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What's in your Backyard?

The Environment Agency has provided a service call What's in your Backyard (WIYBY) for the last 20 years. The series is an interactive environmental database whereby information is presented on a map. For example the location of current and historical landfill sites, the extent of groundwater source protection zones and the location of groundwater abstractions, aquifer classifications and many other categories. It is an extremely useful tool for assessing the environmental sensitivity of a site setting. The Environment Agency were intending to close this website at the end of July 2017 although this has been postponed. Some of the datasets have been moved to DATA.GOV.UK for use under open government licence.

It was intended originally for users to be able to download the data for use on their own systems. By clicking on the "Link" button within the Resource Locator section on the DATA.GOV.UK website, access is provided to where the data can be download. Most of the data is provided as shapefiles which is a file format for spatial data. It is necessary to use GIS (Geographic Information System) software to use a shapefile, there are a number of online and free applications that can be used. Some data is provided in a tabular format (as Microsoft Excel spreadsheets or Access databases). Where datasets are provided with location information as coordinates, either as Eastings and Northings or National Grid References, this data can be used to show the locations on a map and can also be used in Google Earth.

It is not known if the intention of the Environment Agency is to close the WIYBY website in the future. MJCA is using GIS systems currently and are able to access the datasets for to rapidly assess site settings, sensitivities and constraints.

British Standards

The ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. ISO 18400 standards for Soil quality – Sampling has been prepared by Technical Committee ISO/TC 190, Soil quality, Subcommittee SC 2, Sampling. These standards cover a wide variety of situations in which investigations including sampling to determine soil quality may be carried out.

A Drafting Panel has been set up to consider how British Standard BS10175 Investigation of potentially contaminated

sites – Code of Practice should be amended, revised and rationalised to ensure compatibility to accommodate the new BS ISO 18400 standards. These are to be included as a simple amendments the present version of BS 10175.

A more extensive review and revision BS10175 Investigation of potentially contaminated sites – Code of Practice is due in 2018. Kevin Eaton, Technical Director at MJCA has recently joined as a member of the working group.

Risk assessment for hydrocarbons

“The objective of this guidance is to establish an effective, reliable and consistent approach to petroleum hydrocarbon assessment within hydrogeological risk assessments.”

There are two recent publications which will help to standardise the approach to risk assessment by providing technical information which can be applied in risk models, provide information regarding the behaviour of hydrocarbon contaminants and to provide generic assessment criteria as a primary screening tool to assess the concentrations of contaminants recorded in samples of groundwater. A summary of these publications is presented below.

Petroleum Hydrocarbons in Groundwater: Guidance on assessing petroleum hydrocarbons using existing hydrogeological risk assessment methodologies.

This guidance has been prepared by CL:AIRE (Contaminated Land: Applications in Real Environments) together with Shell Global Solutions and reviewed by the regional regulatory authorities and Defra and is supported by the Environmental Industries Commission (EIC), the Society for Remediation Professionals (RemSoc), the Soil and Groundwater Technology Association (SAGTA) and the Society of Brownfield Risk Assessment (SoBRA). The document provides guidance on the assessment of the risks to groundwater from petroleum hydrocarbon compounds and provides a supplementary report to the Environment Agency Remedial Targets Methodology (RTM): Hydrogeological Risk Assessment for Land Contamination report.

The objective of this guidance is to establish an effective, reliable and consistent approach to petroleum hydrocarbon assessment as part of a hydrogeological risk assessment. The large number of hydrocarbon compounds present in a range of petroleum products such as fuels, lubricants and bitumens, together with a broad range of analytical techniques for determining and characterising hydrocarbons, has led to inconsistencies in the approaches used for incorporating this information into hydrogeological risk assessments. The guidance includes advice on how to:

- Evaluate the risk from hydrocarbon mixtures;

- Select and interpret the data from available analytical techniques;
- Estimate the implications of non-aqueous phase liquid (NAPL) for dissolved phase groundwater risk assessments; and
- Promote a lines-of-evidence approach to support the consideration of natural attenuation processes (principally biodegradation) in site-specific risk assessments of petroleum hydrocarbons.

