Situation 6 is a very high risk. Depending on the GSV results there are a number of different methods for the application of this data with regard to the need for gas protection and mitigation measures such as the additional characterisation scheme devised by the National House Building Council (NHBC) using a colour coded 'traffic light' system based on a GSV and the concentrations of methane and carbon dioxide recorded. For example where the gas regime is classified as 'Amber 1' based on the GSV and gas concentrations, this would require the housing development to be constructed with low level gas protection using a membrane and ventilated underfloor void in accordance with BRE Report 414, with the ventilated void providing at least one air change per day. Where the gas regime is classified as 'Red', the development of a low rise residential housing is not acceptable without further detailed assessment of the ground gas regime, a suitable risk assessment and mitigation measures.

Carbon dioxide is widespread in the sub surface environment and is generated by natural microbial and geochemical processes. If there is any organic, carbonate or pyrite content to the soils or rocks then carbon dioxide could potentially be present at concentrations as high as 21% v/v. Carbon dioxide can be recorded in natural strata, made ground and landfills. Similarly methane can arise from a variety of sources including the degradation of organic matter in superficial deposits such as peat, alluvium and some glacial deposits, as well as from made ground and landfills and Coal Measures. It is important therefore that a suitable Conceptual Site Model is developed to assess the likely source of the ground gases recorded and the potential pathways so that an appropriate investigation can be carried out and the data can be interpreted based on reasonable assumptions.

Gas monitoring data recorded with field equipment can occasionally record anomalies for example 'false positive' concentrations of methane can be recorded on contaminated sites associated with other organic gases in the ground. Testing the ground gas with a photoionisation detector (PID) to record if other organic gases are present can help assess if the recorded concentrations are false positives, although a more robust assessment may be necessary to confirm the gas composition whereby a sample of ground gas is tested by a specialist laboratory. Testing the gas sample for methane, carbon dioxide, oxygen, nitrogen, carbon monoxide and a suite of volatile organic compounds (VOC) including ethane, ethene, butane, propane, pentane, hexane and heptane should help confirm if elevated VOC concentrations are present which can potentially cause a false positive elevated concentrations of 'methane' recorded by field equipment. The composition of the gas provided by laboratory testing is also helpful to assess the likely source of the gas for example from made ground, landfill or Coal Measures using a range of interpretative methods including graphical plots of the gas data.

One method is the use of a ternary plot of gas concentrations allow for trends in gas composition to be determined which can help to identify the potential source of the ground gas. An interpretation of a ternary

Ground gas assessment—continued

plot can also help to assess whether the classification of the gas Characteristic Situation needs to be reassessed. When plotting the gas concentration data on a ternary plot it is considered that the gases methane, carbon dioxide, oxygen and nitrogen comprise 100% by volume of the gas and that there is no contribution from any trace gases. Trace gases are typically recorded at parts per million concentrations although these trace components need to be considered as part of an overall assessment of the source of the ground gas. One method of plotting the data is to use the relative proportion of methane, carbon dioxide and oxygen in each sample as the gas concentration and divided by the concentration of nitrogen, which represents the relative proportions of each gas, excluding nitrogen. Plotting these results can be used to distinguish between landfill gas and gas from Coal Measures.

If the data is still inconclusive stable isotope analysis of the isotope carbon C_{13} can be used to distinguish if the methane is from the biodegradation of materials in made ground or a landfill and therefore a biogenic source, or from Coal Measures which is a thermogenic source.

Development of small brownfield sites

The National House Building Council (NHBC) Foundation supported the preparation of a guidance document published by CIRIA entitled, "A guide to small brownfield sites and land contamination", released in November 2018.

The guidance document provides advice for house builders regarding issues associated with small brownfield sites. It deals with ground conditions such as contamination, derelict structures and buried services and other characteristics of small sites that can impinge on the viability of the development of a small project. The guide also includes a section on managing dormant brownfield sites. The guideline document can be download from the following link.

The document includes the definitions of site size and brownfield sites, guidance on getting professional advice, the steps necessary before purchasing a brownfield site, including financial viability, the need for environmental due diligence, the planning context, funding options and grants/government incentives and developing a risk register and project programme.

Information about the planning application stage, including the likely planning conditions, the need for ecological surveys, contaminated land investigation including groundwater and ground gas assessment and geotechnical assessment, information about the Community Infrastructure Levy, and the benefits of a warranty and engagement with building control. There is information regarding the preparation for building works, including Building Regulations approval applications, the discharge of planning applications, and the process of the preparation of a remediation strategy. In each section the guide includes informative case studies.

Details regarding the construction phase include implementing the remediation strategy and completing verification actions, the need for ground improvement, information about managing waste (including waste exemptions and WRAP protocols and recycling aggregates), managing the effects of construction, changes to plans, phase financing and site inspections. The document concludes with a closeout section including final inspection, verification reports, health and safety, discharge of planning conditions, waste records, asbestos register and homeowner packs.

Although this document is very informative it is quite technical. Understanding the process set out in each section for the development of small brownfield sites is certainly beneficial to a developer although it is quite a substantial document and there are other guidance documents which provide this information in a simpler and easier to follow format.

"The guidance document provides advice for house builders regarding issues associated with small brownfield sites"

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MJCA provides independent advice on environmental issues to the public and private sectors. Delivering our services to high technical standards and commercial awareness enables us to provide practical, cost effective advice and sustainable solutions. Further information regarding our services can be found on our website www.mjca.co.uk

CONTACT US

Please contact Kevin Eaton for more information on any of the issues raised in this newsletter, or on any other Contaminated Land issues.

Soil guideline values

The Environment Agency (EA) has withdrawn the Soil Guideline Value (SGV) and supporting toxicological (TOX) report for mercury which was published in 2009. This follows discussions with Public Health England regarding a revised opinion from the European Food Safety Authority (EFSA). In 2012, EFSA published their scientific opinion on public health risks from inorganic mercury and methyl mercury in food. A summary and the full report is available here. EFSA recommended the use of oral tolerable daily intake (TDI) values for both inorganic mercury and methyl mercury in the assessment of guideline criteria which are lower than the oral health criteria value (HCV) that was used in deriving the former SGV. The EA will not update or publish new reports as it is no longer involved in preparing this guidance information.

The SGV Report, the TOX Report, and the supporting information document for mercury will remain available for historical reference on the Government and Environment Agency archives and on the CL:AIRE WALL, which can be found here.

The SGVs were developed using Contaminated Land Exposure Assessment (CLEA) software tool and whilst some SGVs are still in use there has been publication of more widely used generic assessment criteria (GAC) for soils including the GACs for 89 potential contaminants presented in the document entitled "The LQM/CIEH S4ULs for Human Health Risk Assessment" published in 2015 referred to as "Suitable for use levels" (S4ULs) and the GACs for 35 substances presented in the Environmental Industries Commission (EIC) document entitled "The Soil Generic Assessment Criteria for Human Health Risk Assessment". Generic and site specific risk assessment criteria can be derived using the CLEA software tool and it is also possible to assess whether a measured concentration in soil, and where available a measured concentration in ambient air, indoor air and vegetables will present a risk to human health under certain circumstances.

Comparison of the concentrations of contaminants recorded in samples of soil with GACs provides an initial assessment regarding land contamination. If a substance is recorded at a concentration in soil which exceeds a GAC this does not mean necessarily that the land is Contaminated Land as defined in legislation nor does it mean that there is a potential unacceptable risk to the health of site users. To assess the potential health risks to site users requires more detailed site specific quantitative risk assessment.