

Essentials of Contaminated Land Management (CLM) – An introduction to contaminated land management

EMAQ+ and Land Quality Management Ltd (LQM) are working in partnership to offer the 'Essentials of Contaminated Land Management (CLM)' training course for local authority officers.

This structured package of training is delivered in 5 separate units. This training opportunity is intended as a foundation course for officers with land contamination related responsibilities to demonstrate that they have the knowledge necessary to operate under Part 2A(or Part iiA as it is referred to in Scotland) of the Environmental Protection Act 1990 and relevant requirements of the Town and Country Planning etc. Acts. In addition, and building on this foundation, intermediate, advanced and refresher training will continue to be offered separately by LQM under the EMAQ+ programme.

The purpose of this training opportunity is to provide officers with the following core skills and knowledge in relation to CLM:

Organisational/administrative

- An ability to access and use appropriate data sources
- An understanding of the administrative requirements of Part 2A; e.g. to maintain a decision record for individual sites
- An understanding of the roles of potential partners/other stakeholders
- A knowledge of sources of guidance and support

Policy and law

- An understanding of the policies, legislation, key guidance and processes underpinning Part 2A and other regimes and how they interrelate
- An understanding of the differences in risk evaluation between Part 2A and planning
- An understanding of risk-based good practice to CLM and of the principles and approaches to human health risk assessment (HHRA) including the four stages of the risk assessment process (hazard identification, hazard characterisation, risk estimation and risk evaluation) and the use of proprietary software models

Science

- An understanding of the range and behaviour of common contaminants
- An understanding of toxicology and its application to HHRA
- An understanding of the various techniques to remediate contaminated land (soil and groundwater)
- Able to undertake a simple remediation option appraisal

Regulatory

- An ability to develop conceptual site models for current and intended land uses
- An understanding of the various types of site investigation techniques
- An ability to formulate site specific aim and objectives for intrusive investigations
- An understanding of the principles and practices of sampling
- An ability to critically review third party site investigation, risk assessment and remediation reports

Though each of the five units may be taken separately it is intended that over time officers would attend all five; together the five units comprise an integrated programme of study that, if completed successfully, leads to a Certificate of Proficiency in CLM. Those achieving the Certificate will have demonstrated that they have a foundation level knowledge and

understanding of the functions required of a local authority. This knowledge, when coupled with practical experience gained 'on the job' as part of an individual's continuing professional development plan, will provide them with the necessary confidence to operate effectively, and their managers with evidence of an individual's ability to implement CLM requirements at the defined level.

The course is, therefore, a vehicle for personal development and a means by which LAs may strengthen their infrastructure for delivering CLM. Those taking the course should view it as a partnership between themselves and their sponsoring organisations (usually the Authority they work for); consequently participants are required to obtain the active support of their management before they can register. More detail and the Rules of Participation can be found at <http://emaq-opa.aeat.com/>

The five training units are all entitled "Essentials of CLM..." in common with EMAQ+'s other successful foundation programmes and so as to distinguish them from other courses offered by either EMAQ or LQM and are as follows:

1. Essentials of CLM – Overview of Contaminated Land Management
2. Essentials of CLM – Site investigation
3. Essentials of CLM – Risk Assessment
4. Essentials of CLM – Remediation and brownfield redevelopment
5. Essentials of CLM – Peer reviewing third party reports

Seminar 1: Essentials of CLM – Overview of Contaminated Land Management

The purpose of this seminar is to introduce the background to land contamination and the key legal frameworks for its control, including, in particular: Part 2A/iiA of the Environmental Protection Act 1990, the various planning regimes in each of the four countries in the UK, the role of local regulators in those frameworks and the central importance of risk assessment.

TOPIC	Theory or Practical	Learning outcome
Introduction to the Essentials of CLM package	Theory	Understand the purpose of the training package and introduce key elements: <ul style="list-style-type: none"> • The 5 separate units • distinction between Essentials of CLM and ‘advanced’ courses • seminar and course assessment
Policy, legislation etc <ul style="list-style-type: none"> • Part 2A Environmental Protection Act 1990 • Development Control • Other 	Theory	Understand the key legal drivers for risk based contaminated land management in the UK; highlight differences between the four countries and between different regulatory regimes.
Duties of a Local Authority Officer	Theory	Understand the legal duties of LA Officers under Part 2A of the Environmental Protection Act 1990 (and subsequent revisions)
The Risk Assessment Framework	Theory	Understand the four stage risk assessment framework in a risk based land management context
The Conceptual Site Model <ul style="list-style-type: none"> • Development • Creating • Using 	Theory and practical	Understand the role of and development of the conceptual site model (CSM) including the significance of uncertainty in the CSM for risk assessment
Questions		

Seminar 2: Essentials of CLM – Site investigation

The purpose of this seminar is to introduce the processes of developing a conceptual site model, designing a site investigation and selecting methods of obtaining appropriate and sufficient soil, groundwater and gas samples in the field. In the process, the basic chemistry of some common contaminants and considerations of contaminant 'fate' and 'transport' will be introduced.