The document also provides advice on selecting appropriate water quality targets for petroleum hydrocarbon compounds. The migration of petroleum hydrocarbon compounds in the subsurface is also a potential pathway to human receptors, including vapour intrusion into buildings which can also be via transport with groundwater. The risks to human health may also need to be assessed although this is not covered in this guidance document.

The guidance document can be accessed from the following [link](#).

Development of Generic Assessment Criteria for Assessing Vapour Risks to Human Health from Volatile Contaminants in Groundwater

The Society of Brownfield Risk Assessment (SoBRA) has prepared this report which presents a methodology and Generic Assessment Criteria (GAC) that risk assessors may choose to use to help in the assessment of chronic health risks from the inhalation of vapours arising from groundwater (GAC_{gwvap}).

Volatile contaminants in groundwater have the potential to affect human health via volatilisation and migration of vapours into overlying buildings or outdoor air space followed by inhalation. Where the Conceptual Site Model identifies this contaminant linkage as being of possible concern it is usually necessary to assess the risks arising from this pathway to determine whether these are acceptable or not.

One approach is to apply a screening method





Risk assessment for hydrocarbons continued

to compare the concentrations of volatile contaminants recorded in samples of the groundwater with suitable GAC_{gwvap}. Provided the assumptions that underpin the GAC_{gwvap} are suitably precautionary for the site being assessed this comparison can be used to screen out contaminants and thereby to focus a more detailed risk assessment process on those contaminants which remain a concern following the screening process.

SoBRA have develop a methodology that would be suitable for assessing the long-term (chronic) risk to human health from inhalation of vapours arising from groundwater which is compatible with the UK approach to risk assessment. This methodology has been applied to derive GAC_{gwvap} for selected contaminants including petroleum hydrocarbons, polycyclic aromatic hydrocarbons (PAHs), a range of pesticides and halogenated organic compounds together with a few other organic compounds and

elemental mercury. There is also a range of organic compounds listed in the report for which GAC_{gwvap} have not been derived due to these compounds being insufficiently volatile or having insufficient aqueous solubility.

As with GAC for providing a screening assessment of contaminants in soil, it is necessary to make sure that a suitable and robust Conceptual Site Model is developed so it can be assessed whether application of the GAC_{gwvap} is appropriate given the site specific circumstance. The application of GAC_{gwvap} for groundwater are extremely useful as this will allow more focused risk assessment to be carried out where necessary to be able to demonstrate that certain contaminants do not need to be considered further in the risk assessment process.

The guidance can be accessed via the SoBRA [website](#) although it is necessary to become a member of the society.



Brownfield Land Registers

The Town and Country Planning (Brownfield Land Register) Regulations 2017 are intended to fulfil Government policy that brownfield land is used as much as possible for housing. Local authorities already collect information on housing land supply, including brownfield land, although the data is not necessarily consistent or easily accessible. The brownfield registers policy is intended to support a general increase in housing supply.

The current planning application process asks developers to provide substantial amounts of information up-front, even as part of an application for outline planning permission. This means that developers will often have to expend significant time and cost prior to achieving certainty that any development will be able to go ahead in principle. Permission in Principle introduces a new way of obtaining planning permission for housing-led development.

Permission in Principle is designed to separate decision making on 'in principle' issues addressing land use, location and amount of development from matters of technical detail. The aim of Permission in Principle is to provide certainty that the fundamental principles of development are acceptable before developers need to get into costly, technical matters. Permission in Principle must be followed by an application with all the necessary technical details covering remaining detailed matters such as the design of buildings, development layout and landscaping schemes.

An explanatory memorandum can be accessed [here](#). The Department for Communities and Local Government are to publish guidance to support the introduction of brownfield land registers and Permission in Principle.

“Local authorities already collect information on housing land supply, including brownfield land...”

Guidance on the approach to groundwater protection

“...GP3 contains technical information which is of interest to practitioners involved in preparing risk assessments in support of Environmental Permit applications or selecting compliance points...”

A new version of the Environment Agency (EA) Groundwater Pollution Prevention Principles (GP3), was issued in March 2017. The guidance describes how the EA manage and protect groundwater. The guidance document is entitled “The Environment Agency’s approach to groundwater protection” and can be accessed [here](#). GP3 was previously revised in 2012 and was intended to be a single controlled document which the EA suggest should be accessed on-line and which they will update periodically.

The principles in the guidance have not changed and the EA has not introduced any new position statements, although the text has been revised and updated. The intention is that the revised guidance aligns with the government digital transformation aims to be able to find the information you need more quickly. This means that much of the background text from GP3 has been removed and archived and can no longer be accessed on the web pages. New web pages have been produced for certain definitions, Environmental Permitting Regulations (EPR) exclusions and discernibility. GP3 contains technical information which is of interest to practitioners involved in preparing risk assessments in support of Environmental Permit applications or selecting compliance points for use in land contamination risk assessments. The technical guidance presented in GP3 was intended to lead to greater consistency nationally when determining remedial goals to protect surface and groundwater resources and follows a similar format as set out in the guidance related to EPR.

The EA position statements are available in a single downloadable pdf document. The guidance clarifies the EA position statements covering a broad range of activities for example land contamination, solid waste management and the discharge of liquid effluents into the ground, together with statements on specific activities such as mining pollution, cemetery developments and burial of animal carcasses. Information on cemeteries has been consolidated and put onto separate web pages rather than pdf documents.

A key objective for the prevention of pollution groundwater includes preventing the input of hazardous substance into groundwater and limiting the entry of non-hazardous pollutants. Where hazardous substances or non-hazardous pollutants have already entered groundwater the guidance is to minimise further entry and take necessary and reasonable measures to limit pollution to groundwater which may include reducing the expansion of a contaminant plume. Where there is a passive release of pollutants from land contamination discharging to groundwater this does not need to be permitted under EPR unless there is an activity that disturbs the contamination and causes a new discharge of pollutants. The EA consider that voluntary remediation schemes and measures under planning and development control regimes, Anti-Pollution Works and Part 2A provide the necessary controls over passive discharges from land contamination. Most pollution incidents resulting in an impact on the quality of groundwater are likely to be dealt with by the EA under the EPR where the 2017 incidents ‘...*cause or knowingly permit a water discharge activity or groundwater activity...*’. The term ‘*groundwater activity*’ includes both those activities that require a permit, and those activities that are unlawful, for instance causing pollution to groundwater, whether deliberate or accidental. The consequences of unforeseeable accidents or exceptional circumstances may not be determined by the EA to be a groundwater activity although this does not apply in circumstances where the release of pollutants is due to the poor design of facilities, negligence or poor operating practices, since such events are neither unforeseeable nor exceptional.



SAGTA—C4SLs

At the beginning of 2015 the Soil and Groundwater Technology Association (SAGTA) whose members include the Homes and Community Agency, National Grid and Shell announced that they are to support the next phase of preparing Category 4 Screening Levels (C4SLs) for possibly up to 50 substances. A Steering Group has been established which comprises professionals from Defra, The Environment Agency, Natural Resources Wales, Public Health England/Wales, Homes and Community Agency and representatives from several local authorities. A consultation process invited selected industry representatives from a wide-range of backgrounds and who are technically focussed to select a range of substances which together with a response from an open consultation will be used to derive C4SLs for a short-list of 25 substances initially.

Defra have published previously C4SL for six contaminants (arsenic, cadmium, chromium VI, lead, benzo (a) pyrene and benzene) as part of the SPI010 project.

SAGTA have recently announced a call for an expression of interest from toxicologists to assist in the preparation of the criteria. Therefore it is likely to be quite a while before the free publication of C4SLs is released.