TOPIC	Theory or Practical	Learning outcome
LA Officer duties	Theory	Understand how, working with partners/stakeholders as necessary, to ensure the right information is collected to inform regulatory decisions
Intrusive site investigation: Introduction and objectives	Theory	Understand how to use the uncertainty identified in the conceptual model to design the site investigation
Practical: Task 1 Exercise	Practical	Experience, from working in groups, how to formulate and express the aim and SMART objectives of a site specific intrusive investigation
Intrusive Site Investigation Techniques	Theory	Understand the commonly used techniques of site investigation
Sampling Strategies	Theory	Understand the link between the objectives of a site investigation and the sampling strategy (where, what and how to take soil, water and vapour/ ground gas samples).
Practical: Task 2	Practical	Formulate basic sampling strategies
Analytical Strategies	Theory	Given the link between the objectives of a site investigation and the analytical strategy, understand how the analytical strategy may influence the sampling strategy. Understand the relative strengths and weaknesses of site and laboratory analyses. Understand the importance of correct sample containers, preservation and transportation.
Practical: Task 3	Practical	Formulate basic analytical strategies for common scenarios (e.g. former petrol station; former gasworks; former landfill site).
Questions		

Seminar 3: Essentials of CLM – Risk Assessment

The purpose of this seminar is to introduce the principles of generic and detailed quantitative risk assessment for human health and groundwater. It will cover the use of generic assessment criteria and the role of site specific assessment criteria.

TOPIC	Theory or Practical	Learning outcome
LA Officer duties	Theory	Understand the role and objective of risk assessment and what LA Officers are required to do by means of risk assessment under Part 2A and Planning
Human Health Risk Assessment: UK Policy and Guidance	Theory	Understand UK policy on human health risk assessment, including the different levels of risk in Part 2A and planning
Human Health Risk Assessment: The Basics	Theory	Understand how the source pathway receptor paradigm is quantified for human health
Toxicology and Health Criteria Values	Theory	Understand the dose response relationship for threshold and non threshold behaviour and the nature of different types of health criteria and health guideline values
Using Generic Assessment Criteria (Soil Guideline Values; LQM/CIEH GAC; C4SL)	Theory & practical	Understand how to use various generic assessment criteria (including EA SGVs, Defra C4SLs, LQM/CIEH S4ULs)
Data Interpretation & representative Site Concentrations	Theory	Understand basic interpretation of site investigation data
Using software to derive assessment criteria (demonstration & practical)	Practical	Understand how to use industry standard software to derive assessment criteria
Detailed Quantitative Risk Assessment	Theory	Understand how to gather and use site specific information (eg bioaccessibility or plant uptake) to develop site specific assessment criteria. Understand how the LQM/CIEH Dose-Response Roadmaps can inform risk evaluation.
Questions		

Seminar 4: Essentials of CLM – Contaminated land remediation and brownfield redevelopment

The purpose of this seminar is to give participants familiarity with the range of remediation technologies used in the UK to demonstrably break the source-pathway-receptor contaminant linkage. Participants will also practice using the conceptual model (as introduced in seminar 2) to inform remediation options appraisal and will gain awareness of the key strategies in verifying remediation has achieved its objectives. An insight into the evolving understanding of what sustainable remediation is will be provided. The interaction between remediation and brownfield redevelopment will be explored.

TOPIC	Theory or Practical	Learning outcome
LA Officer duties	Theory	Understand what LA Officers are required to do by means of options appraisal and verification under Part 2A and Planning
What is Risk Management?	Theory	Understand how remediation contributes to risk management
Waste legislation	Theory	Understand how the waste regulation regimes interact with contaminated land management
Remedial technologies including: <ul style="list-style-type: none"> • Civil-engineering technologies • Monitored natural attenuation • Permeable reactive barriers • Biological technologies • Physical technologies • Chemical technologies • Thermal technologies • Solidification/stabilization 	Theory	Understand the basic way in which commonly used remediation technologies operate and indicators of good and bad implementation
Options selection	Theory	Understand how to use a conceptual site model to inform remediation options appraisal
Options selection Practical Exercise	Practical	Execute a simple remediation option appraisal
Monitoring and verification	Theory	Understand circumstances when on-going monitoring might be required and how achievement of remediation objectives may be verified
Brownfield redevelopment	Theory	Understand how integrating remediation with redevelopment of brownfield sites can enhance the economic viability and overall sustainability of redevelopment projects.
Questions		

Seminar 5: Essentials of CLM – Peer reviewing third party reports

The purpose of this seminar is to give delegates a framework for reviewing third party (whether local authority contractor or planning applicant) site investigation, risk assessment and remediation reports. This seminar draws on the previous 4 and acts both to consolidate and integrate the learning as well as providing useful skills in what to look for in third party reports.

TOPIC	Theory or Practical	Learning outcome
Management and enforcement issues	Theory	Costing; charges; risk summaries; fraudulent reports.
Reviewing Desk study and Walkover Reports & Practical 1	Theory & practical	Understand what to look for in reports of desk studies and walkover surveys
Reviewing Phase Intrusive investigation Reports & Practical 2	Theory & practical	Understand what to look for in factual and interpretive site investigation reports
Reviewing Risk Assessment Reports & Practical 3	Theory & practical	Understand what to look for in risk assessment reports – including how to check the derivation of assessment criteria
Remediation reports	Theory	Understand what remediation option appraisal, design and verification reports should contain.
Sources of Information	Theory	Where to deepen your knowledge and keep up to date.
Questions		