There has recently been the an update to the ATRISK Soil Screening Values (SSV) with the criteria provided for 100 compounds. These have been developed using the Contaminated Land Exposure Assessment (CLEA) model v1.071 software based on C4SL exposure assumptions and land uses comprising:

- residential with consumption of home-grown produce,
- residential without consumption of home-grown produce,
- commercial,
- public open space (residential),
- public open space (parks), and
- allotments

For residential and allotments land uses the criteria are calculated using a predicted

exposure from each home grown produce type. The two produce groups that result in the highest predicted exposure are set at the 90th percentile consumption rates and the remaining produce groups are set at the mean consumption rate. This is the method set out in the C4SL Project Methodology documentation.

Generic assessment criteria (GAC) for soils for 89 potential contaminants are presented in the document entitled “The LQM/ClEH S4ULs for Human Health Risk Assessment” published in 2015 referred to as “Suitable for use levels” (S4ULs), Furthermore GACs are published for 35 substances in the Environmental Industries Commission (EIC) document entitled “The Soil Generic Assessment Criteria for Human Health Risk Assessment”.

One of the most significant modifications in the development of C4SLs was to apply a toxicological threshold for contaminants referred to as a ‘Low Level Toxicology Concern’ (LLTC) which is based on the principle of ‘low risk’ rather than applying the toxicological data which had been used to determine the Health Criteria Value (HCV) which is the approach that had been applied previously in the CLEA model to develop the Soil Guideline Values (SGVs) and which is regarded as the principle of ‘minimal risk’.

This has led to a range of guidance criteria available currently and with more C4SLs on the way. Given that they are ‘screening levels’ all the generic criteria are precautionary.

It is likely that certain contaminants will have two set of generic criteria, a C4SL and a GAC. Currently only benzo (a) pyrene has both a published GAC and C4SL. The C4SL criteria are significantly higher than the GAC, for example for allotment land use with 1% organic carbon the GAC value is 0.97mg/kg whereas the C4SL is 5.7mg/kg. The use of higher criteria values that are likely with C4SL may open up the debate on what is precautionary and the principle of ‘minimal risk’.



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Technical advisers on
 environmental issues



ABOUT MJCA

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.

Misclassification of waste

The waste and resource management industry including input from MJCA has published an easy to use guide on common misconceptions in waste classification and how to avoid them. The guide lists the most common mistakes in waste classification, explains why they are wrong, and sets out what to do about. It covers categories such as waste acceptance criteria (WAC), List of Waste/European Waste Codes (EWC) and hazard property codes, as well as waste types such as metals, hydrocarbons and inert wastes. For example one of the most common problems in waste classification for contaminated land is using landfill Waste Acceptance Criteria (WAC) results to classify a waste. A WAC test will not identify whether a waste is hazardous or non-hazardous. Another example is only analysing the determinands listed in the WAC tables whereas the analytical suite must be based on the hazardous substances that might be present in the waste which may be based on an assessment of the historical land uses on site.

Waste must be classified as being either hazardous or non-hazardous using the characterisation assessment and analysis described in the WM3 technical guidance. The Hazardous Waste (Miscellaneous Amendments) Regulations 2015, which give effect to

the new waste classification system in England, came into force in July 2015. The Environment Agency together with Natural Resources Wales (NRW), the Scottish Environment Protection Agency (SEPA) and Northern Ireland Environment Agency (NIEA) has published supporting guidance entitled "Guidance on the classification and assessment of waste (1st edition 2015). Technical Guidance WM3". The Classification, Labelling and Packaging Regulations (CLP) which introduce a new system of chemical classification based on hazard statements have replaced the old methodology which was based on risk phrases.

Generally for waste classification assessment of contaminated soil it is necessary to base the assessment on the likely worst case substance or combination of substances that may reasonably exist associated with a contaminant and that is most likely to result in each hazardous property applying. There is specific guidance in WM3 on the assessment of construction and demolition waste containing asbestos, waste containing coal tar, waste soils and waste containing or contaminated with oil all of which may be encountered during the investigation and development of contaminated land. Where it is necessary for contaminated waste soil to be removed off site, careful

classification of the waste soil in accordance with WM3 is important and MJCA has developed in-house tools to assist in the classification of waste.

The guide prepared by the Environmental Service Association (ESA) can be accessed [here](#)

